THE EFFECTS OF MACROECONOMIC VARIABLES AND INSTITUTIONAL QUALITIES ON STOCK PRICES: A PANEL DATA ANALYSIS.

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WESTERN SYDNEY UNIVERSITY

A dissertation submitted for the degree of Doctor of Philosophy

Western Sydney University

2021

DECLARATION

I hereby declare that the discussion and presented in this report is solely my own research and that, to the best of my knowledge, the research is original, except where references to other writers or studies indicate otherwise.

There has been no part of this dissertation applied for any other degree or certificate.

[redacted]

(Mohammad Toammel Hossain)

Date: 05 July 2021

ACKNOWLEDGEMENT

I am indebted to Dr Mamta B Chowdhury, my principal supervisor, who deserves special thanks for her excellent guidance and support during this study. Her prompt direction, outstanding organisation, and enormous encouragement assisted me greatly not only during my current research cycle but even before that when I was studying for my Graduate Certificate in Research studies at Western Sydney University.

Associate Professor Girijasankar Mallik, who co-supervised my research and thus assisted me in conducting my econometric analysis, is also thanked greatly.

I'm also grateful for the inspiration and guidance I've received from different friends and family members. Finally, I'd like to mention that any inaccuracies or errors in this dissertation are solely my responsibility.

(Mohammad Toammel Hossain)

Date: 05 July 2021

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ABBREVIATIONS

ACWI	All Country World Index
ADF	Augmented Dickey-Fuller
AEX	Amsterdam Stock Exchange
AIC	Akaike Information Criterion
APT	Asset Pricing Theory
ARDL	Autoregressive Distributed Lag
AR-GARCH	Augmented Autoregressive GARCH
ARMA	Autoregressive–Moving-Average Model
ATVR	Annualised Traded Value Ratio
CAPM	Capital Asset Pricing Model
CPI	Consumer Price Index
CR	Corruption Risk Rating
DDM	Dividend Discount Model
DH	Dumitrescu-Hurlin Test
DJ	Dow Jones
DJIA	Dow Jones Industrial Average
DOLS	Dynamic Ordinary Least Square
DSE	Dhaka Stock Exchange
ECM	Error Correction Mechanism
ECT	Error Correction Term
EGARCH	Exponential Generalized Autoregressive Conditional Heteroskedasticity
EMH	Effective Market Hypothesis
FDI	Foreign Direct Investment
FEVD	Forecast Error Variance Decomposition
FMOLS	Fully Modified Ordinary Least Square
FPE	Final Prediction Error
FPE	Final Prediction Error
GARCH	General Autoregressive Conditional Heteroskedasticity
GCC	Gulf Cooperation Council's

GCF	Gross Capital Formation
GFC	Global Financial Crisis
GFD	Global Financial Development
GMM	Generalized Method of Moments
GNI	Gross National Income
GNP	Gross National Product
GS	Government Stability
HQ	Hannan-Quinn Information Criterion
ICRG	International Country Risk Guide
IMF	International Monetary Fund
IPI	Industrial Production Index
IPS	Im, Pesaran and Shin
IR	Interest Rate
IR	90 Days Bank Bill Rate Used as Interest Rate
IRF	Impulse Response Function
KLSI	Kuala Lumpur Syariah Index
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
LLC	Levin, Lin And Chu
LnCPI	Natural Logarithm of Consumer Price Index
LnCR	Natural Logarithm of Corruption Risk Rating
LnFDI	Natural Logarithm of Foreign Direct Investment
LnGS	Natural Logarithm of Government Stability
LnIPI	Natural Logarithm of Industrial Production Index
LnOPEN	Natural Logarithm of Trade Openness
LnREER	Natural Logarithm of Real Effective Exchange Rate
LnREMI	Natural Logarithm of Workers' Remittances
LnRGDP	Natural Logarithm of Real Gross Domestic Product
LnSPI	Natural Logarithm of Share Price Index
LR	Sequential Log Likelihood Ratio
LSE	London Stock Exchange
M3	M3 Money Supply

MENA	Middle East and North Africa
MSCI	Morgan Stanley Capital Inc.
NASDAQ	National Association of Securities Dealers Automated Quotations
NPV	Net Present Value
NYSE	New York Stock Exchange
OECD	Organisation for Economic Co-Operation and Development
OLS	Ordinary Least Square
OPEN	Trade Openness
PGC	Panel Granger Causality
PP	Phillips–Perron
PRS	Professional Risk Solutions Pty Ltd
PSE	Philadelphia Stock Exchange
PVM	Present Value Model
REER	Real Effective Exchange Rate
REMI	Workers' Remittances
RGDP	Real Gross Domestic Product
SEA	South East Asian
SIC	Schwarz Information Criterion
SML	Security Market Line
SVAR	Structural Vector Autoregression
TSX	Toronto Stock Exchange
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
USA	United States of America
VAR	Vector Autoregressive
VDC	Variance Decomposition
VECM	Vector Error Correction Model
WACC	Weighted Average Cost of Capital
WDI	World Development Indicators

ABSTRACT

The unresolved dispute about the stochastic behaviour of the financial exchange, macroeconomic factors, and their cointegrating residuals continues. There is no consensus on the nature of the interaction between capital market returns and macroeconomic variables. This study aims to observe whether the institutional quality and macroeconomic variables individually and/or jointly contribute to the dynamic behaviour of the stock market. In particular, this study attempts to analyse the long run equilibrium and short-term dynamic relationship between the stock prices of developed and emerging markets and selected institutional quality and macroeconomic variables over the period between 1984 and 2019.

The major outcome of this thesis is that it provides various empirical results on the bivariate and multivariate causality and cointegrating relationships between the share price index and macroeconomic and institutional quality variables of 21 developed and 9 emerging markets around the world. The major variables used in this study are Share Price Index (SPI), Real Gross Domestic Product (RGDP), Industrial Production Index (IPI), Consumer Price Index (CPI), Foreign Direct Investment (FDI), Workers' Remittances (REMI), Real Effective Exchange Rate (REER). Trade Openness (OPEN), Interest Rate (IR), Corruption Risk Rating (CR), Government Stability (GS). This study also observed a known structural break in 2008 attributable to the global financial crisis (GFC), and a dummy variable D_{GFC} is used to capture the impact of GFC on the share price indices.

The robustness of restricted and unrestricted Vector Autoregressive (VAR) and Fully Modified Ordinary Least Square (FMOLS) and Dynamic Ordinary Least Square (DOLS) frameworks were tested for this purpose. Using an updated data set of 36 yearly observations collected from 1984 to 2019, an empirical framework represents the linkage among variables of interest. Particularly, a

wide range of techniques, including panel unit root tests, Pedroni Cointegration tests, Panel Granger Causality tests was employed, which demonstrated that the share price index corresponds to long run and short run, the relationship of selected macroeconomic and institutional quality variables.

This study found that there exists cointegrating relationship among selected variables of developed markets. Emerging and developed markets combinedly demonstrated the same cointegration results, but emerging markets demonstrated no cointegrating relationship among variables.

This study suggests that in developed markets, real GDP, industrial production, foreign direct investment, worker's remittances, and real effective exchange rate positively influences the share price index in the long run. However, trade openness has a mixed influence on the share price index in the long run in developed markets. Similar results are found for emerging and developed markets combinedly in the existing literature. For example, in developed markets, the Consumer price index positively influences the share price index, but the consumer price index has a negative effect on the share price index in emerging and developed markets combinedly. This study also finds that, in emerging markets, real GDP growth, FDI growth, REER growth, corruption risk rating, and government stability positively influence share price growth in the short run. But interest rate has a negative influence on share price growth in the short run.

This study recommends that policymakers in developed and emerging markets promote manufactured exports by providing incentives and adopting economic policies that will enhance productivity, government spending, better education and training to enhance productivity and accelerate economic growth. This, in turn, will generate employment, income, and long run potential for the country. It appears that the export of labour force promotion is a feasible economic growth strategy. For this strategy to be attained, policymakers should guide policies to support expanding international trade. This recommendation can be achieved when policymakers of developed markets will encourage and facilitate foreign direct investment from other countries and the employment of citizens in foreign countries. These will accelerate economic growth and generate employment. This study also recommends that policymakers in developed markets maintain a stable real effective exchange rate to accelerate economic growth. Depreciation of the real exchange rate would improve the attractiveness of firms' goods in terms of cheaper rates and increase their revenues from other countries. This higher export contributes to further income for the domestic firms and thus boosts the firms’ values and share price. Therefore, real exchange rate depreciation will lift the real share price. Policymakers can provide supports to promote net exports. This could be accomplished by adopting new policies that would enhance productivity gain, such as introducing better technologies. This would make domestic products cheaper and attract foreign countries to import.

The empirical results, along with the outcome, provide the basis for policy and investment implications, emphasizing that using macroeconomic indicators would be beneficial to policymakers and securities investors in promoting the development of the stock market.

1 Chapter 1: Introduction

1.1 Introduction

A competent stock market is the backbone (Fisher, 1907) of an economy as it plays a crucial role in economic growth and efficiency in the financial sector. It also creates investment channels that contribute to attracting domestic and foreign capital (Ahmad et al., 2015). In addition, the stock market serves as a valuable platform for channelling funds from savers to the borrowers of an economy (Alshogeathri, 2011). Thus, an efficient stock market can contribute to the economic growth and prosperity of a country by stabilising the financial sector. However, at the same time stock market can also be a potential risk to the economy. Stock market crashes occasionally took place since 1929, from the Tulip Mania Bubble to the Chinese stock market crash in 2015-16, including the global financial crisis in 2008-2009. All of these crushes had an adverse impact on economic growth through the downturn and even a significant negative impact on corporate profits (Leigh, 1997). A well-functioning stock market favours profitable companies' shares rather than those of failed companies, relying on the concept of the pricing system (Leigh, 1997). Therefore, the market mechanism guarantees the efficient productivity of the present and potential resources available to the economy, in the sense that the cost of capital to a prosperous business would be smaller than the cost to failed firms (Leigh, 1997).

Academics and practitioners have studied the determinants of stock returns and the factors of stock return fluctuations from a macroeconomic viewpoint, among the numerous questions regarding the diverse issues of the stock market (Chen et al., 1986; Fama, 1990; Hsing & Hsieh, 2012). While their results vary due to various markets and timeframes, they allow investors to make informed financial decisions, assist policymakers in designing financial policies, and help academics, researchers, observers, and financial analysts to obtain a better understanding of the stock market activities and test new advanced mechanisms for the growth of the market.

The key contributions of this study are that the results clarify the nexus between macroeconomic conditions and the stock market through discussion of existing literature and rigorous quantitative analysis not only for developed economies but also for emerging economies. Nonetheless, the recent studies on share markets continue to concentrate on the success of financial markets in emerging economies where they have been recently formed and appear to be more fragile than markets in developed economies (Abugri, 2008; Başcı & Karaca, 2013; Rahman et al., 2009).

This study explores selected developed and emerging markets listed by Morgan Stanley Capital Inc. (MSCI), carrying out a literature review on the global financial market. Therefore, more perspectives into fostering and stabilising the output of the developing and emerging markets need to be investigated. The research objectives, questions, and hypotheses are discussed in the following pages, which also explain the purpose and goals of this study. The research contributions are subsequently presented to illustrate how the analytical results may improve the relationship between various macroeconomic and institutional qualities and the stock market.

1.2 Objectives of the Study

Existing literature has attempted to enhance the understanding of the efficiency of the stock market by analysing multiple determinants from a macroeconomic viewpoint. However, the existing literature has limited research on the relationship between institutional efficiency and macroeconomic indicators, considering the relevance of this issue, especially in the context of developed and emerging markets. As a result, the key objective of this analysis is to perform analytical studies on the effect of institutional quality and macroeconomic variables on the developed and emerging countries' stock market and their volatility.

The objective of this study also includes the investigation of whether the institutional quality and macroeconomic variables individually and/or jointly contribute to the dynamic behaviour of the stock market. In particular, this study attempts to analyse the long run equilibrium and short-term dynamic relationship between the stock market and selected institutional and macroeconomic variables over the period from 1984 to 2019.

Selected macroeconomic and institutional quality variables are Real Gross Domestic Product (RGDP), Consumer Price Index (CPI), Industrial Production Index (IPI), Foreign Direct Investment (FDI), Workers' Remittances (REMI), Real Effective Exchange Rate (REER), Trade Openness (OPEN), Interest Rate (IR), Corruption Risk Rating (CR), Government Stability (GS).

The specific objectives of this study are as follows:

1. Determine the relationship between each of the selected macroeconomic and institutional quality variables and the share price of the selected countries using panel data analysis.

2. Determine the effect of change in selected macroeconomic and institutional quality variables on the volatility of share price in selected countries using panel cointegration methodology.

3. Determine the direction of the causal relationship between share price and selected macroeconomic and institutional quality variables.

1.3 Research Questions and Hypotheses

Previous research studies, such as Fama (1981, 1990), Geske and Roll (1983), and Chen et al. (1986), and Schwert (1989), among others, show a link between the movements of macroeconomic factors between increased price fluctuations in the stock market. In order to shed light on the relationship, if any, between institutional quality and macroeconomic variables and the behaviour of the stock market, it is therefore important to analyse the relationship between the stock market and a collection of institutional quality and macroeconomic variables.

The recent studies on share markets continue to concentrate on the success of financial markets in emerging economies where they have been recently formed and appear to be more fragile than markets in developed economies (Abugri, 2008; Başcı & Karaca, 2013; Rahman et al., 2009). It is important to distinguish the stock markets of developed countries from that of emerging countries as the previous studies demonstrated that the share price of these two markets reacts differently to the effects of selected variables of the study (Liu, 2013; Özen & Tetik, 2019).

For example, inflation has an inverse relationship with stock returns in developed economies like the USA, Australia, Canada, Japan, France, Germany, Italy, the Netherlands, Switzerland, and the UK (Barrows & Naka, 1994; Chen et al., 2005; Chen et al., 1986; Fama & Schwert, 1977; Fama, 1981; Saunders & Tress, 1981; Yunus, 2012) but some researchers (M. H. Ibrahim & H. Aziz, 2003; Maysami et al., 2004) found a positive relationship in emerging economies like Korea and Malaysia. Issahaku et al. (2017) find that remittances limit stock market growth in low-remittance recipient countries, but remittances encourage stock market development in remittance-dependent countries. They also found that growth of the stock market stimulates remittance inflows in remittance-dependent countries while at the same time hindering them in low remittance recipient countries. Aggarwal (1981) and Adjasi and Biekpe (2006) have found that real effective exchange rate (REER) has a positive impact on stock returns in developed economies like the USA and Sweden but Tsai (2012) found REER impacts negatively in emerging economies like Singapore, Thailand, Malaysia and Korea.

A contradictory view argues that in developed economies such as the United Kingdom, corporate bribery is not as obvious as in emerging markets (Lau et al., 2013) so that financially developed countries are less harmed by an increase in corruption, as funds can be borrowed more easily (Ahlin & Pang, 2008). Pastor and Veronesi (2012) claim that if investors regard bribery as an enterprise resource, it removes confusion regarding government policy and tends to solve the country's inefficiencies. In this context, especially in emerging markets, bribery can reduce stock volatility. On the other hand, several studies suggest that corruption has a negative impact on the development of the stock market.

Ozem and Tetik (2019) attempted to determine whether the stock market indices of some developed and emerging countries react similarly to the price movements in the Dow Jones Industrial Average (DJIA). In their study, the impact of DJIA on other indices during the 2008 global financial crisis, was explored by using the Vector Error Correction Model. The data used was analysed in two periods: (1) the expansionary period; and (2) the contractionary period of the FED’s policies. The results of the analysis indicate that the developed and emerging stock markets react differently to the DJIA.

This study aims to observe whether the institutional quality and macroeconomic variables individually and/or jointly contribute to the dynamic behaviour of the stock market in developed and emerging economies.

For two important reasons, the institutional quality and macroeconomic variables listed in the previous section were chosen. First, these variables are widely used in the literature (Ahlin & Pang, 2008; Aidt, 2009; Bardhan, 1997; Billmeier & Massa, 2009; Cherif & Gazdar, 2010; Cuervo-Cazurra, 2008; Egger & Winner, 2005; Habib & Zurawicki, 2002; Lambsdorff, 2003; Lau et al., 2013; Law & Azman-Saini, 2012; Leff, 1964; Lui, 1985; Ng, 2006; Olken, 2007; Voyer & Beamish, 2004; Wei, 2000) to analyse the theoretical relation between institutional quality and macroeconomic variables and the stock market (see chapter three for the literature review). Second, these indicators are available on an annual frequency basis.

It is evident from the previous studies that selected macroeconomic variables may not have a similar impact on the stock market in the long run and short run. For example, Ratanapakorn and Sharma (2007) analysed the long-term and short-term relationships between the US stock price index (S&P 500) and six macroeconomic variables. The macroeconomic variables used in this analysis were money supply, short-term interest rate, long-term interest rate, inflation, exchange rate, and industrial production. They noted that stock prices are negatively related to the long-term interest rate but are positively related to the supply of money, industrial output, inflation, the exchange rate, and the short-term interest rate. Thus, in the context of Granger causality, each macroeconomic variable affects market prices in the long run, but not in the short run. Moreover, these findings are also confirmed by variance decomposition analysis (VDC), i.e., stock values are comparatively exogenous compared to other variables, and stock prices clarify almost 87 % of their variance even after 24 months.

Using monthly data from January 1974 to April 2006 and applying VECM methods, Rahman and Mustafa (2008) analysed the long run and short-run dynamic impact of large money supply (M2) and oil prices on the U.S. stock market (S&P500). A co-integrating relationship is identified among the three variables. Though short-run interactive feedback interactions exist, the vector error-correction model and variance decomposition do not show any converging long run relationship.

Hunjra et al. (2014) applied Cointegration and Granger Causality to investigate the effect of macroeconomic variables, namely, exchange rate, inflation rate, GDP, and interest rate on Pakistan's stock price, using monthly data from 1 January 2001 to 31 December 2011. Their results showed that there is no relationship between the stock price and the macroeconomic factors in the short run. However, the long-term results have indicated a significant relationship between stock markets and macroeconomic variables.

Mahmood and Mohd (2007) investigate the dynamic relationship between stock markets and economic variables in six Asian-Pacific countries such as Malaysia, Korea, Thailand, Hong Kong, Japan, and Australia using the Johansen cointegration test and VECM. The monthly data on the stock price indices, the foreign exchange rate, the CPI, and the industrial development index from January 1993 to December 2002 are included. Furthermore, the findings of the study suggest the presence of a long run equilibrium relationship between the variables in only four countries, i.e., Japan, Korea, Hong Kong, and Australia. As for short-run relationships, all countries except for Hong Kong and Thailand show some significant interactions. For example, Hong Kong reports a clear correlation between exchange rate and market price, whereas Thailand reports a higher significant correlation between production and stock price.

Overall, the purpose of this study is to address the following research questions:

1. Do these selected key macroeconomic and institutional quality variables included in this study share long run equilibrium relationships with share prices?

2. Do these selected key macroeconomic and institutional quality variables have causal relationships during the sample period in their 1st differences? If so, what is the direction of the causality among share price return and each of these variables in their 1st difference?

Answers to these three questions can be obtained by using multiple approaches.

The first question will be resolved using the Pedroni (1999) multivariate cointegration test, the Granger (1969) causality test and/or the Engel-Granger (1987) causality test. To answer the final question, the regular vector error correction model (VECM) will be employed. Later in the dissertation, all of these methods would be explained in depth.

1.4 Significance of the Research

This study aims at providing a valuable contribution to the existing stock market literature, since there is limited comprehensive literature on the stock market, by evaluating the relationships between stock return and selected macroeconomic and institutional quality variables. The importance of this analysis is to enhance the understanding of stated macroeconomic and institutional quality variables on the stock market in both developed and emerging markets.

This study is expected to provide insights for policymakers, shareholders, and portfolio managers based on econometric analysis. This research is critical for shareholders and portfolio managers in that context. Investors will be able to make better decisions based on macroeconomic dynamics; investment funds in the capital market would be strengthened and contribute to increased global financial growth. It lays the framework under which investors can make informed investment decisions.

The primary concern of policymakers is to investigate the determinants of the financial market and how stock market shocks carry over to actual economic activity (Alshogeathri, 2011). The analysis is also important for public and private policy institutions to boost the resilience and performance of the financial markets of both developed and emerging economies.

This research will promote consumer confidence and encourage investor decisions from an analytical point of view since the outcomes of the study and policy proposals were based on the rigorous quantitative analysis of this study. This will help policymakers to take measures to regulate the economic activities and implement economic targets and policies to boost the capital stock market, thereby facilitating future economic growth.

In the field of prices and economic activity, this analysis can lead to some valuable policy implications; the analysis of the outcome of the relationship can boost the forecasting potential of policymakers. Therefore, both macroeconomic contractions and expansion may be predicted and estimated with some degree of certainty.

1.5 Structure of the Thesis

This study consists of eight chapters. Chapter 1 is the preliminary chapter, which indicates the situations, scope, context, and rationale for the analysis to be carried out. The aims of the study are also discussed in this section.

Chapter 2 presents an overview of the developed and emerging economy. It provides a snapshot of selected individual countries of developed and emerging markets in the present century, including the capital market and macroeconomic situation.

Chapter 3 analyses both theoretical and empirical studies on the relationship between the macroeconomic factors and institutional quality and the stock market of developed and emerging markets. Following the introductory remarks, this chapter discusses the theoretical literature on macroeconomic factors and the stock market in developed markets, followed by emerging markets. The very last section of this chapter reviews the literature on stock market determinants.

The primary objective of chapter 4 is to explain the method used in this analysis by specifying the model. This chapter begins with the study's model definition. It then includes a detailed description of the econometric analysis used to accomplish the purpose and goals of the analysis proposed in chapter 1. Since the primary objective of this research is to analyse the long run relationship between selected macroeconomic variables and the share price index, after comparing other distinct cointegration approaches, this study employs the Pedroni cointegration tests (1999).

Chapter 5 primarily discusses the responses of macroeconomic and institutional quality factors to the stock market of developed and emerging markets combinedly. It illustrates the research findings, including the VECM dynamic response. Pedroni's (1999) cointegration, VECM, and Granger causality are the evaluation techniques that are integrated into this chapter. The long-term relationship between the variables and their short-term dynamics are presented in this section. This chapter further demonstrates the short-and long-term predictability of the factors used in the analysis.

Chapters 6 and 7 include the cointegrating analysis for emerging and developed markets, respectively. Following the existing literature, starting section of these chapters identifies the countries in emerging and developed markets of the world. These chapters also review the existing literature and show a few statistical techniques applied in the research, such as Descriptive statistics, Correlation analysis, Unit root tests results and other econometric analyses such as cointegration analysis, VAR framework and Granger causality tests.

Chapter 8 outlines the main conclusions of the study and draws lessons for the authorities and policymakers of the developed and emerging markets to enhance the understanding of the complex relationships between macroeconomic and institutional efficiency variables and the stock market. It proposes policies for responsible authorities to optimize the advantages of stock market booms and prevent future adverse effects for both short-term stability and long-term growth. To offset the adverse effects of share price fluctuations, realistic and responsive policies are necessary. This chapter also reveals some of the study's shortcomings and provides recommendations for further research on the subject.

1.6 Concluding Remarks

After considering the objectives of the study and undertaking the above-mentioned methods, the current study continues its evaluation. This will allow policymakers to consider the complex interactions of stock markets and other macroeconomic and institutional quality factors in developed and emerging markets in order to make informed decisions and enact policies.

2 Chapter 2: Overview of Stock Market

2.1 Introduction

The stock market is a term that refers to a set of marketplaces and exchanges where regular operations such as buying, selling and issuing shares of publicly-held firms occur. Ranjan et al. (2021) defines a stock market as “A stock market, equity market or share market is the aggregation of buyers and sellers (a loose network of economic transactions, not a physical facility or discrete entity) of stocks (also called shares), these may include securities listed on a stock exchange as well as those only traded privately.” The organisation that facilitates this market in an economy is known as a stock exchange. Stock exchange facilitates companies to raise capital from investors and, at the same time, creates opportunities for investors to claim a part of the profit of the company they invested in.

In 2018, globally, 43,342 listed domestic companies raised $68.65 trillion as market capitalization, which is 91.90% of world GDP. The turnover ratio of domestic shares traded globally stands at 104.64%. The total value of these stocks traded globally is 68.21 trillion, which is 96.49% of world GDP (World Development Indicators, 2019).

This chapter consists of 4 sections. Section 2.2 discusses the development of the stock market. Section 2.3 presents brief financial and economic profiles of 21 developed and 9 emerging markets. Section 2.4 addresses about MSCI share price index.

2.2 Development of Stock Market

The existence of a capital market can be traced back to the 1100s in France, where traders used to trade agricultural debts on behalf of the banks. It was claimed by many researchers that in the 13th-century merchant of Venice was the first to trade government securities and followed by other Italian bankers (Hur, 2021) and later other European markets in the 1400s and 1500s.

Antwerp, Belgium, was the first to introduce the world's first stock market without publicly traded stocks. Van der Beurze family was influential in the commercial centre of Belgium-Antwerp, and the stock market was known as Beurzen (Hur, 2021).

In 1602, the Dutch East India Company was the first to issue shares to the public through Amsterdam Stock Exchange (AEX). London Stock Exchange (LSE) was formed in 1801 and Philadelphia Stock Exchange and followed by New York Stock Exchange (NYSE) in 1817, Toronto Stock Exchange (TSX) in 1861 (Hur, 2021). Amsterdam Exchange index (AEX), London Stock Exchange Group (LSE), New York Stock Exchange (NYSE), The Toronto Stock Exchange (TSX) was dominating the market until the creation of the National Association of Securities Dealers Automated Quotations (NASDAQ) Stock exchange in 1971 in New York for electronic trading of stocks (Hur, 2021).

Currently, most of the countries of the world have their own stock exchange, and major stock markets of the developed world emerged in the 19th and 20th centuries.

2.3 Country Profiles

This study classified the global economy into three major categories, which is proposed by Morgan Stanley capital Inc. (MSCI), covering 67 countries of the world. Proposed three major categories of MSCI are:

1. Developed markets.

2. Emerging markets, and

3. Frontier markets

MSCI classified the global market based on economic development, size and liquidity as well as market accessibility (MSCI Market Classification Framework, 2021). Given the broad range of development levels within each of these two realms (Developed markets and emerging markets), the economic development criterion is only used to classify Developed Markets, whereas this criteria has not been applied to classify Emerging and Frontier Markets by MSCI. The size and liquidity requirements are centered on the MSCI Global Standard Indexes' minimum investability criteria. Market accessibility is a criterion that seeks to reflect the experience of international professional investors investing in a certain market, and as a result, it has various sub-criteria. These criteria are generally based on qualitative measures that are reviewed for all markets at least once a year during the MSCI Global Market Accessibility Review.

MSCI regularly reviews the market classification of all countries included in the MSCI Indexes to ensure that they remain reflective of the evolution of the different markets. In particular, changes in the assessments under the classification framework serve as the basis for determining the markets that will be reviewed for potential market reclassification as part of the Annual Market Classification Review.

Table 2.1: Country classification criteria of MSCI for Frontier, Emerging and Developed economy.

Criteria	Frontier	Emerging	Developed
A. Economic Development			
A.1 Sustainability of economic development	No requirement	No requirement	Country Gorss National Income (GNI) per capita 25% above the World Bank high income threshold* for 3 consecutive years
B Size and liquidity requirement			
B.1 Number of companies meeting the following Standard Index Criteria	2	3	5
Company Size (Full market cap)**	USD 1,171 mil	USD 2,343 mil	USD 4,685 mil
Security size (float market cap)**	USD 88 mil	USD 1,71 mil	USD 2,343 mil
Security liquidity in Annualised traded value ratio (ATVR)	2.5% ATVR	15% ATVR	20% ATVR
C Market Accessibility Criteria			
C.1 Openness to foreign ownership	At least some	Significant	Very High
C.2 Ease of Capial inflows / outflows	At least partial	Significant	Very High
C.3 Efficiancy of operational framework	Modest	Good and tested	Very High
C.4 Availability of Investment Instrument	High	High	Unrestricted
C.5 Stability of the institutional framework	Modest	Modest	Very High

*High income threshold: 2019 GNI per capita of USD 12,536 (World Bank Atlas method)
** Minimum in use for the May 2021 Semi-Annual Index Review, Updated on a semni-annual basis
Source: https://www.msci.com/market-classification

MSCI only considers markets for an upgrade if a change in classification status is reviewed. Every June, MSCI communicates its conclusions from the discussions with the investment community on the list of countries under review and announce the new list of countries, if any, under review for potential market reclassification in the upcoming cycle. While adhering to the regular timeline for such communication, it helps provide greater predictability and is less disruptive to a market's normal functioning, MSCI may from time to time exercise prudent discretion and consider off-cycle communications should significant market events take place outside the regular review cycle.

Due to the data unavailability, this study will only consider developed and emerging markets proxied for developing markets. Classification by Morgan Stanley Capital Inc. (MSCI) of the global economy is presented in Table 2.1.

Table 2.2: Classification of The Global Economy

DEVELOPED MARKETS			EMERGING MARKETS		
Americas	Europe & Middle East	Pacific	Americas	Europe, Middle East & Africa	Asia
Canada United States	Austria Belgium Denmark Finland France Germany Ireland Israel Italy Netherlands Norway Portugal Spain Sweden Switzerland United Kingdom	Australia Hong Kong Japan New Zealand Singapore	Brazil Chile Colombia Mexico Peru	Czech Republic Egypt Greece Hungary Poland Qatar Russia South Africa Turkey United Arab Emirates	China India Indonesia Korea Malaysia Pakistan Philippines Taiwan Thailand

Source: The Table is constructed by the author using MSCI data[1].

[1] https://www.msci.com/market-classification

2.3.1 Developed Markets

Developed markets of MSCI are consist of 23 countries of the world, as mentioned in Table 2.1, but this study excludes Hong Kong and Singapore due to data unavailability. The total real GDP of developed markets is US$45.75 trillion, which is 57.11% of the world's real GDP of US$80.1 trillion. The total market capitalisation of developed markets is US$57.46 trillion, which is 72.52% of the global market capitalisation of US$79.22 trillion. The developed market traded value of US$53.35 trillion through 21,092 listed domestic companies, whereas the global total listed domestic companies is 43,036 and trade US$77.56 trillion in 2017 (World Development Indicators, 2019). The study uses the developed market, as shown in the table below.

Table 2.3: List of Selected Developed Markets of the World

DEVELOPED MARKETS		
Americas	**Europe & Middle East**	**Pacific**
Canada	Austria	Australia
United States	Belgium	Japan
	Denmark	New Zealand
	Finland	
	France	
	Germany	
	Ireland	
	Israel	
	Italy	
	Netherlands	
	Norway	
	Portugal	
	Spain	
	Sweden	
	Switzerland	
	United Kingdom	

Source: The Table is constructed by the author using MSCI data[2].

[2] https://www.msci.com/market-classification.

Table 2.4: Macroeconomic Variables of Developed Markets

Country	RGDP (Billion)		RGDP Growth (%)		CPI		FDI (Billion)		REMI (Million)		RGDP Per Capita		OPEN	
	2000	2019	2000	2019	2000	2019	2000	2019	2000	2019	2000	2019	2000	2019
Australia	849.14	1,450.50	3.93	2.16	74.38	119.80	121.69	714.25	518.33	1,753.57	44,334.42	57,186.62	85.36	45.71
Austria	336.50	448.76	3.38	1.42	82.60	118.06	31.16	205.63	1,804.52	3,045.30	42,001.21	50,552.91	142.23	107.78
Belgium	405.83	546.85	3.72	1.74	81.42	117.11	195.22	566.12	4,004.60	12,156.78	39,588.60	47,618.30	83.04	163.06
Canada	1,207.14	1,939.18	4.92	1.66	81.89	116.76	325.02	1037.09	554.56	1,311.78	39,338.84	51,588.76	82.98	64.98
Denmark	298.22	382.98	3.75	2.85	81.68	110.35	73.57	105.75	666.51	1,335.84	55,850.63	65,820.24	74.89	109.29
Finland	209.14	272.69	5.77	1.15	86.08	112.33	24.27	78.35	472.73	797.18	40,403.20	49,397.23	55.86	80.04
France	2,333.52	2,971.92	3.92	1.51	84.39	110.05	184.21	868.69	8,869.55	26,837.55	38,309.44	44,317.39	61.53	64.52
Germany	3,118.65	3,944.38	2.91	0.56	85.70	112.85	470.94	953.31	3,603.50	16,474.12	37,934.45	47,446.73	175.14	87.99
Ireland	167.81	393.85	9.45	5.55	78.36	106.58	127.09	1120.30	251.91	586.69	44,101.11	79,703.41	71.23	239.22
Israel	174.46	319.39	7.46	3.47	80.79	108.15	20.43	166.23	182.40	952.00	27,741.28	35,278.92	50.41	56.77
Italy	2,068.66	2,151.42	3.79	0.34	80.71	110.62	122.53	445.74	1,789.50	10,458.52	36,329.25	35,680.16	19.82	59.96
Japan	5,348.94	6,210.70	2.78	0.65	102.66	105.48	50.32	222.53	773.41	4,373.84	42,169.73	49,187.83	125.52	0.00
Netherlands	739.50	961.78	4.20	1.68	81.95	115.91	243.73	1749.78	425.80	2,396.21	46,435.21	55,488.97	68.52	156.22
New Zealand	113.24	191.73	2.91	2.81	77.00	114.24	24.10	81.34	215.30	497.01	29,354.51	38,992.97	74.65	0.00
Norway	366.70	494.98	3.20	1.15	81.93	120.27	30.27	167.48	270.45	616.43	81,653.34	92,556.32	67.45	72.15
Portugal	221.21	253.23	3.82	2.24	78.53	110.62	34.22	161.64	258.75	544.85	21,497.50	24,658.50	60.08	86.78
Spain	1,152.48	1,572.01	5.25	1.95	75.93	110.96	156.35	751.51	648.65	3,208.02	28,408.81	33,392.53	81.48	66.78
Sweden	398.73	596.69	4.77	1.26	86.23	110.51	93.79	339.54	437.80	3,184.92	44,941.67	58,012.96	98.11	90.48
Switzerland	487.15	680.90	3.94	0.93	91.75	99.55	101.63	1350.68	994.93	2,413.31	67,807.93	79,406.66	52.13	119.44
United Kingdom	2,100.87	2,921.45	3.44	1.46	81.47	119.62	439.46	2075.27	5,074.37	4,214.81	35,672.91	43,711.71	25.04	64.29
United States	12,620.27	18,300.39	4.13	2.16	78.97	117.24	2783.24	9465.84	4,395.00	6,724.00	44,726.97	55,753.14	85.36	26.31

Source: The Table is constructed by the author using WDI data.

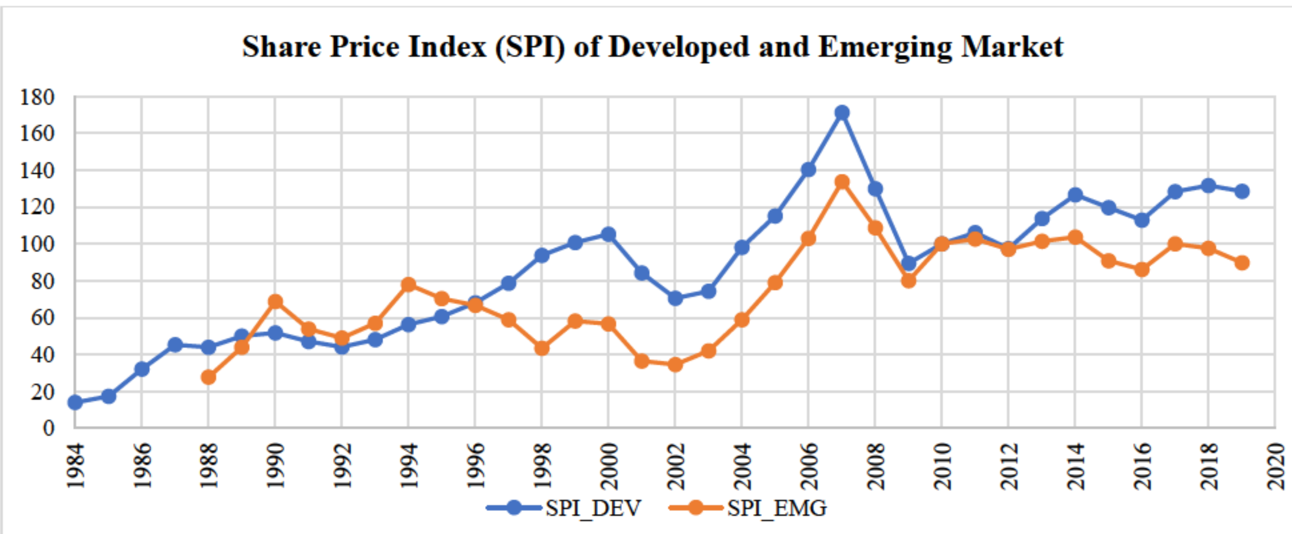
Table 2.5: Financial Variables of Major Developed Markets

Country	Market Capitalisation (Millions)		No. of Listed Company		Turnover Ratio		REER		Sectoral Composition (%) in 2017		
	2000	2017	2000	2017	2000	2017	2000	2017	Agriculture	Industry	Serviuce
Australia	372.79	1,508.46	1,333	2013	57.20	56.08	75.73	99.81	3.6	25.3	71.2
Austria	29.94	150.65	97	67	32.29	25.15	91.81	101.41	1.3	28.4	70.3
Belgium	182.48	437.79	265	116	21.14	-	89.50	101.52	0.7	22.1	77.2
Canada	770.84	2,367.06	1,507	3278	81.53	59.46	77.51	84.71	1.6	28.2	70.2
Denmark	111.82	-	225	-	80.41	-	90.43	96.46	1.3	22.9	75.8
Finland	293.63	-	158	-	71.74	-	91.74	99.96	2.7	28.2	69.1
France	1,446.63	2,749.31	1,185	465	74.68	-	89.58	94.35	1.7	19.5	78.8
Germany	1,270.24	2,262.22	744	450	143.85	64.36	88.91	94.49	0.7	30.7	68.6
Ireland	81.88	146.55	76	41	17.97	-	77.28	84.45	1.2	38.6	60.2
Israel	66.74	231.05	664	431	43.01	28.84	126.51	128.23	2.4	26.5	69.5
Italy	768.36	-	297	-	128.79	-	86.61	95.20	2.1	23.9	73.9
Japan	3,157.22	6,222.83	2,055	3598	78.58	82.34	153.38	102.14	1.1	30.1	68.7
Netherlands	640.46	1,100.11	392	102	101.55	40.84	85.48	96.62	1.6	17.9	70.2
New Zealand	18.61	94.69	131	164	53.59	11.56	73.12	102.75	5.7	21.5	72.8
Norway	65.77	287.19	191	180	91.76	34.41	88.86	88.08	2.3	33.7	64.0
Portugal	60.68	75.59	111	43	91.60	-	87.21	95.49	2.2	22.1	75.7
Spain	504.22	888.84	1,720	3110	314.06	62.74	83.76	96.42	2.6	23.2	74.2
Sweden	328.34	-	292	-	115.45	43.50	98.95	84.32	1.6	33.0	65.4
Switzerland	792.32	1,686.50	252	228	80.03	52.64	101.15	122.03	0.7	25.6	73.7
United Kingdom	2,576.99	-	2,428	-	71.14	-	100.96	80.91	0.7	20.2	79.2
United States	15,107.75	32,120.70	6,917	4336	197.13	-	113.49	120.14	0.9	19.1	80.0
Note: some of the data is missing from this table due to the unavailability of data in WDI.											

Source: The Table is constructed by the author using WDI data.

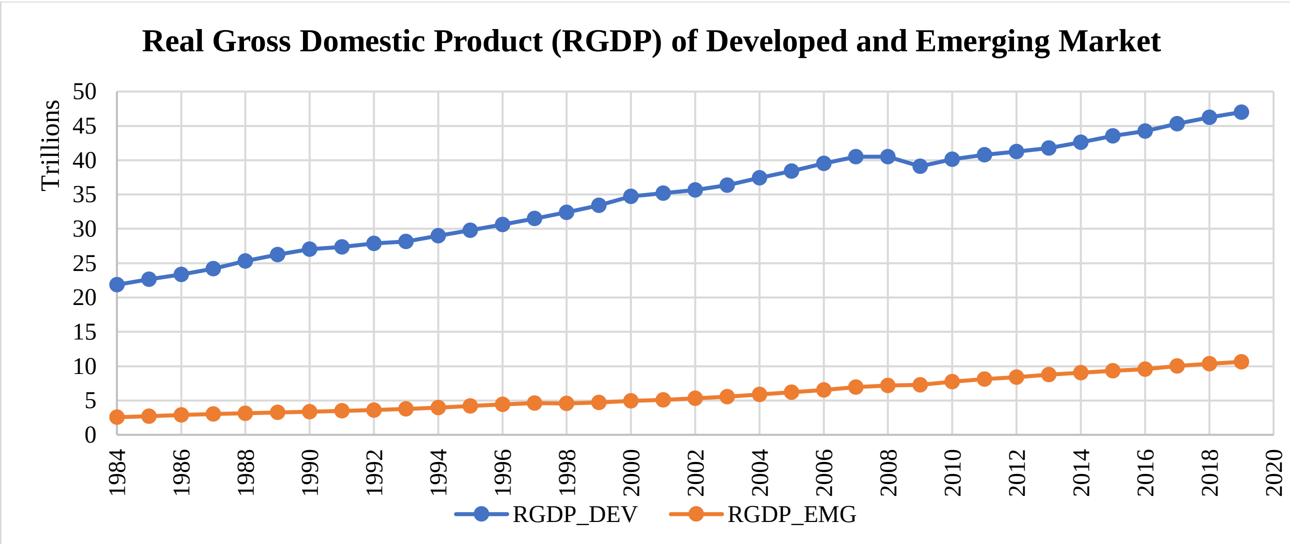
Macroeconomic factors influence the stock market's performance. Therefore, when valuing equities, investors take into account macroeconomic factors. This study compares significant macroeconomic and institutional quality variables trends of developed and emerging markets to picturise the volatility.

Figure 2.1: Share Price Index (SPI) of Developed and Emerging Market



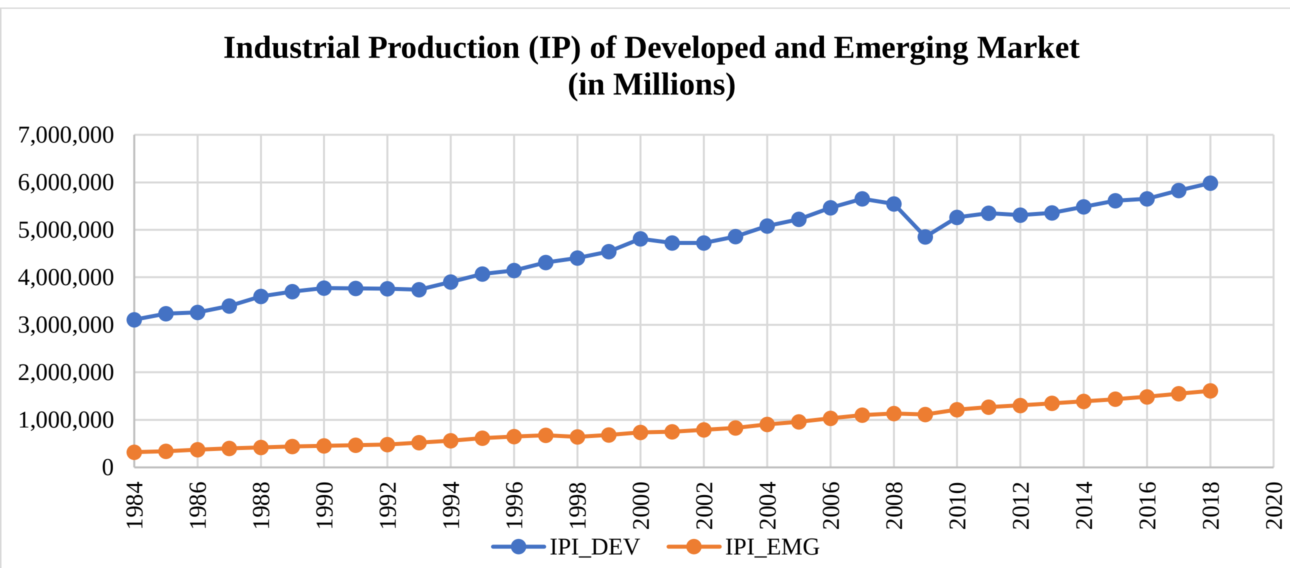
Source: The Table is constructed by the author using WDI data.

Figure 2.2: Real Gross Domestic Product (RGDP) of Developed and Emerging Markets



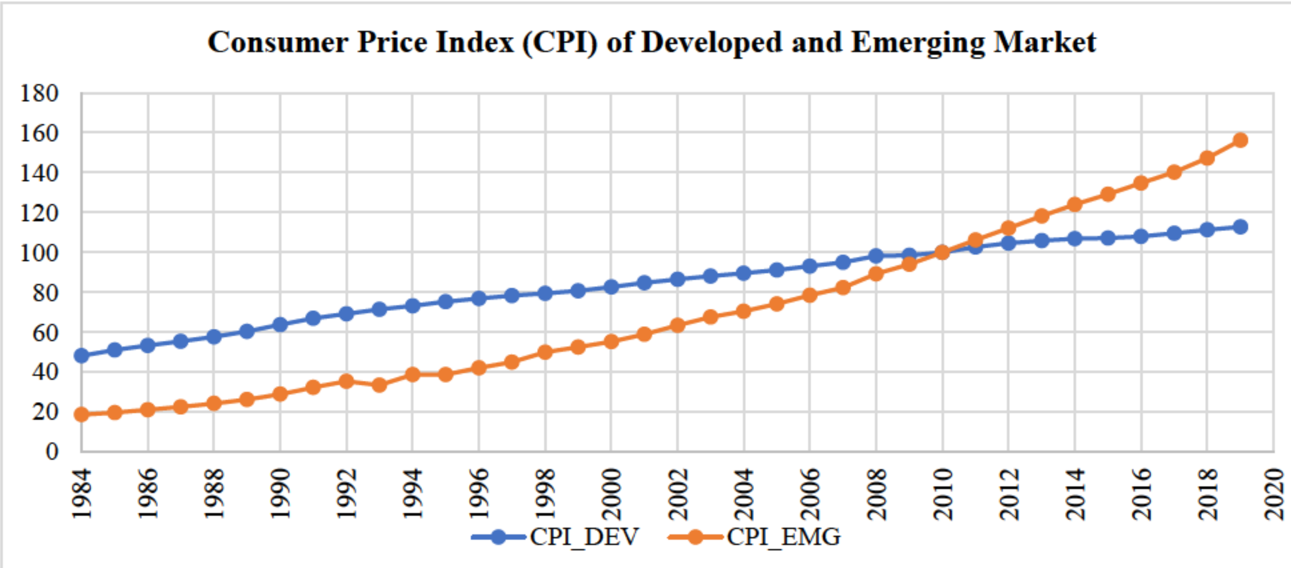
Source: The Table is constructed by the author using WDI data.

Figure 2.3: Industrial Production (IP) of Developed and Emerging Market (in Millions)



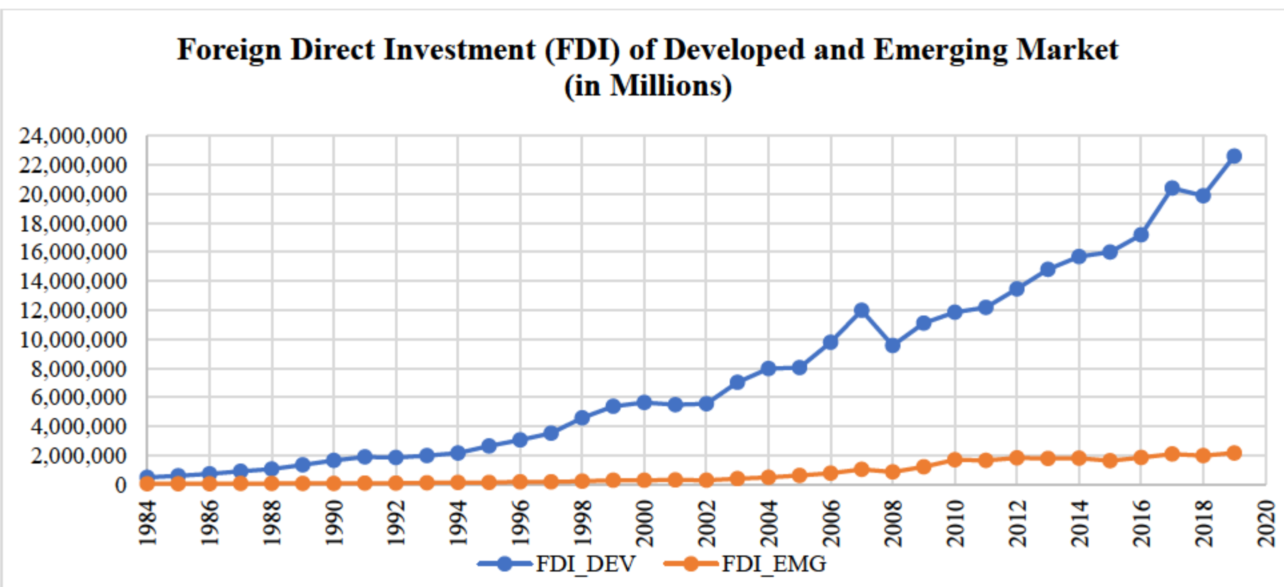
Source: The Table is constructed by the author using WDI data.

Figure 2.4: Consumer Price Index (CPI) of Developed and Emerging Market



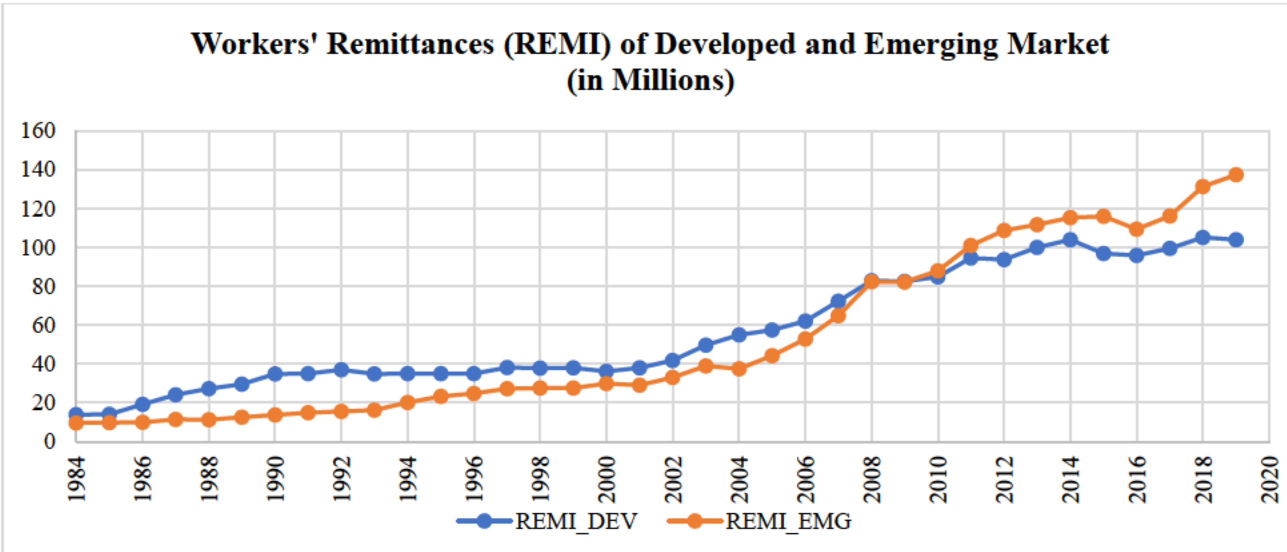
Source: The Table is constructed by the author using WDI data.

Figure 2.5: Foreign Direct Investment (FDI) of Developed and Emerging Market



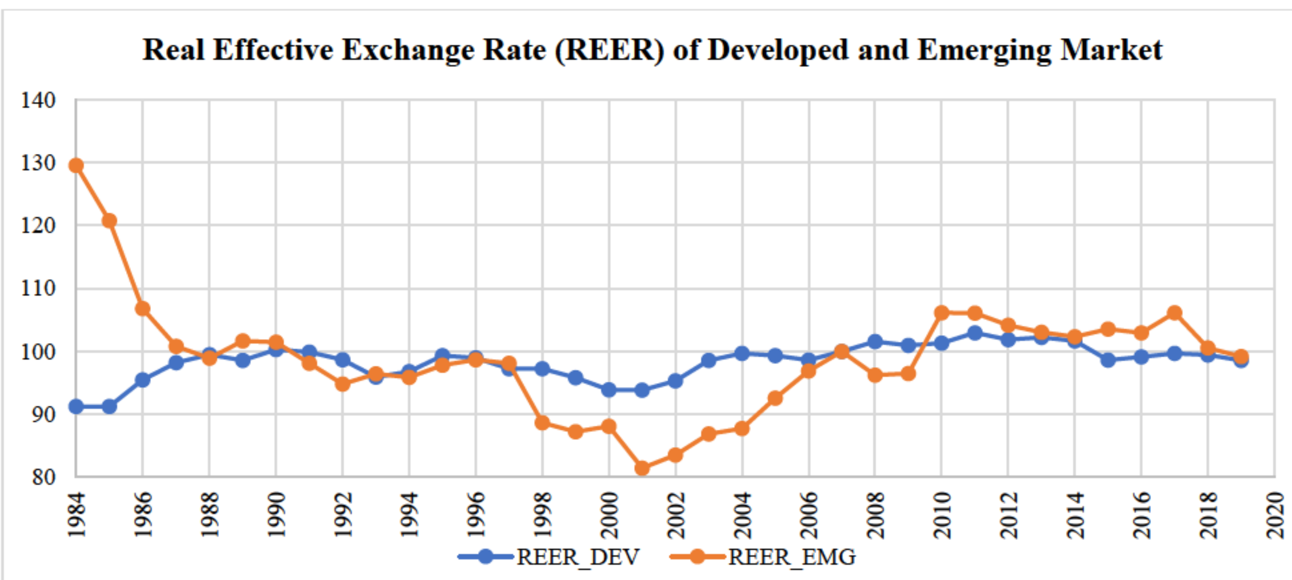
Source: The Table is constructed by the author using WDI data.

Figure 2.6: Workers' Remittances (REMI) of Developed and Emerging Market



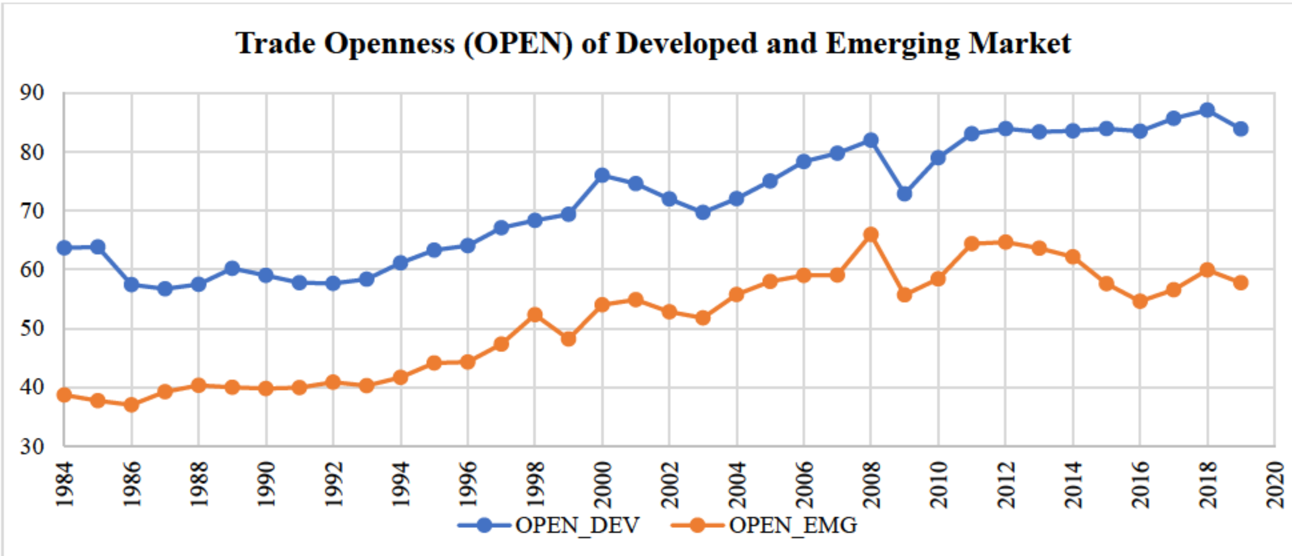
Source: The Table is constructed by the author using WDI data.

Figure 2.7: Real Effective Exchange Rate (REER) of Developed and Emerging Market



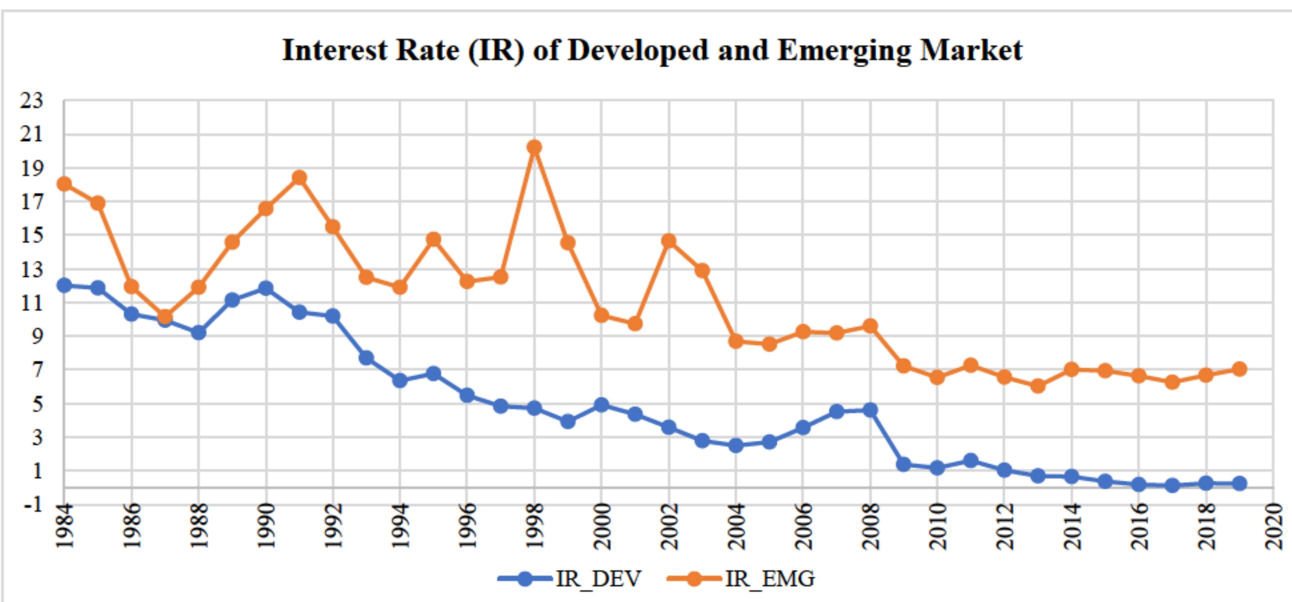
Source: The Table is constructed by the author using WDI data.

Figure 2.8: Trade Openness (OPEN) of Developed and Emerging Market



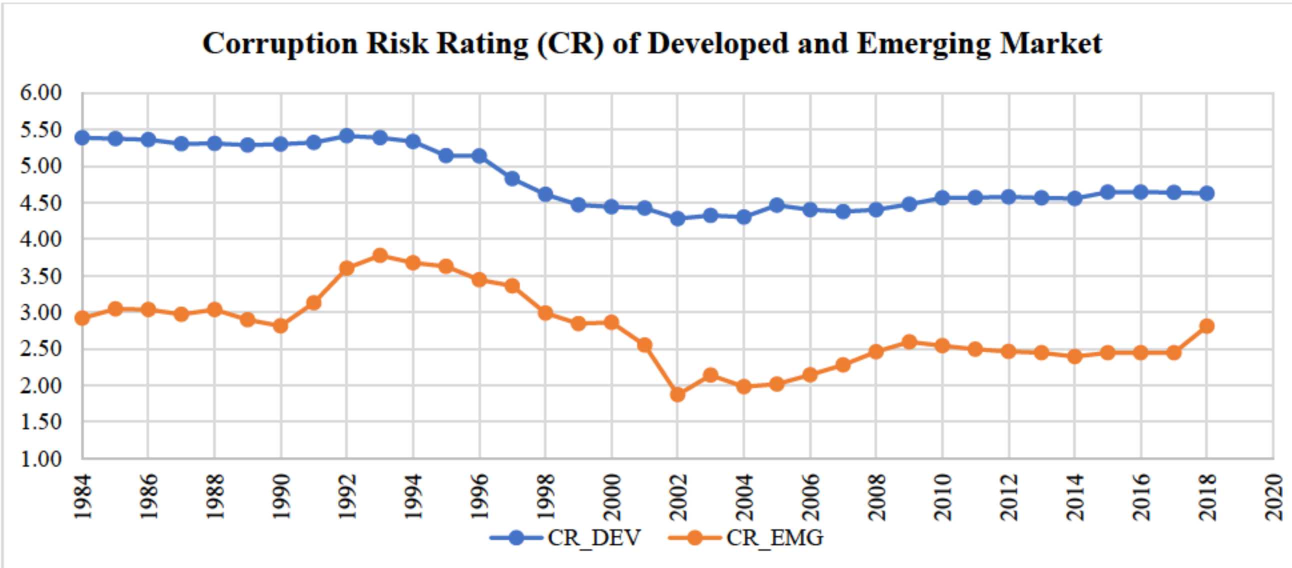
Source: The Table is constructed by the author using WDI data.

Figure 2.9: Interest Rate (IR) of Developed and Emerging Market



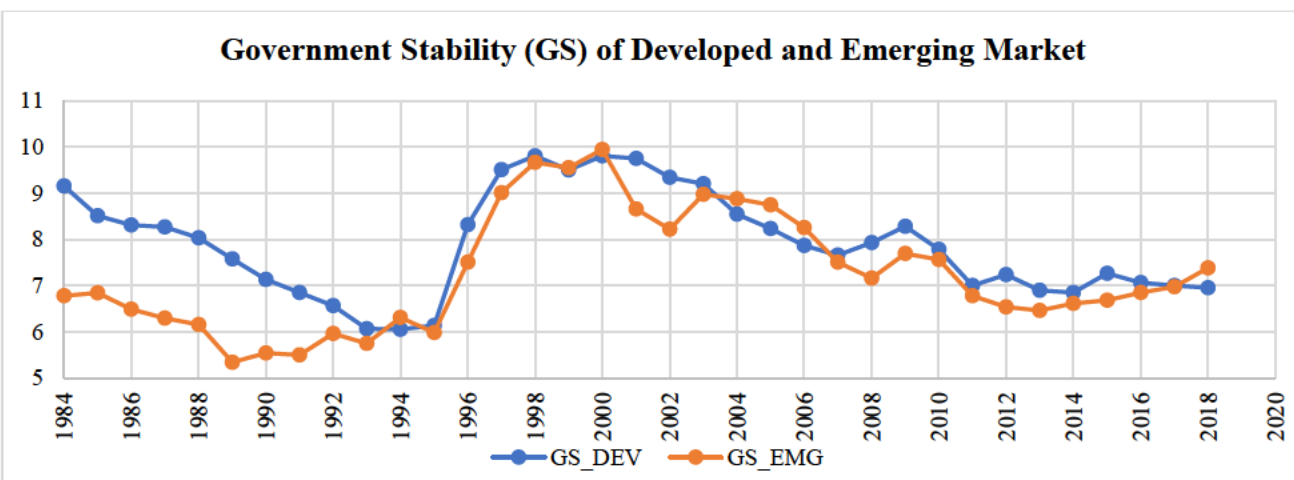
Source: The Table is constructed by the author using WDI data.

Figure 2.10: Corruption Risk Rating (CR) of Developed and Emerging Market



Source: The Table is constructed by the author using WDI data.

Figure 2.11: Government Stability (GS) of Developed and Emerging Market



Source: The Table is constructed by the author using WDI data.

Developed Markets of Americas

Canada

Canada is the 10th largest economy in the world, with a real gross domestic product (GDP) of US$1.87 trillion in 2019 and real GDP per capita of US$51,167 (World Development Indicators, 2019). The sectoral composition of the GDP of Canada consists of agriculture 1.6%, industry 28.2%, and services 70.2% (The World Factbook-CIA, 2017).

There are three major stock exchanges registered in Canada. 3,278 listed domestic companies in Canada in 2017 raised a market capital of US$2,367.05 billion, which is 143 % of GDP. The total value of stocks of domestic listed companies traded was US$1,279.54 billion, which is 77.55% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in Canada is 54.06%. Canada raises 2.99% market capital of the world and 7.55% of listed domestic companies of the world. The total value of the stocks traded in Canada is 1.65% of the world (World Development Indicators, 2019).

United States of America

United States of America (USA) is the largest economy in the world with a real gross domestic product (GDP) of US$17.40 trillion in 2017 and real GDP per capita of US$53,552 (World Development Indicators, 2019). The sectoral composition of the GDP of the United States consists of agriculture 0.9%, industry 19.1%, and services 80% (The World Factbook-CIA, 2017).

There are 13 stock exchanges registered in the United States. 4,336 listed domestic companies in the United States in 2017 raised market capital of US$32,120.70 billion, which is 164.56% of GDP. The total value of stocks of domestic listed companies traded was US$39,785.88 billion, which is 203.83% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in the United States is 116.08%. The USA raises 40.54% of the market capitalisation of the world, and 9.98% of listed domestic companies of the world. The total value of the stocks traded in the United States is 51.29% of the world (World Development Indicators, 2019).

Developed Markets of Europe and The Middle East

Austria

Austria is the 27th largest economy in the world, with a real gross domestic product (GDP) of US$431 billion in 2017 and real GDP per capita of US$49,031 (World Development Indicators, 2019). The sectoral composition of the GDP of Austria consists of agriculture 1.3%, industry 28.4%, and services 70.3% (The World Factbook-CIA, 2017).

There is only one stock exchange registered in Austria, namely as Vienna stock exchange. 67 listed domestic companies of Austria in 2017 raised market capital of US$150.64 billion, which is 36.11% of GDP. The total value of stocks of domestic listed companies traded was US$39.98 billion, which is 9.58% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in Austria is 26.27%. Austria raises 0.19% market capital in the world, and there are 0.15% of listed domestic companies worldwide. The total value of the stocks traded in Austria is 0.05% of the world (World Development Indicators, 2019).

Belgium

Belgium is the 24th largest economy in the world, with a real gross domestic product (GDP) of US$528 billion in 2017 and real GDP per capita of US$46,409 (World Development Indicators, 2019). The sectoral composition of the GDP of Belgium consists of agriculture 0.7%, industry 22.1%, and services 77.2% (The World Factbook-CIA, 2017).

In 2000, Euronext was first established by merging the Brussels Stock Exchange, the Paris Bourse, the Lisbon Stock Exchange, and Amsterdam Exchanges. 116 listed domestic companies of Belgium in 2017 raised market capital of US$437.79 billion, which is 88.86% of GDP. The total value of stocks of domestic listed companies traded was US$107.24 billion, which is 20.19% of real GDP (World Development Indicators, 2019).

In 2014 turnover ratio of domestic shares of Belgium is 28.33%. Belgium raises the world's 0.55% market capital, and there are 0.27% of listed domestic companies (World Development Indicators, 2019).

Denmark

Denmark is the 35th largest economy in the world, with a real gross domestic product (GDP) of US$364 billion in 2017 and real GDP per capita of US$63,216 (World Development Indicators, 2019). The sectoral composition of the GDP of Denmark consists of agriculture 1.3%, industry 22.9%, and services 75.8% (The World Factbook-CIA, 2017).

Only one stock exchange was registered in Denmark, namely ‘The Copenhagen Stock Exchange’, which was later merged with NASDAQ Nordic. The market value of the publicly traded shares of Danish domestic companies was estimated at US$151 billion in 2004 (World Development Indicators, 2019).

Finland

Finland is the 42nd largest economy in the world, with a real gross domestic product (GDP) of US$265.57 billion in 2017 and real GDP per capita of US$48,213 (World Development Indicators, 2019). The sectoral composition of the GDP of Finland consists of agriculture 2.7%, industry 28.20%, and services 69.1% (The World Factbook-CIA, 2017).

Helsinki stock exchange has been part of NASDAQ NORDIC since 2003. The market value of the publicly traded shares of Finnish domestic companies was estimated at US$183 billion in 2004 (World Development Indicators, 2019).

France

France is the 5th largest economy in the world, with a real gross domestic product (GDP) of US$2,857.08 billion in 2017 and real GDP per capita of US$42,567 (World Development Indicators, 2019). The sectoral composition of the GDP of Belgium consists of agriculture 1.7%, industry 19.5%, and services 78.8% (The World Factbook-CIA, 2017).

Paris Bourse was first founded in 1724 in Paris, and later, In 2000, Paris Bourse merged with other stock exchanges in Europe to create Euronext. In 2017, 465 French-listed companies raised a market capitalisation of US$2,749.31 billion, which is 105.94 % of GDP (World Development Indicators, 2019).

Germany

Germany is the 4th largest economy in the world, with a real gross domestic product (GDP) of US$3,873 billion in 2017 and real GDP per capita of US$46,862 (World Development Indicators, 2019). The sectoral composition of the GDP of Germany consists of agriculture 0.7%, industry 30.7%, and services 68.6% (The World Factbook-CIA, 2017).

There are seven regional securities exchanges in Germany, and the Frankfurt stock exchange is the largest one among all of them. In 2017, 450 domestic listed companies in Germany raised a market capitalisation of US$2,262.22 billion, which is 61.43 % of GDP. The total value of stocks of domestic listed companies traded was US$1558.60 billion, which is 42.32% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in Germany is 63.58%. Germany raises 2.86% market capitalisation in the world, and there are 1.04% of listed domestic companies in the world. The total value of the stocks traded in Germany is 2.01% of the world (World Development Indicators, 2019).

Ireland

Ireland is the 34th largest economy in the world, with a real gross domestic product (GDP) of US$344.96 billion in 2017 and real GDP per capita of US$71,755 (World Development Indicators, 2019). The sectoral composition of GDP of Ireland consists of agriculture 1.2%, industry 38.6% and services 60.2% (The World Factbook-CIA, 2017).

Euronext Dublin, formerly known as the 'Irish Stock Exchange', is the main stock exchange in Ireland established in 1793. In 2017, 41 domestic listed companies in Ireland raised a market capitalisation of US$146.55 billion, which is 43.66 % of GDP. The total value of stocks of domestic listed companies traded was US$28.92 billion, which is 8.62% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in Germany is 19.71%. Germany raises 0.18 market capitalisation in the world, and there are 0.09% of listed domestic companies in the world. The total value of the stocks traded in Germany is 0.04% of the world (World Development Indicators, 2019).

Israel

Israel is the 38th largest economy in the world, with a real gross domestic product (GDP) of US$298 billion in 2017 and real GDP per capita of US$34,243 (World Development Indicators, 2019). The sectoral composition of the GDP of Israel consists of agriculture 2.4%, industry 26.5%, and services 69.5% (The World Factbook-CIA, 2017).

Tel Aviv Stock Exchange is the stock exchange in Israel founded in 1953. In 2017, 431 domestic listed companies of Israel raised market capital of US$231 billion, which is 65.41 % of GDP. The total value of stocks of domestic listed companies traded was US$69.04 billion, which is 19.54% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares of Israel is 29.88%. Israel raises 0.29% of market capital in the world, and there are 0.99% of listed domestic companies in the world. The total value of the stocks traded in Israel is 0.09% of the world (World Development Indicators, 2019).

Italy

Italy is the 9th largest economy in the world, with a real gross domestic product (GDP) of US$2,124 billion in 2017 and real GDP per capita of US$35,086 (World Development Indicators, 2019). The sectoral composition of the GDP of Italy consists of agriculture 2.1%, industry 23.9%, and services 73.9% (The World Factbook-CIA, 2017).

Italian Stock Exchange-Borsa Italiana- Milan is the only stock exchange in Italy founded in 1808. In 2015, 353 domestic listed companies in Italy raised market capital of US$2,960.00 billion, which is 34.80 % of Italian GDP (World Development Indicators, 2019).

Netherlands

The Netherlands is the 18th largest economy in the world, with a real gross domestic product (GDP) of US$924 billion in 2017 and real GDP per capita of US$53,942 (World Development Indicators, 2019). The sectoral composition of the GDP of the Netherlands consists of agriculture 1.6%, industry 17.9%, and services 70.2% (The World Factbook-CIA, 2017).

Amsterdam Exchange index (AEX) is the stock exchange in the Netherlands traced back to being established in 1602. Later, AEX merged with other stock exchanges and formed Euronext and converted into Euronext Amsterdam. In 2017, 102 domestic listed companies in the Netherlands raised Market capital of US$1,100.11 billion, which is 132 % of GDP. The Netherlands raises 1.39% market capital in the world, and there are 0.23% of listed domestic companies in the world (World Development Indicators, 2019).

Norway

Norway is the 25th largest economy in the world, with a real GDP of US$483 billion in 2017 and real GDP per capita of US$91,549 (World Development Indicators, 2019). The sectoral composition of the GDP of Norway consists of agriculture 2.3%, industry 33.7%, and services 64.0% (The World Factbook-CIA, 2017).

Oslo Stock Exchange is the only stock exchange in Norway founded in 1819. In 2017, 180 listed domestic companies of Norway raised market capital of US$287.19 billion, which is 72.09 % of GDP. The total value of stocks of domestic listed companies traded was US$117.84 billion, which is 29.58% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in Norway is 35.05%. Norway raises 0.36% market capital of the world and 0.41% of listed domestic companies of the world. The total value of the stocks traded in Norway is 0.15% of the world (World Development Indicators, 2019).

Portugal

Portugal is the 46th largest economy in the world, with a real gross domestic product (GDP) of US$240.83 billion in 2017 and real GDP per capita of US$23,380 (World Development Indicators, 2019). The sectoral composition of GDP of Portugal consists of agriculture 2.2%, industry 22.1% and services 75.7% (The World Factbook-CIA, 2017).

Lisbon Stock Exchange was one of the ancient stock exchanges in the world founded in 1769. Later it was merged with other European stock exchanges and formed Euronext, and changed into Euronext Lisbon. In 2017, 43 listed domestic companies of Portugal raised market capital of US$75.59 billion, which is 34.15 % of GDP. Portugal raises 0.10% market capital in the world, and there are 0.10% of listed domestic companies worldwide (World Development Indicators, 2019).

Spain

Spain is the 12th largest economy in the world, with a real gross domestic product (GDP) of US$1,505.36 billion in 2017 and real GDP per capita of US$32,308 (World Development Indicators, 2019). The sectoral composition of the GDP of Spain consists of agriculture 2.6%, industry 23.2%, and services 74.2% (The World Factbook-CIA, 2017).

There are four stock exchanges in Spain, and Bolsa de Madrid (Madrid Stock Exchange) is the major stock exchange in Spain founded in 1831. Others are The Bilbao, Barcelona, and Valencia stock exchanges. In 2017, 3,110 domestic listed companies in Spain raised a market capital of US$888.84 billion, which is 67.72 % of GDP. The total value of stocks of domestic listed companies traded was US$741.73 billion, which is 56.51% of real GDP (World Development Indicators, 2019).

Spain raises 1.12% market capital of the world, and 7.16% listed domestic companies of the world. The turnover ratio of domestic shares of Spain is 82.62%. The total value of the stocks traded in Spain is 0.96% of the world (World Development Indicators, 2019).

Sweden

Sweden is the 22nd largest economy in the world, with a real gross domestic product (GDP) of US$578 billion in 2017 and real GDP per capita of US$57,467 (World Development Indicators, 2019). The sectoral composition of the GDP of Sweden consists of agriculture 1.6%, industry 33% and services 65.4% (The World Factbook-CIA, 2017).

Stockholm stock exchange is the major stock exchange in Sweden founded in 1863 and operating under NASDAQ OMX since 2014.

Switzerland

Switzerland is the 20th largest economy in the world, with a real gross domestic product (GDP) of US$656 billion in 2017 and real GDP per capita of US$77,684 (World Development Indicators, 2019). The sectoral composition of the GDP of Switzerland consists of agriculture 0.7%, industry 25.6%, and services 73.7% (The World Factbook-CIA, 2017).

The Swiss Exchange (SIX), formerly known as the Swiss stock exchange located in Zurich, Switzerland, was founded in 1850. In 2017, 228 domestic listed companies of Switzerland raised market capital of US$1,686.50 billion, which is 248.42 % of GDP. The total value of stocks of domestic listed companies traded was US$948.33 billion, which is 139.47% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in Switzerland is 55.39%. Switzerland raises 2.13% market capital in the world, and there are 0.52% of listed domestic companies in the world. The total value of the stocks traded in Switzerland is 1.22% of the world (World Development Indicators, 2019).

United Kingdom

United Kingdom is the 6th largest economy in the world, with a real gross domestic product (GDP) of US$2,841 billion in 2017 and real GDP per capita of US$43,010 (World Development Indicators, 2019). The sectoral composition of the GDP of the United Kingdom consists of agriculture 0.7%, industry 20.2%, and services 79.2% (The World Factbook-CIA, 2017).

There are seven stock exchanges in the United Kingdom, United Kingdom overseas territories, and the British Crown Dependencies. London stock exchange is the major stock exchange among all of them and was founded in 1571. In 2014, 1,858 domestic listed companies in the United Kingdom and raised market capital of US$1,686.50 billion, which is 109.4 % of nominal GDP in 2016. The total value of stocks of domestic listed companies traded was US$2357.01 billion, which is 77.9% of real GDP in 2014 (The world bank data 2019). The turnover ratio of domestic shares in the United Kingdom is 84.04% (World Development Indicators, 2019).

Developed Markets of Pacific

Australia

Australia is the 13th largest economy in the world, with a real gross domestic product (GDP) of US$1,379.14 billion in 2017 and real GDP per capita of US$56,058 (World Development Indicators, 2019). The sectoral composition of the GDP of Australia consists of agriculture 3.6%, industry 25.3%, and services 71.2% (The World Factbook-CIA, 2017).

Out of 2 stock exchanges in Australia, the Australian Securities Exchange (ASX) is the largest one among all of them. ASX was founded in 1987. In 2017, 2,013 domestic listed companies in Australia raised market capital of US$1,508.46 billion, which is 113.49 % of GDP. The total value of stocks of domestic listed companies traded was US$809.22 billion, which is 60.88% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in Australia is 53.65%. Australia raises 1.90% market capital of the world, and there are 4.63% of listed domestic companies worldwide. The total value of the stocks traded in Australia is 1.04% of the world (World Development Indicators, 2019).

Japan

Japan is the 3rd largest economy in the world, with a real gross domestic product (GDP) of US$6,150 billion in 2017 and real GDP per capita of US$48,510 (World Development Indicators, 2019). The sectoral composition of the GDP of Japan consists of agriculture 1.1%, industry 30.1%, and services 68.70% (The World Factbook-CIA, 2017).

The major stock exchange of Japan is The Tokyo Stock Exchange was formally founded as a stock market in 1878. In 2017, 3,598 domestic listed companies in Japan raised market capital of US$6,222.82 billion, which is 1,27.86 % of GDP. The total value of stocks of domestic listed companies traded was US$5,778.43 billion, which is 118.73% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in Japan is 92.84%. Japan raises 7.85% market capital in the world, and there are 8.28% of listed domestic companies in the world. The total value of the stocks traded in Japan is 7.45% of the world (World Development Indicators, 2019).

New Zealand

New Zealand is the 52nd largest economy in the world, with a real gross domestic product (GDP) of US$180.46 billion in 2017 and real GDP per capita of US$37,570 (World Development Indicators, 2019). The sectoral composition of the GDP of New Zealand consists of agriculture 5.7%, industry 21.5%, and services 72.8% (The World Factbook-CIA, 2017).

New Zealand stock exchange was created as an amalgamation of several regional stock exchanges in 1974. In 2017, 164 domestic listed companies in New Zealand raised market capital of US$94.69 billion, which is 46 % of GDP. The total value of stocks of domestic listed companies traded was US$11.87 billion, which is 5.77% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in New Zealand is 12.35%. New Zealand raises 0.12% market capital in the world, and there are 0.38% of listed domestic companies in the world. The total value of the stocks traded in New Zealand is 0.02% of the world (World Development Indicators, 2019).

2.3.2 Emerging Markets

Emerging markets of MSCI consist of 24 countries (including Taiwan, which is not considered an independent country by the United Nations) of the world. Among 24 countries, this study has chosen 9 emerging countries due to data unavailability shown in Table 2.5 below.

Table 2.6: List of Selected Emerging Markets of the world

EMERGING MARKETS		
Americas	**Europe, Middle East & Africa**	**Asia**
Brazil	Greece South Africa Turkey	India Indonesia Korea Pakistan Thailand

Source: The Table is constructed by the author using MSCI data[3].

The total real GDP of emerging markets of MSCI is US$26.35 trillion, which is 32.89% of the world's real GDP of US$80.1 trillion. The total market capitalisation of emerging markets is US$19.30 trillion, which is 24.36% of the global market capitalisation of US$79.22 trillion. The emerging-market traded value of US$22.88 trillion through 17,015 listed domestic companies, whereas the global total listed domestic companies were 43,036 and traded US$77.56 trillion in 2017.

Emerging Markets of The Americas

Brazil

Brazil is the 8th largest economy in the world, with a real gross domestic product (GDP) of US$2,290 billion in 2017 and real GDP per capita of US$11,021. The sectoral composition of the GDP of Brazil consists of agriculture 6.6%, industry 20.70%, and services 72.7% (The World Factbook-CIA, 2017).

[3] https://www.msci.com/market-classification.

Brazil's stock exchange was formed in 1890 and was known as Bolsa de Valores de Sao Paulo (Sao Paulo Stock Exchange). Until 2000, several stock exchanges emerged and closed during that time. In 2000, 9 stock exchanges were integrated into one platform.

In 2017, 335 domestic listed companies of Brazil raised market capital of US$954.72 billion, which is 46.28% of GDP. The total value of stocks of domestic listed companies traded was US$642.50 billion, which is 31.15% of real GDP (World Development Indicators, 2019). The turnover ratio of domestic shares in Brazil is 67.02%. Brazil raises 1.20% of market capital in the world, and there are 0.77% of listed domestic companies worldwide. The total value of the stocks traded in Brazil is 0.83% of the world (World Development Indicators, 2019).

Table 2.7: Macroeconomic Variables of Emerging Markets

Emerging Markets														
	RGDP (Billion)		**RGDP Growth**		**CPI**		**FDI (Billion)**		**REMI (Million)**		**REER**		**Trade Openness**	
	2000	**2019**	**2000**	**2019**	**2000**	**2019**	**2000**	**2019**	**2000**	**2019**	**2000**	**2019**	**2000**	**2019**
Brazil	1,538.71	2,347.24	4.39	1.14	52.53	167.40	109.97	640.73	1,349.59	3,213.62	83.13	94.01	22.64	28.98
Greece	251.51	257.45	3.92	1.87	72.20	101.95	14.11	40.51	2,193.82	676.33	82.92	93.03	58.42	74.38
India	873.36	2,940.16	3.84	4.18	54.34	180.44	16.34	426.93	12,883.47	83,332.08	92.02	124.87	26.90	39.55
Indonesia	453.41	1,204.48	4.92	5.02	44.02	151.18	25.06	232.61	1,190.20	11,666.40	74.22	106.77	71.44	37.30
Korea	724.60	1,482.76	9.06	2.04	73.11	115.16	43.74	238.55	4,523.50	7,373.90	82.76	90.56	66.10	77.00
Pakistan	116.75	256.73	4.26	0.99	43.41	182.32	6.92	34.80	1,075.00	22,245.00	105.86	102.22	25.36	30.44
South Africa	267.00	430.17	4.20	0.15	59.90	158.93	43.45	150.95	324.66	890.06	101.50	92.02	51.44	59.20
Thailand	217.71	452.67	4.46	2.35	77.35	113.27	30.94	254.42	1,696.79	8,162.16	90.25	121.97	121.30	110.39
Turkey	523.52	1,261.91	6.93	0.92	20.59	234.44	18.81	164.91	4,560.00	810.00	80.16	67.29	42.35	62.68

Source: The Table is constructed by the author using WDI data.

Emerging Markets of Europe, Middle East and Africa

Greece

Greece is the 43rd largest economy in the world, with a real gross domestic product (GDP) of US$247.93 billion in 2017 and real GDP per capita of US$23,053. The sectoral composition of the GDP of Greece consists of agriculture 4.1%, industry 16.9%, and services 79.1% (The World Factbook-CIA, 2017).

Athens Stock Exchange was formed in 1876. In 2017, 196 domestic listed companies in Greece raised market capital of US$50.61 billion, which is 24.86% of GDP. The total value of stocks of domestic listed companies traded was US$15.21 billion, which is 7.47% of real GDP (World Development Indicators, 2019).

Greece raises 0.06% of market capital in the world and 0.45% of listed domestic companies in the world. The turnover ratio of domestic shares in Greece is 29.19%. The total value of the stocks traded in Greece is 0.02% of the world (World Development Indicators, 2019).

South Africa

South Africa is the 29th largest economy in the world, with a real gross domestic product (GDP) of US$426.16 billion in 2017 and real GDP per capita of US$7475.17. The sectoral composition of South Africa's GDP consists of agriculture 2.8%, industry 29.7%, and services 67.5% (The World Factbook-CIA, 2017).

Johannesburg stock exchange was formed in 1886. In 2017, 294 domestic listed companies in South Africa raised market capital of US$1,231 billion, which is 352.16% of GDP. The total value of stocks of domestic listed companies traded was US$409.72 billion, which is 117.21% of real GDP (World Development Indicators, 2019).

The turnover ratio of domestic shares in South Africa is 25.74%. South Africa raises 1.55% market capital in the world, and there are 0.68% of listed domestic companies in the world. The total value of the stocks traded in South Africa is 0.53% of the world.

Turkey

Turkey is the 16th largest economy in the world, with a real gross domestic product (GDP) of US$1,206.04 billion in 2017 and real GDP per capita of US$14,936.40. The sectoral composition of the GDP of Turkey consists of agriculture 6.8%, industry 32.3%, and services 60.7% (The World Factbook-CIA, 2017).

Borsa İstanbul is the only stock exchange in Turkey. In 2017, 374 domestic listed companies in Turkey raised market capital of US$227.51 billion, which is 26.49% of GDP. The total value of stocks of domestic listed companies traded was US$377.30 billion, which is 44.31% of real GDP (World Development Indicators, 2019). The turnover ratio of domestic shares in Turkey is 165.76%. Turkey raises 0.87% of market capital in the world, and there are 0.29% of listed domestic companies in the world. The total value of the stocks traded in Turkey is 0.49% of the world (World Development Indicators, 2019).

Emerging Markets of Asia:

India

India is the 7th largest economy in the world, with a real gross domestic product (GDP) of US$2,659.42 billion in 2017 and real GDP per capita of US$1,986.63. The sectoral composition of the GDP of India consists of agriculture 15.4%, industry 23.0%, and services 61.5% (The World Factbook-CIA, 2017).

Bombay stock exchange is the largest stock exchange in India which was formed in 1850. In 2017, 5,615 domestic listed companies in India raised market capital of US$2,331.57 billion, which is 87.89% of GDP. The total value of stocks of domestic listed companies traded was US$1,186.01 billion, which is 44.71% of real GDP (World Development Indicators, 2019). The turnover ratio of domestic shares in India is 50.87%. India raises 13.05% market capital of the world, and there are 2.94% of listed domestic companies worldwide. The total value of the stocks traded in India is 1.53% of the world (World Development Indicators, 2019).

Indonesia

Indonesia is the 17th largest economy in the world, with a real gross domestic product (GDP) of US$1,090.48 billion in 2017 and real GDP per capita of US$4,120.52. The sectoral composition of the GDP of Indonesia consists of agriculture 13.7%, industry 41.0%, and services 45.4% (The World Factbook-CIA, 2017).

The Indonesia stock exchange was formed in 1912. In 2017, 566 domestic listed companies of Indonesia raised market capital of US$520.69 billion, which is 51.27% of GDP. The total value of stocks of domestic listed companies traded was US$92.51 billion, which is 9.11% of real

GDP (World Development Indicators, 2019). The turnover ratio of domestic shares in Indonesia is 17.77%. Indonesia raises 0.66% market capital in the world, and there are 1.30% of listed domestic companies in the world. The total value of the stocks traded in Indonesia is 0.12% of the world (World Development Indicators, 2019).

Korea

Korea is the 14th largest economy in the world, with a real gross domestic product (GDP) of US$1,412.07 billion in 2017 and real GDP per capita of $27,492.58. The sectoral composition of the GDP of Korea consists of agriculture 2.2%, industry 39.3%, and services 58.3% (The World Factbook-CIA, 2017).

Korea exchange is the only stock exchange in South Korea that was formed in 1956. 2,114 domestic listed companies in Korea, in 2017, raised a market capital of US$1,771.76 billion, which is 109.11% of GDP. The total value of stocks of domestic listed companies traded was US$2,011.93 billion, which is 123.90% of real GDP. The turnover ratio of domestic shares in Korea is 112.36%. Korea raises 2.24% market capital in the world, and there are 4.87% of listed domestic companies worldwide. The total value of the stocks traded in Korea is 2.59% of the world (World Development Indicators, 2019).

Pakistan

Pakistan is the 45th largest economy in the world, with a real gross domestic product (GDP) of US$240.20 billion in 2017 and real GDP per capita of US$1,155.36. On the other hand, the sectoral composition of Pakistan's GDP consists of agriculture 24.4%, industry 19.1%, and services 56.5% (The World Factbook-CIA, 2017).

Karachi stock exchange is the largest stock exchange in Pakistan which was formed in 1947. Later, in 2016 Karachi stock exchange became the Pakistan stock exchange after merging all other stock exchanges in Pakistan.

Malaysia

Malaysia has a real gross domestic product (GDP) of $399 billion in 2017 and real GDP per capita of US$11,736.85. The sectoral composition of Malaysia's GDP consists of agriculture 24.4%, industry 19.1%, and services 56.5% (The World Factbook-CIA, 2017).

Bursa Malaysia is the largest stock exchange in Malaysia, founded in 1964 as the Kuala Lumpur stock exchange. There were 890 domestic listed companies in Malaysia in 2017, raising market capital of US$455.77 billion, which is 144.82% of GDP. The total value of stocks of domestic listed companies traded was US$137.41 billion, which is 43.67% of real GDP (The world bank data 2019). The turnover ratio of domestic shares in Malaysia is 30.06% (World Development Indicators, 2019).

Malaysia raises 2.07% market capital in the world, and there are 0.58% of listed domestic companies in the world. The total value of the stocks traded in Malaysia is 0.18% of the world.

Thailand

Thailand is the 30th largest economy in the world, with a real gross domestic product (GDP) of US$424 .64 billion in 2017 and real GDP per capita of US$6,135.47. The sectoral composition of the GDP of Thailand consists of agriculture 8.2%, industry 36.2%, and services 55.6% (The World Factbook-CIA, 2017).

The stock exchange of Thailand (SET) was formed in 1960. There were 688 domestic listed companies in Thailand in 2017, raising market capital of US$548.80 billion, which is 120.27% of GDP. The total value of stocks of domestic listed companies traded was $339.53 billion, which is 74.41% of real GDP (World Development Indicators, 2019). The turnover ratio of domestic shares in Thailand is 61.87%. Thailand raises 0.69% market capital in the world, and there are 1.58% of listed domestic companies in the world. Therefore, the total value of the stocks traded in Thailand is 0.44% of the world (World Development Indicators, 2019).

3 Chapter 3: Literature Review

3.1 Introduction

Over the last five decades, recent economic and financial literature proposes a variety of theories that described the relationship between macroeconomic variables and the stock market. These theories include Net Present Value (NPV), the Portfolio Theory, Dividend Discount Model (DDM) or Present Value Model (PVM), Capital Asset Pricing Model (CAPM), and Asset Pricing Theory (APT), which integrates Efficient Market Hypothesis (EMH), rational expectations hypothesis and macroeconomic variables into stock market valuation method.

This chapter consists of 10 sections. Section 3.2 discusses the Efficient Market Hypothesis (EMH) of the stock market. Section 3.3 presents Dividend Discount Model (DDM) or Present Value Model (PVM). Section 3.4 addresses about Capital Asset Pricing Model (CAPM). Section 3.5 explores Asset Pricing Theory (APT). Section 3.6 describes the relationship between macroeconomic variables and the share price index, while section 3.7 covers the relationship between institutional quality variables and the share price index. Section 3.8 presents empirical studies on developed markets related to stock markets, and Section 3.9 illustrates empirical studies on emerging markets related to stock markets. Finally, section 3.10 concludes the chapter.

3.2 Efficient Market Hypothesis (EMH)

Fama (1965) initially proposed the concept of an "efficient market," which assumed that share price would follow a random walk. With respect to the EMH, if the stock market is efficient, the share price will automatically respond to new announcements and relevant information immediately (Fama, 1965). This ensures that there will be no excess returns reliability generated in the long run.

Roberts (1964) first described "effective market theories" alongside the distribution of market performance from weak to strong type. The EMH became more popular with the description of Fama's empirical findings (Fama, 1970). Regarding Fama's (1970) report, the market is called efficient if all the related information on securities can be completely expressed by its prices.

Thus, the market is categorised into three distinct performance levels (i) weak form, (ii) Semi-strong form, and (iii) Strong form.

(i) **Weak form efficiency**: In stock markets, historical information is embedded in share price. Therefore, technical analysis, or the trend of historical market fluctuations in share price, cannot produce excess returns.

(ii) **Semi-strong form efficiency:** Share price contains information that is open to the public. Fundamental analysis does not estimate excess returns. More precisely, investors cannot achieve higher returns consistently. The returns are better than the risk that they represent.

(iii) **Strong form efficiency:** The strong form of efficiency states that stock prices contain all related information, including private information. If the stock market is at its highest efficiency level, even trading on inside information, excess returns are seldom obtained.

An economy's effectiveness and efficiency can be seen as a very critical step in recognising share price behaviour. Before empirical tests are established, a range of analyses on the relationship between macroeconomic factors and the stock market depends on EMH 's context (Alam & Uddin, 2009; Ibrahim, 1999)

3.3 Dividend Discount Model (DDM)

Irving Fisher made an early contribution to contemporary portfolio theory. Fisher developed the idea of the intrinsic rate of return in his two well-known publications, "The Rate of Interest" (1907) and "The Principle of Interest" (1930), a central influence on the eventual emergence of the modern valuation system. John Burr Williams (1938) later extended the concept of intrinsic value to common stocks and can be interpreted in quantitative terms as follows:

$$P = \sum_{t=1}^{\propto} \left(\frac{D_t}{(1+R_t)^t}\right) \cdots\cdots\cdots (3.1)$$

Where,

P = Intrinsic value of the common stock (or the market value),

D_t= Expected dividend for time t, and

R_t = Rate of discount (later specified as the necessary rate of return) in time t.

It maintains the fundamental principle of the Dividend Discount Model (DDM) that the current value of all projected future cash flows as dividends of this stock is valued as present value.

The simplest method of DDM was the so-called Gordon Growth Model (popularised by Myron J. Gordon (1962)) – also known as the Constant Growth Model, assuming a firm's dividends rise annually (normally on an annual basis) at a particular percentage. The formula is as follows:

$$P = \frac{D_0(1+g)}{R-g} = \frac{D_1}{R-g} \cdots\cdots\cdots (3.2)$$

Where,

P = Intrinsic value of the common stock (or the market value),

D_0 = Dividend for current year,

D_1 = Expected dividend for next year,

R = Rate of return by investors and

g = dividend constant growth rate.

The Gordon (1962) model is created on the supposition that the rate of return required by investors is higher than the dividend growth rate (R>g) and that the dividend growth rate is consistent. Therefore, it is appropriate for firms with a sustainable growth conditions. Nevertheless, expecting a steady rate of dividend growth appears to be impractical as most companies have non-constant increases in projected earnings and dividends. They expect that businesses will experience multiple growth stages, suggesting that the growth rate will be volatile over time. As a result, the dividend discount model (DDM) was revised to utilise in multistage models later. The multistage model has three different forms: the standard two-stage model, the two-stage h-model, and the three-stage model.

3.4 Capital Asset Pricing Model (CAPM)

CAPM was first developed by Harry Markowitz in 1952 and tweaked by several others over a decade. The security market line (SML) demonstrates an initial description of a popular hypothesis, the CAPM, first cited in the unpublished dissertation of Jack Treynor (1962) . This unpublished dissertation of Jack Treynor (1962) is now commonly referred to as William F. Sharpe's "Hypothesis of Market Equilibrium in the Conditions of Risk," this was published in 1964 and awarded the Nobel Prize for his thesis (Treynor, 1962). In addition, Lintner (1965) also contributed to this model by performing a parallel risk assessment analysis.

The required rate of return is the primary expectation of investors from an underlying security. CAPM is a unique method to estimate the rate of return required by investors. Utilising the security market line (SML), Brigham and Gapenski (1996) exhibited the determinants of the required rate for a particular security. In particular, the required or expected rate of return for investors on a stock or a portfolio can be determined by adding up risk-free returns and market premiums.

Because each particular asset in a portfolio includes both systemic and non-systematic risks (also known as specific risks), the systemic risk is classified into three groups, namely interest risk, market risk, and purchasing power risk. In contrast, unsystematic risks are classified, such as business risk and financial risk. The systematic risk may be minimised by different strategies, such as asset allocation or hedging. However, the unsystematic risk may be reduced by diversifying the portfolio. Investors only face systematic risk when they hold a market portfolio because the unsystematic risk can be diversified.

Briefly, CAPM makes an important contribution in measuring the systematic risk of a security in the market portfolio.

The equation Sharpe-Lintner CAPM is written in the following form:

$$E(R_i) = R_f + \beta_i[E(R_M) - R_f] \cdots\cdots\cdots (3.3)$$

To calculate the expected return $E(R_I)$ on the asset, the CAPM formula integrates three inputs, namely the rate of return of a risk-free asset (R_f), the expected risk premium on the market portfolio (R_M)and the asset market beta (β_i). According to the Sharpe-Lintner CAPM, the projected return on any asset can be calculated using the risk-free rate of return plus a risk premium which equals the asset's risk rate, (β_i), multiplied by the risk premium rate per unit, $[E(R_M) - R_f]$. In short, the CAPM concludes that beta is the sole descriptive variable that can justify an investment's real return, meaning that CAPM is a single-factor model.

Assumptions and Problems with CAPM

Harry Markowitz's (1952) underlying assumptions for CAPM can be summarized as follows:

- All investors think of possible returns on an investment in an asset in terms of probability distributions of expected returns over a holding period (Pratt & Grabowski, 2014).

- Investors measure the risk of the asset in proportion to the expected variability of its expected returns (total risk as measured by variance) and mean, and variance is the only two parameters considered by investors when considering an investment (Pratt & Grabowski, 2014).

- Investors prefer less risk compared to more risk for a given level of expected returns. (Pratt & Grabowski, 2014).

In the real world, the CAPM has extreme constraints since most of the predictions are impractical. Buyers often do not diversify their investment in a conscious manner. Besides, based on the process of compilation, the Beta coefficient is unpredictable, ranging from time to time. It does not reflect the potential uncertainty of returns due to the unpredictable existence of Beta, but it is focused on the experience of the past. Historical data from Beta experiments have demonstrated that they are unreliable and that potential risk predictions are inefficient.

3.5 Arbitrage Pricing Theory (APT)

Stephen Ross developed and introduced the Arbitrage Pricing Theory (APT) in 1976. The fundamental difference between APT and CAPM lies in the concept of systematic investment risk. A single, market-wide risk factor is proposed by CAPM, while APT considers multiple variables representing market-wide risks (Rajesh, 2016).

The APT differentiates from the CAPM by inserting more explanatory variables. The APT leads to CAPM in an atmosphere of a single-factor market. The equation of APT can be represented as:

$$E(R_i) = R_f + \beta_{i1}R_1 + \beta_{i2}R_2 + \cdots + \beta_{in}R_n + u_{in} = R_f + \sum_{j=1}^{n} \beta_{ij}R_j + u_{in} \cdots \cdots \cdots (3.4)$$

Where $E(R_i)$ is the expected return of asset i, R_f is the risk-free rate of return; β_{ij} is the sensitivity of the security to factor n; R_j is the risk premium or the standardised factor score in that it has zero mean and unit standard deviation. $u_{in}$is normally distributed error term with mean zero. By assuming no arbitrage opportunities, the expected returns on asset i becomes:

$$E(R_i) = R_f + \beta_{i1}R_1 + \beta_{i2}R_2 + \cdots + \beta_{in}R_n = R_f + \sum_{j=1}^{n} \beta_{ij}R_j \cdots \cdots \cdots (3.5)$$

The major assumptions of APT were as follows (Rajesh, 2016):

• Capital markets are perfectly competitive.

• Investors always prefer more wealth to less wealth with certainty.

Like CAPM, APT assumes:

1. Investors have homogenous beliefs.
2. Investors are risk-averse expected utility maximizers.
3. Asset markets are perfectly competitive: there is an unlimited number of assets, so investors can form well-diversified portfolios that eliminate firm-specific or asset-specific risk.
4. There are no restrictions on short selling of any of the assets.
5. Realised returns are generated by a factor model.

Unlike CAPM, APT does not assume:

1. A single period investment horizon
2. Absence of taxes
3. Borrowing and lending at the risk-free rate
4. Investors' selection of portfolios is based on expected returns and variances (Markowitz, 1952).

Interestingly, APT does not define the form or number of macroeconomic factors to be included in its analysis by researchers. For instance, although Chen et al. (1986) analysed the impact of four factors, including inflation, gross national product (GNP), investor trust, and yield curve shifts, they indicated that these factors should not be restricted to the APT. Therefore, according to the stock market they analysed, there is a wide body of empirical research that has covered a large number of various macroeconomic variables. Therefore, several macroeconomic variables will be included in this analysis to analyse their impacts on the stock market. Analysts also take on the responsibility of recognizing variables that play a significant role in understanding individual stock market movements. Although analysts can predetermine some economic factors, their selection must be based on reasonable theory (Chen et al., 1986).

Several studies were constructed using diverse collections of macroeconomic factors to predict stock returns under the principle of arbitrage pricing of Ross (1976). Chen et al. (1986) carried out the seminal work promoting the APT, in which the economic condition systematically guided stock market values. Shanken and Weinstein (2006) developed the APT model using the same mechanism as in Chen et al. (1986) to determine the relationship between expected returns and five macroeconomic factors (industrial production, unanticipated inflation, expected inflation, the excess return of low-grade corporate bonds over long-term government bonds, the excess return of long-term government bonds over T-bills with one month to maturity).

3.6 Macroeconomic Factors and Share Price Index (SPI)

This section discusses the influence of macroeconomic factors on the share price. Changes in the macro-economic factors are underlying risk factors of an investment as they can result in fluctuations in the stock return (Rjoub et al., 2009). The variations in the macroeconomic conditions are reflected in the capital market performance (Bansal et al., 2005; Jones et al., 1998). The impact of macroeconomic factors is studied in both emerging and developed stock markets literature (Adjasi & Biekpe, 2006; Gani & Ngassam, 2008; Hearn & Piesse, 2010). Early studies affirmed that macroeconomic variables greatly impact the stock returns of world economies (Fama & Schwert, 1977; Jaffe & Mandelker, 1976; Nelson, 1976). These studies show that the effect of macroeconomic variables on each economy and its stock market is different.

For example, the study by Wongbangpo and Sharma (2002) reported that the stock prices have a negative long run relationship with the CPI, while Ibrahim and Aziz (2003) identified a positive relationship between CPI and stock index price in the long run. However, Flannery and Protopapadakis (2002) argue that the effects of macroeconomic factors on the stock returns is of limited empirical support.

The interaction of macro-economic variables with the developed and emerging stock markets is very discrete. According to Ozlen and Ergun (2012), the stock markets of developed markets exhibit less volatility than emerging markets. This is primarily because the emerging market is sensitive to local macroeconomic variables and global macroeconomic variables. Similarly, the cointegration analysis by Yunus (2012) in ten developed countries found that there are fewer cointegrating macroeconomic factors that influence stock prices in a smaller market like Germany and Switzerland compared to mature and larger developed countries like Australia and the US. The heterogeneity of macroeconomic conditions in different countries leads to differing impacts of macroeconomic variables on stock market performance.

The effect of macroeconomic variables on each economy and its stock market is different (Özlen & Ergun, 2012). Masami and Sims (2001a, 2001b, 2002) studied the relationship between macroeconomic variables and stock returns in Hong Kong and Singapore, Malaysia and Thailand, and Japan and Korea. They employed the Error-Correction Modelling technique to investigate the relationship between macroeconomic variables and stock returns in the six countries. These studies analysed the effect of interest rate, inflation, money supply, exchange rate and real activity to ascertain the impact of the 1997 Asian financial crisis on stock markets. Various studies found that although macro-economic variables had a statistically significant impact on stock performance, there were variations in the nature of the impact. The detailed analysis of each of the macroeconomic variables chosen for this study on the stock market performance is discussed in the following subsections.

3.6.1 Share Price Index and Real Gross Domestic Product (RGDP)

The real GDP growth rate is typically used as a substitute to gauge the level of existent economic activity. It has been theoretically demonstrated that the productive capacity of an economy grows during economic growth, which successively contributes to the cash flow generation of the potential of the company.

Figure 3.1: Effect of Real Gross Domestic Product on Share Price Index

Real GDP ↑→ Investment ↑→ Demand for Share ↑ → Share Price Index ↑

Mansor (2011) conducted a cointegration analysis based on the VAR model to study the impact of stock market development in Thailand. GDP, aggregate price level, and the investment ratio were identified as the key controllers of the stock market in Thailand. Another study conducted by Singh et al. (2011) in Taiwan exampled the influence of GDP and employment rate on the Taiwan index found that these variables positively affect the Taiwan Index of all portfolios.

Jareno and Negrut (2016) carried out a time-evolution analysis of the USA's Dow Jones (DJ) prices and GDP from 2008 -2014. A positive relationship was observed between the DJ and GDP. The study also revealed that contributions of DJ increased from the fourth quarter of 2009, while GDP rose from the second quarter of 2010. Therefore, pointing that the DJ index is ahead of US GDP by approximately six months. Thus, this evidence from existing studies indicates that GDP positively impacts stock market performance (Fama, 1981; Mukherjee & Naka, 1995). This means that an increase in real GDP leads to an increase in stock performance.

3.6.2 Share Price Index and Industrial Production Index (IPI)

IPI is the economic indicator that shows the real output of manufacturing, mining, electricities, and gas of an economy at a given period using a base year. IPI will increase when the real output of manufacturing, mining, electricity, and gas increases. Consequently, it creates more profit for those companies and thus creates demand for shares in the capital market for those companies. Hence it increases the share price through expected future cash flow (Fama, 1990).

Figure 3.2: Effect of Industrial Production Index on Share Price Index

IPI ↑ → Revenue ↑ → Future Cash Flow ↑ → Profit ↑ → Dividend ↑→Demand for Shares ↑ → Share Price Index ↑

Nasseh and Strauss (2000) argued that German industrial production had a positive effect on Germany's stock market and other European stock markets like the UK, Holland, France, Italy, and Switzerland. Kasman et al. (2005) and Burcu (2016) found IPI and stock returns share a positive correlation as an increase in the former leads to an increase in cash flows and profitability of the firms. Likewise, Jareño and Negrut 2016 reported a positive correlation between USDJ and IPI.

On the other hand, Filis (2010) and Brahmasrene and Jiranyakul (2007) found a negative relationship between IPI and the stock market.

3.6.3 Share Price Index and Consumer Price Index (CPI)

CPI, which calculates the percentage rise in the price of a basket of goods and services consumed by households, is the most well-known indicator of inflation. The study by Chen et al. (1986) examined the influence of macroeconomic variables on stock returns and found that unanticipated inflation is a significant predictor of stock return. The negative relationship between stock price and inflation supports the proxy effect of Fama (1981), which explains that higher inflation raises the production cost. Consequently, higher production cost adversely affects the profitability and real economic activity; since the real activity is positively associated with the stock return, an increase in inflation reduces the share price.

Figure 3.3: Effect of Consumer Price Index on Share Price Index

↑ Inflation → Asset price↓ →Share price index↓

The negative correlation between stock returns and inflation is well established in existing research (Barrows & Naka, 1994; Chen et al., 2005; Chen et al., 1986; Fama & Schwert, 1977). Saunders and Tress (1981), in their study on the Australian stock market, reported a significantly negative correlation between stock market returns and inflation. The study also talked about the unidirectionality of the relationship between inflation and stock returns, with price level changes leading the equity index in time. However, not all studies identified a negative association between inflation and stock market returns. According to Malkiel (1982), the negative association between inflation rate and stock market price is due to the direct association of the inflation rate with the interest rate, which negatively influences equity prices and the negative effect of the inflation rate on the profit margins of companies in specific sectors which leads to decrease in stock prices. In the study by Gjerdea and Sættem (1999), the negative association between stock return and inflation measured as change in CPI is insignificant. Spyrou (2001) examined the relationship between inflation and stock returns for Greece's emerging economy. It was found that inflation and stock returns were negatively linked, but only until 1995, later, the relationship became insignificant. Islam and Watanapalachaikul (2003) studied the relationship between six macroeconomic variables from 1992 to 2001 and observed a strong negative relationship between CPI and stock market performance. This means that an increase in the inflation rates leads to a decline in stock prices. Similarly, Singh et al. (2011) found that the inflation rate has exhibited a negative relationship with portfolios of big and medium companies. Diaz and Jareno (2009) examined the impact of the inflation rate on the Spanish Stock market and found that when the inflation rate is higher than expected, it negatively affects the stock market. Similarly, Mittal and Pal (2011) employed a VAR model to study Indian stock returns during 1995–2008. They concluded that high inflation rates have a negative influence on the Indian stock markets. The study conducted by Mazuruse (2014) to examine the impact of macroeconomic variables on the stock returns in the Zimbabwe stock exchange from 1994 to 2008 indicates that macroeconomic variables, including CPI, cause significant variation in the stock returns Zimbabwe stock exchange.

The literature review also identified studies that found a positive impact of CPI on stock prices. For instance, a significant positive relationship was observed between inflation and stock returns in reports on the UK (Firth, 1979), Singapore (Maysami et al., 2004), and Ghana (Adam & Tweneboah, 2008). Similarly, In the study by Maysami and Sim (2001a), the Korean stock markets showed a positive association with inflation. Inflation can positively influence stock returns if stocks can hedge against inflation (Asprem, 1989). Examining the association between stock returns and inflation in the economies with capital markets characterised by rapid growth rates is identified to be positive as the equities in these economies allow to hedge against inflation (Maysami et al., 2004; Ratanapakorn & Sharma, 2007). The literature review shows that an increase in the inflation rate is followed by both lower earnings growth and higher real returns (Fisher, 1930; Tripathi & Kumar, 2015).

The association between Malaysia stock prices and CPI was also examined in the study by Ibrahim and Aziz (2003). The study found that there is a positive long run relationship between CPI and stock prices in Malaysia. The study by Yunus (2012) examined the impact of macroeconomic factors on the real estate stock price indices over a period from January 1990 to December 2007 in ten developed countries, namely the U.S, the UK, Canada, Japan, Australia, Germany, Switzerland, France, Italy and the Netherland. Impulse response functional analysis revealed that CPI induces a positive impact on property returns in most countries. Nasseh and Strauss (2000) carried out a time frame analysis for the period 1962 to 1995 for several countries such as Germany, the UK, Holland, France, Italy, and Switzerland. They concluded that CPI and Industrial Production (IP) have substantial positive effects in the mentioned countries' stock markets. Joreno and Negrut (2016) observed a positive relationship between the US stock market and the CPI as analysed from 2008 to 2014. With the increase in inflation rates, the cost of goods/products to the customer increases, implying that the CPI increases. Rasiah and Ratneswary (2010) suggested that the positive impact of inflation on the stock markets may have originated from increased output prices, revised by the businesses anticipating inflation ahead of time. The revised output price is greater than the increased input price. This allows improved cash flows, resulting in identifying the positive impact of inflation on stock market performance. The evidence on the impact of inflation on stock markets is mixed. Although the observation that inflation positively affects stock market performance contradicts the general postulation that inflation negatively influences stock markets (Chen et al., 1986), a counter justification is proposed.

3.6.4 Share Price Index and Foreign Direct Investment (FDI)

FDI is characterised as an investment involving a long-term partnership representing the long-term interest and authority of a resident in one economy (foreign direct investor or parent) in an enterprise resident in another economy (United Nations Conference on Trade and Development, 2019).

FDI will substantially contribute to the economic growth and prosperity of the recipient country by reducing and amortising the shock generated by low domestic savings and investment. Several reports investigate the relationship between FDI, foreign portfolio investment (FPI), and financial markets in various countries. It is expected that an improvement in FDI would positively affect the liquidity and capitalisation of the stock exchange (Adam & Tweneboah, 2008).

Figure 3.4: Effect of Foreign Direct Investment on Share Price Index

FDI ↑→ Investment ↑→ Demand for share ↑ → Share price Index ↑

Clark and Berko (1996) find supporting evidence for the positive relationship between foreign direct investment and stock market return in Mexico as one of the earliest explorations. The positive relationship of FDI to Ghana stock returns was stated by Adam and Tweneboah (2009). Gümüs (2010) also concludes that the relationship between BIST 100 bond return and foreign direct investment exhibit is positive in Turkey. Investigating the relationship between foreign direct investment and stock market performance for Turkey, Okuyan and Erbaykal (2011) find positive long-term interaction between these variables, whereas no short-term relationship is stated. The US economy has been analysed by Egly et al. (2010) using the VAR framework and has reported a positive relationship between foreign direct investment and US stock market results from 1997 to 2007. For 20 developed countries, Paramati et al.(2016) analysed the relationship between these variables from 1991 to 2012 and found that foreign investment had a positive long-term impact on stock results. However, Lipsey (2001) asserts that flows of foreign direct investment (FDI) are not the significant driver of capital development and production in developed countries. The lack of impact indicates that the primary function of FDI for emerging countries is not to fund capital formation.

3.6.5 Share Price Index and Workers' Remittances (REMI)

Workers' remittances are the outcome of the method of the migrant workers moving a part of their wages and salaries to their home country as foreign currency, which plays a significant and increasing role in countries' markets and global development (Oshaibat & al-Majali, 2016). In addition to being a source of revenue in foreign currency, workers' remittances are also a source of savings and capital formation that make one of the significant sources of external funding for emerging countries after the foreign direct investment (Aggarwal et al., 2011).

There is a growing agreement on a variety of consequences that are generated by the increase of remittance, such as consumption, increasing schooling and health care promoting investment in home and land property, etc. Thus increasing economic growth as well as the share price index through economic activity within the country (Billmeier & Massa, 2009; Jansen et al., 2012). Chowdhury (2011) suggests remittances promote financial development.

Figure 3.5: Effect of Workers' Remittances on Share Price Index

REMI ↑ → IP ↑ → future cash flow ↑ → profit ↑ → dividend ↑ → Share price index ↑

Remittance's impact on stock returns is speculative as it can be positive or negative. Gupta et al. (2009) indicate that remittances positively impact poverty mitigation by increasing income and higher living conditions in remittance-receiving households. Billmeier and Massa (2009) also found remittances have a positive and significant impact on market capitalization. Issahaku et al. (2017) find that remittances limit stock market growth in low-remittance recipient countries, but remittances encourage stock market development in remittance-dependent countries. They also found that growth of the stock market stimulates remittance inflows in remittance-dependent countries while at the same time hindering them in low remittance recipient countries. Chami et al. (2003) find that remittances have a detrimental impact on economic growth as they decrease the willingness of migrant family members to work.

3.6.6 Share Price Index and Real Effective Exchange Rate (REER)

REER is the nominal effective exchange rate (also known as international competitiveness and measured as the value of a currency against a weighted average of trade partners' foreign currencies) divided by the relative price. An increase in REER, real depreciation, implies that exports become cheaper, and imports become expensive; therefore, an increase indicates improved trade competitiveness (International Monetary Fund 2019).

The core formula is:

$$\text{REER} = \text{Nominal effective exchange rate} \times \frac{\text{Average price in home country}}{\text{Average price in foreign country}} \cdots (3.6)$$

The relationship between the real exchange rate and the real stock price is explained in two key ways: the 'good business approach' and 'the portfolio balance approach' (Dornbusch & Fischer, 1980). The good market approach suggests that real exchange rates can affect the share price (Aggarwal, 1981). Depreciation of the real exchange rate would improve the attractiveness of firms' goods in terms of cheaper rates and increase their revenues from other countries if the elasticities of changes in exports are greater than the changes in the exchange rate (Dornbusch & Fischer, 1980). This higher export contributes to further income for the domestic firms and thus boosts the firm's values and share price. Therefore, real exchange rate depreciation will lift the real share price, whilst appreciation of the real exchange rate will decrease the real share price (Dornbusch & Fischer, 1980; Pan et al., 2007; Ülkü & Demirci, 2012).

Figure 3.6: Effect of Real Effective Exchange Rate on Share Price Index

REER ↑ → Investment ↑ → Demand for Share ↑ → Share price↑

The relationship between stock prices and the exchange rate has been empirically analysed over the past three decades. The results are somewhat mixed as to the significance and direction of influences between stock prices and exchange rates.

Using monthly data on U.S. stock markets from 1974 to1978, Aggarwal (1981) found that stock prices and real exchange rates are positive. According to Solnik (1987), there is only a weak positive relationship between stock returns and real exchange rates. The relationships between foreign exchange and the stock market are being checked by Katechos (2011). The higher-yielding currencies positively relate to global stock returns, while the less-yielding currency has a negative connection (Katechos, 2011). The greater the disparity in interest rates, the better the correlation between the exchange rate market and the stock market (Katechos, 2011). In the analysis of share prices in Sweden, Hatemi-J and Irandoust (2002) used monthly data between 1993 and 1998. The findings revealed that Grange's causality is unidirectional from share price to exchange rates. The results also indicate that an increase in Swedish stock prices is associated with an appreciation of the Swedish krona. Adjasi and Biekpe (2006) studied the interaction between stock-market returns and exchange-rate fluctuations in seven African countries. Tests of cointegration have shown that depreciation of the long-term exchange rate contributes to share price rise in certain countries, whereas in the short-term, depreciation leads to lower share prices.

Based on the 1980-1986 data, Soenen and Hennigar (1988) find that the exchange rate has a negative effect on US share prices. In its study of the relations between stock and foreign currency markets in the United States from 1974 to1998, Kim (2003) adopted a multivariate cointegration and error correction model; results showed that in the long or short run, stock prices and exchange rates are negatively correlated. Tsai (2012) uses monthly data from January 1992 to December 2009 for analysing the relationship between exchange and stock prices in Singapore, Thailand, Malaysia, the Philippines, South Korea, and Taiwan. The findings reveal an important trend in the relationship between the currency and stock market in Asia, indicating that when exchange rates are exceptionally high or low, the negative relationship between stock and foreign exchange markets is apparent (Tsai, 2012). In the monthly panel data study for the period August 2008 to June 2011, Liang et al. (2013) discuss the ties between exchange rates and share prices of Indonesia, Malaysia, Philippines, Singapore, and Thailand. The report concludes that the portfolio balance approach notes that exchange rates have negative effects on stock prices by capital mobility.

The positive relations between stock prices and exchange rates have been found in various studies like Aggarwal (1981), Solnik (1987), Abdalla and Murinde (1997), Ravazzolo and Phylaktis (2000) and Apte (2001), Hatemi-J and Irandoust (2002), whereas other studies like Soenen and Hennigar(1988) and Ma and Kao(1990), Ajayi and Mougoue (1996) have shown a significant negative relationship between stock prices and exchange rates. Other studies have shown that the stock market and the foreign exchange are separate in the long run since there is very weak or no relationship evidence has been demonstrated between these two variables such as Solnik (1984), Ozair (2006), Bartov and Bodnar (1994), Franck and Young (1972).

3.6.7 Share Price Index and Discount Rate (DR)

Depending upon the context, the discount rate has different definitions and usages. The discount rate is the interest rate charged to commercial banks and other financial institutions for short-term loans they take from the Federal Reserve Bank. For business valuation purposes, the discount rate is typically a firm's Weighted Average Cost of Capital (WACC). Investors use WACC because it represents the required rate of return that investors expect from investing in the company. A basic idea in economics and finance is that when the discount rate falls, investment should rise (Lamont, 2000). As documented by Barro (1990) and Blanchard et al. (1993), current (as well as lagged) profits are strongly positively related to current investment. Consequently, demand for shares will increase and share price will follow positively.

Figure 3.7: Effects of Discount rate on Share Price Index

Discount rate (IR) ↓ → Cost of capital ↓→ Investment ↑→ Profit ↑ →

Demand for share ↑ → Share price ↑

Waud (1970) finds that discount rate decreases produce positive stock market reactions, while increases are met with negative price movements. Previous studies establish that financial markets react quickly to discount rate changes. Such as Sellon (1980) discusses how discount rate changes may alter bank lending and influence stock returns. First, discount rate changes may affect price level by impacting the level of borrowing from the reserve bank. For example, a decrease in discount rate causes increased borrowing from the reserve banks and subsequent increases in commercial bank lending. Second, discount rate changes may impact lenders' expectations, and hence, their level of lending even though the amount borrowed from the reserve bank remains unchanged (Gilbert, 1985).

Smirlock and Yawitz (1985) discuss two avenues by which discount rate changes may affect stock returns. Discount rate changes influence interest rate forecasts and the cost of capital. Discount rate changes further affect investors' expectations of corporate profitability.

3.6.8 Share Price Index and Trade Openness (OPEN)

Trade openness, defined as the removal of non-tariff barriers, can alleviate certain input quantity constraints. Trade Openness is the sum of imports and exports normalized by GDP. Theoretically, trade openness can lead to more or less domestic volatility because trade can concentrate or diversify country risk depending on the production, and market structure. Social and political conditions (Kim, 2007). Country risk refers to the economic, social, and political conditions and events in a foreign country that may adversely affect a financial institution's operations (Wentzler, 2001).

$$P_0 = \sum_{t=1}^{t=\infty} \frac{E(CF_t)}{(1+k_e)^t} \cdots\cdots\cdots (3.7)$$

In the Equation, any macroeconomic factors can affect the numerator term, the expected cash flows and the denominator term, k_e, which considers the riskiness of the factor variable.

Figure 3.8: Effects of Trade Openness on Share Price Index

OPEN ↑ →Country risk ↑ → future cash flow ↓ → profit ↓ → dividend ↓

→ Share price index ↓

On one hand, trade openness can increase domestic volatility, because trade by definition promotes specialization of production according to comparative advantage, and economies with a more specialized production structure will be more vulnerable to external economic shocks (Kim, 2007). Other studies suggest that trade openness might have a negative impact on growth (Rifat Baris Tekin, 2012; Rıfat Barış Tekin, 2012). Spilimbergo (2000) presents a model in which trade between a developed country and an emerging country can reduce long term growth rates in the developed country. Bhagwati (1988) proposed that the growth led to the export hypothesis that economic growth stimulates both the supply and demand sides of the economy. The Hopenhayn–Melitz model selection effects increase the expected cost of introducing a new variety, and this tends to lead to slow growth.

Figure 3.9: Effects of Trade Openness on Share Price Index

OPEN ↑ →Economic activity↑ → future cash flow ↑ → profit ↑ → dividend ↑ → Share price index ↑

On the other hand, Grossman and Helpman (1991) developed an endogenous growth model whereby trade between a developed and emerging country can, under certain conditions, improve the long-term rate of growth in the emerging country. Taylor (1993) reveals that greater trade openness brings about higher economic growth rates. Moreover, trade openness promotes the efficient allocation of resources, factor accumulation, technology diffusion, and knowledge spillovers. According to Basu and Morey's (2005) studies, a more open economy is predicted to enjoy real-economy growth due to more efficient resource utilisation. According to Fama (1990) and Ferson and Harvey (1997), growth in the real economy boosts future cash flow and profits, which leads to an increase in stock values. As a result, there is a positive link between trade openness and stock prices. Jaleel and Samarakoon (2009) discovered a link between stock market volatility and liberalisation in Sri Lanka. Kim, Lin, and Suen (2010) discovered that trade openness is an important factor in influencing financial development in a wide sample of both developed and emerging nations.

When a country opens its economy to commerce, the growth process becomes self-sustaining due to increased productivity. The process of self-sustaining growth results in technical efficiency, which shows as random walk behaviour in stock prices (Nikmanesh, 2016). Reflecting this theoretical ambiguity, existing empirical evidence for the openness volatility relationship is largely mixed. Some econometric studies report a significantly positive relationship between economic openness and output volatility, especially in developing countries, while others find an insignificant or even a negative effect of openness on macroeconomic volatility, and still, others find a mixed effect (Kim, 2007).

3.6.9 Share Price Index and Interest Rate (IR)

Organisation for Economic Co-operation and Development (OECD) defines interest rate as the price paid by the borrower to use the funds saved by the lender and to pay the lender for the deferring expenses. Interest rates have been seen to be short-term, usually three months, and long-term, generally ten years.

Interest rate is used as a measure of the opportunity cost of holding shares. Therefore, an increase in the interest rate will lead to a movement of investment away from shares to treasury bills. Again, as interest rates increase, both companies and customers will reduce their consumption. This will spark a decline in profits and a decrease in stock values. On the other hand, if interest rates have decreased substantially, consumers and firms would raise consumption and increase share prices. Hence, a negative relationship is expected between interest rate and stock return (Issahaku et al., 2013).

Figure 3.10: Effects of Interest Rate on Share Price Index

Interest rate (IR) ↑ → Investment ↓ → Demand for share ↓ → Share price↓

The association between stock prices and interest rates has gained substantial attention in the literature as a popular field of study over the years. Previous research, including those of Waud (1970) , Nelson (1976), Fama and Schwert (1977), and Fama (1981), indicate that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), and Ferrer et al. (2016) have also confirmed this trend of relationship. Fama (1981) suggests that the predicted inflation is negatively associated with the expected economic activity, which is positively correlated with the return on the stock market. Thus, stock market returns can be negatively associated with anticipated inflation, which is mostly proxied by short-term interest rates. Arango et al. (2002) found that some evidence of the non-linear and negative relationship between the stock market share prices in Bogota and the interest rate was determined by the interest rate of the interbank loan, which is to some degree influenced by monetary policy. Hsing (2004) adopts a structural VAR model allowing multiple endogenous variables such as output, real interest rate, exchange rate, stock market index to find an inverse relationship between stock prices and interest rate. Uddin and Alam (2009) analyse the linear relationship between share price and interest rate, share price and changes of interest rate, changes of share price and interest rate, and changes of share price and changes of interest rate on the Dhaka Stock Exchange (DSE). In all cases, it was found that interest rate has a significant negative relationship with share price changes.

The relationship between the stock market and the short-term interest rate was examined using three-year rolling regressions by Lee (1997). He attempted to estimate the excess returns (i.e. the gap between stock market returns and the risk-free short-term interest rate) on the Standard and Poor 500 index with the short-term interest rate but noticed that the relationship was not constant over time (Lee, 1997). It switches steadily from a substantially negative relationship to no relation or even a positive, but insignificantly (Lee, 1997). A study by Elton and Gruber (1988) shows a positive relationship between stock and short-term interest rates. This positive relationship is underpinned by the sticky-price model of the Keynesian hypothesis. Keynes indicates the stock price can be influenced by money supply if it alters perceptions of future Fed policy or changes in future interest rates (Elton & Gruber, 1988). Recent research, such as Ologunde et al. (2007), has also supported this positive relationship finding. It has also appeared in the literature that the essence of the relationship between interest rates and market returns differs over time and across the various market.

3.7 Institutional Quality Factors and Share price index

Institutional quality is key to the good functioning of an economy and channelling funds from the savers to investors via the stock market. That provides support to the further investment, production, employment and output and income of a country. In the literature, it is found institutional quality can affect the performance of the stock markets. With sound, institutional structure in the country, efficiency and productivity of institutions increase any political event, law, and order of the economies, policy decisions, individual rights, government regulations, and services have a direct bearing on the volatility of the stock market. Winful et al. (2016) defined institutional factors as elements that have to be in place to encourage an enabling business environment. La Porta et al. (1999) stressed the role of legal and institutional factors on stock market development in transition and emerging economies. Law and Azman-Saini (2012) examined the effect of institutional quality on financial development in developed and emerging markets. Their empirical results demonstrated that a high-quality institutional environment is vital for financial development, specifically for the banking sector (Law & Azman-Saini, 2012). However, the relationship between the stock market and institutional quality is described below.

3.7.1 Share Price Index and Corruption Risk Rating (CR)

Corruption worldwide is considered to be pervasive and ubiquitous and detrimental to low economic growth, stifles productivity, and impedes the provision of public services. To raise inequalities to such a degree, international organisations such as the World Bank have described corruption as the single biggest barrier to economic and social progress (Morgan, 1964).

The concept of corruption differs widely, but the most widespread seems to be the one given by Klitgaard (1991), which emphasises the deviation of public officials from formal duties. As Klitgaard points out, a corrupt official deviates from the formal duties of a public position due to private benefit (personal, close relatives, private clique) of pecuniary or status; or violating laws against the practice of such private conduct. Transparency International defines corruption as the misuse of delegated authority for personal benefits. Transparency International (2005) argued that corruption is one of the fundamental problems of today's world that destabilizes good governance, effectively distorts good policies, misuses public services, undermines the growth of the private sector, and harms the poor masses.

Figure 3.11: Effect of Corruption Risk Rating on Share Price Index

Corruption Risk Rating ↑ → Expenses ↑→ Profit ↓ →Stock price index↓

Although there is general agreement in the literature on the negative effects of corruption on economic development, some scholars continue to argue that corruption is a growth driver; there are two conflicting approaches to how corruption can impact economic growth:

1. Corruption sands the wheel of the economy and
2. Corruption greases the wheel of the economy.

The results from empirical research on the effect of corruption on the stock market are contradictory and inconsistent.

Theoretically, corruption is not necessarily bad for stock markets; early studies show that corruption positively impacts stock market development (Leff, 1964; Lui, 1985). Leff (1964) stated that corruption acts as the driving force for economic growth when the government forces strict/ineffective regulations because bribery enables private agents to buy their way out of politically imposed inefficiencies. Sunkanmi and Isola (2014) analysed the relationship between corruption and economic development in Nigeria using the Ordinary Least Squares (OLS) methodology and time-series data from 1980 to 2010 obtained from the Central bank of Nigeria (CBN) Statistical Bulletin, Anti-graft Agency reports and other secondary sources. The study found evidence that corruption has had a positive relationship with FDI, Gross Capital Formation (GCF), and government spending but found no substantial relationship between corruption and GDP, as well as economic transparency and globalization. The finding suggested that the country's degree of corruption has been an essential component of economic development. Farooq et al. (2013) analyses the long-term relationship between capital market development, corruption, and economic growth in Pakistan using the ARDL bounds testing methodology and the implementation of cointegration tests and the VECM Granger causality process to examine the course of causality between variables for the period 1987–2009. They find an increase in corruption positively impacts financial growth. Lau et al.(2013) suggest that corruption (bribery) helps firms solve the inefficiencies of the economic system and decreases instability, which is likely to lead to positive outcomes. Corruption will have a positive impact on the growth of the stock market by its impact on FDI, serving as 'grease' by expediting transactions and helping private businesses to circumvent inadequate legislation and government agencies (Aidt, 2009; Bardhan, 1997; Cuervo-Cazurra, 2008; Egger & Winner, 2005; Leff, 1964). Ahlin and Pang (2008) claim that corruption raises demands for liquidity and therefore increases financial changes. Hillman and Krausz (2004) prove that corruption provides short-term efficiency advantages. For instance, Wang and You (2012) suggest that corruption is likely to increase firm growth in undeveloped financial markets while it deters solid growth in more developed financial markets.

A contradictory view argues that in developed economies such as the United Kingdom. Corporate bribery is not as obvious as in emerging markets (Lau et al., 2013) so financially developed countries are less harmed by an increase in corruption, as funds can be borrowed more easily (Ahlin & Pang, 2008). Pastor and Veronesi (2012) claim that if investors regard bribery as an enterprise resource, it removes confusion regarding government policy and tends to solve the country's inefficiencies. In this context, especially in emerging markets, bribery can reduce stock volatility. On the other hand, several studies suggest that corruption has a negative impact on the development of the stock market.

O'Toole and Tarp (2014) tested the effects of corruption on capital expenditure productivity using firm-level data from World Bank Business Surveys covering 90 developed and transition economies. The results showed that bribery lowered investment efficiency in such a way that the negative effect on small and medium-sized businesses was more robust. Nwankwo (2014) used Granger causality and regression techniques to explore the influence of corruption on Nigerian economic development. The outcome revealed that corruption has a negative impact on economic development. Nageri et al. (2013) also analysed the effects of corruption and economic growth in Nigeria by applying the ordinary least square (OLS) methodology using time series data from 1996 to 2012 collected from the World Bank and Transparency International. The outcome also shows that the impact of corruption on economic development in Nigeria was strongly negative. Mashal (2011) argues that corruption spoils economic growth by dwindling domestic competition that undermines domestic and foreign companies' efficiency. In addition, corruption makes it more difficult and costly to conduct foreign operations by obtaining licenses and permits (Cuervo-Cazurra, 2008; Habib & Zurawicki, 2002; Voyer & Beamish, 2004). Ng (2006) claims that managers might participate in projects otherwise not only accept bribes that create waste and increase transaction costs in the economy. In addition, corruption can hurt the growth of the stock market through its adverse effects on FDI. Wei (2000), Lambsdorff (2003), and Voyer and Beamish (2004) find a negative association between the corruption of the host country and the received FDI (Lambsdorff, 2003; Voyer & Beamish, 2004; Wei, 2000). Other scholars, Jain et al.2012; Lau et al.2013 refer to corruption as "sands the wheels ", viewing government officials as bribery-holders who would attempt to put up market barriers so that they can obtain more bribery. Some research indicates that asymmetric corruption impacts stock market growth based on the development of the economy, such as the developed and emerging economy. De Rosa et al. (2010) find that corruption has a detrimental impact on company competitiveness in Central and East European countries. Yartey (2010) explores the effect of corruption as part of the institutional determinants of stock market growth, using panel data from 42 emerging economies from 1990 to 2004. This study found that the association between corruption and the growth of the stock market is negative. Cherif and Gazadar (2010), using the International Country Risk Guide’s (ICRG) corruption indexes as a proxy for corruption index, investigated the relationship between institutional indicators and stock market growth (Cherif & Gazdar, 2010). Using data from 14 MENA countries for the period 1990 to 2007 and applying panel data and instrumental variable approaches were found a negative association between corruption and the growth of the stock market. Using panel data from 42 emerging economies for the period from 1996 to 2011, Hasan and Nuri (2013) examined the role of corruption and the growth of the banking sector in stock market development. The outcome has demonstrated, among other factors, that corruption has had a more negative impact on the growth of these countries' capital markets than the positive effects of the development of the financial sector. Similarly, Pinheiro (2010) suggests that corruption in more developed countries is inversely associated with stock market returns. In contrast, the higher degree of corruption has a positive effect on stock exchanges in emerging economies.

On the other hand, Olken (2007) finds that corruption can seriously hinder the distribution efforts of emerging countries (Olken, 2007). Conversely, corruption in a less developed financial system is more prohibitive (Ahlin & Pang, 2008). Another strand of empirical research indicates that corruption is plundering economic development/growth by rising market costs and uncertainty in the decision-making process. As asset values are calculated based on potential discounted cash flows; thus, they are good ways to calculate the cost of corruption from the investor's point of view. Thus, corruption raises the company's borrowing costs and consequently lowers the stock value and increases the stock market (Ng, 2006).

3.7.2 Share Price Index and Government Stability (GS)

Some of the important institutional quality factors that affect the stock market are political stability and absence of violence, government effectiveness, regulatory quality, the rule of law, and corruption (Winful et al., 2016).

Government stability is one of the components of political risk described by PRS Group while developing International Country Risk Guide indexes. Government stability is an assessment of the government's capacity to carry out its declared policies and its ability to continue in power. Three subcomponents, namely Government Unity, Legislative Power, and Public Popularity, constitute the risk level applied to this variable. Each of these components will achieve a maximum four-point score and a minimum 0-point score. A score of 4 points is a very low risk, and a score of 0 points is a very high risk (Howell, 2011).

Figure 3.12: Effect of Government Stability on Share Price Index

Gov't stability ↑→ business confidence ↑ → investment ↑ → share price index↑

Yartey (2008) highlighted the impact of institutional quality factors in the IMF working paper. The study by Yartey (2008) analysed dynamic panel data on 42 emerging countries from 1990 to 2004 and used the political risk index as a substitute for the quality of the institutions. The results highlighted that political risk, law and order, and bureaucratic quality is important determinants of stock market development as they enhance the viability of external finance (Yartey, 2008).

Perotti and Pieter (2001) investigated the effect of trust and the rule of law on stock market development by applying correlation analysis in 48 countries. They observed a positive correlation between the two. The results were further confirmed when the data was studied over 15 years, i.e., from 1980 to 1995. Winful, Sarpong and Agyei-Ntiamoah (2016) studied the effect of institutional quality on stock market performance by using the Calderon Rossell model on panel data of 41 emerging countries from 1996 to 2011. The study found that the institutional qualities of political stability and corruption control have a prominent role in enhancing the stock market's performance. It is supposed that a country with solid institutional structures leads to better institutional efficiency and substantial productivity, resulting in better stock market performance.

Similarly, Gani and Ngassam (2008) studied the interaction between institutional factors and stock market performance in eight Asian countries. The study concluded that political stability directly affected stock market performance. In addition, the stock market performance got adversely affected by poor institutional quality. Winful, Sarpong and Agyei-Ntiamoah (2016) proposed that high institutional quality would lead to more liquid stock markets.

3.8 Review of Empirical Studies on Developed Markets[4]

Some studies have been produced for both developed and emerging countries to recognise the importance of evaluating the effects of economic factors on stock market returns. Initially, more stock return determinant analyses focused on well-developed economies, but with the rapid growth of capital markets, academic interest started focusing on emerging markets. However, it is still worth evaluating historical contributions to these markets before exploring current research on both developed and emerging markets.

[4] Summary of empirical studies on developed markets are presented in Table 3.1A of Appendix 3A.

Chaudhuri and Smiles (2004) reported long-term relationships between macroeconomic indicators and stock returns in the Australian economy, using the multivariate cointegration technique. They used M3, World Oil Price Index, GDP, and Private Personal Consumption Expenditure as variables and applied Johansen Cointegration Test, Impulse Response Function (IRF) Analysis, and Forecast Error Variance Decomposition (FEVD) Analysis. IRF and FEVD analysis observed weak evidence for the relationship between the Australian real stock price index and all variables used in the study.

Ligocká et al. (2018) examined the nature of a relationship between the stock returns of financial sector firms listed on the Vienna Stock Exchange and selected macroeconomic variables such as interest rates, inflation, the gross domestic product, and the money supply M3 and the unemployment rate. For this reason, they have chosen CA Immobilien Anlagen, Erste Group Bank AG, Immofinanz AG, Raiffeisen Bank International AG, Uniqa Insurance Group AG and Vienna Insurance Group AG. The Johansen cointegration test and the VECM were used to analyse the long-term and short-term relationship using a time series of quarterly data from 2005 to 2015. Their primary observation is that the macroeconomic variables used predominantly negatively affect the chosen institutions' portfolio returns (Ligocká & Stavárek, 2018).

Darrat (1990), using the Akaike Final Prediction Error (FPE)/multivariate Granger-causality modelling technique, checks whether a variety of economic factors, including money supply, interest rates, and its volatility, inflation, exchange rates, fiscal deficits, real income, are the source of shifts in Canadian market returns on monthly data from January 1972 to February 1987. The empirical findings indicate that lagging changes in fiscal deficits Granger cause stock returns. However, this finding becomes inconsistent with market efficiency if there are no time-varying returns on equity.

The relationship between conditional stock market volatility and macroeconomic variables such as industrial production (IP), M2 Money supply, CPI, and trade variable (measured as the Export Price Index Separated by the Import Price Index) was studied by Liljeblom and Stenius (1997) using the VAR model and monthly data for Finland from 1920 to 1991. Results of the study suggest that macroeconomic volatility may be attributed to anything from one-sixth to over two-thirds of shifts in aggregate market volatility. In addition, this study also finds a negative relationship between stock market volatility and growth in trading volume.

Using the data VECM and causality tests to describe the short run dynamics of demand for money, Thornton (1998) sought to use the Johansen cointegration test to test the hypothesis of a stationary relationship between real money balances, real wages, interest rates and real stock prices in Germany for the period 1960-89. The findings show that real stock prices have a positive and significant influence on long-term demand for real M1 money supply balances on wealth, there are feedback effects between real money balances and interest rates; and unidirectional Granger-causality exists from real income to interest rates, from interest rates to real stock prices, and from real money balances to real income.

By analysing the historical relationship between stock prices and bank lending in Japan, Kim and Moreno (1994) attempt to focus on whether stock price changes have responded to recent fluctuations in bank lending in Japan using the VAR model. The relationship between stock prices and bank lending was weak before the mid-1980s but subsequently improved considerably. This coincided with a shift in the regulatory atmosphere that prompted banks to pay more attention to their place in the capital. As a result, fluctuations in stock markets seem to have contributed significantly to changes in bank loans in Japan since the late 1980s.

Mukherjee and Naka (1995) find that the Japanese stock market is cointegrated with a group of six macroeconomic variables (Money Supply, Long-Term Government Bond Rate, Call

Money Rate, Inflation, Exchange Rate, Industrial Production) using 240 monthly data from January 1971 to December 1990 by using the vector error correction model (VECM) in a system of seven equations. The proposed equilibrium relations are usually confirmed by the signs of long-term elasticity coefficients of macroeconomic variables on stock prices. In six-dimensional structures and two sub-periods, their results are stable for various configurations of macroeconomic variables. In addition, in predicting capacity, the VECM consistently outperforms the vector autoregressive model.

There is little proof that the New Zealand Stock Index is a leading indicator for shifts in macroeconomic variables. Gan et al. (2006) analysed the relationships between the New Zealand Stock Index and a set of seven macroeconomic variables, namely M1, short-term interest rate, long-term interest rate, inflation rate, CPI, exchange rates, domestic retail oil price, GDP using Johansen cointegration checks, Forecast Error Variance Decomposition data from January 1990 to January 2003. To determine if the New Zealand Stock Index is a leading index for macroeconomic indicators, they used the Johansen Maximum Likelihood and Granger causality tests. In addition, they used creativity accounting analysis to analyse the short-term dynamic linkages between share index and macroeconomic variables.

By using the multivariate vector autoregressive (VAR) method on Norwegian data, Gjerde and Saettem (1999) investigated to what degree significant findings on relationships between stock returns and macroeconomic variables from major markets are true in a small open economy. They employed monthly observations over 20 years from 1974 to 1994 and 8 macroeconomic variables such as Stock returns, interest rates and inflation, industrial production and consumption, the OECD industrial production index, the foreign exchange rate Norwegian Krone NOK/USD, and oil prices. In contrast to several previous reports, which have used a different approach on other European economies, several important relationships have been identified. The results are consistent with the US and Japanese results, with real interest rate changes influencing equity returns and inflation. The stock market is reacting correctly to changes in oil prices. The capital market, on the other hand, shows a sluggish reaction to shifts in actual domestic behaviour.

The relationships between mutual fund flow, stock market returns, and macroeconomic variables are studied by Lobão and Levi (2016), mutual fund flows, stock market index, GDP growth, industrial production growth, consumption growth, and unemployment rate growth in Portugal during the 2000Q2 - 2012Q2 period. They found evidence of a statistically significant positive relationship between the flows of mutual funds and the return on the stock market, consistent with a typical approach to information on potential economic growth. In addition, their analysis shows that both mutual fund flows and returns on the stock market are forward-looking and help to predict the evolution of macroeconomic factors. For all decision-makers who need to predict economic growth, these observations have relevant consequences.

Moya-Martínez et al. (2015) use a wavelet-based approach to analyse the relationship between interest rate shifts and the Spanish stock market at a sector level over the timeframe from January 1993 to December 2012. The empirical findings suggest that Spanish businesses typically demonstrate considerable interest rate sensitivity. However, the impact of interest rate exposure varies greatly across sectors and depends on the time period under consideration. In particular, the most vulnerable to interest rates are regulated sectors such as utilities, heavily indebted industries such as real estate, utilities, technology and telecommunications, and the banking sector. This result is consistent with the assumption that long-term investors are more likely to obey macroeconomic fundamentals in their investment choices, such as interest rates.

Maysami et al. (2004) explore the long-term equilibrium relationships between selected macroeconomic variables using the Singapore Stock Market Index (STI) and the finance index, the property index, and the hotel index with different Singapore Exchange Business indices. Using monthly data from January 1989 to December 2001, this study applied the Johansen Cointegration Test and VECM. The finding suggests that the Singapore stock market and the property index are related to the shifts in short and long-term interest rates, industrial productivity, price levels, exchange rates, and the availability of capital (Maysami et al., 2004). The index of the financial sector showed an important relationship with all the macroeconomic variables included in the analysis, with the exception of actual economic activity and the money supply. The hotel index also displayed no major association with the supply of capital and short-term interest rates but showed essential relationships with all the macroeconomic variables included in the report.

Talla (2013) analysed the effect of shifts in selected macroeconomic variables on the stock prices in Sweden. Using monthly data from 1993 to 2012, the unit root test, Multivariate Regression Model computed on the Standard Ordinary Linear Square (OLS), and the Granger causality test have been used to predict the relationship. Inflation and currency deflation have been shown to have a significant negative impact on stock prices. Moreover, the interest rate shows a negative but insignificant relationship with the share price. On the other hand, though insignificant, the money supply is positively related to sharing prices. Except for one unidirectional causal relationship from stock prices to inflation, no unidirectional Granger Causality is observed between stock prices and all the predictor variables under research.

To examine the impact of money growth fluctuations on British stock returns using the London share price index, Abdullah (1998) employs seven macroeconomic variables in the vector autoregression method. Monthly data from 1973M1 to 1995M12 for the M1 money supply, budget deficits and surpluses, industrial production, CPI, and long-term interest rates were used in the model. The author used forecast error variance decompositions (FEVD) used by Sims

(1980) to calculate economic implications. The findings showed that the fluctuations in money growth accounted for 22.82% and 19.53% of the volatility in interest rates and equity returns, respectively. In describing the volatility of UK stock returns, the remainder of the variables used in the model was statistically significant.

The statistical relationship between the availability of money and stock price levels and the amount of interest rates and stock prices in the USA was analysed by Hashemzadeh and Taylor (1998) using weekly data ending from 02 January 1980 to 04 July 1986. By analysing the direction of causality between the supply of capital, stock prices and interest rates using the Granger-Sims test for deciding unidirectional causality. This study suggests that a feedback system describes the relationship between the supply of money and stock prices, with the supply of money influencing some of the observed volatility in stock price levels and vice versa. The findings are not as conclusive with regard to the relationship between stock prices and interest rates. In this case, the causality appears to flow more from interest rates to stock prices and not the other way around.

Malliaris and Urrutia (1991) attempted to make an analytical contribution to the literature on the relationship between actual, monetary, and financial variables of the economy using the Granger causality test methodology. They used monthly average estimates for the Standard and Poor 500 Index and Money Supply M1, Industrial Development Index of USA market for the period January 1970 to June 1989. Their observations reveal that: (i) Money Supply and S&P 500 exhibit statistically significant causality; (ii) Money Supply appears to be leading the S&P 500 Index and (iii) the Industrial Production Index appears to be leading the S&P 500 Index. Their results appear to affirm the significant role that money supply plays in the economy and the popular theory that volatility in stock returns is a leading determinant of subsequent economic performance in the future.

In the vector autoregressive system, Abdullah and Hayworth (1993) employ Granger causality tests and Sims' innovation accounting in the US economy to describe variations in monthly stock returns. The results indicate that previous currency growth, budget deficits, inflation, and short-and long-term interest rates Granger cause stock returns. These variables also explain a significant proportion of the forecast error in the return on the stock. It has been observed that stock returns are linked to inflation and money growth positively and to fiscal deficits, trade deficits, and both short-term and long-term interest rates negatively, which is expected by economic theory. Dhakal et al. (1993) examine the interaction between macroeconomic variables such as Money supply M1, industrial production, short-term interest rate, CPI, and share prices in the wake of the recent volatility of share prices in the United States. They employed the VAR model on monthly data from 1973M1 to 1991M1 in their study. This study has shown that changes in the supply of money directly impact changes in share prices and an indirect impact on share prices by affecting interest rates and inflation rates. The results have suggested that volatility in share prices is causing real output fluctuations. Serletis (1993) analysed the long run relationship between money and stock prices in the United States applying Engle and Granger two-step cointegration method and Johansen's maximum likelihood approach on monthly data for the period 1970M1 to 1988M5. It is observed that money and share prices do not cointegrate, which is consistent with the efficient market hypothesis.

Darrat and Dickens (1999) employ multivariate cointegration and error-correction modelling to examine the Granger causal interrelationships among industrial production, money stock, and the S&P 500 index on monthly data of the US economy covering January 1970 through June 1989. This study reveals strong evidence of cointegration and causal interrelationships among the three macroeconomic variables. Moreover, such interrelationships are strengthened when they included inflation and interest rates in the model.

Sadorsky (1999) investigated the interaction between oil prices and economic activity, especially the impact that oil price shocks may have on stock market returns using macroeconomic variables real interest rate, real oil price, and industrial production of the USA. This study employed VAR Model and Forecast Error Variance Decomposition (FEVD) Analysis using monthly data covering the period 1947:1-1996:4. This study finds that positive oil shocks have a negative effect on actual stock yields, while stock yields have a positive impact on interest rates and IP. This study also revealed evidence that a large portion of the forecast error variance in actual stock returns, especially after 1986, is explained by oil price movements.

Applying the Johansen Cointegration Test, Causality Test, and Forecast Error Variance Decomposition (FEVD) Analysis on monthly data over the period 1975:1-1999:4, Ratanapakorn and Sharma (2007) analysed the long-term and short-term relationships between the US stock price index (S&P 500) and six macroeconomic variables. The macroeconomic variables used in this analysis were money supply, short-term interest rate, long-term interest rate, inflation, exchange rate, and industrial production. They noted that stock prices are negatively related to the long-term interest rate but are positively related to the supply of money, industrial output, inflation, the exchange rate, and the short-term interest rate. Thus, in the context of Granger causality, in the long run, but not in the short run, each macroeconomic variable affects market prices. Moreover, these findings are also confirmed by variance decomposition (VDC), i.e., stock values are comparatively exogenous compared to other variables, and its stock clarifies almost 87 % of its own variance even after 24 months.

Using monthly data from January 1974 to April 2006 and applying VECM methods, Rahman and Mustafa (2008) analysed the long run and short run dynamic impact of large money supply (M2) and oil prices on the U.S. stock market (S&P500). A cointegrating relationship is identified among the three variables above. Though short run interactive feedback interactions exist, the vector error-correction models do not show any converging long run causal flows. The U.S. stock market was originally weakened by negative money and oil shocks.

Errunza and Hogan (1998), who use monthly figures from January 1959 to about March 1993, investigates whether macroeconomic variation can justify period variation in the fluctuations of the European stock market. They implemented Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models, VAR Model and OLS on macroeconomic variables such as stock returns, industrial output, money supply and inflation. They find that unlike the reported case of the US, in many countries, the periodic fluctuations in stock market volatility have been greatly influenced by the past instability in either monetary or real macroeconomic influences. Their results have significant consequences on the distribution of resources and portfolios.

Wong et al. (2006) examine long-term balance relationships between the major stock indices of Singapore and the United States and selected macro-economic variables by means of daily time series data for the period January 1982 to December 2002 using the Johansen Cointegration Test, the Fractional Cointegration Test and the Causality Test. The findings of numerous cointegration experiments indicate that share prices in Singapore typically exhibit a long-term equilibrium relationship with interest rate and money supply (M1), but the same kind of relationship does not hold for the United States. In the United States, asset markets were strongly cointegrated with macroeconomic factors before the 1987 stock market crisis, but the cointegrating relationship afterward was compromised and ultimately vanished with the onset of the 1997 Asian crisis. Finally, the findings of Granger causal tests show some of the systemic causal relationships that suggest that the success of the stock market may be a strong predictor of the monetary policy change of the Central Bank.

Using monthly data from January 1965 to June 2005, Humpe and Macmillan (2009) analyse whether macroeconomic factors impact stock markets in the US and Japan. Cointegration research is used to model the long-term relationship between industrial production, consumer price index, money supply, long-term interest rates and stock markets in the US and Japan. The data are compatible with a single cointegrating vector for the US, where market values are positively related to factory development and negatively related to both the CPI and the long-term interest rate. However, two cointegrating vectors were found for Japanese results. The first cointegrating vector finds that market values are positively affected by industrial production and negatively by the money supply. The second cointegrating vector found that industrial production was negatively affected by the CPI and the long-term interest rate.

Christopoulos et al. (2018) evaluate and analyse the causal relationship between major macroeconomic variables and chosen stock market indices for the behaviour of private investment and consumption per capita using the ARMA (m, n) model and consequences of the economic crisis. For the quarterly period 1995-2013, this study was performed on Germany, Denmark and Spain, chosen based on their income level (GDP) in the European Union (E.U.). According to the report, the authors found that the 2008-2009 recession impacted households and enterprises, which reduced their consumption and investment planning horizons. With respect to the second part of this analysis, the authors used the Granger causality test to find that the stock market of Germany, to some degree, influences shifts in macroeconomic variables.

Jareño et al. (2019) used quarterly data from 2000Q1 to 2014Q4 to research the possible association between the stock market of six related countries (Germany, Italy, Spain, France, the United Kingdom, and the United States) and some significant macroeconomic indicators, such as the GDP, CPI, IPI and unemployment. The GDP and the unemployment display statistically significant positive and negative associations with these foreign stock markets, respectively, especially during the sub-period of the crisis.

By using the cointegration methodology on daily data from January 1988 to April 1995, Muradoglu et al. (2001) analysed the long-term association between stock returns and monetary variables in developed and emerging markets over time. The findings of this study suggest that overall outcomes cannot be included in the formulation of investment strategies because they may be misleading in the sense that stock price variables can change over time. In the Istanbul Stock Exchange (ISE) case, the effects of monetary expansion and interest rates vanished as the economy became more mature and foreign currency prices recovered their anticipated significance.

Wenshwo (2002) provides strong evidence that currency depreciation negatively affects equity returns and/or raises market uncertainty over the duration of the Asian crisis between 6 January 1997 and 31 December 1999 by using a generalised autoregressive conditional heteroskedasticity (GARCH) model on daily data for Thailand, Hong Kong, Singapore, South Korea, and Taiwan stock markets. The assumption is that before taking action, multinational investors and fund managers preparing to invest in the newly emerging East Asian capital markets must ascertain the resilience of the foreign exchange markets.

3.9 Review of Empirical Studies on Emerging Markets[5]

This section presents the empirical literature on the relationship between stock prices and various macroeconomic variables for emerging markets.

[5] Summary of empirical studies on emerging markets are presented in Table 3.2A of Appendix 3A.

Dos Santos et al. (2013) proposed investigating the relationship of the Brazilian market with macroeconomic variables, using the VECM, from January 2001 to December 2011. This study uses the Exchange rate, interest rate, industrial production, and consumer prices index as right-hand side variables. They found that the Brazilian stock market index (IBOVESPA) responded negatively to interest rate differential, Brazilian federal funds (SELIC) rate, and exchange rate volatility, and positively to the IPCA (Extended National CPI of Brazil) price index. Moreover, a significant result archived from the decomposition analysis of the variance shows that the differential interest rate that reflects the foreign investor's risk perception explains a considerable variation of the IBOVESPA index during the period.

Hondroyiannis and Papapetrou (2001) research dynamic relationships between macroeconomic variables, such as industrial development, interest rate, and exchange rate, international stock market results, oil prices, and stock returns. They used monthly data from 1984:1 to 1999:9 and applied the Multivariate VAR Model to analyse whether the flow of economic activity influences the success of Greece's stock market. Changes in oil prices illustrate the fluctuations in stock prices, which have a negative effect on macroeconomic activity.

Patra and Poshakwale (2006) discuss the short-term dynamics and long-term equilibrium of selected macroeconomic variables (CPI, money supply, exchange rate), trade value and stock returns on the emerging Greek stock market. They used monthly data for the period 1990 to 1999 and employed the Causality Test and Vector Error Correction Model. Empirical findings demonstrate the short run and long run relationship between inflation, money supply and the trade volume in Athens stock prices. There is no short-term or long-term equilibrium relationship that exists between exchange rates and stock prices. The findings of this analysis are consistent with the theoretical claims and realistic trends that have taken place in the Greek capital markets during the study period. Results further show that the Athens Stock exchange is informationally unreliable since widely accessible knowledge of macroeconomic factors and market rates can theoretically be used to predict stock prices.

Ahmed (2008) uses quarterly data to analyse the existence of the causal relations between stock prices and important macroeconomic variables reflecting the real and financial sectors of the Indian economy for the period from March 1995 to March 2007. The index of industrial development, exports, FDI, money supply, exchange rate, interest rate, NSE Nifty and BSE Sensex of India are macroeconomic variables included in this report. In order to investigate long run relationships, Johansen's cointegration method and Toda and Yamamoto Granger causality test were used while BVAR modelling was applied to analyse short run relationships for variance decomposition and impulse response functions. The findings of the analysis show unequal causal connections between aggregate macroeconomic indicators and stock indexes in the long term and all markets in the short term. The study reveals that stock prices in India are leading economic activity excluding interest rate changes, but the interest rate seems to be causing stock prices. The analysis reveals that the Indian stock market continues to be driven by real results and projected future performance. The analysis shows that the volatility of stock prices not only stems from the actions of main macroeconomic factors but is also one of the causes of movement in other macroeconomic aspects.

The relationships between five macroeconomic variables and the Indian Stock Market Index were examined by Naik and Phadi (2012), namely the wholesale price index, industrial production index, exchange rates, money supply, and treasury bill rates over the period 1994:04-2011:06, using Johansen Vector Correction Model (VECM). The analysis has shown that the stock market index and macroeconomic variables are cointegrated and that a long-term relationship exists between them. It is further considered that stock prices have been positive in relation to industrial production and the money supply but have been negatively linked to inflation (Naik & Padhi, 2012). Short-term interest and exchange rates were considered negligible in affecting stock prices. In the spirit of Granger causality, the macro-economic indicators cause long-term, but not short-term, share prices. Bi-directional causality occurred between stock prices and industrial production, while unidirectional causality from stock prices to inflation, money supply to stock prices, and interest rates to stock prices is observed.

The shock of macroeconomic variables on stock market activity was investigated by Naik (2013), considering Indian data and applying the Vector error correction model and Johansen cointegration to discover the long run equilibrium relationship between the stock market index and macroeconomic variables over the period 1994:4-2011:04. The five (5) macro-economic factors included in this study were the industrial production index, inflation, money supply, short-term interest rates, and the stock price index. The study revealed that macroeconomic variables and the stock market index are cointegrated, and there is also a long-term correlation between the variables. It also illustrates that stock prices are positively related to the money supply and industrial production index but are negatively linked to inflation. It was found that the interest rate and exchange rate were insignificant.

Ray and Sarkar (2014) analysed the complex relationship between the Indian stock market and macroeconomic variables: money supply, 91-day Treasury bills, long-term government bonds, exchange rate, industrial output, and wholesale price index, using quarterly data from 1991:01 to 2008:04. They used the Johansen Cointegration Test, the Vector Error Correction Model, and the Creativity Analysis. Their studies have shown that the long-term stock market is positively correlated to the exchange rate and industrial production and negatively related to the short-term and long-term interest rate, inflation, and money supply. The innovation analysis and causality findings explain that the Indian stock market affects industrial practices, and the market is predicted to be more vulnerable to shocks of its own over the estimated duration of the report.

Using the Structural Vector Autoregression (SVAR) model on monthly data from January 2003 to September 2015, Yang et al. (2018) explore macroeconomic shocks' impact on core macro variables and stock market returns in Korea. They propose a three-variable SVAR model that integrates inflation, growth in production and returns on stocks. This study follows a non-zero z-ratio constraint for the long run identification assumption to accommodate economically realistic relationships between variables. Although the findings confirm the negative (positive) relation of demand (supply) shocks to stock returns, this research also finds that demand shocks have a more significant effect on stock market variance than supply shocks. Furthermore, the sub-period study reveals that global market fluctuations had minimal effect on Korean stock market results since the global financial crisis. They also discuss the generalised five-variable model, which involves the foreign exchange rate and the interest rate, verifying the findings of the three-variable scenario.

The Vector Autoregressive (VAR) model was used by Hussin et al. (2012) using the monthly data from April 1999 to October 2007 to analyse the relationship between the growth of Islamic financial markets and macroeconomic variables. The analysis included the CPI, IPI, aggregate monetary supply (M3), the Kuala Lumpur Syariah Index (KLSI) and the Islamic Interbank rate. Their results indicated that Islamic share prices were associated with the identified macroeconomic variables. The share price is positively and significantly correlated with the industrial production index and strongly and negatively correlated with the money supply, Islamic interbank rate, and the US Dollar exchange rates. The Granger causal relationship that CPI and M3 Granger causes KLSI and KLSI Granger cause IPI, CPI and Malaysian ringgit.

Naseri and Masih (2013) used Vector Error Correction, Long-Term Structural Modelling, and Variance Decomposition technique to investigate the causality between macroeconomic variables and the Islamic stock market in Malaysia using monthly data from November 2006 to September 2013. The variables used in the analysis were exchange rate, consumer price, and money supply. They observed that there was cointegration between the macroeconomic variables and the Islamic stock market, and the selected macroeconomic variables affected the Islamic stock market in Malaysia.

Abdullah et al. (2014) used a variety of time-series methods and a new Wavelet analysis approach to analyse the causality between the Stock Market Index and the Macroeconomic Variables in Malaysia using monthly data for the period January 1996 to September 2013. Variables used for the study were the CPI, the Exchange rate, the short-term interest rate, export, government bond rate and the Kuala Lumpur Composite Index. Their studies have shown that the government bond, the short-term interest rate and the KLC are exogenous variables; in fact, the short-term interest rate is the leading variable.

The relationship between selected macroeconomic variables (inflation, GDP, money supply and exchange rate, interest rates) and stock market returns in Malaysia has been examined by Zakaria and Shamsuddin (2012) using monthly data from January 2000 to June 2012. The study used a GARCH and VAR model and found a weak relationship between macroeconomic volatility and stock market volatility. The regression analysis confirms that only volatility of money supply is significantly linked to volatility in stock markets, but volatilities of the macroeconomic variables as a group are insignificantly correlated with the volatility of the stock market. Furthermore, only inflation volatility is Granger causing stock market volatility, while out of five macroeconomic variables, only interest-rate volatility has been shown to be

Granger caused by stock market volatility. Also, volatility of macroeconomic factors as a group does not Granger cause volatility in stock market returns.

Ibrahim (1999) investigated the dynamic interactions between seven macroeconomic variables and the stock prices for Malaysia, an emerging market, applying cointegration and Granger causality tests using monthly data series for the period January 1977 to June 1996. Seven macroeconomic variables include Kuala Lumpur Composite Index, M1 Money Supply, M2 Money Supply, CPI, Exchange Rate, Domestic Credit, Foreign Reserve, and Industrial Production. The results show that the Malaysian stock market is inefficient in terms of information on consumer prices, official reserves, and domestic credit aggregates. This study also provided evidence that stock prices were Granger caused by official reserves and short-term exchange rates. There was a marginal cointegration between Malaysian stock prices with M2, and there was no long-term relationship between stock prices and M1.

Ibrahim (2006) constructs a six-variable (Share price, Bank loans, Interest rates, Exchange rate, Price Level, Output.) VAR model and induces generalized impulse response functions using quarterly data to test complex interactions between bank loans and stock prices, covering the period from 1978Q1 to 1998Q2. This study finds evidence that bank loans respond positively to stock price rises, but there does not appear to be any effect on stock prices from bank loans. Likewise, bank loans tend to address real production expansion with no impact on real economic activity from bank loans. Notably, considering the noted currency mismatch between bank assets and liabilities as an aggravating factor in the currency crisis, there is no evidence that fluctuations in the exchange rate have had an impact on bank lending. The exchange rate seems to influence bank lending activities through its impact on real production and stock prices.

By using the Johansen Cointegration Test, causality test, Impulse Response Feature Analysis, and Prediction Error Variance Decomposition (FEVD) Analysis, Hasan and Javed (2009) analyse the complex long-term relationship between stock prices and monetary variables using monthly data for the period June 1998 to June 2008. Money Supply, Treasury bill prices, CPI, and Foreign Exchange Rates were variables included in this report. The multivariate cointegration analysis of Johansen and Juselius suggests the existence of a dynamic long-term relationship between the stock market and monetary variables. Between monetary variables and the stock market, Unidirectional Granger causality is observed. A positive relationship follows the liquidity theory in the case of the money supply. The study of the impulse response reveals that the interest rate shock has a negative effect on the return on equity in the Pakistani equity market. In the short term, exchange rates also have a negative effect on stock returns. Inflation, however, has little effect on stock returns. A study of variance decomposition shows that a significant source of variability for stock returns is the interest rate, exchange rate, and money supply shocks. The VECM also confirms the existence of a short-term relationship between the macroeconomic factor and returns on equity.

Sohail and Hossain (2012) employed Johansen's cointegration technique to analyse the answer in response of stock price to the macroeconomic variables of stock prices. They used CPI, Money supply, industrial production index, actual 3-month treasury bill rate and the exchange rate for three share indices, ISE10 indices, LSE25 indexes, and KSE100 index. KSE100 indexes as variables. For this purpose, they used monthly data from December 2004 to June 2008. This study demonstrated that industrial production has a long-term impact on share prices in the three stock markets. The exchange rate impacts all indexes except the ISE10 index positively. CPI is also related positively to Karachi's stock returns, although it is related negatively to the other two stock exchanges. Finally, the money supply adversely affects stock returns while the treasury bill rate has a mixed effect.

The following macroeconomic factors, such as exchange rate, foreign exchange reserve, industrial production index, interest rate, import, money supply, wholesale price index, and export, are examined by Hussain et al. (2012). The study uses augmented dickey-full (ADF) and Kwiatkowski-Phillips-shin (KPSS) unit root tests, Johansen cointegration test, VECM, and Granger causation tests. They used monthly data of all macroeconomic variables and stock prices from January 2001 to December 2010. A positive and significant relationship between stock prices was demonstrated by foreign exchange reserves, interest rate, money supply, and wholesale price index, while exchange rate and export indicated a negative and significant relationship with stock prices. The results of Granger causality show that the wholesale price index and money supply have two directions, whereas the unidirectional relationship between foreign exchange reserve, exchange rate, and import is with the stock price, but there are no causal relationships between interest rate, industrial production index, and export.

By applying the Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) using macroeconomic variables including interest rate, inflation, and gross domestic product from December 1991 to August 2012, Attari and Safdar (2013) analyse the time series to study the relationship between economic variables and the Pakistan stock market. The findings indicate that macroeconomic factors have a significant effect on stock prices. As a result, stock markets have a significant effect on the country's economy and are also known to be the best proxies for future financial and economic forecasts. The implication of causality implies that there is no relationship between GDP and stock returns when they move in the independent directors. But there is a causal effect of the inflation rate on stock returns, and there is another unidirectional link between stock returns and the interest rate.

Haroon et al. (2013) studied the effect of macro-economic factors on the share price activity of the Karachi Stock Exchange from July 2001 to June 2010 using a correlation and regression methodology. The macroeconomic variables included the Treasury bill rate, the sensitive price index (a proxy for inflation), the wholesale price index, CPI. Their analysis has shown that macroeconomic variables significantly affect the Karachi Stock Exchange (KSE100) price index.

Hunjra et al. (2014) applied Cointegration and Granger Causality to investigate the effect of Macroeconomic variables, namely: exchange rate, inflation rate, GDP, and interest rate on Pakistan's stock price, using monthly data from 1 January 2001 to 31 December 2011. Their results showed that there is no relationship between the stock price and the macroeconomic factors in the short run. However, the long-term results have indicated a significant relationship between stock markets and macroeconomic variables.

Kibria et al. (2014) explore the impact on stock market returns in Pakistan of macroeconomic variables such as GDP per capita, inflation, GDP savings, exchange rate and money supply using annual data from 1991 to 2013. They applied Correlation Analysis, Descriptive Analysis, Regression Analysis and Granger causality measures. The results of the Granger Causality test imply that unidirectional Granger supports the GDP savings and exchange rate causes Money. On the other hand, GDP savings are also unidirectional Granger caused by the KSE. The results of the Regression Analysis indicate that inflation, the exchange rate, the supply of currency, GDP per capita and GDP savings have had a positive effect on the KSE 100 index.

Khan et al. (2014) study the relationship between KSE-100 and the macro-economic variables, namely the gross domestic product, the exchange rate, the interest rate and the inflation rate in Pakistan using monthly data over the 1992 to 2011 sampling period. They used Multiple Regression and Pearson's correlations and observed that gross domestic product, exchange rate and inflation were positively correlated to stock prices. However, there was a negative effect on the interest rate index of the stock markets. They also showed that 80 % of differences in independent variables clarified the stock prices in Pakistan.

Ibrahim, M. H. (2011) employed cointegration and VAR model and examined the stock market development and macroeconomic performance in Thailand using quarterly data from 1993 to 2007. The macroeconomic variables were a real gross domestic product, market capitalization ratio, investment ratio, and the aggregate price level. The Cointegration test results indicate the existence of a long-term relationship between the variables, namely the real gross domestic product (GDP), the market capitalization ratio, the investment ratio, and the aggregate price level. In addition, the impulse-response functions and variance decomposition simulated from the estimated VAR models indicate positive and important contributions to both the real GDP and the investment ratio of stock market growth. Lastly, the super exogeneity test shows that the creation of the stock market in the system is super exogenous. Therefore, the relationship between economic growth and the development of the stock market is structurally invariant to policy changes.

Using monthly time-series observations of nineteen emerging markets, covering the twenty years from 1976 to 1997, Muradoglu et al. (2000) investigated the interactions between stock returns and macroeconomic variables using the Johansen cointegration test. Their analysis used money supply, Overnight Interest Rate, Foreign Exchange Rate, inflation, and industrial performance as macroeconomic variables. During the sample period from 1988 to 1989, the three monetary variables were found not to cointegrate with stock prices in their analysis. However, for the sub-period from 1990 to 1995, all three other monetary variables were cointegrated with stock prices. These findings indicated that the results of the study were adaptive to the time under review.

Chinzara (2010) studied macroeconomic, and stock market volatility for South Africa using VAR models and augmented autoregressive GARCH (AR-GARCH) using monthly data. The findings demonstrated positive volatility spillover from the Treasury bill rate, the exchange rate, and the gold price and negative volatility spillover from inflation. The study finds out that stock market volatility is significantly affected by macroeconomic uncertainty, that financial crises increase the stock market volatility, and that fluctuations in exchange rates are. Short-term interest rates are the main influential variables in affecting stock market instability. In contrast, volatilities in gold prices, inflation and oil prices play insignificant roles in affecting stock market volatility.

Barakat et al. (2015) used monthly data from January 1998 to January 2014 to shed light on the relationship between the stock market and macroeconomic factors in two emerging markets: Egypt and Tunisia. For this analysis, they applied ADF, VAR, Johansen Cointegration test and Granger causality test. The findings showed that there is a causal correlation between the stock index and the CPI, the exchange rate, the supply of money, and the interest rate in Egypt. The same goes for Tunisia, except for CPI, which had no causal connection with the market index. The findings have also shown that the four macroeconomic markets are cointegrated with the stock market in both countries.

Hsing and Hsieh (2012) analysed the macroeconomic determinants of Poland's stock market index based on a quarterly sample from 2000.Q1–2010.Q2 applying the GARCH or ARCH model (Barakat et al., 2015). This study used industrial production, real GDP, M2/GDP ratio, government borrowing/GDP ratio, Treasury bill rate, exchange rate, inflation, and government bond yield as macroeconomic indicators as independent variables. Hsing and Hsieh (2012) found that the Polish stock market index is positively correlated with industrial output or real GDP and negatively influenced by the government borrowing/GDP ratio, the real interest rate, the nominal effective exchange rate, the expected inflation rate, and the government bond yield in German stock market. Furthermore, the paper indicates that a stock market index and the M2/GDP ratio are positively (negatively) linked when the M2/GDP ratio is less (greater) than 43.68 %.

Wongbampo and Sharma (2002) explored the association between stock market behaviour and macroeconomic fundamentals in five Asian nations, including Malaysia, Philippines, Thailand, Singapore, and Indonesia, using monthly data from 1985 to 1996 employing the ADF, Johansen cointegration test, Granger causality test. These macroeconomic variables were Gross National Product (GNP), inflation, money supply, interest rates, and exchange rates. Their analysis revealed that, in the long run, all the five nations' stock price indexes were positively related to growth in output and negatively related to the total price level. Conversely, they also found a negative relationship between interest rates and stock prices for Singapore, Thailand, and the Philippines but positively related to Malaysia and Indonesia.

Hammoudeh and Choi (2006) examined the relationship between the equity index S&P 500 and global factors such as Oil Price, and the US T-bill Rate using weekly data from 15 February 1994 to 28 December 2004. This study employs VECM, Impulse Response Function Analysis, and Forecast Error Variance Decomposition (FEVD) Analysis. In this report, it was observed that there is a direct impact of the US T-bill rate on some of the Gulf Cooperation Council’s (GCC) markets. However, the price of the S&P500, the West Texas Intermediate, and the price of oil did not have an excessively strong effect. It is found that dependent on global stocks, the S&P 500 shocks were assumed to affect all GCC regions over a 20-week projection period positively. A lack of consensus on the effect of the T-bill rate and the VDC study found that the impact of oil price would explain approximately 30% of the variations in Oman's stock market and about 19% of the variations in the Saudi stock market.

Mahmood and Mohd (2007) investigate the dynamic relationship between stock markets and economic variables in six Asian-Pacific selected countries such as Malaysia, Korea, Thailand, Hong Kong, Japan, and Australia using the Johansen cointegration test and VECM. The monthly data on the stock price indices, the foreign exchange rate, the CPI, and the industrial development index from January 1993 to December 2002 are included. Furthermore, the study's findings suggested the presence of an economic equilibrium relationship between and among variables in only four countries, i.e., Japan, Korea, Hong Kong, and Australia. As for short run relationships, all countries except for Hong Kong and Thailand show some excellent interactions. For example, Hong Kong reports a clear correlation between exchange rate and market price, whereas Thailand reports a more significant correlation between production and stock price.

Using panel data from 42 emerging economies from 1990 to 2004, Yartey (2008) analyses the structural and macroeconomic determinants of stock market development. This analysis utilises the level of income, savings and investment, liquidity of the financial exchange, macroeconomic stability, private capital flows, and political risk as institutional quality variables. This study finds that macroeconomic factors such as income, gross domestic investment, the growth of the financial sector, the movement of private capital, and the stock market's liquidity are significant determinants of the development of the stock market in emerging markets and countries. The findings also indicate that, since they determine the competitiveness of foreign financing, political risk, law and order, and bureaucratic efficiency are essential determinants of stock market development. The study also highlights the reasons mentioned above, as the growth of the stock market in South Africa can also be clarified by assessing stock market patterns in emerging economies.

Alam (2013) uses monthly time series data from July 2003 to June 2011 to analyse macroeconomic variables and business features in describing stock market returns in four broad South East Asian (SEA) countries, namely Indonesia, Malaysia, Singapore, and Thailand. Seven macroeconomic variables included changes in money supply (M1 and M2), industrial production growth rate, change in the exchange rate, change in CPI as a proxy for inflation, short-term and long-term interest rates, change in term structure, and growth rate of crude oil prices for study. This study uses ADF, OLS methods in this study. Analytical results indicate that the significant relationship between portfolio stock returns and macroeconomic variables for both subperiods was not reliable.

The effects of macroeconomic variables on stock market development in specific countries of Europe have been examined by Śükrüoğlu and Nalin (2014) using a Dynamic Panel for the period 1995 to 2011. Their independent variables were liquid liabilities, GDP, stocks traded by percentage of GDP as a liquidity ratio, shares traded by% of market capitalization as a turnover ratio and cash surplus as a budget balance, GDS as a savings ratio, and consumer inflation. They observed that profits, monetization ratio, liquidity ratio, saving rate, and inflation impacted the growth of the stock market. According to the report, the monetization ratio and inflation have a negative effect on stock market growth. In contrast, the profits, the liquidity ratio, and the saving rate positively affect stock market development. Interestingly, the monetization ratio is determined by the development of the banking sector, which negatively affects the growth of the stock market. In addition, stock market liquidity is a significant element in the capitalisation of the stock market, and it was significantly positive.

Abugri (2008) explores if four Latin American countries (Argentina, Brazil, Chile, Mexico), dynamics in primary macroeconomic variables such as exchange rates, interest rates, industrial output, and money supply adequately explain stock returns. For this reason, Abugri (2008) used the ADF, VAR model on monthly data for the nominal exchange rate, money supply (M1), industrial production index and nominal interest rate, US 3-month T-bill yield, and MSCI world index from January 1986 to August 2001. In explaining returns in all markets, the study finds that global variables are continuously relevant. The country factors are defined with widely varying importance and magnitudes to influence the markets. Such results may have significant consequences for investors and national policymakers' decision-making. The findings indicate that the MSCI world index and the U.S. 3-month T-bill yield are consistently relevant for all the four markets analysed. In three out of the four markets studied, interest rates and exchange rates are relevant. For the most part, the significant coefficients for the MSCI world index, the U.S. 3-month T-bill return, interest rates, and exchange rates reflect the predicted signals. Generally, the output of money supply and industrial production is insufficient.

3.10 Research Gap

While conducting the literature review, this study identifies the following gaps in literature from previous researchers.

1. Despite this increasing interest in emerging stock markets. the volume of literature in this area is still far less than that focusing on developed stock markets.
2. Previous studies employed a various combinations of macroeconomic variables as determinants of stock markets but very few studies have been conducted on the combination of macroeconomic and institutional quality variables to determine the effects on stock markets.

3. Moreover, time-series data analysis is dominating previous studies on determining the effects of macroeconomic and institutional quality variables on stock markets but a small number of research was done using panel data for the same purpose.

This study fills these important gaps in the literature by considering both developed (21 countries) and emerging (9 markets) markets separately as well as a combination of both and provides further evidence that has important implications for various stakeholders in the capital market. This study uses eight macroeconomic and two institutional quality variables in twelve different combinations using more updated annual panel data ranging from 1984 to 2019.

3.11 Conclusion

In conclusion, it can be suggested that the empirical literature on the relationship between stock price and macroeconomic variables has been mixed. Some studies have shown strong positive relationships between stock returns and macroeconomic variables, and some have a negative relationship. Some studies find an insignificant relationship between them. This combination of observations and results derives from variations in methods, the variables/factors used, and the length of the analysis. The time frame, study field, and the country chose also have inequalities that profoundly influence the actions of macroeconomic variables. Utilizing a new approach and research field can fill the gap provided by some of the examined studies. This is how the various strategies and variables used vary from each other. From 1984 to 2019, the world stock market went through several phases: stock market crashes in October 1987 (Black Monday); Global Financial Crisis 2008-2009; 2010 flash crash, 2015-2016 Chinese stock market crash and significant development in the information technology.

In the literature, the relation and the effects of macroeconomic variables on share prices are mixed and ambiguous. However, this study has considered some variables from the literature to conduct this study for emerging markets based on their theoretical contribution.

4 Chapter 4: Model Specification and Methodology

4.1 Introduction

In the existing literature, numerous methodologies have been used to examine the influence of macroeconomic and institutional quality variables on the capital market performance of a country. Most of the studies were conducted to investigate the relationship between macroeconomic factors and share price, but very few studies have incorporated institutional quality factors in their research. Following the existing literature, this study will apply the cointegration test for panel data to examine the existence of long run equilibrium and error correction models to check short run dynamics among macroeconomic and institutional quality variables and share price. Later this study applied the Granger causality test to check causal relationships among variables.

This chapter starts with mentioning sources of data used in this study, followed by the model specification of the study, expected signs of the estimated coefficients, and later it provides a detailed explanation of the econometric methodology that this study employed to obtain the aim and objectives of the research proposed in chapter 1.

Following the relevant literature, seven macroeconomic variables and two institutional-quality variables are selected to examine their influences on share price within the context of developed and emerging markets.

These macroeconomic indicators are studied: Real GDP, IPI, CPI, FDI, REMI, REER, OPEN, IR, and two institutional-quality variables are CR and GS as control variables as defined in the earlier chapters. The rationale of variables selected for this study has been explored based on empirical findings of several recent pieces of literature in chapter 3.

4.2 Data Sources

This study uses yearly data from 1984 to 2019 for emerging markets and developed markets for the variable used. Data used in this study has been collected from different sources, which are listed below:

Table 4.1: Source and Span of Data

Variables	Description of the variables	Sources
LnSPI	Natural logarithm of Share Price Index (SPI)	MSCI
LnRGDP	Natural logarithm of Real gross domestic product (RGDP)	WDI
LnIPI	Natural logarithm of industrial production index (IPI)	UNCTAD
LnCPI	Natural logarithm of Consumer Price Index (CPI)	WDI
LnFDI	Natural logarithm of foreign direct investment (FDI)	UNCTAD
LnREMI	Natural logarithm of workers' remittances (REMI)	WDI
LnREER	Natural logarithm of the real effective exchange rate (REER)	BRUEGEL
LnOPEN	Natural logarithm of Trade openness (OPEN)	WDI
IR	90 days bank bill rate used as interest rate	OECD
LnCR	Natural logarithm of Corruption Risk Rating (CR)	ICRG
LnGS	Natural logarithm of Government Stability (GS)	ICRG
Note: MSCI: Morgan Stanley Capital Inc.; **UNCTAD:** United Nations Conference on Trade and Development; **WDI:** World Development Indicators; **ICRG:** International Country Risk Guide; **OECD**: Organisation for Economic Co-operation and Development; **BRUEGEL** is a Brussels based independent economic think tank.		

Source: The Table is constructed by the author.

4.3 MSCI Share Price Index

This study has applied the MSCI share price index (SPI) as the dependent variable. The MSCI all-country world index (ACWI), MSCI's flagship global equity index, is designed to represent the performance of the full opportunity set of large- and mid-cap stocks across 23 developed and 27 emerging markets.

MSCI Developed Markets Indexes are built using MSCI's Global Investable Market Index (GIMI) methodology, which is designed to consider the variations reflecting conditions across regions, market cap segments, sectors, and styles. The indexes are available in various sizes – large, mid, small, micro caps, or a combination.

The MSCI Emerging Markets (EM) Index was launched in 1988 including 9 countries with a weight of about 0.9% in the MSCI ACWI Index. Currently, it captures 26 countries across the globe and has a weight of 12% in the MSCI ACWI Index.

4.4 Model Specification

This research intends to explain the relationship between share price and seven macroeconomic and two institutional quality variables based on the context of developed and emerging markets. SPI utilized in this study is grounded on the MSCI stock market index. This study proposes the following 12 models for analysis[6]:

Model 1: $SPI = f(RGDP, CPI)$

Model 2: $SPI = f(IPI, CPI)$

Model 3: $SPI = f(RGDP, CPI, FDI, REMI, REER)$

Model 4: $SPI = f(IPI, CPI, FDI, REMI, REER)$

Model 5: $SPI = f(RGDP, CPI, FDI, REMI, OPEN)$

[6] This study has applied 32 different models which are provided in Appendix 4A (Table 4.1A), but only 12 models have been reported in this thesis paper.

Model 6: $SPI = f(IPI, CPI, FDI, REMI, OPEN)$

Model 7: $SPI = f(RGDP, CPI, FDI, REER, OPEN)$

Model 8: $SPI = f(IPI, CPI, FDI, REER, OPEN)$

Model 9: $SPI = f(RGDP, CPI, REMI, REER, OPEN)$

Model 10: $SPI = f(IPI, CPI, REMI, REER, OPEN)$

Model 11: $SPI = f(RGDP, CPI, FDI, REMI, REER, OPEN)$

Model 12: $SPI = f(IPI, CPI, FDI, REMI, REER, OPEN)$

In this study, panel data has been used for analysis. Panel data usually contain more degrees of freedom and more sample variability than cross-sectional data, which may be viewed as a panel with T = 1, or time-series data, a panel with N = 1, hence improving the efficiency of econometric estimates (Hsiao, 2007).

4.5 Expected Sign of the Coefficients of the Variables

This section summarises the key findings of some of the relevant literature to show the direction of the relationship between the share price index and other macroeconomic variables to provide an idea of our expected signs for those variables.

Table 4.2: Expected Sign of the coefficients of Right-hand Side Variables with SPI.

Variables	Definition of variables	Expected sign of the coefficients of the variables
RGDP	GDP at purchaser's prices equals the total of the gross value contributed by all resident producers in the economy plus any product taxes and minus any subsidies not included in the product value. It is computed without regard for depreciation of manufactured assets or depletion and deterioration of natural resources. The figures are in constant 2010 US dollars. GDP statistics in dollars are translated from native currencies using official exchange rates from 2010. (World Development Indicators, 2019)	**Positive**
IPI	An industrial production index includes mining, manufacturing, and public utilities (electricity, gas, and water) but excludes buildings. The exact coverage, weighting methodology, and calculation techniques vary per nation, but the differences are less significant than price and salary indexes (Organisation for Economic Co-operation and Development, 2008).	**Positive**

CPI	CPI represents variations in the typical consumer's cost of obtaining a basket of goods and services that may be set or modified at predetermined intervals, such as annually. In most cases, the Laspeyres index formula is employed. The data represent averages for a certain time period (International Monetary Fund, 2019).	**Negative**
FDI	According to World Investment Report (2019), “Foreign direct investment (FDI) is defined as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate)”.	**Positive**
REMI	Personal remittances include personal payments and employee compensation. Personal transfers include any current financial or kind transfers made or received by resident households to or from nonresident households. Employee compensation refers to the earnings of the border, seasonal, and other short-term workers working in an economy where they are not residents, as well as residents hired by non-resident businesses. Data are the total of personal transfers and employee remuneration. The figures are in current US dollars (World Development Indicators, 2019).	**Positive**

REER	The nominal effective exchange rate (a measure of a currency's value versus a weighted average of multiple foreign currencies) is divided by a price deflator or relative price to calculate the real effective exchange rate (REER). An increase in REER suggests real depreciation, making exports less expensive and imports more expensive; hence, an increase indicates improved trade competitiveness (International Monetary Fund, 2019). $$\mathrm{REER} = \mathrm{e}\frac{\mathrm{P_f}}{\mathrm{P_d}} \cdots\cdots\cdots (4.1)$$ Here, P_f refers to the average price of goods and services in foreign countries and $\mathrm{P_d}$ refers to the average price of domestic goods and services.	**Positive**
OPEN	Trade Openness was determined in this study as the total of imports and exports normalised by GDP. The value of all commodities and other market services offered to the rest of the world is represented by exports of goods and services. They include the cost of goods, freight, insurance, transportation, travel, royalties, license fees, and other services, including communication, construction, financial, information, business, personal, and government services. They do not include employee salary, investment income (formerly known as factor services), or transfer payments. The value of all products and other market services received from the rest of the world is represented by imports of goods and services. They include the cost of goods, freight, insurance, transportation, travel, royalties, license fees, and other services, including communication, construction, financial, information, business, personal, and government services. They do not include employee salary,	**Positive**

	investment income (formerly known as factor services), or transfer payments (World Development Indicators, 2019).	
IR	Interest is the price paid by a borrower for the use of funds preserved by a lender and the lender's compensation for delaying expenditures. This compensation consists of two parts: a payment corresponding to the principal's loss of buying power throughout the loan's duration and a balance representing the lender's actual interest. Short-term interest rates are typically the three-month interbank offer rate attached to loans given and taken between banks for any excess or shortage of liquidity over several months, or the rate associated with Treasury bills, Certificates of Deposit, or comparable instruments, each with a three-month maturity (Organisation for Economic Co-operation and Development, 2008).	**Negative**

CR	Financial corruption, in the form of requests for specific payments and bribes associated with import and export permits, currency controls, tax assessments, police protection, or loans, is the most prevalent kind of corruption encountered directly by businesses. Corruption can make it difficult to conduct business successfully and, in some circumstances, cause the withdrawal or withholding of an investment (Howell, 2011). Corruption Risk Rating is graded on a scale of zero to six (0-6), with higher scores suggesting a reduced probability of corruption. For example, a positive correlation between corruption and stock returns indicates that greater gains are connected with better corruption status.	**Negative**
GS	Government stability is an evaluation of the government's capacity to carry out its proclaimed program(s) and to remain in power. This variable's risk rating is the total of three subcomponents, each with a maximum score of four points and a minimum score of zero points (0-4). Government Unity, Legislative Strength, and Popular Support are the subcomponents. A number of 4 points indicates low risk, while a score of 0 indicates very high risk (Howell, 2011).	**Positive**

4.6 Methodology

Furthermore, to investigate whether there exists a long run equilibrium and short run dynamics between share price, macroeconomic variables, and institutional quality, this research employs the cointegration analysis and VECM to examine long run relationships and short run dynamics of the variables under study.

In general, the presence of cointegration between economic variables indicates that they maintain a long-term link across time, even if they deviate in the short run. When difference variables are included in a regression analysis model, critical information regarding the long run relationship between time-series data is lost (Sawng et al., 2021). As a result, determining the existence of cointegration between non-stationary time-series is an important stage in the analysis of an economic relation. When economic variables are cointegrated, a random external shock can have a short run impact but the shock will converge in the long run and bring it to the equilibrium position. As a result, the presence of cointegration indicates that the variables have a stable long run relationship. As a result, the cointegration test can be used as a pre-test to exclude spurious regression.

Gonzalo (1994) examined five alternative methods of estimating long run relationships namely ordinary least squares (OLS), nonlinear least squares (NLS), maximum likelihood in an error correction model (MLECM), and principal components (PC), and canonical correlations (CC). Gonzalo (1994) shows that maximum likelihood in a fully specified error correction model (Johansen's approach) has clearly better properties than the other estimators.

This study used panel data for econometric analysis and there are three conintegration tests available for panel data namely Pedroni, Kao and Fisher tests. Pedroni and Kao panel cointegration tests extend the Engle-Granger two-step (residual-based) cointegration framework. Fisher's cointegration test combines individual cross-sections. Among these three tests, this study applied the Pedroni test is comprehensive in cointegration testing as Pedroni proposes seven tests for cointegration that allow for heterogeneous intercepts and trend coefficients across cross-sectional dependence.

This study sums up the main strengths and weaknesses of three popular approaches towards cointegration as follows.

Table 4.3: Advantages and Limitations of Different Cointegration Approaches

Method	**Advantages**	**Limitations**
Single Equation Method: Residual-Based Tests (Engle and Granger, 1987)	• Easy to understand and to implement. • Useful for bivariate analysis.	• Sensitive to the order of the variables • Inability to detect more than one co-integrating relationship. • Some errors generated from the first step can be carried over into the second step based on this two-step estimator. • All the variables are required to be integrated of the same order.
Multiple Equation Method based on Canonical Correlations: Johansen cointegration Tests (Johansen, 1991, 1995)	• Avoid the problem of normalization that plagues other estimators by using one-step estimation. • Able to detect more than one co-integrating relationship by using the multiple-equation approach. • Applicable for multiple variables. • Allow testing of restrictions on the co-integrating vector.	• Extremely sensitive to the assumption regarding to the underlying distributions of the error terms. • Tendency to find spurious cointegration. • High variance and high probability of producing outliers. • Require that all the variables be I(1).
Bounds Test within ARDL Modelling Method	• Simple to implement and interpret. • Irrespective to the order of the integration of the variables.	• Not applicable if there is a presence of I(2) in the system. • Highly sensitive to the order of lags.

	• Allow for differential lag lengths for the variables, and able to accommodate more variables than in other models (i.e. VAR). • Allow for inference on long-run estimates.	

Sources: Compiled by the Researcher from Asteriou and Hall (2011, pp. 366-367); Maddala and Kim (1998, pp. 173, 220-221); Pesaran and Shin (1999); Pesaran et al. (2001).

If the variables are cointegrated, a long run relationship exists among the variables, and VECM would be applied to check the speed of adjustment, followed by the causality test. In that case, the coefficient of the ECT (with one lag) will be negative (will lie between -1 and 0) and significant. The estimated co-efficient will show the speed of adjustment of the variables that adjust to the long run.

If the variables do not have cointegrated, the relationship between macroeconomic indicators and share index, VAR model would be applied followed by Granger Causality test. Since no cointegrated relation exists between variables, the speed of adjustment does not need to be checked, and causal relationships can be checked without ECT.

As a prerequisite of the cointegration analysis, this study begins with the unit root test of all the variables under study using different panel unit root tests.

If the data is non-stationary, then the regression results will be spurious. Therefore, there is a need to test whether the variable is stationary or not. This objective will be attained by unit root testing of the variables. For example, if the time series variable is not stationary, the series contains a unit root.

The presence of unit root in the time series data generates unreliable results in terms of hypothesis testing. Before carrying out hypothesis testing, the non-stationary time series data must be differenced until stationarity is confirmed.

Within the specified framework, the data analysing procedure is proposed with the following main steps:

(i) Unit root tests,

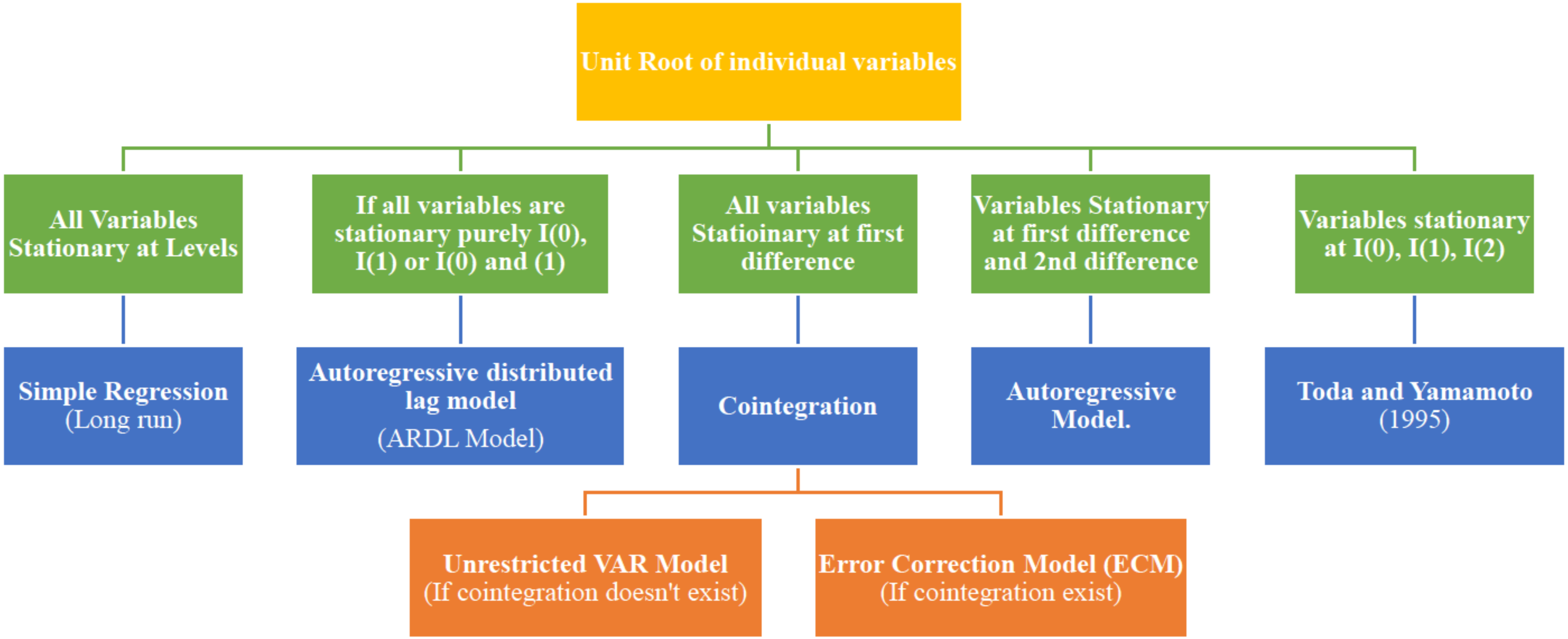
(ii) Cointegration tests,

(iii) VECM and

(iv) Causality tests.

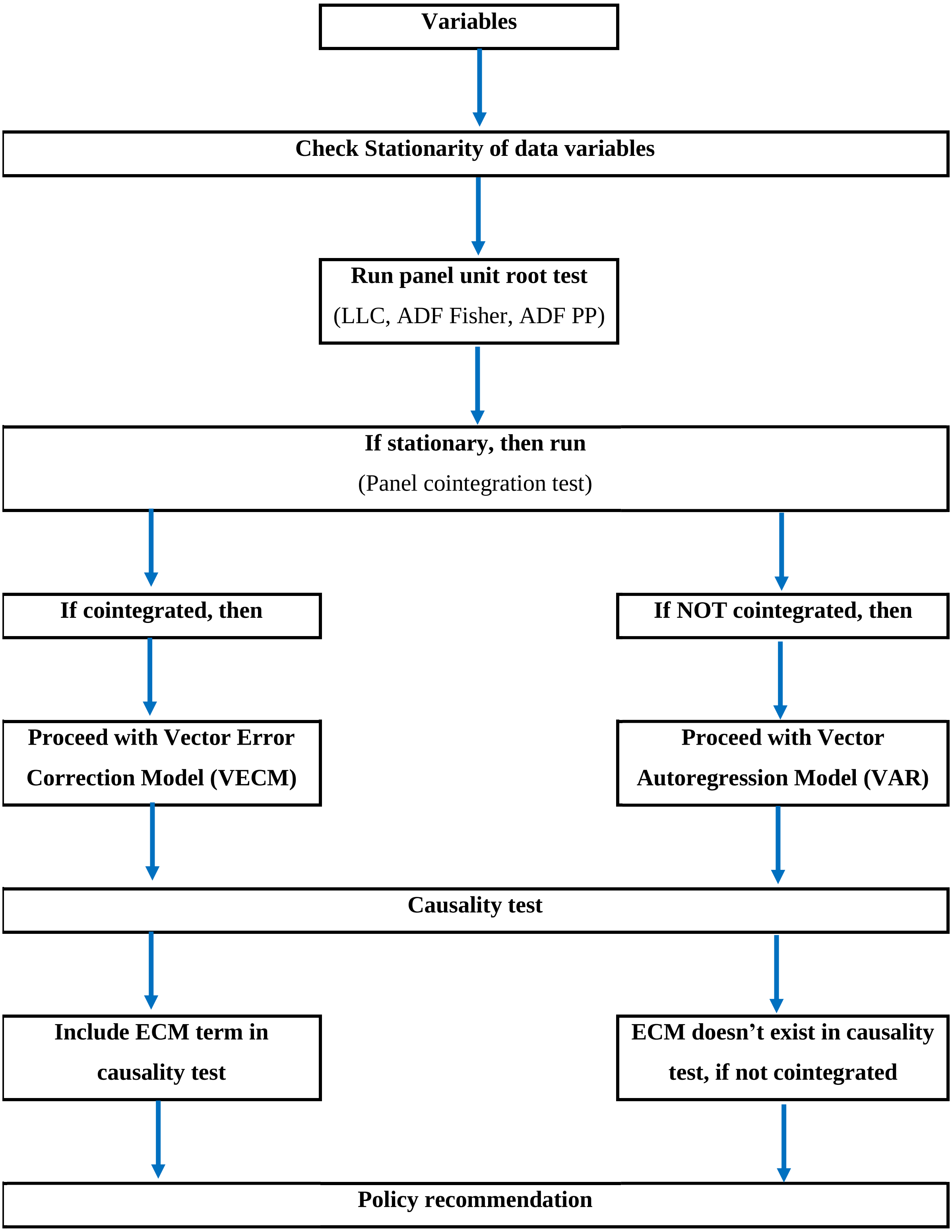
These selected steps of econometric analysis are described throughout the following subsections.

Figure 4.1: Statistical Model Selection on The Base of Data Stationarity.



Source: Retrieved from http://saeedmeo.blogspot.com/search/label/Time%20series%20Model%20Selection

Figure 4.2: Research Methodology



Source: This figure was constructed by the author.

4.7 Unit Root Test

In this section, this study will provide a brief description of the generic panel unit root test. In the panel unit root test framework, two generations of tests have been developed:

The main limitation of the first generation of tests (Levin, Lin, and Chu (LLC) test (2002), Im, Pesaran and Shin (IPS) test (2003), and Fisher-type tests (1932)) is the assumption of cross-sectional independence across units; the second generation of tests rejects the cross-sectional independence hypothesis (Barbieri, 2009).

Within this second generation of tests, two major approaches can be distinguished: the covariance restrictions approach, which was pioneered by Chang (2002, 2004), and the factor structure approach, which was pioneered by Bai and Ng (2004a), Phillips and Sul (2003), Moon and Perron (2004a), Choi (2002), and Pesaran (2003), among others (Barbieri, 2009)[7].

Table 4.4: Panel Unit Root Test

First Generation	***Cross-sectional independence***
1. Non-stationarity tests	Levin and Lin (1992, 1993)
	Levin, Lin and Chu (2002)
	Harris and Tzavalis (1999)
	Im, Pesaran and Shin (1997, 2002, 2003)
	Maddala and Wu (1999)
	Choi (1999, 2001)
2- Stationarity tests	Hadri (2000)
Second Generation	***Cross-sectional dependencies***
1- Factor structure	Bai and Ng (2001, 2004)
	Moon and Perron (2004a)
	Phillips and Sul (2003a)
	Pesaran (2003)
	Choi (2002)
2- Other approaches	O’Connell (1998)
	Chang (2002, 2004)

Source: Hurlin, C. and V. Mignon (2007). "Second-generation panel unit root tests."

[7] A simple but detailed comparison of them is available with Laura Barbieri, Panel Unit Root Tests: A Review.

Among all these methods, LLC, IPS and Fisher-type tests are most commonly used in practice[8]. From the first-generation unit root tests, this study will employ LLC and Fisher-types unit root tests. Therefore, the following section briefly describes LLC, ADF-Fisher (Maddala & Wu, 1999) and ADF-PP (Choi, 2001) unit root test.

Levin, Lin and Chu (2002) Test

Levin and Lin (1992, 1993) and Levin, Lin, and Chu (2002) present some new panel unit root testing results. They expand Quah's model to account for heterogeneity in individual deterministic effects (constant and/or linear time trend) as well as heterogeneous serial correlation structure of the error components under the assumption of homogeneous first-order autoregressive parameters. They suppose that both N and T tend to infinity, but that T increases faster, resulting in $N/T \rightarrow 0$. Where "N" is the number of countries examined in the study and "T" is the number of years considered in the study.

They devise a technique that uses the estimator's pooled t-statistic to compare the hypothesis that each individual time series has a unit root against the alternative hypothesis that each time series is stationary.

This technique produces a considerably higher power test than running a separate unit root test for each person by imposing a cross-equation constraint on the first-order partial autocorrelation coefficients under the null.

[8] See Table 4.2A in the Appendix 4A for a summary of the main characteristics of this first generation of tests.

LLC demonstrates that the asymptotic properties of regression estimators and test statistics are a combination of properties derived from stationary panel data and those derived in the time series literature on unit root tests. However, the presence of a unit root causes the convergence rate of the estimators and t statistics to be larger when T than when N (referred to in the time series literature as "super-consistency").

According to Levin et al. (2002), their panel-based unit root tests are better applicable for panels of intermediate size (i.e., $10 < N < 250$ and $25 < T < 250$). In reality, existing unit root test techniques are appropriate when T is very big or when $T \to \infty$ is very small, but $N \to \infty$ is very high. However, for moderate-sized panels, traditional multivariate techniques may not be computationally feasible or powerful enough, and the LLC test appears to be more suited.

Unfortunately, there are certain limits to the LLC test. First and foremost, the test is critically dependent on the premise of independence across individuals and is hence inapplicable if a cross-sectional correlation exists.

The Fisher's Type Test: Maddala and Wu (1999) and Choi (2001) Test

Maddala and Wu (1999) and Choi (2001) examine the limitations of both the LLC and IPS frameworks and propose a different testing approach. They next propose employing a non-parametric Fisher-type test to test for a unit root in panel data, which is based on a combination of the p-values of the test-statistics for a unit root in each cross-sectional unit (the ADF test or other non-stationarity tests). Both the IPS and Fisher tests incorporate information from individual unit root tests and loosen the LLC test's restrictive assumption that ρ_i is the same under the alternative. On the other hand, the Fisher test is based on more broad assumptions than the earlier suggested ones (Quah's, LLC, and IPS tests). Previous tests, as Choi (2001) pointed out, have several similar inflexibilities that might limit their usage in applications:

- They all need an unlimited number of groups.
- The non-stochastic component is considered to be the same for all groups.
- T is assumed to be the same for all cross-section units, and further simulations are necessary to address the scenario of imbalanced panels.
- According to Levin and Lin, the critical values in ADF regressions are sensitive to the choice of lag lengths.
- Finally, under the alternative hypothesis, all prior tests anticipate that none of the groups has a unit root: they do not allow for some groups to have a unit root while others do not.

Choi (2001) attempts to circumvent these constraints by proposing a very basic test based on a combination of p-values from a unit root test applied to each group in the panel data. There are numerous viable p-value combinations for this goal, but Fisher's is the preferable choice. The Fisher test has several significant advantages:

- It does not need a balanced panel, as the IPS test does.
- It may be used for any derived unit root test.
- Different lag durations might be used in the individual ADF regression.

The main disadvantage of this test is that the p-values have to be derived by Monte Carlo simulation. When N is large, it is necessary to modify the P test since it has a degenerate distribution in the limit. Having for the P test

$E[-2\ln p_i] = 2$ and $Var[-2\ln p_i] = 4$, Choi (2001) proposes a Z test:

$$Z = \frac{1}{2\sqrt{N}}\sum_{i=1}^{N}(-2\ln p_i - 2) \cdots\cdots\cdots (4.2)$$

The IPS test is easy to use because there are tables available in the paper for $E(t_{iT})$ and (t_{iT}) . However, these are valid only for the ADF test. This statistic corresponds to the standardized cross-sectional average of individual p-values. Under the cross-sectional independence assumption of the p_i's, the Lindeberg-Levy central limit theorem is sufficient to show that under the unit root hypothesis, Z converges to a standard normal distribution as $(T_{i,}N \rightarrow \infty)_{seq}$. Choi (2001) also studies the effects of serial correlation in it u on the size for the panel unit root tests and concludes that this is an essential source of size distortions.

4.8 Cointegration Tests

The terminology of cointegration was initially introduced by Granger (1981) and broadly extended by Engle and Granger (1987), Engle and Yoo (1987), Johansen (1988, 1991, 1995, 2000), Stock and Watson (1988, 1993), among others.

Even if the variables may move apart in the short term, the presence of cointegration indicates a long run equilibrium between them (Engle and Granger, 1987). In other words, a linear combination of non-stationary cointegrated variables is stationary. Therefore, at least one variable in the model must respond by correcting the departure from the long run equilibrium or the equilibrium error (Enders, 2004).

Regarding the economic modelling for variables in level or integrated of order one, Granger and Weiss (1983) were forerunners in emphasising the importance of cointegration analysis. The practical use of this notion has grown over time as several major statistical frameworks have been created. Three sound econometric techniques for testing the existence of cointegration[9] can be considered for time series data-integrated of order one.

i) a single equation method or two-step error correction model (Engle and Granger, 1987);

ii) the maximum likelihood cointegration test (Johansen, 1991, 1995); and

iii) the bounds test within the autoregressive distributed lag (ARDL) approach (Pesaran and Shin, 1999; Pesaran et al., 2001)).

This study uses the panel data for 30 countries (21 developed and 9 emerging markets) of the world over the period of 1984 to 2019 to test the cointegration for panel data. Therefore, the above mentioned cointegration techniques will not be applicable in this context. This study uses Pedroni Cointegration Approach, which is more appropriate for panel data.

To test the cointegrating relationship, all the variables under study should be non-stationary or integrated of order 1 (I(1)). Therefore, it is important to test the order of integration of all the variables under study.

4.8.1 Pedroni Cointegration Approach

Pedroni (1999) recommends two statistics, both of which are based on a group-mean method. The Group PP statistic is non-parametric and corresponds to the Phillips–Perron t-statistic, whereas the Group ADF statistic is parametric and corresponds to the ADF t-statistic. These

[9] Advantages and limitations of different Cointegration approaches are presented in Table 4.3A of Appendix 4A.

are known as between dimension statistics since they average the estimated autoregressive coefficients for each country.

The autoregressive coefficient is permitted to vary between countries under the alternative premise of cointegration. This enables the modelling of an extra source of possible variability across the panel (countries)[10].

Following adequate standardisation, both of these statistics converge to the standard normal distribution, with $N \rightarrow \infty$ and T departing to negative infinity under the alternative hypothesis. As a result, the null hypothesis of non-cointegration is rejected using the left tail of the normal distribution.

Following a pre-conditional test for integration of all of the variables, the econometric analysis technique contains further steps:

(i) selecting the optimal lag length for the model.

(ii) Conducting cointegration tests for the presence of long run relationships among the variables.

If the variables are cointegrated Vector Error Correction Model (VECM) will be considered to test the short run relationship. If the variables are not cointegrated, then vector autoregression (VAR) will be considered.

[10] Pedroni (1999) also provides four within-dimension statistics [panel v-statistic, panel ρ-statistic, panel t-statistic (non-parametric) and panel t-statistic (parametric)] that efficiently pool the autoregressive coefficients across countries during unit root testing. Under the alternative hypothesis of cointegration, a shared value for the autoregressive coefficient is provided in these tests.

4.9 Selection of the Optimal Lag Length

It is of primary importance to note that the cointegration test results are considerably sensitive to the lag length and the type of deterministic structures. Therefore, the wrong choice of lag length may lead to imprecise cointegration test results. To achieve better output for the cointegration tests, various criteria are developed to select the ideal lag number for the model. Finally, the optimal lag length obtained from the estimation should be used to determine the rank of cointegration and estimate the models afterward.

There are five commonly used statistical criteria in practice, including the sequential log-likelihood ratio (LR) (Lorden, 1972), the final prediction error (FPE), Akaike information criterion (AIC) (Akaike, 1973; Akaike, 1974), Schwarz information criterion (SIC) (Schwarz, 1978) and the Hannan-Quinn information criterion (HQ) (Hannan and Quinn, 1979) tests. Among others, the AIC and SIC are the most used lag selection criteria methods for checking the lag order of dependent variables and regressors. In the case of small sample size, Pesaran and Shin (1998) stated that the SIC performs slightly better than the AIC because the SIC is a consistent model selection criterion while AIC is not.

4.10 Panel Long run Estimators

Once the study has confirmed that cointegration relationship exists among the variables, the following step is to determine the long run parameters. For that reason, this study uses panel FMOLS and panel DOLS.

Kao and Chiang (2001) argued that these two estimators correct the standard pooled OLS for serial correlation and endogeneity of regressors that are generally present in the long run equilibrium.

4.10.1 Fully Modified Ordinary Least Square (FMOLS)

The Fully Modified Least Squares (FMOLS) system is a non-parametric method that considers the possibility of a relationship between the error term and the first difference of the regressors. Phillips and Hansen (1990) created FMOLS to administer optimum cointegrating regression estimation. However, for the panel cointegration regression, the Pedroni FMOLS estimator was employed since it has the benefit of reducing endogeneity bias and serial correlation. FMOLS, which incorporates heterogeneous cointegration, is the most appropriate approach for the panel, according to Hamit-Haggar (2016). Considering that a panel FMOLS estimator for the coefficient of different models:

$$\hat{\beta}_{i,FMOLS} = \frac{1}{N}\sum_{i=1}^{N}\frac{\left(\sum_{t=1}^{T}(x_{it}-\overline{x_{\imath}})\, y_{it}^{*} - T_{\hat{\tau}_i}\right)}{\sum_{i=1}^{T}(x_{it}-\overline{x_{\imath t}})^2} \cdots\cdots\cdots (4.3)$$

Where,

$y_{it}^{*} = (x_{it} - \overline{y_{\imath}}) - \frac{L_{21l}}{L_{22l}}\,\Delta x_{it},$ described as the transformed variable of y_{it} in order to achieve the endogeneity correction,

$\hat{\tau}_i = \Gamma'_{21} + \Omega'^{0}_{21i} - \frac{L_{21i}}{L_{22i}}\left(\Gamma'_{21} + \Omega'^{0}_{21i}\right)$

also described as the serial correlation term and L_i is a lower triangular decomposition of Ω_i (i.e. long run covariance matrix) is explained as follows:

$$\Omega_i = \begin{bmatrix} \Omega_{11} & \Omega_{12} \\ \Omega_{21} & \Omega_{22} \end{bmatrix}$$

4.10.2 Dynamic Ordinary Least Square (DOLS)

DOLS is based on the parametric approach (by including leads and lags of the differences of regressors) to overcome the endogeneity and serial correlation.

DOLS is a different technique that has certain benefits over both the OLS and the maximum likelihood processes, as suggested by (Stock and Watson, 1993). Their approach outperforms OLS by dealing with limited sample sizes and dynamic sources of bias.

Kao and Chiang (2001) extend the DOLS estimator to panel analysis by developing finite sample characteristics for the OLS, DOLS, and Pedroni's FMOLS. In a panel scenario, the DOLS estimator may be derived by conducting the following regression.

$$y_{it} = \alpha_i + \beta_i x_{it} + \sum_{k=q}^{q} c_{ik}\, \Delta\, x_{it+k} + \mu_{it}\ ; \ \ t = 1, \cdots T\ , \cdots\cdots\cdots (4.4)$$

$$(i = 1, \cdots, N)$$

Where, α_i denotes country-specific effects and c_{ik} is the coefficient of a lead or lag of first differenced exogenous variables, q denotes the numbers of leads/lags typically chosen using some info criterion. Lastly, μ_{it} is the error term which is assumed to be I(0). The parameter estimates of DOLS is as follows:

$$\beta_{i,DOLS} = \frac{1}{N} \sum_{i=1}^{N} \frac{\left(\sum_{t=1}^{T} Z_{it}\, y_{it}^{*}\right)}{\left(\sum_{t=1}^{T} Z_{it}\, \grave{Z}_{it}\right)} \cdots\cdots\cdots (4.5)$$

Where,

$Z_{it} = (x_{it} - \bar{x}_i, \Delta x_{it-k}, \cdots \Delta x_{it+k})$ *is the* $2(k+1) \times 1$ Vector of regressors.

Monte Carlo simulations determined that the DOLS surpasses both the OLS and the FMOLS estimators in terms of unbiased estimation in finite samples. The DOLS estimator also has a benefit in reducing endogeneity in the model, as augmentation using the regressor's lead and delayed differences suppresses endogenous feedback. As a result, the DOLS estimate approach provides a strong correction for explanatory variable endogeneity.

The asymptotic distribution of the Dynamic OLS estimator was the same as that of Pedroni's panel FMOLS estimation. To check the consistency of the output, both the DOLS and FMOLS estimates were conducted as illustrated.

4.11 Vector Autoregression (VAR) and Vector Error Correction Model (VECM)

Suppose there is no evidence of a cointegrated relationship between macroeconomic variables and the stock price index. In that case, this study will apply VAR to determine the potential future paths of specified variables in the model.

The estimation under the VAR approach of order p for nonstationary cointegrated variables can be specified from the following equations:

$$\boldsymbol{Y_{it}} = \boldsymbol{\alpha_{10}} + \sum_{\boldsymbol{i=1}}^{\boldsymbol{m}} \boldsymbol{\beta_{1i} Y_{it-1}} + \sum_{\boldsymbol{i=1}}^{\boldsymbol{m}} \boldsymbol{\beta_{2j} X_{it-1}} + \cdots + \boldsymbol{u_{it}} \quad \cdots\cdots\cdots (4.6)$$

$$(i = 1, \cdots, N; t = 1, \cdots, T)$$

Where, coefficients α_{10}, β_{1i}, β_{2j} are the coefficients of the linear projection of Y_{it} on constant, past values of Y_{it} and X_{it}.

The estimation under the Structural VAR (SVAR) approach for stationary or $I(0)$ and nonstationary $I(1)$variables can be specified from the following equations:

$$\Delta Y_{it} = \alpha_{10} + \sum_{i=0}^{p} \beta_{1i} \Delta X_{it-1} + u_{it} \cdots\cdots\cdots (4.7)$$

$$(i = 1, \cdots, N; t = 1, \cdots, T)$$

Where, coefficients α_{10}, β_{1i}, are the coefficients of the linear projection of Y_{it} on constant, past values of Y_{it} and X_{it}. SVAR models are useful tools to analyse the dynamics of a model by subjecting it to an unexpected shock (Gottschalk 2001).

If non-stationary variables are found to be cointegrated, they are said to have a long run relationship. In other words, there exists an equilibrium link between such variables. Engle-Granger (1987) introduced an error correction mechanism (ECM) to see how this equilibrium is reached while there may be disequilibrium in the short run. ECM allows for correcting the disequilibrium in the cointegration relationship to observe the causality among cointegrated variables for both the long and short run (Hamdi et al., 2013).

The multivariate counterpart of ECM is referred to as the vector error correction model (VECM), which is known as a restricted form of the VAR model. VECM allows for checking the presence of short run dynamics in the system. The estimation under the VECM approach for nonstationary cointegrated variables can be specified from the following equations:

$$\Delta Y_{it} = \alpha_{10} + \sum_{i=1}^{p} \beta_{1i} \Delta Y_{it-1} + \sum_{j=1}^{q} \beta_{2j} \Delta X_{it-1} + \cdots + \eta_{1i} ECT_{1t-1} + \xi_{ut} \quad \ldots (4.8)$$

Where Δ represent the first difference, $\boldsymbol{\eta_{1i}}$ is the parameter of the ECT, representing the long run equilibrium. The absolute value of $\boldsymbol{\eta_{1i}}$ reveal the speed of getting back to equilibrium.

$\boldsymbol{\xi_{ut}}$ is the ECT obtained from the long run model at lagged number j, also called the lagged equilibrium error term, which is normally distributed. ECT term is added to the model to represent the short run relations among variables.

The estimation of $\boldsymbol{\beta_{2j}}$ capture the short run influences from changes in X to Y.

4.12 Granger Causality Test

Even though the cointegration tests account for the presence of long- or short run dynamics between variables, they are not able to show the direction of these relationships.

In a seminal paper, Granger (1969) developed a methodology for analysing the causal relationships between time series to find out whether there are any unidirectional or bidirectional causal relations among the specified variables.

The following section briefly discusses the ideas of the Granger causality test, which can be applied for the standard pairwise Granger causality test using the Dumitrescu - Hurlin (DH) test for panel data.

4.12.1 Standard Granger Causality Test

A causality relationship between two variables occurs when one variable causes a change in another variable, or the past values of one variable can help predict the future values of another.

Suppose X_t and Y_t are two stationary series. Then the following model:

$$\boldsymbol{Y_t = \alpha + \sum_{K=1}^{K} \gamma_k y_{t-k} + \sum_{K=1}^{K} \beta_k x_{t-k} + \varepsilon_t} \qquad (4.9)$$

with t=1….T

The above equation can be used to test whether x causes y. The basic idea is that if past values of x are significant predictors of the current value of y even when past values of y have been included in the model, then x exerts a causal influence on y.

Using (1), one might easily investigate this causality based on an F-test with the following null hypothesis:

$$\boldsymbol{H_0: \beta_1 = \cdots = \beta_k = 0}$$
$$\boldsymbol{H_a: Not\ all\ \beta s\ are\ zero} \qquad (4.10)$$

If $\boldsymbol{H_0}$ is rejected, one can conclude that causality from x to y exists. The x and y variables can, of course, be interchanged to test for causality in the other direction, and it is possible to observe bidirectional causality.

4.13 Conclusion

In conclusion, this chapter has provided a discussion of the methods and procedures which will be employed in this study.

The chapter started with a very general model specification for this study, then outlined and described the testing process. Since the primary objective of this study is to examine the long run relationship between macroeconomic and share price index, this study adopted the Pedroni cointegration tests (2001) process after comparing other different cointegration methods such as Engle and Granger (1987) Modelling Method.

As a prerequisite of the cointegration test, this study considered the unit root test, and this chapter described the justification of choosing LLC, The Fisher's type test proposed by Maddala and Wu (1999) and Choi (2001) test which is appropriate for unbalanced panel data.

Following the unit root test and cointegration test, this chapter described the vector autoregression and Vector Error Correction Model in brief, followed by the Granger causality test.

5 Chapter 5: Cointegration Analysis for Developed and Emerging Markets Combinedly

5.1 Introduction

This chapter discusses the results of the cointegration analysis of selected 30 countries (21 developed and 9 emerging) while investigating the long run relationship between shock prices and selected macroeconomic and institutional quality variables. This chapter is consisting of 10 Sections as follows: Section 5.2 presents selected emerging and developed markets, section 5.3 and 5.4 show descriptive statistics and correlation matrix, respectively. Section 5.5 provides the results of the unit root test of the selected variables. Section 5.6 discusses the results for panel cointegration with Pedroni cointegration techniques. Section 5.7 presents the long run coefficient using fully modified ordinary least square (FMOLS) and dynamic ordinary least square (DOLS) method. Section 5.8 presents the results for short run coefficients using VECM, where Section 5.9 discusses the results on panel causality. Lastly is the conclusion of the study is provided in section 5.10.

5.2 Selection of Emerging and Developed Markets

Morgan Stanley Capital International Inc. (MSCI) classified the world capital market into three categories: developed markets, emerging markets, and frontier markets. This study has considered 21 developed markets and 9 emerging markets. The market classification of MSCI has been adopted for this study. However, frontier markets and some emerging markets are not considered for this study due to data unavailability of that category.

5.3 Descriptive Statistics

The descriptive statistics of variables (in natural logarithm) and growth variables (first difference in natural logarithm) in this study are presented in Table 5.1 (panels A and B, respectively).

Table 5.1 summarises the basic summary statistics of the data under consideration, including the mean, median, maximum, minimum, and standard deviation for the variables in their levels and first differences.

It can be seen that the mean of LnSPI is 4.1784, and the median is 4.3911. Based on the dispersion levels of the series obtained from the standard deviation statistics (Table 5.1 Panel A), LnSPI, LnCPI, LnREER, LnOPEN, LnCR, and LnGS are less volatile in comparison with the remaining macroeconomic variables used in this study. The highest volatility is seen in IR.

On average, the share price growth for all countries combined is 5.52% per annum, and the real GDP growth is 2.83%. The average inflation is 4.49%. Average IP growth and FDI growth are 2.66% and 11.07%, respectively. The share price growth volatility is the highest, and the real GDP growth is the lowest, as illustrated in Table 5.1.

Table 5.1: Summary Statistics (Developed and Emerging Markets)

Panel A: For level variables (in natural logarithm)

	LnSPI	**LnRGDP**	**LnIPI**	**LnCPI**	**LnFDI**	**LnREMI**	**LnREER**	**LnOPEN**	**IR**	**LnCR**	**LnGS**
Mean	4.1784	27.1364	11.2808	4.2947	11.2255	21.1399	4.5781	4.05	6.0067	1.3637	2.0189
Median	4.3911	26.8829	11.1012	4.4312	11.3541	21.1902	4.5805	4.0732	4.6581	1.5041	2.045
Maximum	6.1601	30.5379	14.6486	5.4572	16.0632	25.1461	5.3233	5.4774	48.8451	1.8362	2.4054
Minimum	1.5023	24.7421	8.7887	0.0143	6.4625	16.7298	3.9351	2.503	-0.7838	-1.0987	0.7732
Std. Dev.	0.7851	1.1765	1.191	0.5402	1.7447	1.3521	0.1554	0.5245	5.5303	0.4125	0.2246

Panel B: For growth variables

	ΔLnSPI	**ΔLnRGDP**	**ΔLnIPI**	**ΔLnCPI**	**ΔlnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**ΔLnCR**	**ΔLnGS**
Mean	0.0552	0.0283	0.0266	0.0449	0.1107	0.0765	0.0000	0.0094	-0.0029	-0.0048
Median	0.0652	0.0276	0.0267	0.0253	0.1015	0.0458	0.0043	0.0145	0.0000	-0.0026
Maximum	1.5570	0.2244	0.6514	3.0800	1.1947	20.0026	0.3930	0.5410	1.7918	0.6642
Minimum	-1.6532	-0.1407	-0.2641	-0.0458	-1.1763	-2.6555	-0.7149	-0.4240	-1.0986	-0.6131
Std. Dev.	0.2506	0.0283	0.0543	0.1187	0.1880	0.6719	0.0663	0.0721	0.1289	0.1522

Note: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; OPEN: Trade Openness; CR: Corruption risk rating; and GS: Government stability.

5.4 Correlation Analysis:

The correlation matrix (Table 5.2 and Table 5.3) shows the degree of association of variables (in natural logarithm) and growth variables (the 1st difference), respectively.

The results presented in Table 5.2 are the correlation coefficients among the variables in level reveal that the correlations between the variables under study are not very high except for LnRGDP and LnIPI. To avoid multicollinearity problems, this study will not use LnRGDP and LnIPI together for further econometric analysis.

As a result, there is hardly any evidence of multicollinearity in the system, which makes calculating model parameters confusing (Brooks, 2008: p.171). To determine the possibility of multicollinearity, the data series are converted into percentage changes by converting level data into a natural log form and comparing their first differences (Table 5.3).

The correlation coefficients among the growth variables presented in Table 5.3 are not very high (below 0.7) and, therefore, can be considered together in the analysis.

Table 5.2: Correlation Matrix of Variables in level (Developed and Emerging Markets)

Panel A: For level variables											
	LnSPI	**LnRGDP**	**LnIPI**	**LnCPI**	**LnFDI**	**LnREMI**	**LnREER**	**LnOPEN**	**IR**	**LnCR**	**LnGS**
LnSPI	1.0000										
LnRGDP	0.0986*** (2.9703)	1.0000									
LnIPI	0.1377*** (4.1671)	0.9561*** (9.7887)	1.0000								
LnCPI	0.5133*** (17.9324)	0.2185*** (6.7147)	0.1915*** (5.8486)	1.0000							
LnFDI	0.4723*** (16.0679)	0.6520*** (25.7797)	0.6144*** (23.3456)	0.5582*** (20.1707)	1.0000						
LnREMI	0.3549*** (11.3830)	0.4899*** (16.8473)	0.5243*** (18.4622)	0.3447*** (11.0091)	0.5374*** (19.1044)	1.0000					
LnREER	0.1764*** (5.3720)	0.1378*** (4.1702)	0.1333*** (4.0330)	0.1842*** (5.6196)	0.0263 (0.7891)	-0.0166 (-0.4976)	1.0000				
LnOPEN	0.1999*** (6.1179)	-0.5252*** (-18.5038)	-0.4477*** (-15.0110)	0.1534*** (4.6545)	0.0529 (1.5890)	-0.0822** (-2.4720)	-0.2373*** (-7.3229)	1.0000			
IR	-0.4597*** (-15.5189)	-0.2262*** (-6.9640)	-0.2025*** (-6.1992)	-0.6365*** (-24.7464)	-0.5305*** (-18.7634)	-0.1827*** (-5.5715)	-0.2021*** (-6.1879)	-0.2766*** (-8.6307)	1.0000		
LnCR	-0.1074*** (-3.2375)	-0.0513 (-1.5398)	-0.1224*** (-3.6971)	-0.0483 (-1.4504)	-0.0166 (-0.4992)	-0.3090*** (-9.7423)	0.0104 (0.3124)	0.1255*** (3.7942)	-0.1902*** (-5.8079)	1.0000	
LnGS	-0.0860 (-2.5878)	0.0082 (0.2467)	0.0195 (0.5846)	-0.1249*** (-3.7738)	-0.0334 (-1.0009)	-0.1695*** (-5.1572)	-0.0955*** (-2.8754)	0.0369 (1.1081)	-0.0062 (-0.1856)	0.0882*** (2.6553)	1.0000

Note 1: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; OPEN: Trade Openness; CR: Corruption risk rating; and GS: Government stability.
Note 2: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.
Note 3: t-statistics in parentheses.

Table 5.3: Correlation Matrix of Growth Variables (Developed and Emerging Markets)

Panel B: For growth variables										
	ΔLnSPI	**ΔLnRGDP**	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**ΔLnCR**	**ΔLnGS**
ΔLnSPI	1.0000									
ΔLnRGDP	0.4192*** (14.0883)	1.0000								
ΔLnIPI	0.3910*** (12.9632)	0.7946*** (39.9347)	1.0000							
ΔLnCPI	0.0314 (0.9582)	0.0634* (1.9380)	0.0437 (1.3354)	1.0000						
ΔLnFDI	0.2852*** (9.0785)	0.2083*** (6.4970)	0.1991*** (6.1993)	-0.0108 (-0.3286)	1.0000					
ΔLnREMI	0.0652** (1.9930)	0.0156 (0.4763)	0.0333 (1.0163)	0.0140 (0.4278)	0.0433 (1.3211)	1.0000				
ΔLnREER	0.4039*** (13.4701)	0.2017*** (6.2839)	0.0812** (2.4859)	0.0862*** (2.6409)	0.2167*** (6.7746)	0.0366 (1.1174)	1.0000			
ΔLnOPEN	-0.0292 (-0.8903)	0.1108*** (3.4029)	0.3038*** (9.7307)	-0.0031 (-0.0955)	-0.1273*** (-3.9153)	0.0181 (0.5525)	-0.5548*** (-20.3475)	1.0000		
ΔLnCR	0.0333 (1.0177)	0.0674** (2.0604)	0.0508 (1.5511)	-0.0889** (-2.7236)	0.0218 (0.6646)	0.0058 (0.1756)	0.0783** (2.3969)	-0.0405 (-1.2368)	1.0000	
ΔLnGS	0.0458 (1.3996)	0.0618* (1.8908)	0.0242 (0.7401)	0.0182 (0.5545)	0.0077 (0.2365)	-0.0016 (-0.0477)	0.0796** (2.4361)	-0.1091*** (-3.3489)	0.1120*** (3.4399)	1.0000

Note 1: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; OPEN: Trade Openness; CR: Corruption risk rating; and GS: Government stability.
Note 2: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.
Note 3: t-statistics in parentheses.

5.5 Unit Root Tests Results

An essential first step is to identify the stationary properties of the variables in panel data analysis, particularly for cointegration and Granger causality tests (Pradhan et al., 2018). As a prerequisite of the cointegration analysis, the variables in level should be integrated at order one, i.e. I (1), and the corresponding 1st difference should be stationary of I (0).

For this purpose, while there are a number of panel unit root tests, this study performs three-panel unit root tests Levin Lin Chu (LLC) test, Augmented Dicky Fuller (ADF) Fischer Chi-square test and Phillips-Perron (PP) Fischer Chi-square test proposed by Levin et al., (2002), Maddala and Wu (1999) and Choi (2001) respectively. Many researchers widely use these tests. However, the null hypothesis of these unit root tests is that there exists a unit root in the series, i.e., the variables are non-stationary.

This study subsequently runs the LLC tests, ADF tests and PP tests on all of the variables individually in order to check stationarity for every data series under the research. Regarding the LLC, ADF and PP tests, the null hypothesis of a unit root cannot be accepted unless the computed t-statistic excesses the critical values at a 5 % level of significance, which is the preferable statistical significance level used in many econometric papers. The ADF and PP tests results are mostly consistent in all variables in level except for IR.

Table 5.4: Result of Panel Unit Root (Developed and Emerging Markets)

Level					1st Difference			
	LLC	**ADF**	**PP**	**Order**	**LLC**	**ADF**	**PP**	**Order**
LnSPI	5.729	11.464	9.731	**I (1)**	-21.760***	527.819***	525.493***	**I (0)**
LnRGDP	28.628	0.545	0.227	**I (1)**	-10.950***	221.272***	222.930***	**I (0)**
LnIPI	12.408	2.118	1.944	**I (1)**	-18.124***	486.729***	509.174***	**I (0)**
LnCPI	16.294	3.672	0.763	**I (1)**	-22.872***	456.660***	627.389***	**I (0)**
LnFDI	17.896	1.417	0.274	**I (1)**	-19.433***	511.228***	577.080***	**I (0)**
LnREMI	9.134	7.270	7.268	**I (1)**	-23.956***	618.877***	654.435***	**I (0)**
LnREER	1.594	30.270	32.877	**I (1)**	-26.137***	714.169***	748.388***	**I (0)**
LnOPEN	4.440	11.832	11.192	**I (1)**	-29.333***	826.181***	838.927***	**I (0)**
IR	-11.343***	226.105***	253.268***	**I (0)**	N/A	N/A	N/A	
LnCR	-2.689	54.860	61.868	**I (1)**	-25.146***	685.017***	766.014***	**I (0)**
LnGS	-2.238**	40.547	42.504	**I (1)**	-29.396***	805.061***	1014.830***	**I (0)**

Note 1: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; OPEN: Trade Openness; CR: Corruption risk rating; and GS: Government stability.

Note 2: LLC stands Levin–Lin–Chu test (Levine et al., 2002), ADF stands for ADF- Fischer Chi-square test (Maddala and Wu, 1999), PP stands PP-Fischer Chi-square test (Choi, 2001), I (1) stands for integrated of order one or non-stationary, and I (0) stands for integrated of order zero or stationary.

Note 3: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

The unit root test results are presented in Table 5.4 using LLC, Augmented Dicky-Fuller (ADF) and Philips Perron (PP). The result shows that LnSPI, LnCPI, LnRGDP, LnIPI, LnFDI, LnREMI, LnREER, LnOPEN, LnCR, LnGS are non-stationary and IR is stationary at levels of their natural logarithm value, and the variables are stationary at their first difference. This certainly meets the requirements of the cointegration, VECM and Granger Causality test.

Hence, the next step is to test whether there exists a long run equilibrium relationship among these variables under study. While there is a number of tests to serve this purpose, this study used the Pedroni cointegration test due to its popularity.

5.6 Cointegration Test

The concept of cointegration is recognised as a milestone to examine the long run equilibrium relationships of two or more data series. The data series are cointegrated if there is a long run relationship among them that a movement in one data series leads to a movement in the others at least given time for adjustment to short run changes; in simpler words, in the long run, they move together.

Table 5.5: Results of Panel Cointegration Analysis (Developed and Emerging Markets)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Panel (A): Pedroni cointegration test												
	LnSPI LnRGDP LnCPI	LnSPI LnIPI LnCPI	LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER	LnSPI LnIPI LnCPI LnFDI LnREMI LnREER	LnSPI LnRGDP LnCPI LnFDI LnREMI LnOPEN	LnSPI LnIPI LnCPI LnFDI LnREMI LnOPEN	LnSPI LnRGDP LnCPI LnFDI LnREER LnOPEN	LnSPI LnIPI LnCPI LnFDI LnREER LnOPEN	LnSPI LnRGDP LnCPI LnREMI LnREER LnOPEN	LnSPI LnIPI LnCPI LnREMI LnREER LnOPEN	LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER LnOPEN	LnSPI LnIPI LnCPI LnFDI LnREMI LnREER LnOPEN
Group PP	-3.1319*** (0.0009)	-2.6277*** (0.0043)	-1.4354* (0.0756)	-1.0602 (0.1445)	-1.7341** (0.0414)	-1.5283** (0.0632)	-0.8348 (0.2019)	-0.9918 (0.1606)	-0.7366 (0.2307)	0.3998 (0.6554)	0.3346 (0.6311)	-0.1136 (0.4548)
Group ADF	-7.2118*** (0.0000)	-6.8693*** (0.0000)	-8.0170*** (0.0000)	-8.2713*** (0.0000)	-7.4611*** (0.0000)	-6.0614*** (0.0000)	-6.0664*** (0.0000)	-7.2869*** (0.0000)	-6.2936*** (0.0000)	-5.2020*** (0.0000)	-6.5018 (0.0000)	-6.2444*** (0.0000)
Panel (B): Westerlund (2007) panel cointegration test												
Panel *v*-Statistic $(\boldsymbol{G_\tau})$	1.0172 (0.1545)	-0.3844 (0.6497)	-1.0014 (0.8417)	-1.8308 (0.9664)	-0.3853 (0.6500)	-1.5822 (0.9432)	-0.9313 (0.8242)	-3.5197 (0.9998)	-2.3809 (0.9914)	-3.4886 (0.9998)	-1.8576 (0.9684)	-3.2753 (0.9995)
Panel rho-Statistic $(\boldsymbol{G_\alpha})$	-2.1712** (0.0150)	-0.9032 (0.1832)	2.1018 (0.9822)	1.9499 (0.9744)	1.5106 (0.9346)	1.9348 (0.9735)	1.1641 (0.8778)	2.1166 (0.9829)	1.7187 (0.9572)	2.1864 (0.9856)	3.1874 (0.9993)	2.8854 (0.9980)
Panel PP-Statistic $(\boldsymbol{P_\tau})$	-3.1444*** (0.0008)	-2.0777** (0.0189)	-0.7075 (0.2396)	-1.1398 (0.1272)	-1.2644 (0.1030)	-0.9055 (0.1826)	-1.8059** (0.0355)	-0.6401 (0.2610)	-0.9946 (0.1600)	-0.5478 (0.2919)	0.0070 (0.5028)	-1.1572 (0.1236)
Panel ADF-Statistic $(\boldsymbol{P_\alpha})$	-4.2605*** (0.0000)	-3.3060*** (0.0005)	-4.2669*** (0.0000)	-3.3615*** (0.0004)	-4.6911*** (0.0000)	-3.9881*** (0.0000)	-4.4985*** (0.0000)	-2.4887*** (0.0064)	-4.7137*** (0.0000)	-3.9582*** (0.0000)	-4.0259 (0.0000)	-4.2488*** (0.0000)

Note: ***, ** and *stand for significance at the 1%, 5% and 10% levels, respectively.

It is evident from the above section that all variables under study are integrated into order one, which satisfies the criteria of the cointegration test. The next step is then to test whether there is a long-term relationship among these variables under study. Although there are a variety of tests available here, such as Maddala and Wu (1999), Kao (1999) and Pedroni(1999), this analysis used Pedroni (1999)[11] because it is most commonly used in previous research.

The null hypothesis under consideration is that there is no existence of cointegrating relationship among variables. The results of the Pedroni cointegration tests are exhibited in Table 5.5 for twelve models[12] separately.

The results of the panel cointegration test, based on Group PP and Group ADF statistics, are shown in Table 5.5 (Panel A). It may be seen that the Group ADF statistics are significant at least at the 1% level for most of the models, and some of them are significant for Group PP. This study also checked cointegration existing among the

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[11] To assess the null hypothesis of non-cointegration in a panel, Pedroni (1999) establishes the asymptotic and finite-sample properties of the research statistics. The tests allow heterogeneity between individual panel participants, including heterogeneity in both long run cointegrated vectors and dynamics, as there is no reason to assume that all parameters throughout countries are the same Lee, C.-C., & Chang, C.-P. (2009). FDI, financial development, and economic growth: International evidence. *Journal of Applied Economics, 12*(2), 249-271. https://doi.org/10.1016/S1514-0326(09)60015-5

Pedroni (1999) proposes two types of tests. The first type of test is based on the within-dimension approach, which includes four statistics: the panel v-statistic, the panel rho-statistic, the panel PP-statistic, and the panel ADF-statistic. These statistics pool the autoregressive coefficients across different members for the unit root tests on the estimated residuals. Pedroni's (1999) second type of test is based on the between-dimension approach and includes three statistics: the group ρ-statistic, the group PP-statistic, and the group ADF-statistic. These statistics are based on estimators that simply average the individually estimated coefficients for each member.

[12] This study has considered 32 different models with different combinations of variables. These models are presented in Table 4.1A of Appendix 4A, but 12 models are reported in this chapter.

variables used in this study by implementing the four-panel cointegration tests ($P_\alpha, P_\tau,\ G_\alpha\ and\ G_\tau$) developed by Westerlund (2007). The results are shown in Panel B of Table 5.5. Similarly, the panel ADF statistics are significant for all models at the 1% level. Therefore, we can conclude that the variables are cointegrated at their level, and the null hypothesis of non-cointegration can be rejected. As the variables are cointegrated, the results support the existence of a long run relationship among the variables under study.

These tests are very flexible and allow for an almost completely heterogeneous specification of both the long- and short run parts of the Error-Correction model, where the latter can be determined from the data.

5.7 Estimation of Long run Coefficients

Having confirmed the existence of cointegration of proposed panels, the next step is to estimate the associated long run cointegration parameters. In the presence of cointegration, the OLS estimator is known to yield biased (that is, spurious) and inconsistent results (Pradhan et al., 2018). For this reason, several other methods have been proposed (Nasreen & Anwar, 2014). In this study, the long run equilibrium relationship was estimated using panel DOLS and Panel FMOLS. This study estimated twelve versions of a long run equation in which LnSPI is “explained” by LnRGDP, LnIPI, LnCPI, LnFDI, LnREMI, LnREER and LnOPEN in different specifications. The results of these tests are presented in Table 5.6.

This study aims to identify the nature of the relationship (positive or negative) of the variables, such as LnRGDP, LnIPI, LnCPI, LnFDI, LnREMI, LnREER and LnOPEN.

This observation could allow this study to argue that these variables may influence the share price index. Furthermore, this study investigates the long run (LR) relationship among the variables taking either LnRGDP or LnIPI separately because LnIPI is the proxy of LnRGDP. To estimate the long run relationship, this study considered FMOLS and DOLS methods. The results are presented in Table 5.6.

Panel A of Table 5.6 shows the long run relationship results using LnRGDP for different specifications, and Panel B shows the results using LnIPI for FMOLS and DOLS.

Table 5.6: Estimation of the Long run Coefficients (Dependent Variable: LnSPI) for Developed and Emerging Markets

	Model 1		Model 3		Model 5		Model 7		Model 9		Model 11	
Panel A	LnSPI LnRGDP LnCPI		LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER		LnSPI LnRGDP LnCPI LnFDI LnREMI LnOPEN		LnSPI LnRGDP LnCPI LnFDI LnREER LnOPEN		LnSPI LnRGDP LnCPI LnREMI LnREER LnOPEN		LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER LnOPEN	
	Panel FMOLS	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**
LnRGDP	1.7981*** (10.5390)	2.1153*** (11.486)	0.0393 (0.1674)	0.9143*** (2.7950)	0.1585 (0.6577)	1.5993*** (4.7326)	0.0904 (0.3911)	1.2082*** (4.0232)	0.9654*** (4.8203)	1.5985*** (6.1165)	0.0889 (0.3774)	1.8034*** (4.4782)
LnCPI	-0.2115* (-1.6962)	-0.4360*** (-2.8599)	-0.2594** (-2.4461)	-0.4277** (-2.3860)	-0.2700** (-2.4671)	-0.8893*** (-4.9673)	-0.2621** (-2.3840)	-0.6188*** (-3.8294)	-0.2579** (-2.3157)	-0.6068*** (-3.1999)	-0.2651** (-2.4913)	-0.9921*** (-4.1654)
LnFDI			0.3417*** (6.7217)	0.2570*** (3.9300)	0.4142*** (7.1674)	0.2823*** (3.6707)	0.4929*** (9.0925)	0.3211*** (4.8812)			0.3550*** (6.1200)	0.1849** (2.0901)
LnREMI			0.1905*** (4.8169)	0.0956* (1.9330)	0.1431*** (3.5631)	0.1206** (2.4123)			0.2867*** (7.2751)	0.1942*** (4.0108)	0.1859*** (4.6201)	0.0927 (1.5606)
LnREER			1.1135*** (4.6732)	1.3666*** (5.2019)			0.5841** (2.1695)	1.3684*** (4.0974)	1.4857*** (5.4794)	1.5257*** (4.5451)	1.0241*** (3.8390)	1.2890*** (3.2768)
LnOPEN					-0.4462** (-2.4589)	-0.4279** (-2.1402)	-0.3938* (-1.9600)	0.1164 (0.5041)	0.4355** (2.3987)	0.3480* (1.7444)	-0.1824 (-0.9237)	0.0225 (0.0828)
	Model 2		**Model 4**		**Model 6**		**Model 8**		**Model 10**		**Model 12**	
Panel B	LnSPI LnIPI LnCPI		LnSPI LnIPI LnCPI LnFDI LnREMI LnREER		LnSPI LnIPI LnCPI LnFDI LnREMI LnOPEN		LnSPI LnIPI LnCPI LnFDI LnREER LnOPEN		LnSPI LnIPI LnCPI LnREMI LnREER LnOPEN		LnSPI LnIPI LnCPI LnFDI LnREMI LnREER LnOPEN	
	Panel FMOLS	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**
LnIPI	1.0337*** (6.9947)	0.8738*** (5.3524)	-0.0395 (-0.2545)	0.7368*** (3.2698)	-0.0604 (-0.3720)	0.7869*** (3.2105)	0.0525 (0.3466)	0.9808*** (4.7447)	0.4078** (2.5536)	1.0989*** (4.8719)	0.0019 (0.0123)	0.9906*** (4.2138)
LnCPI	-0.3226*** (-2.8303)	-0.5386*** (-3.3853)	-0.2157** (-2.1978)	-0.0801 (-0.4290)	-0.1836* (-1.8077)	-0.5056** (-2.4394)	-0.2264** (-2.2134)	-0.2270 (-1.0818)	-0.0100 (-0.1008)	-0.2728 (-1.2819)	-0.2205** (-2.2346)	-0.1822 (-0.7268)
LnFDI			0.3572*** (8.4852)	0.2357*** (4.1084)	0.4468*** (9.4204)	0.3930*** (5.8801)	0.4983*** (10.888)	0.3433*** (5.7013)			0.3699*** (7.4565)	0.2549*** (3.3623)
LnREMI			0.1901*** (4.7536)	0.1033* (1.8224)	0.1447*** (3.5210)	0.0822 (1.3936)			0.3168*** (7.8886)	0.1625*** (2.9299)	0.1833*** (4.5002)	0.1208** (1.9925)
LnREER			1.1183*** (4.6716)	1.7033*** (5.6576)			0.6332** (2.3591)	1.6861*** (4.3965)	1.9157*** (7.2573)	2.4048*** (6.1575)	1.0501*** (3.9608)	1.4002*** (3.3614)
LnOPEN					-0.4256** (-2.2718)	-0.5023** (-2.1165)	-0.3716* (-1.8192)	-0.2694 (-1.0916)	0.6798*** (3.7073)	0.6092*** (2.8286)	-0.1630 (-0.8108)	-0.3163 (-1.1032)

Note 1: ***,** and *stand for significance at the 1%, 5% and 10% levels, respectively.
Note 2: t-statistics are presented in parenthesis.

It can be seen (Panel A Model 1 of Table 5.6) that the long run estimated coefficients for LnRGDP is positive and significant, and the estimated coefficient for LnCPI is negative and significant for both FMOLS and DOLS estimation procedure. A similar result can be seen for model 2 in Panel B of Table 5.6, while LnIPI was considered instead of LnRGDP. The estimated coefficients for the LnRGDP/LnIPI are positive and significant for all models and negative and significant for the LnCPI. Therefore, it can be concluded higher real GDP implies a higher Share Price Index, and a higher CPI lowers the Share price index.

Mansor (2011) conducted a cointegration analysis based on the VAR model to study the impact of stock market development in Thailand. GDP, aggregate price level, and the investment ratio were identified as the key controllers of the stock market in Thailand (Mansor, 2011). Another study conducted by Singh et al. (2011) in Taiwan exampled the influence of GDP and employment rate on the Taiwan index, and found that these variables have a positive effect on the Taiwan Index of all portfolios.

Kasman et al. (2005) and Burcu (2016) found IPI and stock returns share a positive correlation as an increase in the former leads to an increase in cash flows and profitability of the firms. Furthermore, Nasseh and Strauss (2000) argued that German industrial production positively affected Germany's stock market and other European stock markets like the UK, Holland, France, Italy, and Switzerland. Likewise, Jareño and Negrut 2016 reported a positive correlation between USDJ and IPI.

The negative correlation between stock returns and inflation is well established in existing research (Fama and Schwert, 1977, Chen et al., 1986, Barrows and Naka, 1994, Chen et al., 2005). Saunders and Tress (1981), in their study on the Australian stock market, reported a significantly negative correlation between stock market returns and inflation.

It can be seen (Panel A Model 3 of Table 5.6) that the long run estimated coefficients for LnFDI, LnREMI, and LnREER are positive and significant for both FMOLS and DOLS estimation procedures. A similar result can be seen for model 4 in Panel B of Table 5.6, while LnIPI was considered in place of LnRGDP. The estimated coefficients for the LnFDI, LnREMI and LnREER are positive and significant for all models except model 6 for the DOLS estimation procedure. Therefore, it can be concluded higher the FDI, REMI and REEER imply a higher Share Price Index.

These results are consistent with the analytical expectation and with various existing literature. The positive relationship of FDI to Ghana stock returns was stated by Adam and Tweneboah (2009). Gümüs (2010) also concludes that the relationship between BIST 100 bond return and foreign direct investment exhibit is positive in Turkey. Investigating the relationship between foreign direct investment and stock market performance for Turkey, Okuyan and Erbaykal (2011) find positive long-term interaction between these variables, whereas no short-term relationship is stated. The US economy has been analysed by Egly et al. (2010) using the VAR framework and has reported a positive relationship between foreign direct investment and US stock market results from 1997 to 2007.

Gupta et al. (2009) indicate that remittances positively impact poverty mitigation by increasing income and higher living conditions in remittance-receiving households. In addition, Billmeier and Massa (2009) also found remittances positively and significantly impact market capitalization.

Using monthly data on U.S. stock markets from 1974 to1978, Aggarwal (1981) found that stock prices and real exchange rates are positive. However, the relationships between foreign exchange and the stock market are being checked by Katechos (2011). The higher-yielding currencies positively relate to global stock returns, while the less-yielding currency has a negative connection (Katechos, 2011).

It can be seen that the long run estimated coefficients for LnOPEN are negative in some models and positive in other models. The long run estimated coefficients for LnOPEN are found negative and significant in Table 5.6 Panel A model 5, Panel B model 6 and model 8. In Table 5.6, Panel A model 9 and Panel B model 10, the long run estimated coefficients are found positive and significant in both FMOLS and DOLS estimation procedures. In Table 5.6 Panel A model 7 and model 11, the long run estimated coefficients for LnOPEN are found negative for the FMOLS estimation procedure, but for the DOLS estimation procedure, the long run estimated coefficients for LnOPEN are found positive and insignificant.

According to Basu and Morey's (2005) studies, a more open economy is predicted to enjoy real-economy growth due to more efficient resource utilisation. According to Fama (1990) and Ferson and Harvey (1997), growth in the real economy boosts future cash flow and profits, which leads to an increase in stock values. As a result, there is a positive link between trade openness and stock prices. Lida (2016) discovered that trade openness positively affects stock market volatility in Indonesia and Malaysia but has a negative effect in Thailand. Although the effect of trade openness on Philippine and Singaporean stock market volatility is not significant across the whole sample period, trade openness is shown to influence stock market volatility in the Philippines and Singapore in subsamples.

5.8 Vector Error Correction Model (VECM)

Error Correction Terms (ECT) and Panel VECM Short run Coefficients

Since most of the results suggest a long run relationship between macroeconomic indicators and SPI, this study then applied VECM to check the speed of adjustment, followed by the causality test with the coefficient of ECT to check the causal relationship.

Based on unit root and cointegration test results cited above, the following VECMs were set up to study short run fluctuations and long run equilibrium.

Estimated VECM equations:

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{11} + \sum_{k=1}^{p} \beta_{1ik}\Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik}\Delta \mathrm{LnRGDP}_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik}\Delta \mathrm{LnCPI}_{(it-k)} + \varphi_{1i}\mathrm{EX}_{it} + \lambda_{ki}\mathrm{ECT}_{1it-1} + \xi_{1it} \cdots\cdots\cdots\cdots (\mathbf{5.1})$$

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{12} + \sum_{k=1}^{p} \beta_{2ik}\Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{2ik}\Delta \mathrm{LnIPI}_{(it-k)} + \sum_{k=1}^{p} \delta_{2ik}\Delta \mathrm{LnCPI}_{(it-k)} + \varphi_{2i}\mathrm{EX}_{it} + \lambda_{ki}\mathrm{ECT}_{1it-1} + \xi_{2it} \cdots\cdots\cdots\cdots (\mathbf{5.2})$$

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{13} + \sum_{k=1}^{p} \beta_{3ik}\Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{3ik}\Delta \mathrm{LnRGDP}_{(it-k)} + \sum_{k=1}^{p} \delta_{3ik}\Delta \mathrm{LnCPI}_{(it-k)} + \sum_{k=1}^{p} \theta_{3ik}\Delta \mathrm{FDI}_{(it-k)} + \sum_{k=1}^{p} \pi_{3ik}\Delta \mathrm{REMI}_{(it-k)} + \sum_{k=1}^{p} \eta_{3ik}\Delta \mathrm{REER}_{(it-k)} + \varphi_{3i}\mathrm{EX}_{it} + \lambda_{ki}\mathrm{ECT}_{1it-1} + \xi_{3it} \cdots\cdots\cdots\cdots (\mathbf{5.3})$$

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{14} + \sum_{k=1}^{p} \beta_{4ik}\Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{4ik}\Delta \mathrm{LnIPI}_{(it-k)} + \sum_{k=1}^{p} \delta_{4ik}\Delta \mathrm{LnCPI}_{(it-k)} + \sum_{k=1}^{p} \theta_{4ik}\Delta \mathrm{FDI}_{(it-k)} + \sum_{k=1}^{p} \pi_{4ik}\Delta \mathrm{REMI}_{(it-k)} + \sum_{k=1}^{p} \eta_{4ik}\Delta \mathrm{REER}_{(it-k)} + \varphi_{4i}\mathrm{EX}_{it} + \lambda_{ki}\mathrm{ECT}_{1it-1} + \xi_{4it} \cdots\cdots\cdots\cdots (\mathbf{5.4})$$

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{15} + \sum_{k=1}^{p} \beta_{5ik}\Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{5ik}\Delta \mathrm{LnRGDP}_{(it-k)} + \sum_{k=1}^{p} \delta_{5ik}\Delta \mathrm{LnCPI}_{(it-k)} + \sum_{k=1}^{p} \theta_{5ik}\Delta \mathrm{FDI}_{(it-k)} + \sum_{k=1}^{p} \pi_{5ik}\Delta \mathrm{REMI}_{(it-k)} + \sum_{k=1}^{p} \psi_{5ik}\Delta \mathrm{OPEN}_{(it-k)} + \varphi_{5i}\mathrm{EX}_{it} + \lambda_{ki}\mathrm{ECT}_{1it-1} + \xi_{5it} \cdots\cdots\cdots\cdots (\mathbf{5.5})$$

$$\Delta LnSPI_{it} = \alpha_{16} + \sum_{k=1}^{p} \beta_{6ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{6ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{6ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{6ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{6ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \psi_{6ik}\Delta OPEN_{(it-k)} + \varphi_{6i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{6it} \cdots\cdots\cdots \mathbf{(5.6)}$$

$$\Delta LnSPI_{it} = \alpha_{17} + \sum_{k=1}^{p} \beta_{7ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{7ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{7ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{7ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \eta_{7ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{7ik}\Delta OPEN_{(it-k)} + \varphi_{7i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{7it} \cdots\cdots\cdots \mathbf{(5.7)}$$

$$\Delta LnSPI_{it} = \alpha_{18} + \sum_{k=1}^{p} \beta_{8ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{8ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{8ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{8ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \eta_{8ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{8ik}\Delta OPEN_{(it-k)} + \varphi_{8i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{8it} \cdots\cdots\cdots \mathbf{(5.8)}$$

$$\Delta LnSPI_{it} = \alpha_{19} + \sum_{k=1}^{p} \beta_{9ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{9ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{9ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \pi_{9ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{9ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{9ik}\Delta OPEN_{(it-k)} + \varphi_{9i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{9it} \cdots\cdots\cdots \mathbf{(5.9)}$$

$$\Delta LnSPI_{it} = \alpha_{20} + \sum_{k=1}^{p} \beta_{10ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{10ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{10ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \pi_{10ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{10ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{10ik}\Delta OPEN_{(it-k)} + \varphi_{10i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{10it} \cdots\cdots\cdots \mathbf{(5.10)}$$

$$\Delta LnSPI_{it} = \alpha_{21} + \sum_{k=1}^{p} \beta_{11ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{11ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{11ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{11ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{11ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{11ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{11ik}\Delta OPEN_{(it-k)} + \varphi_{11i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{11it} \cdots\cdots\cdots \mathbf{(5.11)}$$

$$\Delta LnSPI_{it} = \alpha_{22} + \sum_{k=1}^{p} \beta_{12ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{12ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{12ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{12ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{12ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{12ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{12ik}\Delta OPEN_{(it-k)} + \varphi_{12i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{12it} \cdots\cdots\cdots (\mathbf{5.12})$$

Where,

- p = optimum lag length[13] is 2 in this study using SIC.

- $\beta_{ik}, \gamma_{ik}, \delta_{ik}, \theta_{ik}, \pi_{ik}, \eta_{i}, \psi_{ik}\varphi_{ik}, =$ short run dynamic coefficients of the model's adjustment long run equilibrium.

- EX_{it} implies either IR, LnCR, LnGS and D_{GFC}. This study considers one exogenous variable at a time to avoid multicollinearity.

- λ_{ki}= speed of adjustment parameter with a negative sign. For all k=1,2, -----, 12

- ECT_{it-1}= the error correction term is the lagged value of the residuals obtained from the cointegrating regression of the dependent variable on the regressors that contains long run information derived from the long run cointegrating relationship.

- ξ_{it}=residuals in the equations.

Importantly, this study also observed that there exists a known structural break in 2008 attributable to the global financial crisis (GFC). This study added the dummy variable D_{GFC} to capture the effect of GFC on the Share price index.

D_{GFC} = 0 from 1990 to 2008 and 1 after 2008[14].

[13] Selection of Optimal Lag Length (Developed and Emerging Markets) are presented in Table 5.1A of Appendix 5A.

[14] This study also used developed markets (DEV=1, 0 otherwise) dummy but the results were not significant. Results will be available upon request.

Table 5.7: Panel Error Correction Model (Model 1) of Developed and Emerging Markets

Variables	Dependent variable: ΔLnSPI_{it}				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM_{i(t-1)}}$	-0.0947*** (-8.4139)	-0.1063*** (-9.9489)	-0.0613*** (-6.5277)	-0.0851*** (-7.8328)	-0.0488*** (-6.6166)
$\Delta \text{LnSPI}_{i(t-1)}$	0.3298*** (9.8361)	0.3723*** (10.8654)	0.3238*** (9.2773)	0.3296*** (9.6262)	0.2984*** (8.7115)
$\Delta \text{LnSPI}_{i(t-2)}$	-0.1822*** (-5.6923)	-0.1852*** (-5.7419)	-0.1886*** (-5.6332)	-0.1730*** (-5.2750)	-0.2001*** (-6.2273)
$\Delta \text{LnRGDP}_{i(t-1)}$	-0.8490** (-2.5549)	-0.5207 (-1.5482)	-0.7095** (-2.0403)	-0.8247** (-2.4253)	-0.9281** (-2.7761)
$\Delta \text{LnRGDP}_{i(t-2)}$	1.0450*** (3.1637)	1.0349*** (3.1498)	1.1033*** (3.2367)	0.99171*** (2.9300)	0.7939** (2.3867)
$\mathbf{\Delta lnRGDP \rightarrow \Delta\ lnSP}$	**4.4756****				
$\Delta \text{LnCPI}_{i(t-1)}$	-0.0877 (-0.4898)	1.3813*** (4.1635)	0.3685* (1.7891)	0.2193 (1.1463)	0.2400 (1.1936)
$\Delta \text{LnCPI}_{i(t-2)}$	0.0743 (0.9251)	-0.191912** (-2.2041)	0.054808 (0.6626)	0.057301 (0.7011)	0.067513 (0.8354)
$\mathbf{\Delta lnCPI \rightarrow \Delta\ lnSPI}$	**4.7089*****				
Constant	0.0240** (2.1256)	0.0653*** (5.6892)	-0.0573* (-1.6673)	-0.1466** (-2.0288)	0.0646*** (4.6757)
IR		-0.0159*** (-7.3040)			
LnCR			0.0456** (2.1702)		
LnGS				0.0799** (2.2441)	
$\mathbf{D_{GFC}}$					-0.1124*** (-6.7918)
Sample Size	916	889	886	886	916
R-squared	0.1731	0.2260	0.1508	0.1676	0.1684
S.E. equation	0.2074	0.1974	0.2126	0.2105	0.2081
Akaike AIC	-0.2993	-0.3970	-0.2485	-0.2685	-0.2914
Schwarz SIC	-0.2572	-0.3485	-0.1999	-0.2199	-0.2441
F-statistic	27.1595***	32.1102***	19.4693***	22.0767***	22.9588***

Note 1: ***, **and * represents significant at 1%, 5% and 10% level.
Note 2: Figures within brackets represents the t-statistics.
Note 3: ΔLnCPI → ΔLnSPI implies consumer price index growth Granger cause share price index growth if the F-Stat is significant (Calculated using Bi-variate Granger causality).

Table 5.7 reports estimated coefficients of panel VECM results using equation 5.1 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (5.1) for different specifications, that is, considering interest rates, corruption risk rating, government stability, and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. In general, the ECT term should be negative and significant and should lie between zero and (-1). It can be seen that the estimated coefficients of the ECT are negative and significant at 1% level for all specifications suggests that through ECT, a short run disequilibrium may eventually be converged to long run equilibrium. For example, The ECT in column 1 for the model without having the exogenous variables is -0.0947suggests that approximately 9.47% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

The estimated coefficients for $\Delta LnSPI_{i(t-1)}$ are positive and significant, and $\Delta LnSPI_{i(t-2)}$ is negative and significant implying that in the short run, $\Delta LnSPI_{i(t-1)}$ does influence the $\Delta LnSPI_{it}$.

The estimated coefficients for $\Delta LnRGDP_{i(t-1)}$ are negative and significant at 5% level, and $\Delta LnRGDP_{i(t-2)}$ is positive and significant at a 1% level implying that in the short run $\Delta LnRGDP_{i(t-2)}$ influence $\Delta LnSPI_{it}$. It has been theoretically demonstrated that the productive capacity of an economy grows during economic growth, which successively contributes to the cash flow generation potential of the company. Jareno and Negrut (2016) carried out a time-evolution analysis of the USA's Dow Jones (DJ) prices and GDP from 2008 to 2014. A positive relationship was observed between the DJ and GDP. Evidence from existing studies indicates that GDP positively impacts stock market performance (Fama, 1981; Mukherjee & Naka, 1995). This means that an increase in GDP leads to an increase in stock performance.

The estimated coefficient of interest rate (IR) is negative and significant at a 1% level, implying that the stock price index growth will be reduced when the interest rate will be higher, which is in line with the existing literature. In general, lowering the interest rate implies that the borrowers can borrow and invest money in the business or stock market, which increases the stock market movements and will affect the stock price (or the growth of SPI) positively and vice versa. With lower interest rates, consumers' disposable income increases and increases purchasing power, which positively influences the stock prices. Previous research, including those of Waud (1970) , Nelson (1976), Fama and Schwert (1977), and Fama (1981), indicate that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), and Ferrer et al. (2016) have also confirmed this trend of relationship. Arango et al. (2002) found some evidence of the non-linear and negative relationship between Bogota's stock market share prices. Hsing (2004) adopts a structural VAR model allowing multiple endogenous variables such as output, real interest rate, exchange rate, and stock market index to find an inverse relationship between stock prices and interest rate. Similarly, Uddin and Alam (2009) also found a negative relationship.

The estimated coefficient for LnCR (that is, corruption risk rating) is positive and significant at a 5% level, implying that a higher risk of corruption[15] lowers the share price index growth. Mashal (2011) argues that corruption spoils economic growth by dwindling domestic competition that undermines domestic and foreign companies' efficiency. In addition, corruption makes it more difficult and costly to conduct foreign operations by obtaining licenses and permits (Habib and Zurawicki, 2002, Voyer and Beamish, 2004, Cuervo-Cazurra, 2008). Ng (2006) claims that managers might participate in projects otherwise not only accept bribes that create waste and increase transaction costs in the economy. In addition, corruption

[15] Rating for corruption risk is from zero to six (0-6), the higher points indicating lower risk of corruption. Please see Table 4.2.

can have a negative effect on the growth of the stock market through its adverse effects on FDI. Wei (2000), Lambsdorff (2003), and Voyer and Beamish (2004) find a negative association between the corruption of the host country and the received FDI (Wei, 2000, Lambsdorff, 2003, Voyer and Beamish, 2004).

Similarly, the estimated coefficient for LnGS is positive and significant at the 5% level, implying that the higher the government stability[16] index higher the share price index growth. Government stability is an assessment of the government's capacity to carry out its declared policies and its ability to continue in power. Three subcomponents, namely Government Unity, Legislative Power, and Public Popularity, constitute the risk level applied to this variable. Each of these components will achieve a maximum four-point score and a minimum 0-point score.

Similarly, the estimated coefficient of the dummy variable (D_{GFC}) for the Global Finance Crisis (GFC) is negative and significant at a 1% level, implying that the share price index growth was hampered during the global financial crisis period, which is shown by a negative and significant relationship between SPI and D_{GFC}. During the GFC, the affected countries had the experience of downfall in economic activities and production level, which lead to decreased share price index growth.

Row 8 of Table 5.7 shows the bivariate Granger causality result, and the direction of causality. The F-stat is significant at a 5% level shows that real GDP growth Granger[17] causes SPI growth. Similarly, row 11 of Table 5.7 indicates that the F-stat is significant implies that inflation Granger causes share price growth.

[16] A score of 4 points is a very low risk and a score of 0 points is a very high risk. Please see Table 4.2.
[17] In Table 5.19 this study found similar result in a multivariate framework.

Table 5.8: Panel Error Correction Model (Model 2) of Developed and Emerging Markets

Variables	Dependent variable: $\Delta LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$ECM_{i(t-1)}$	-0.0687*** (-6.8839)	-0.1070*** (-9.7034)	-0.0359*** (-4.9098)	-0.0653*** (-6.7596)	-0.0511*** (-6.8352)
$\Delta LnSPI_{i(t-1)}$	0.3130*** (9.4778)	0.3634*** (10.9179)	0.3013*** (8.9422)	0.3094*** (9.3660)	0.2753*** (8.2962)
$\Delta LnSPI_{i(t-2)}$	-0.1544*** (-4.7389)	-0.1471*** (-4.5556)	-0.1770*** (-5.3283)	-0.1558*** (-4.7871)	-0.1789*** (-5.5439)
$\Delta LnIPI_{i(t-1)}$	-0.2514* (-1.7010)	-0.2686* (-1.8847)	-0.2308 (-1.5238)	-0.2605* (-1.7637)	-0.3110** (-2.1240)
$\Delta LnIPI_{i(t-2)}$	0.2145 (1.4595)	0.1754 (1.2396)	0.2394 (1.5951)	0.1672 (1.1289)	0.1215 (0.8319)
$\Delta lnIPI \rightarrow \Delta lnSPI$	**3.4412****				
$\Delta LnCPI_{i(t-1)}$	0.3426* (1.7381)	1.5130*** (4.5346)	0.4053* (1.8825)	0.3639* (1.8323)	0.3918* (1.8976)
$\Delta LnCPI_{i(t-2)}$	0.0360 (0.4372)	-0.2197** (-2.5062)	0.0447 (0.5361)	0.0383 (0.4655)	0.0363 (0.4447)
$\Delta lnCPI \rightarrow \Delta lnSPI$	**4.7089*****				
Constant	0.0178* (1.7543)	0.0774*** (7.1075)	-0.0509 (-1.5226)	-0.1585** (-2.1549)	0.0621*** (5.1568)
IR		-0.0154*** (-7.1798)			
LnCR			0.0485** (2.2734)		
LnGS				0.0870** (2.4192)	
D_{GFC}					-0.1153*** (-6.6684)
Sample Size	886	859	886	886	886
R-squared	0.1463	0.2211	0.1281	0.1487	0.1635
Adj. R-squared	0.1395	0.2138	0.1202	0.1409	0.1558
Akaike AIC	-0.2455	-0.3689	-0.2222	-0.2460	-0.2635
Schwarz SIC	-0.2023	-0.3191	-0.1735	-0.1974	-0.2149
F-statistic	21.4961***	30.1644***	16.1117***	19.1432***	21.4229***

Table 5.8 reports estimated coefficients of panel VECM results using equation 5.2 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (5.2) for different specifications, that is, considering interest rates, corruption risk rating, government stability, and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant at 1% level for all specifications suggesting that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. For example, the ECT in column 1 for the model without having the exogenous variables is -0.0687 suggests that approximately 6.87% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

The estimated coefficients for $\Delta LnIPI_{i(t-1)}$ are negative and significant, and $\Delta LnIPI_{i(t-2)}$ is positive, which is consistent with existing literature but found to be insignificant in this study. This result implies that in the short run, $\Delta LnIPI_{i(t-1)}$ does influence the $\Delta LnSPI_{it}$. Industrial production growth will increase when the real output of manufacturing, mining, electricity and gas increases. Consequently, it creates more profit for those companies and thus creates demand for shares in the capital market for those companies. Hence it increases the share price through expected future cash flow (Fama, 1990). Kasman et al. (2005) and Burcu (2016) found IPI and stock returns share a positive correlation as an increase in the former leads to an increase in cash flows and profitability of the firms. Nasseh and Strauss (2000) argued that German industrial production not only had a positive effect on Germany's stock market but also on that of other European stock markets like the UK, Holland, France, Italy and Switzerland. Likewise, Jareño and Negrut 2016 reported a positive correlation between USDJ and IPI.

The estimated coefficients for $\Delta LnCPI_{i(t-1)}$ are positive and significant at 10% level implying that in the short run, $\Delta LnCPI_{i(t-1)}$ do influence the $\Delta LnSPI_{it}$. Inflation can positively influence stock returns if stocks can provide a hedge against inflation (Asprem, 1989). Examining the association between stock returns and inflation in the economies with capital markets characterised by rapid growth rates is identified to be positive as the equities in these economies allow to hedge against inflation (Maysami et al., 2004; Ratanapakorn & Sharma, 2007). The literature review shows that an increase in the rate of inflation is followed by both lower earnings growth and higher real returns (Fisher, 1930; Tripathi & Kumar, 2015). The association between Malaysia stock prices and CPI was also examined in the study by Ibrahim and Aziz (2003). The study found that there is a positive long run relationship between CPI and stock prices in Malaysia.

Row 8 of Table 5.8 shows the direction of causality using bivariate Granger causality analysis. The F-stat is significant 5% level shows that IPI growth Granger[18] cause share price growth. Similarly, row 11 of Table 5.8 indicates that the F-stat is significant implies that inflation Granger causes share price growth.

[18] In Table 5.20 this study found similar result in a multivariate framework.

Table 5.9: Panel Error Correction Model (Model 3) of Developed and Emerging Markets

Variables	Dependent variable: Δ LnSPI$_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
ECM$_{i(t-1)}$	-0.0257*** (-3.8822)	-0.0805*** (-9.7219)	-0.0040 (-0.9743)	-0.0059 (-1.2331)	-0.0393*** (-6.3235)
ΔLnSPI$_{i(t-1)}$	0.3531*** (9.4723)	0.4004*** (10.8154)	0.3439*** (8.9640)	0.3512*** (9.2134)	0.3326*** (9.0262)
ΔLnSPI$_{i(t-2)}$	-0.2382*** (-6.7673)	-0.2229*** (-6.4619)	-0.2532*** (-6.9372)	-0.2434*** (-6.7404)	-0.2390*** (-6.9093)
ΔLnRGDP$_{i(t-1)}$	-0.9050*** (-2.6626)	-0.2333 (-0.7025)	-0.7506** (-2.1206)	-0.8895** (-2.5499)	-0.6231* (-1.8566)
ΔLnRGDP$_{i(t-2)}$	0.7719** (2.3011)	0.7417** (2.2972)	0.8112** (2.3556)	0.6832** (1.9787)	0.6697** (2.0320)
ΔlnRGDP → ΔlnSPI	**4.4756****				
ΔLnCPI$_{i(t-1)}$	-0.5330*** (-2.7584)	1.6634*** (5.0345)	-0.2463 (-1.1743)	-0.3462* (-1.7202)	0.3416* (1.6588)
ΔLnCPI$_{i(t-2)}$	0.1444* (1.7547)	-0.2206** (-2.5246)	0.1389* (1.6519)	0.1467* (1.7479)	0.0654 (0.8031)
ΔlnCPI → ΔlnSPI	**4.7089*****				
ΔlnFDI$_{i(t-1)}$	0.1702*** (4.4682)	0.1804*** (4.9541)	0.1828*** (4.6730)	0.1808*** (4.6261)	0.1492*** (3.9291)
ΔlnFDI$_{i(t-2)}$	-0.1786 (0.0392)	-0.1858 *** (-4.9539)	-0.1727*** (-4.2932)	-0.1715*** (-4.2691)	-0.1945*** (-5.0448)
ΔlnFDI → ΔlnSPI	**13.3169*****				
ΔLnREMI$_{i(t-1)}$	0.0221 (0.7934)	0.0259 (0.9997)	0.0313 (1.0990)	0.0294 (1.0319)	0.0356 (1.3056)
ΔLnREMI$_{i(t-2)}$	0.0220 (0.8005)	0.0158 (0.6227)	0.0284 (1.0128)	0.0285 (1.0152)	0.0397 (1.4804)
ΔlnREMI → ΔlnSPI	**0.9609**				
ΔLnREER$_{i(t-1)}$	-0.5257*** (-4.1849)	-0.4046*** (-3.4114)	-0.5616*** (-4.3461)	-0.5666*** (-4.3901)	-0.4613*** (-3.7305)
ΔLnREER$_{i(t-2)}$	0.4808*** (3.9044)	0.6534*** (5.6258)	0.4947*** (3.8986)	0.4891*** (3.8555)	0.5313*** (4.3958)
ΔlnREER → ΔlnSPI	**9.3277*****				
Constant	0.0464*** (3.6563)	0.0670*** (5.5675)	-0.0309 (-0.8765)	-0.1170 (-1.5827)	0.0611*** (4.0177)
IR		-0.0184*** (-8.3640)			
LnCR			0.0451** (2.1026)		
LnGS				0.0773** (2.1345)	
D$_{GFC}$					-0.1206*** (-6.5490)
Sample Size	891	864	861	861	891
R-squared	0.1952	0.2983	0.1830	0.1835	0.2295
Adj. R-squared	0.1833	0.2867	0.1695	0.1700	0.2172
Akaike AIC	-0.2960	-0.4640	-0.2553	-0.2558	-0.3373
Schwarz SIC	-0.2207	-0.3813	-0.1724	-0.1730	-0.2566
F-statistic	16.3615***	25.7806***	13.5398***	13.5821***	18.6360***

Table 5.9 reports estimated coefficients of panel VECM results using equation 5.3 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (5.3) for different specifications, that is, considering interest rates, corruption risk rating, government stability, and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5) respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant at 1% level for all specifications suggesting that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. The ECT in column 1 for the model without having the exogenous variables is -0.0257 suggests that approximately 2.57% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

Table 5.9 demonstrates similar results of estimated coefficients of $\Delta LnRGDP_{i(t-1)}$, $\Delta LnRGDP_{i(t-2)}$, $\Delta LnCPI_{i(t-1)}$ and $\Delta LnCPI_{i(t-2)}$ which were presented in preceding Tables of this chapter.

The estimated coefficients for $\Delta LnFDI_{i(t-1)}$ are positive and significant at 1% level, and $\Delta LnFDI_{i(t-2)}$ is negative and significant at the 1% level implying that in the short run, $\Delta LnFDI_{i(t-1)}$ does influence $\Delta LnSPI_{it}$. FDI will substantially contribute to the economic growth and prosperity of the recipient country by reducing and amortising the shock generated by low domestic savings and investment. Several reports investigate the relationship between FDI, foreign portfolio investment (FPI), and financial markets in various countries. It is expected that an improvement in FDI would positively affect the liquidity and capitalisation of the stock exchange (Adam & Tweneboah, 2008). Clark and Berko (1996) find supporting evidence for the positive relationship between foreign direct investment and stock market return in Mexico as one of the earliest explorations. The positive relationship of FDI to Ghana stock returns was stated by Adam and Tweneboah (2009). Gümüs (2010) also concludes that the relationship between BIST 100 bond return and foreign direct investment exhibit is positive in Turkey.

The estimated coefficients for $\Delta LnREER_{i(t-1)}$ are negative and significant, and $\Delta LnREER_{i(t-2)}$ is positive and significant at a 1% level implies that in the short run, $\Delta LnREER_{i(t-1)}$ does influence the $\Delta LnSPI_{it}$. The good market approach suggests that real exchange rates can affect the share price (Aggarwal, 1981). Depreciation of the real exchange rate would improve the attractiveness of firms' goods in terms of cheaper rates and increase their revenues from other countries if the elasticities of changes in exports are greater than the changes in the exchange rate (Dornbusch & Fischer, 1980). This higher export contributes to further income for the domestic firms and thus boosts the firm’s values and share price. Therefore, real exchange rate depreciation will lift the real share price, whilst appreciation of the real exchange rate will decrease the real share price (Dornbusch & Fischer, 1980; Pan et al., 2007; Ülkü & Demirci, 2012). Using monthly data on U.S. stock markets from 1974 to1978, Aggarwal (1981) found that stock prices and real exchange rates are positive. According to Solnik (1987), there is only a weak positive relationship between stock returns and real exchange rates.

Row 14 of Table 5.9 shows the bivariate Granger causality result, and the direction of causality. The F-stat is significant at a 5% level shows that FDI growth Granger[19] causes share price growth. Similarly, Row 17 of Table 5.9 shows that F-stat is insignificant, meaning that REMI growth does not Granger cause share price growth. Similarly, row 20 of Table 5.9 indicates that the F-stat is significant implies that REER growth Granger causes share price growth.

[19] In Table 5.21 this study found similar result in a multivariate framework.

Table 5.10: Panel Error Correction Model (Model 4) of Developed and Emerging Markets

Variables	**Dependent variable:** Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM}_{i(t-1)}$	0.0009 (1.3217)	-0.0815*** (-9.6319)	0.0010 (1.3063)	0.0005 (1.7206)	-0.0501*** (-7.0689)
$\Delta LnSPI_{i(t-1)}$	0.3513*** (9.4049)	0.4116*** (11.2219)	0.3424*** (9.1329)	0.3491*** (9.3681)	0.3295*** (9.0495)
$\Delta LnSPI_{i(t-2)}$	-0.2333*** (-6.4240)	-0.1984*** (-5.6239)	-0.2459*** (-6.7026)	-0.2348*** (-6.4825)	-0.2317*** (-6.5678)
$\Delta LnIPI_{i(t-1)}$	-0.3657** (-2.4175)	-0.3212** (-2.2818)	-0.3065** (-1.9973)	-0.3613** (-2.3953)	-0.2429* (-1.6494)
$\Delta LnIPI_{i(t-2)}$	0.2211 (1.4846)	0.1696 (1.2207)	0.2685* (1.7869)	0.1846 (1.2346)	0.2453* (1.6978)
$\mathbf{\Delta lnIPI \rightarrow \Delta lnSPI}$	**3.4412****				
$\Delta LnCPI_{i(t-1)}$	-0.0872 (-0.4269)	1.7157*** (5.1942)	0.0168 (0.0799)	-0.0428 (-0.2101)	0.4501** (2.2033)
$\Delta LnCPI_{i(t-2)}$	0.1320 (1.5762)	-0.2274*** (-2.5986)	0.1203 (1.4372)	0.1298 (1.5552)	0.0442 (0.5418)
$\mathbf{\Delta lnCPI \rightarrow \Delta lnSPI}$	**4.7089*****				
$\Delta lnFDI_{i(t-1)}$	0.2024*** (5.1779)	0.1871*** (5.0165)	0.1994*** (5.1027)	0.2003*** (5.1371)	0.1479*** (3.8315)
$\Delta lnFDI_{i(t-2)}$	-0.1534*** (-3.8074)	-0.1753*** (-4.5784)	-0.1609*** (-3.9876)	-0.1563*** (-3.8883)	-0.1917*** (-4.8878)
$\mathbf{\Delta lnFDI \rightarrow \Delta lnSPI}$	**13.3169*****				
$\Delta LnREMI_{i(t-1)}$	0.0368 (1.2946)	0.0259 (0.9884)	0.0383 (1.3517)	0.0395 (1.3932)	0.0409 (1.4946)
$\Delta LnREMI_{i(t-2)}$	0.0325 (1.1576)	0.0117 (0.4553)	0.0326 (1.1652)	0.0360 (1.2848)	0.0403 (1.4896)
$\mathbf{\Delta lnREMI \rightarrow \Delta lnSPI}$	**0.9609**				
$\Delta LnREER_{i(t-1)}$	-0.6265*** (-4.8147)	-0.4186*** (-3.4222)	-0.6151*** (-4.7310)	-0.6223*** (-4.7964)	-0.4993*** (-3.9300)
$\Delta LnREER_{i(t-2)}$	0.4983*** (3.8857)	0.6633*** (5.5607)	0.5223*** (4.0661)	0.5121*** (4.0016)	0.5726*** (4.6138)
$\mathbf{\Delta lnREER \rightarrow \Delta lnSPI}$	**9.3277*****				
Constant	0.0242** (2.0048)	0.0784*** (6.7519)	-0.0455 (-1.3531)	-0.1408* (-1.9044)	0.0559*** (4.0252)
IR		-0.0177*** (-8.1538)			
LnCR			0.0483** (2.2498)		
LnGS				0.0808** (2.2383)	
$\mathbf{D_{GFC}}$					-0.1168*** (-6.4343)
Sample Size	861	834	861	861	861
R-squared	0.1790	0.2993	0.1835	0.1848	0.2350
Adj. R-squared	0.1664	0.2873	0.1699	0.1713	0.2224
Akaike AIC	-0.2527	-0.4419	-0.2558	-0.2574	-0.3210
Schwarz SIC	-0.1753	-0.3569	-0.1729	-0.1745	-0.2382
F-statistic	14.2071***	24.9889***	13.5770***	13.6968***	18.5681***

Table 5.10 reports estimated coefficients of panel VECM results using equation 5.4 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (5.4) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant at 1% level for two specifications suggests that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. The ECT in column 2 for the model having the corruption risk rating as an exogenous variable is -0.0815 suggests that approximately 8.15% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

Table 5.10 demonstrates similar results of estimated coefficients of panel VECM, which were presented in the preceding Tables of this chapter.

Table 5.11: Panel Error Correction Model (Model 5) of Developed and Emerging Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
ECM$_{i(t-1)}$	-0.0115*** (-2.8428)	-0.0842*** (-9.1396)	-0.0005 (-0.4661)	-0.0001 (-0.4875)	-0.0537*** (-7.3391)
$\Delta LnSPI_{i(t-1)}$	0.2923*** (8.0627)	0.3394*** (9.3587)	0.2814*** (7.5656)	0.2885*** (7.8062)	0.2717*** (7.6968)
$\Delta LnSPI_{i(t-2)}$	-0.1837*** (-5.3581)	0.3394*** (9.3587)	-0.1943*** (-5.4891)	-0.1836*** (-5.2400)	-0.1709*** (-5.1365)
$\Delta LnRGDP_{i(t-1)}$	-1.1485*** (-3.2589)	-0.3911 (-1.1326)	-0.9677*** (-2.6513)	-1.0683*** (-2.9558)	-0.7376** (-2.1489)
$\Delta LnRGDP_{i(t-2)}$	0.9643*** (2.7619)	0.8930*** (2.6481)	1.0266*** (2.8727)	0.9070** (2.5370)	0.8869*** (2.6219)
$\boldsymbol{\Delta lnRGDP \rightarrow \Delta lnSPI}$	**4.4756****				
$\Delta LnCPI_{i(t-1)}$	-0.5212** (-2.5038)	1.7107*** (5.0017)	-0.2086 (-0.9251)	-0.1740 (-0.7781)	0.4212** (2.0584)
$\Delta LnCPI_{i(t-2)}$	0.1285 (1.5351)	-0.2503*** (-2.7886)	0.1128 (1.3223)	0.1126 (1.3199)	0.0285 (0.3499)
$\boldsymbol{\Delta lnCPI \rightarrow \Delta lnSPI}$	**4.7089*****				
$\Delta lnFDI_{i(t-1)}$	0.1639*** (4.2259)	0.1619*** (4.3332)	0.1725*** (4.3444)	0.1762*** (4.4457)	0.1302*** (3.4062)
$\Delta lnFDI_{i(t-2)}$	-0.1840*** (-4.6625)	-0.1935*** (-5.1044)	-0.1819*** (-4.5080)	-0.1773*** (-4.4017)	-0.2037*** (-5.3160)
$\boldsymbol{\Delta lnFDI \rightarrow \Delta lnSPI}$	**13.3169*****				
$\Delta LnREMI_{i(t-1)}$	0.0159 (0.5603)	0.0136 (0.5125)	0.0236 (0.8160)	0.0243 (0.8424)	0.0263 (0.9612)
$\Delta LnREMI_{i(t-2)}$	0.0273 (0.97323)	0.0129 (0.4938)	0.0337 (1.1807)	0.0369 (1.2904)	0.0412 (1.5212)
$\boldsymbol{\Delta lnREMI \rightarrow \Delta lnSPI}$	**0.9609**				
$\Delta LnOPEN_{i(t-1)}$	0.01178 (0.1125)	-0.1206 (-1.1915)	0.0133 (0.1241)	0.0043 (0.0406)	-0.1257 (-1.2309)
$\Delta LnOPEN_{i(t-2)}$	-0.2083** (-2.0760)	-0.2097** (-2.1901)	-0.2080** (-2.0263)	-0.2226** (-2.1631)	-0.3069*** (-3.1415)
$\boldsymbol{\Delta lnOPEN \rightarrow \Delta lnSPI}$	**4.1615****				
Constant	0.051471*** (3.8630)	0.0690*** (5.6233)	-0.0265 (-0.7377)	-0.1276* (-1.6937)	0.0667*** (4.3626)
IR		-0.0175*** (-7.7456)			
LnCR			0.0445** (2.0498)		
LnGS				0.0808** (2.1925)	
D$_{GFC}$					-0.1268*** (-7.1358)
Sample Size	889	862	861	861	889
R-squared	0.1630	0.2634	0.1547	0.1551	0.2199
Adj. R-squared	0.1505	0.2512	0.1408	0.1411	0.2074
Akaike AIC	-0.2547	-0.4134	-0.2212	-0.2217	-0.3229
Schwarz SIC	-0.1793	-0.3306	-0.1383	-0.1388	-0.2420
F-statistic	13.1040***	21.6334***	11.0631***	11.0946***	17.5940***

Table 5.11 reports estimated coefficients of panel VECM results using equation 5.5 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. Therefore, this study first estimates the coefficients as mentioned in equation (5.5) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant at a 1% level for three specifications suggests that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. The ECT in column 1 for the model without exogenous variables is -0.0115 suggests that approximately 1.15% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

Except for $\Delta LnOPEN_{i(t-1)}$ and $\Delta LnOPEN_{i(t-2)}$, Table 5.11 demonstrates similar results of estimated coefficients of panel VECM, which were presented in the preceding Tables of this chapter.

The estimated coefficient for $\Delta LnOPEN_{i(t-1)}$ is positive but insignificant, and $\Delta LnOPEN_{i(t-2)}$ is negative and significant at a 5% level, implying that in the short run, $\Delta LnOPEN_{i(t-2)}$ influence the $\Delta LnSPI_{it}$. According to Basu and Morey's (2005) studies, a more open economy is predicted to enjoy real-economy growth due to more efficient resource utilisation. According to Fama (1990) and Ferson and Harvey (1997), growth in the real economy boosts future cash flow and profits, which leads to an increase in stock values. As a result, there is a positive link between trade openness and stock prices. Jaleel and Samarakoon (2009) discovered a link between stock market volatility and liberalisation in Sri Lanka. Kim, Lin, and Suen (2010) discovered that trade openness is an important factor in influencing financial development in a wide sample of both developed and emerging markets.

Row 20 of Table 5.11 shows the bivariate Granger causality result, that is the direction of causality. The F-stat is significant at the 5% level shows that OPEN growth Granger[20] cause share price growth.

[20] In Table 5.23 this study found similar result in a multivariate framework.

Table 5.12: Panel Error Correction Model (Model 6) of Developed and Emerging Markets

Variables	Dependent variable: Δ $\mathrm{LnSPI_{it}}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
ECM$_{i(t-1)}$	-0.0034 (-1.4836)	-0.0835*** (-8.9807)	-0.0007 (-0.7091)	-0.0049** (-1.8408)	-0.0559*** (-7.3253)
$\Delta \mathrm{LnSPI}_{i(t-1)}$	0.2739*** (7.6849)	0.3393*** (9.5821)	0.2645*** (7.3876)	0.2718*** (7.6431)	0.2539*** (7.3536)
$\Delta \mathrm{LnSPI}_{i(t-2)}$	-0.1689*** (-4.8807)	-0.1141*** (-3.3503)	-0.1817*** (-5.2087)	-0.1696*** (-4.9118)	-0.1613*** (-4.8142)
$\Delta \mathrm{LnIPI}_{i(t-1)}$	-0.3685** (-2.2517)	-0.3109** (-2.0286)	-0.3319** (-2.0078)	-0.3659** (-2.2423)	-0.2312 (-1.4626)
$\Delta \mathrm{LnIPI}_{i(t-2)}$	0.2670 (1.6444)	0.1727 (1.1347)	0.3091* (1.8847)	0.2365 (1.4549)	0.3043* (1.9465)
ΔlnIPI → ΔlnSPI	**3.4412****				
$\Delta \mathrm{LnCPI}_{i(t-1)}$	-0.0045 (-0.0204)	1.7860*** (5.2045)	-0.0033 (-0.0149)	0.0441 (0.2001)	0.5198** (2.4920)
$\Delta \mathrm{LnCPI}_{i(t-2)}$	0.0864 (1.0137)	-0.2609*** (-2.8922)	0.0857 (1.0058)	0.0840 (0.9875)	0.0016 (0.0195)
ΔlnCPI → ΔlnSPI	**4.7089*****				
$\Delta \mathrm{lnFDI}_{i(t-1)}$	0.1864*** (4.6818)	0.1721*** (4.4783)	0.1815*** (4.5528)	0.1841*** (4.6354)	0.1255*** (3.1988)
$\Delta \mathrm{lnFDI}_{i(t-2)}$	-0.1732*** (-4.2866)	-0.1862*** (-4.8002)	-0.1812*** (-4.4779)	-0.1769*** (-4.3867)	-0.2081*** (-5.3089)
ΔlnFDI → ΔlnSPI	**13.3169*****				
$\Delta \mathrm{LnREMI}_{i(t-1)}$	0.0284 (0.9823)	0.0131 (0.4860)	0.0288 (0.9999)	0.0306 (1.0642)	0.0314 (1.1317)
$\Delta \mathrm{LnREMI}_{i(t-2)}$	0.0369 (1.2889)	0.0090 (0.3396)	0.0358 (1.2541)	0.0401 (1.4055)	0.0417 (1.5192)
ΔlnREMI → ΔlnSPI	**0.9609**				
$\Delta \mathrm{LnOPEN}_{i(t-1)}$	0.0344 (0.3035)	-0.0794 (-0.7280)	0.0395 (0.3491)	0.0349 (0.3089)	-0.0955 (-0.8673)
$\Delta \mathrm{LnOPEN}_{i(t-2)}$	-0.2173** (-1.9995)	-0.2011* (-1.9509)	-0.2271** (-2.0890)	-0.2298** (-2.1180)	-0.3190*** (-3.0254)
ΔlnOPEN → ΔlnSPI	**4.1615****				
Constant	0.0281** (2.2459)	0.0812*** (6.7988)	-0.0346 (-1.0116)	-0.1403* (-1.8597)	0.0677*** (4.8367)
IR		-0.0173*** (-7.6420)			
LnCR			0.0465** (2.1383)		
LnGS				0.0825** (2.2421)	
D_{GFC}					-0.1322*** (-7.1167)
Sample Size	861	834	861	861	861
R-squared	0.1488	0.2589	0.1515	0.1547	0.2134
Adj. R-squared	0.1357	0.2462	0.1374	0.1407	0.2003
Akaike AIC	-0.2165	-0.3859	-0.2174	-0.2211	-0.2931
Schwarz SIC	-0.1391	-0.3009	-0.1345	-0.1383	-0.2102
F-statistic	11.3877***	20.4354***	10.7882***	11.0577***	16.3895***

Table 5.13: Panel Error Correction Model (Model 7) of Developed and Emerging Markets

Variables	**Dependent variable:** Δ $\mathrm{LnSPI_{it}}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM}_{i(t-1)}$	-0.0305*** (-4.0259)	-0.0870*** (-10.183)	0.0021 (0.7872)	-0.0028 (-0.5451)	-0.0454*** (-7.6375)
$\Delta \mathrm{LnSPI}_{i(t-1)}$	0.3688*** (10.068)	0.4253*** (11.726)	0.3640*** (9.6577)	0.3694*** (9.8632)	0.34947*** (9.7320)
$\Delta \mathrm{LnSPI}_{i(t-2)}$	-0.2183*** (-6.1786)	-0.1995*** (-5.7593)	-0.2284*** (-6.2300)	-0.2187*** (-6.043)	-0.2020*** (-5.8645)
$\Delta \mathrm{LnRGDP}_{i(t-1)}$	-0.6673* (-1.9471)	0.1492 (0.4475)	-0.5423 (-1.5252)	-0.7004** (-1.9935)	-0.4218 (-1.2607)
$\Delta \mathrm{LnRGDP}_{i(t-2)}$	0.6069* (1.7697)	0.4347 (1.3295)	0.6202* (1.7649)	0.5110 (1.4506)	0.4751 (1.4259)
$\mathbf{\Delta lnRGDP \rightarrow \Delta lnSPI}$	**4.4756****				
$\Delta \mathrm{LnCPI}_{i(t-1)}$	-0.3862** (-2.0979)	1.8991*** (5.8330)	-0.0510 (-0.2505)	-0.2232 (-1.1796)	0.3789* (1.9528)
$\Delta \mathrm{LnCPI}_{i(t-2)}$	0.1078 (1.3132)	-0.2899*** (-3.3360)	0.1112 (1.3288)	0.1190 (1.4219)	0.0477 (0.5963)
$\mathbf{\Delta lnCPI \rightarrow \Delta lnSPI}$	**4.7089*****				
$\Delta \mathrm{lnFDI}_{i(t-1)}$	0.1644*** (4.4021)	0.1693*** (4.7839)	0.1877*** (4.8984)	0.1795*** (4.6804)	0.1479*** (4.0139)
$\Delta \mathrm{lnFDI}_{i(t-2)}$	-0.1500*** (-3.8553)	-0.1470** (-4.0102)	-0.1263*** (-3.1647)	-0.1320*** (-3.3045)	-0.1467*** (-3.8980)
$\mathbf{\Delta lnFDI \rightarrow \Delta lnSPI}$	**13.3169*****				
$\Delta \mathrm{LnREER}_{i(t-1)}$	-0.8084*** (-5.2438)	-0.8243*** (-5.6682)	-0.8706*** (-5.5046)	-0.8713*** (-5.5217)	-0.8072*** (-5.4082)
$\Delta \mathrm{LnREER}_{i(t-2)}$	0.4768*** (3.0922)	0.7215*** (4.9178)	0.5080*** (3.1961)	0.4778*** (3.0137)	0.5008*** (3.3484)
$\mathbf{\Delta lnREER \rightarrow \Delta lnSPI}$	**9.3277*****				
$\Delta \mathrm{LnOPEN}_{i(t-1)}$	-0.3732*** (-2.9611)	-0.5564*** (-4.5992)	-0.4225*** (-3.2632)	-0.4152*** (-3.2112)	-0.5464*** (-4.4699)
$\Delta \mathrm{LnOPEN}_{i(t-2)}$	0.0276 (0.2234)	0.1198 (1.0118)	0.0166 (0.1309)	-0.0015 (-0.0115)	-0.1012 (-0.8430)
$\mathbf{\Delta lnOPEN \rightarrow \Delta lnSPI}$	**4.1615****				
Constant	0.0440*** (3.6797)	0.0703*** (6.0232)	-0.0379 (-1.1029)	-0.1113 (-1.5534)	0.0648*** (4.4458)
IR		-0.0193*** (-9.0591)			
LnCR			0.0458** (2.1958)		
LnGS				0.0741** (2.0927)	
$\mathbf{D_{GFC}}$					-0.1242*** (-7.1790)
Sample Size	914	887	886	886	914
R-squared	0.2020	0.3153	0.1883	0.1878	0.2504
Adj. R-squared	0.1905	0.3043	0.1752	0.1748	0.2388
Akaike AIC	-0.3199	-0.5042	-0.2801	-0.2795	-0.3802
Schwarz SIC	-0.2461	-0.4232	-0.1990	-0.1985	-0.3012
F-statistic	17.5273***	28.6816***	14.4285***	14.3880***	21.4535***

Table 5.14: Panel Error Correction Model (Model 8) of Developed and Emerging Markets

Variables	**Dependent variable:** Δ LnSPI_{it}				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\textbf{ECM}_{i(t-1)}$	-0.0017*** (-3.1772)	-0.0855*** (-10.0881)	-0.0013*** (-2.6843)	-0.0037*** (-3.4909)	-0.0557*** (-7.9867)
$\Delta\text{LnSPI}_{i(t-1)}$	0.3677*** (10.062)	0.4271*** (11.8849)	0.3580*** (9.7408)	0.3658*** (10.0336)	0.3415*** (9.6038)
$\Delta\text{LnSPI}_{i(t-2)}$	-0.2038*** (-5.6729)	-0.1827*** (-5.2377)	-0.2197*** (-6.0441)	-0.2035*** (-5.6765)	-0.1981*** (-5.6971)
$\Delta\text{LnIPI}_{i(t-1)}$	-0.1850 (-1.1606)	-0.0461 (-0.3105)	-0.1211 (-0.7492)	-0.1870 (-1.1757)	-0.0488 (-0.3151)
$\Delta\text{LnIPI}_{i(t-2)}$	0.1666 (1.0579)	0.0736 (0.5026)	0.2210 (1.3909)	0.1352 (0.8570)	0.2122 (1.3958)
$\boldsymbol{\Delta\text{lnIPI} \rightarrow \Delta\text{lnSPI}}$	**3.4412****				
$\Delta\text{LnCPI}_{i(t-1)}$	0.0505 (0.2627)	1.8922*** (5.8311)	0.1691 (0.8238)	0.0866 (0.4492)	0.4955** (2.5190)
$\Delta\text{LnCPI}_{i(t-2)}$	0.1056 (1.2735)	-0.2899*** (-3.3329)	0.0900 (1.0841)	0.1041 (1.2591)	0.0195 (0.2419)
$\boldsymbol{\Delta\text{lnCPI} \rightarrow \Delta\text{lnSPI}}$	**4.7089*****				
$\Delta\text{lnFDI}_{i(t-1)}$	0.2002*** (5.2371)	0.1717*** (4.7276)	0.1961*** (5.1265)	0.1980*** (5.1954)	0.1383*** (3.6764)
$\Delta\text{lnFDI}_{i(t-2)}$	-0.1085*** (-2.7350)	-0.1401*** (-3.7504)	-0.1192*** (-3.0006)	-0.1114*** (-2.8152)	-0.1506*** (-3.9271)
$\boldsymbol{\Delta\text{lnFDI} \rightarrow \Delta\text{lnSPI}}$	**13.3169*****				
$\Delta\text{LnREER}_{i(t-1)}$	-0.9269*** (-5.9237)	-0.7925*** (-5.3509)	-0.9150*** (-5.8337)	-0.9215*** (-5.9063)	-0.8592*** (-5.6788)
$\Delta\text{LnREER}_{i(t-2)}$	0.5168*** (3.2599)	0.7543*** (5.0374)	0.5366*** (3.3770)	0.5212*** (3.2978)	0.5182*** (3.3965)
$\boldsymbol{\Delta\text{lnREER} \rightarrow \Delta\text{lnSPI}}$	**9.3277*****				
$\Delta\text{LnOPEN}_{i(t-1)}$	-0.4763*** (-3.5435)	-0.5344*** (-4.1569)	-0.4596*** (-3.4197)	-0.4745*** (-3.5406)	-0.5567*** (-4.2996)
$\Delta\text{LnOPEN}_{i(t-2)}$	-0.0145 (-0.1096)	0.1396 (1.1029)	-0.0045 (-0.0340)	-0.0239 (-0.1808)	-0.0989 (-0.7706)
$\boldsymbol{\Delta\text{lnOPEN} \rightarrow \Delta\text{lnSPI}}$	**4.1615****				
Constant	0.0204* (1.8014)	0.0831*** (7.2991)	-0.0530 (-1.6157)	-0.1307* (-1.8268)	0.0606*** (4.5303)
IR		-0.0188*** (-8.9022)			
LnCR			0.0505** (2.4263)		
LnGS				0.0743** (2.1179)	
$\mathbf{D_{GFC}}$					-0.1264*** (-7.1045)
Sample Size	914	887	886	886	914
R-squared	0.2020	0.3153	0.1883	0.1878	0.2504
Adj. R-squared	0.1905	0.3043	0.1752	0.1748	0.2388
Akaike AIC	-0.3199	-0.5042	-0.2801	-0.2795	-0.3802
Schwarz SIC	-0.2461	-0.4232	-0.1990	-0.1985	-0.3012
F-statistic	17.5273***	28.6816***	14.4285***	14.3880***	21.4535***

Table 5.15: Panel Error Correction Model (Model 9) of Developed and Emerging Markets

Variables	Dependent variable: Δ LnSPI$_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
ECM$_{i(t-1)}$	-0.0812*** (-8.2818)	-0.1028*** (-10.083)	-0.0609*** (-7.9601)	-0.0683*** (-7.9217)	-0.0482*** (-7.5161)
ΔLnSPI$_{i(t-1)}$	0.4027*** (11.049)	0.4641*** (12.612)	0.3988*** (10.687)	0.4028*** (10.878)	0.3658*** (9.8951)
ΔLnSPI$_{i(t-2)}$	-0.2329*** (-6.5192)	-0.2340*** (-6.5365)	-0.2335*** (-6.3200)	-0.2287*** (-6.2840)	-0.2431*** (-6.8256)
ΔLnRGDP$_{i(t-1)}$	-0.2258 (-0.6483)	0.1958 (0.5623)	-0.1763 (-0.4935)	-0.2113 (-0.5951)	-0.3000 (-0.8616)
ΔLnRGDP$_{i(t-2)}$	0.6311* (1.8209)	0.4700 (1.3794)	0.6589* (1.8675)	0.5781 (1.6348)	0.3923 (1.1335)
ΔlnRGDP → ΔlnSPI	**4.4756****				
ΔLnCPI$_{i(t-1)}$	0.1929 (1.0428)	1.8825*** (5.5562)	0.2847 (1.4729)	0.3367* (1.7415)	0.3930* (1.9613)
ΔLnCPI$_{i(t-2)}$	0.0492 (0.5993)	-0.3004*** (-3.3515)	0.0572 (0.6883)	0.0489 (0.5890)	0.0391 (0.4780)
ΔlnCPI → ΔlnSPI	**4.7089*****				
ΔLnREMI$_{i(t-1)}$	0.0322 (1.1853)	0.0236 (0.9127)	0.0445 (1.6133)	0.0424 (1.5388)	0.0336 (1.2385)
ΔLnREMI$_{i(t-2)}$	0.0255 (0.9409)	-0.0083 (-0.3236)	0.0313 (1.1400)	0.0313 (1.1414)	0.0252 (0.9336)
ΔlnREMI → ΔlnSPI	**0.9609**				
ΔLnREER$_{i(t-1)}$	-0.8441*** (-5.5618)	-0.9270*** (-6.3007)	-0.8660*** (-5.5962)	-0.8867*** (-5.7395)	-0.8952*** (-5.9395)
ΔLnREER$_{i(t-2)}$	0.5743*** (3.6865)	0.7359*** (4.8385)	0.6175*** (3.8748)	0.5950*** (3.7429)	0.5198*** (3.3572)
ΔlnREER → ΔlnSPI	**9.3277*****				
ΔLnOPEN$_{i(t-1)}$	-0.5833*** (-4.6955)	-0.6984*** (-5.6348)	-0.5816*** (-4.5956)	-0.5856*** (-4.6351)	-0.6589*** (-5.3020)
ΔLnOPEN$_{i(t-2)}$	0.0545 (0.4391)	0.1895 (1.5437)	0.0737 (0.5827)	0.0655 (0.5173)	-0.0296 (-0.2387)
ΔlnOPEN → ΔlnSPI	**4.1615****				
Constant	0.0098 (0.8419)	0.0626*** (5.4625)	-0.0426 (-1.2650)	-0.1199* (-1.6650)	0.0579*** (4.1142)
IR		-0.0184*** (-8.4982)			
LnCR			0.0348* (1.6686)		
LnGS				0.0620* (1.7478)	
D$_{GFC}$					-0.1142*** (-6.9664)
Sample Size	914	887	886	886	914
R-squared	0.2020	0.3153	0.1883	0.1878	0.2504
Adj. R-squared	0.1905	0.3043	0.1752	0.1748	0.2388
Akaike AIC	-0.3199	-0.5042	-0.2801	-0.2795	-0.3802
Schwarz SIC	-0.2461	-0.4232	-0.1990	-0.1985	-0.3012
F-statistic	17.5273***	28.6816***	14.4285***	14.3880***	21.4535***

Table 5.16: Panel Error Correction Model (Model 10) of Developed and Emerging Markets

Variables	Dependent variable: Δ LnSPI_{it}				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM}_{i(t-1)}$	-0.0633*** (-7.9731)	-0.1019*** (-9.7395)	-0.0512*** (-7.3051)	-0.0608*** (-7.6869)	-0.0504*** (-8.0512)
$\Delta\text{LnSPI}_{i(t-1)}$	0.3957*** (10.9354)	0.4626*** (12.6668)	0.3900*** (10.6502)	0.3941*** (10.8700)	0.3581*** (9.8174)
$\Delta\text{LnSPI}_{i(t-2)}$	-0.2177*** (-6.0124)	-0.2164*** (-5.9875)	-0.2293*** (-6.2153)	-0.2195*** (-6.0530)	-0.2325*** (-6.4732)
$\Delta\text{LnIPI}_{i(t-1)}$	-0.0013 (-0.0082)	0.0591 (0.3838)	0.0463 (0.2859)	-0.0053 (-0.0332)	-0.0429 (-0.2714)
$\Delta\text{LnIPI}_{i(t-2)}$	0.1499 (0.9543)	0.0940 (0.6216)	0.1993 (1.2543)	0.1244 (0.7876)	0.1029 (0.6602)
$\mathbf{\Delta lnIPI \rightarrow \Delta lnSPI}$	**3.4412****				
$\Delta\text{LnCPI}_{i(t-1)}$	0.3731* (1.9542)	1.9299*** (5.6939)	0.4439** (2.2395)	0.4012** (2.0776)	0.4504** (2.2704)
$\Delta\text{LnCPI}_{i(t-2)}$	0.0343 (0.4144)	-0.3053*** (-3.3954)	0.0326 (0.3917)	0.0349 (0.4218)	0.0268 (0.3262)
$\mathbf{\Delta lnCPI \rightarrow \Delta lnSPI}$	**4.7089*****				
$\Delta\text{LnREMI}_{i(t-1)}$	0.0453* (1.6437)	0.0258 (0.9867)	0.0465* (1.6796)	0.0459* (1.6639)	0.0405 (1.4815)
$\Delta\text{LnREMI}_{i(t-2)}$	0.0302 (1.0981)	-0.0095 (-0.3660)	0.0293 (1.0601)	0.0313 (1.1368)	0.0271 (0.9940)
$\mathbf{\Delta lnREMI \rightarrow \Delta lnSPI}$	**0.9609**				
$\Delta\text{LnREER}_{i(t-1)}$	-0.9000*** (-5.8284)	-0.9111*** (-6.0647)	-0.9260*** (-5.9799)	-0.9164*** (-5.9378)	-0.9233*** (-6.0466)
$\Delta\text{LnREER}_{i(t-2)}$	0.6443*** (4.0294)	0.7898*** (5.0780)	0.6388*** (3.9746)	0.6296*** (3.9390)	0.5705*** (3.6144)
$\mathbf{\Delta lnREER \rightarrow \Delta lnSPI}$	**9.3277*****				
$\Delta\text{LnOPEN}_{i(t-1)}$	-0.6151*** (-4.6541)	-0.6987*** (-5.3038)	-0.6206** (-4.6723)	-0.6125*** (-4.6308)	-0.6663*** (-5.0756)
$\Delta\text{LnOPEN}_{i(t-2)}$	0.0859 (0.6468)	0.2251* (1.7154)	0.0822 (0.6168)	0.0782 (0.5881)	-0.0049 (-0.0375)
$\mathbf{\Delta lnOPEN \rightarrow \Delta lnSPI}$	**4.1615****				
Constant	0.0119 (1.1848)	0.0708*** (6.6237)	-0.0471 (-1.4522)	-0.1257* (-1.7350)	0.0548*** (4.5020)
IR		-0.0172*** (-8.0845)			
LnCR			0.0404* (1.9200)		
LnGS				0.0674* (1.9013)	
$\mathbf{D_{GFC}}$					-0.1106*** (-6.5878)
Sample Size	861	834	861	861	861
R-squared	0.2105	0.2842	0.2050	0.2106	0.2265
Adj. R-squared	0.1984	0.2720	0.1919	0.1976	0.2137
Akaike AIC	-0.2918	-0.4206	-0.2825	-0.2896	-0.3099
Schwarz SIC	-0.2144	-0.3356	-0.1996	-0.2068	-0.2270
F-statistic	17.3722***	23.2290***	15.5828***	16.1260***	17.6954***

Table 5.17: Panel Error Correction Model (Model 11) of Developed and Emerging Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$ECM_{i(t-1)}$	-0.0246*** (-3.3938)	-0.0817*** (-9.5548)	0.0020 (0.6247)	0.0031 (0.8363)	-0.0384*** (-7.2739)
$\Delta LnSPI_{i(t-1)}$	0.3657*** (9.7519)	0.4267*** (11.4840)	0.3584*** (9.3044)	0.3652*** (9.5474)	0.3435*** (9.3479)
$\Delta LnSPI_{i(t-2)}$	-0.2262*** (-6.2346)	-0.2093*** (-5.8860)	-0.2388*** (-6.3561)	-0.2277*** (-6.1399)	-0.2175*** (-6.1621)
$\Delta LnRGDP_{i(t-1)}$	-0.6434* (-1.8268)	0.1883 (0.5494)	-0.4729 (-1.2941)	-0.6108* (-1.6932)	-0.3550 (-1.0314)
$\Delta LnRGDP_{i(t-2)}$	0.5751 (1.6375)	0.3754 (1.1200)	0.5974* (1.6613)	0.4793 (1.3316)	0.4464 (1.3080)
$\Delta lnRGDP \rightarrow \Delta lnSPI$	**4.4756****				
$\Delta LnCPI_{i(t-1)}$	-0.3848** (-2.0422)	1.9882*** (5.9533)	-0.0598 (-0.2886)	-0.1346 (-0.6840)	0.4027** (2.0232)
$\Delta LnCPI_{i(t-2)}$	0.1094 (1.3185)	-0.2971*** (-3.3671)	0.1073 (1.2695)	0.1170 (1.3868)	0.0445 (0.5496)
$\Delta lnCPI \rightarrow \Delta lnSPI$	**4.7089*****				
$\Delta lnFDI_{i(t-1)}$	0.1666*** (4.3721)	0.1701*** (4.6992)	0.1845*** (4.7250)	0.1850*** (4.7454)	0.1468*** (3.8999)
$\Delta lnFDI_{i(t-2)}$	-0.1550*** (-3.8774)	-0.1535*** (-4.0535)	-0.1396*** (-3.4061)	-0.1355*** (-3.3103)	-0.1587*** (-4.0895)
$\Delta lnFDI \rightarrow \Delta lnSPI$	**13.3169*****				
$\Delta LnREMI_{i(t-1)}$	0.0244 (0.8756)	0.0282 (1.0976)	0.0364 (1.2793)	0.0360 (1.2688)	0.0394 (1.4632)
$\Delta LnREMI_{i(t-2)}$	0.0142 (0.5155)	0.0002 (0.0076)	0.0231 (0.8233)	0.0250 (0.8892)	0.0324 (1.2153)
$\Delta lnREMI \rightarrow \Delta lnSPI$	**0.9609**				
$\Delta LnREER_{i(t-1)}$	-0.8153*** (-5.1691)	-0.8319*** (-5.5779)	-0.8747*** (-5.4150)	-0.8876*** (-5.5153)	-0.8064*** (-5.2862)
$\Delta LnREER_{i(t-2)}$	0.4998*** (3.1739)	0.7694*** (5.1208)	0.5269*** (3.2530)	0.5084*** (3.1468)	0.5303*** (3.4718)
$\Delta lnREER \rightarrow \Delta lnSPI$	**9.3277*****				
$\Delta LnOPEN_{i(t-1)}$	-0.3752*** (-2.9082)	-0.5660*** (-4.5524)	-0.4111*** (-3.1101)	-0.4272*** (-3.2370)	-0.5302*** (-4.2361)
$\Delta LnOPEN_{i(t-2)}$	0.0316 (0.2510)	0.1426 (1.1786)	0.0280 (0.2171)	-0.0002 (-0.0019)	-0.0850 (-0.6942)
$\Delta lnOPEN \rightarrow \Delta lnSPI$	**4.1615****				
Constant	0.0417*** (3.3502)	0.0629*** (5.3057)	-0.0384 (-1.0970)	-0.1289* (-1.7544)	0.0602*** (3.9896)
IR		-0.0191*** (-8.7633)			
LnCR			0.0446** (2.0848)		
LnGS				0.0783** (2.1694)	
D_{GFC}					-0.1209*** (-6.8549)
Sample Size	889	862	861	861	889
R-squared	0.2018	0.3145	0.1916	0.1923	0.2502
Adj. R-squared	0.1881	0.3015	0.1762	0.1770	0.2364
Akaike AIC	-0.2977	-0.4806	-0.2611	-0.2620	-0.3580
Schwarz SIC	-0.2115	-0.3867	-0.1672	-0.1681	-0.2664
F-statistic	14.7142***	24.2262***	12.4998***	12.5581***	18.1840***

Table 5.18: Panel Error Correction Model (Model 12) of Developed and Emerging Markets

Variables	Dependent variable: $\Delta\ \mathrm{LnSPI}_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM}_{i(t-1)}$	-0.0026*** (-3.4340)	-0.0811*** (-9.4777)	0.0004*** (2.6972)	-0.0027*** (-3.4501)	-0.0519*** (-7.86036)
$\Delta \mathrm{LnSPI}_{i(t-1)}$	0.3637*** (9.7800)	0.4323*** (11.767)	0.3537*** (9.4503)	0.36078*** (9.7144)	0.3381*** (9.3310)
$\Delta \mathrm{LnSPI}_{i(t-2)}$	-0.2159*** (-5.8905)	-0.1913*** (-5.3484)	-0.2311*** (-6.2221)	-0.2178*** (-5.9505)	-0.2116*** (-5.9560)
$\Delta \mathrm{LnIPI}_{i(t-1)}$	-0.1584 (-0.9758)	-0.0716 (-0.4725)	-0.1118 (-0.6793)	-0.1628 (-1.0054)	-0.0491 (-0.3117)
$\Delta \mathrm{LnIPI}_{i(t-2)}$	0.1714 (1.0712)	0.0451 (0.3020)	0.2179 (1.3491)	0.1391 (0.8676)	0.1998 (1.2919)
ΔlnIPI → ΔlnSPI	**3.4412****				
$\Delta \mathrm{LnCPI}_{i(t-1)}$	0.1207 (0.6052)	1.9817*** (5.9503)	0.1656 (0.8024)	0.1298 (0.6509)	0.5133 (2.5685)
$\Delta \mathrm{LnCPI}_{i(t-2)}$	0.0959 (1.1467)	-0.2951*** (-3.3410)	0.0881 (1.0508)	0.0961 (1.1518)	0.0170 (0.2094)
ΔlnCPI → ΔlnSPI	**4.7089*****				
$\Delta \mathrm{lnFDI}_{i(t-1)}$	0.1982*** (5.1055)	0.1720*** (4.6259)	0.1939*** (4.9785)	0.1951*** (5.0305)	0.1367*** (3.5622)
$\Delta \mathrm{lnFDI}_{i(t-2)}$	-0.1214*** (-2.9901)	-0.1464*** (-3.7889)	-0.1318*** (-3.2293)	-0.1262*** (-3.1104)	-0.1625*** (-4.1218)
ΔlnFDI → ΔlnSPI	**13.3169*****				
$\Delta \mathrm{LnREMI}_{i(t-1)}$	0.0428 (1.5208)	0.0281 (1.0794)	0.0425 (1.5097)	0.0444 (1.5798)	0.0434 (1.6005)
$\Delta \mathrm{LnREMI}_{i(t-2)}$	0.0296 (1.0581)	-0.0017 (-0.0669)	0.0276 (0.9867)	0.0320 (1.1451)	0.0325 (1.2096)
ΔlnREMI → ΔlnSPI	**0.9609**				
$\Delta \mathrm{LnREER}_{i(t-1)}$	-0.9250*** (-5.8054)	-0.7915*** (-5.2063)	-0.9136*** (-5.7152)	-0.9192*** (-5.7795)	-0.8415*** (-5.4523)
$\Delta \mathrm{LnREER}_{i(t-2)}$	0.5448*** (3.3756)	0.8004*** (5.2164)	0.5573*** (3.4424)	0.5456*** (3.3877)	0.5564*** (3.5762)
ΔlnREER → ΔlnSPI	**9.3277*****				
$\Delta \mathrm{LnOPEN}_{i(t-1)}$	-0.4645*** (-3.3931)	-0.5323*** (-4.0327)	-0.4459*** (-3.2540)	-0.4578*** (-3.3506)	-0.5338*** (-4.0419)
$\Delta \mathrm{LnOPEN}_{i(t-2)}$	-0.0004 (-0.0028)	0.1664 (1.2873)	0.0059 (0.0438)	-0.0102 (-0.0761)	-0.0803 (-0.6158)
ΔlnOPEN → ΔlnSPI	**4.1615****				
Constant	0.0144 (1.2286)	0.0755*** (6.5847)	-0.0523 (-1.5710)	-0.1431* (-1.9567)	0.0562*** (4.0772)
IR		-0.0184*** (-8.5602)			
LnCR			0.0483** (2.2687)		
LnGS				0.0781** (2.1821)	
$\mathbf{D_{GFC}}$					-0.1212*** (-6.7766)
Sample Size	861	834	861	861	861
R-squared	0.1972	0.3126	0.1971	0.2016	0.2536
Adj. R-squared	0.1830	0.2991	0.1819	0.1865	0.2394
Akaike AIC	-0.2705	-0.4563	-0.2680	-0.2736	-0.3409
Schwarz SIC	-0.1821	-0.3600	-0.1741	-0.1797	-0.2469
F-statistic	13.8417***	23.2219***	12.9525***	13.3204***	17.9180***

Table 5.12 to Table 5.18 demonstrates similar results of estimated coefficients of panel VECM, which were presented in the preceding Tables of this chapter.

ECT and Panel VECM Short run Coefficients for Emerging and Developed Markets

Table 5.7 - Table 5.18 reports estimated coefficients of panel VECM results using equations (5.1-5.12) along with interest rates, corruption risk rating, government stability, and dummy variables for Global Financial Crisis as exogenous variables considering $\Delta LnSPI_{i(t-1)}$ as dependent variables.

It can be seen that the $ECT_{i(t-1)}$ is negative and significant at 1% level suggests that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium.

Table 5.7 to Table 5.19 suggests that the estimated ΔLnSPIi(t-1) coefficients are positive and significant at 1% level, and $\Delta LnSPI_{i(t-2)}$ is negative and significant at the 1% significant level.

Table 5.7 to Table 5.18 suggests that the estimated coefficients of $\Delta LnRGDP_{i(t-2)}$ are positive and significant at the 1% level. This result is supported by evidence from existing studies that indicate that GDP positively impacts stock market performance (Fama, 1981; Mukherjee & Naka, 1995). This means that an increase in economic growth leads to a rise in share price.

The estimated coefficients of $\Delta LnIPI_{i(t-1)}$ are negative and insignificant, and $\Delta LnIPI_{i(t-2)}$ is positive and insignificant. This result is supported by Mukherjee and Naka (1995), Liljeblom and Stenius (1997), Abdullah (1998), Gjerde and Saettem (1999), Maysami et al. (2004), Lobão and Levi (2016), which also found a positive and statistically significant relationship between industrial production and stock price.

The estimated coefficients are positive and insignificant for both $\Delta LnCPI_{i(t-1)}$ and $\Delta LnCPI_{i(t-2)}$; this can be evident from Table 5.7 to Table 5.18. This result is similar to previous literature. For instance, a significant positive relationship was observed between inflation and stock returns in reports on UK (Firth, 1979), Singapore (Maysami et al., 2004) and Ghana (Adam & Tweneboah, 2008). Similarly, In the study by Maysami and Sim (2001a) the Korean stock markets showed a positive association with inflation.

Results presented in Tables 5.7 to 5.18 show that the estimated coefficient of panel VECM of $\Delta LnFDI_{i(t-1)}$ is positive and significant at 1% level, and $\Delta LnFDI_{i(t-2)}$ is negative and significant at 1% level. Clark and Berko (1996) also find supporting evidence for the positive relationship between foreign direct investment and stock market return in Mexico.

Tables 5.7 to 5.18 also show that the estimated coefficient of panel VECM of both $\Delta LnREMI_{i(t-1)}$ and $\Delta LnREMI_{i(t-2)}$ is positive, which is consistent with existing literature but found to be insignificant in this study. Gupta et al. (2009) indicate that remittances positively impact poverty mitigation by increasing income and higher living conditions in remittance-receiving households.

It can also be seen from Table 5.7 to Table 5.18 that the estimated coefficient of $\Delta LnREER_{i(t-1)}$ is negative and significant at the 1% level, and $\Delta LnREER_{i(t-2)}$ is positive and significant at the 1% level. The positive relations between stock prices and exchange rates have been found in research studies like Aggarwal (1981). Using monthly data on U.S. stock markets from 1974 to1978, Aggarwal (1981) found that stock prices and real exchange rates are positive.

Tables 5.8 to 5.19 reveal that the estimated coefficient of $\Delta LnOPEN_{i(t-1)}$ is negative and significant at the 1% level, and $\Delta LnOPEN_{i(t-2)}$ is positive and insignificant. According to Basu and Morey's (2005) studies, a more open economy is predicted to enjoy real-economy growth due to more efficient resource utilisation. According to Fama (1990) and Ferson and Harvey

(1997), growth in the real economy boosts future cash flow and profits, which leads to an increase in stock values.

Tables 5.7 to 5.18 also reveal that the estimated coefficients of IR of panel VECM are negative and significant at a 1% level. Previous research, including those of Waud (1970), Nelson (1976), Fama and Schwert (1977) and Fama (1981), indicate that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), and Ferrer et al. (2016) have also confirmed this trend of relationship.

The estimated coefficients for LnCR presented in Table 5.7 to 5.18 also reveal a positive and significant at a 5% level. Mashal (2011) argues that corruption spoils economic growth by dwindling domestic competition that undermines domestic and foreign companies' efficiency. In addition, corruption makes it more difficult and costly to conduct foreign operations by obtaining licenses and permits (Habib and Zurawicki, 2002, Voyer and Beamish, 2004, Cuervo-Cazurra, 2008). Ng (2006) claims that managers might participate in projects otherwise not only accept bribes that create waste and increase transaction costs in the economy.

The estimated coefficients for LnGS presented in Table 5.7 to 5.18 suggest a positive and significant 5% level. Yartey (2008) also supports a positive relationship between government stability and share price. The results highlighted that political risk, law and order, and bureaucratic quality is important determinants of stock market development as they enhance the viability of external finance.

This finding also indicates that the estimated coefficients for the dummy variable (D_{GFC}), global financial crisis (GFC), are negative e and significant at a 1% level.

5.9 Granger Causality Test

The results of the Pedroni cointegration test (1999) showed evidence that variables are cointegrated. Therefore, a dynamic panel data model using the VECM Granger causality under a multivariate framework was estimated. Before the panel VECM estimation, the optimal lag length was established as two, using the SIC under the unrestricted panel VAR model. The panel Granger Causality test results, based on the panel VECM framework, are shown in 12 Tables starting from Table 5.20 to Table 5.31.

Table 5.19: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 1 of Developed and Emerging Markets

Panel A: ΔLnSPI, ΔLnRGDP, ΔLnCPI (Considering IR as an exogenous variable in the VECM model)				
Dependent	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**All**
ΔLnSPI	-	9.9265*** (0.0070)	18.3746*** (0.0001)	32.3073*** (0.0000)
ΔLnRGDP	24.1869*** (0.0000)	-	4.6695* (0.0968)	28.5689*** (0.0000)
ΔLnCPI	7.0306** (0.0297)	11.8764*** (0.0026)	-	13.7413*** (0.0082)
ΔLnSPI↔ΔLnRGDP; ΔLnSPI↔ΔLnCPI				
Panel B: ΔLnSPI, ΔLnRGDP, ΔLnCPI (considering LNCR as an exogenous variable in the VECM model)				
Dependent	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**All**
ΔLnSPI	-	10.7194*** (0.0047)	8.7877** (0.0124)	21.1202*** (0.0003)
ΔLnRGDP	22.9270*** (0.0000)	-	0.2574 (0.8792)	23.0823*** (0.0001)
ΔLnCPI	1.9057 (0.3856)	17.2238*** (0.0002)	-	30.5755*** (0.0000)
ΔLnSPI↔ΔLnRGDP; ΔLnSPI↔ΔLnCPI				
Panel C: ΔLnSPI, ΔLnRGDP, ΔLnCPI (considering LNGS as an exogenous variable in the VECM model)				
Dependent	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**All**
ΔLnSPI	-	9.7503*** (0.0076)	5.0806* (0.0788)	16.19066*** (0.0028)
ΔLnRGDP	22.2160*** (0.0000)	-	0.3508 (0.8391)	22.5895*** (0.0002)
ΔLnCPI	1.2232 (0.5425)	29.6468*** (0.0000)	-	42.6433*** (0.0000)
ΔLnSPI↔ΔLnRGDP; ΔLnSPI↔ΔLnCPI				

Note 1: Chi-square values are provided, along with p values in parenthesis.
Note 2: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.
Note 3: ΔLnSPI↔ΔLnRGDP implies SPI growth and real GDP growth both Granger cause each other.
ΔLnSPI→ΔLnRGDP implies SPI growth Granger causes real GDP growth.

Table 5.19 shows the Granger Causality results in a multivariate framework while considering IR, LnCR, and LnGS as exogenous variables separately.

In panel A, it can be seen that economic growth and Inflation Granger cause share price growth and they also jointly Granger cause share price growth. Similarly, share price growth and inflation Granger cause economic growth separately, and they also jointly Granger cause economic growth. Thus, economic growth and share price growth Granger Causes Inflation are also combined in a multivariate framework, while the interest rate is considered an exogenous variable.

A similar result can be seen in panels B and C.

Table 5.20: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 2 of Developed and Emerging Markets

Panel A:
ΔLnSPI, ΔLnIPI, Δ LnCPI (considering IR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**All**
ΔLnSPI	-	4.2727 (0.1181)	21.4157*** (0.0000)	26.7905*** (0.0000)
ΔLnIPI	22.0356*** (0.0000)	-	2.2428 (0.3258)	25.0172*** (0.0000)
ΔLnCPI	4.6499* (0.0978)	5.9094* (0.0521)	-	7.6613 (0.1048)

ΔLnSPI→ΔLnRGDP; ΔLnSPI↔ΔLnCPI

Panel B:
ΔLnSPI, ΔLnIPI, Δ LnCPI (considering LNCR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**All**
ΔLnSPI	-	4.0774 (0.1302)	8.3415** (0.0154)	12.9721** (0.0114)
ΔLnIPI	22.4904*** (0.0000)	-	8.6266** (0.0134)	31.8957*** (0.0000)
ΔLnCPI	6.7241** (0.0347)	2.7221 (0.2564)	-	14.3935*** (0.0061)

ΔLnSPI→ΔLnRGDP; ΔLnSPI↔ΔLnCPI

Panel C:
ΔLnSPI, ΔLnIPI, Δ LnCPI (considering LNGS as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**All**
ΔLnSPI	-	3.6945 (0.1577	8.0235** (0.0181	12.1924** (0.0160
ΔLnIPI	22.5767*** (0.0000)	-	2.4447 (0.2945)	25.0633*** (0.0000)
ΔLnCPI	4.3051 (0.1162)	6.2678** (0.0435)	-	16.6716*** (0.0022)

ΔLnCPI→ΔLnSPI; ΔLnSPI→ΔLnRGDP

Table 5.20 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen clearly in panel A that Inflation Granger causes share price growth, and inflation combined with ΔLnIPI jointly Granger causes share price growth. Similarly, share price growth Granger cause ΔLnIPI. Share price growth and inflation jointly Granger cause ΔLnIPI. Share price growth and ΔLnIPI Granger cause inflation separately in a multivariate framework, while the interest rate is considered an exogenous variable.

In panel B, Inflation Granger clearly causes share price growth and inflation combined with ΔLnIPI jointly Granger causes share price growth.

Similarly, inflation and share price growth separately Granger cause ΔLnIPI and jointly Granger cause ΔLnIPI. Share price growth Granger causes inflation, and ΔLnIPI and share price growth jointly Granger causes inflation in a multivariate framework while the interest rate is considered an exogenous variable.

A similar result can be seen in panel C.

Table 5.21: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 3 of Developed and Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnRGDP	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	All
ΔLnSPI	-	5.5929* (0.0610)	27.6521*** (0.0000)	55.3222*** (0.0000)	1.4091 (0.4943)	41.9903*** (0.0000)	123.9442*** (0.0000)
ΔLnRGDP	23.9420*** (0.0000)	-	7.4163** (0.0245)	43.5071*** (0.0000)	1.2297 (0.5407)	15.4603*** (0.0004)	89.1007*** (0.0000)
ΔLnCPI	7.6248*** (0.0221)	16.3443** (0.0003)	-	1.4644 (0.4808)	0.6035 (0.7395)	33.0187*** (0.0000)	51.0129*** (0.0000)
ΔLnFDI	0.3414 (0.8431)	15.8632*** (0.0004)	1.0737 (0.5846)	-	2.8987 (0.2347)	0.2137 (0.8987)	25.8102*** (0.0040)
ΔLnREMI	10.1829*** (0.0061)	3.5392 (0.1704)	5.9829** (0.0502)	15.8939*** (0.0004)	-	4.4170 (0.1099)	48.5822*** (0.0000)
ΔLnREER	0.7436 (0.6895)	3.7484 (0.1535)	175.0904*** (0.0000)	58.7832*** (0.0000)	1.3298 (0.5143)	-	229.1660*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnRGDP↔ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnRGDP	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	All
ΔLnSPI	-	6.7450** (0.0343)	2.7758 (0.2496)	44.3612*** (0.0000)	2.2670 0.3219)	32.0687*** (0.0000)	86.7258*** (0.0000)
ΔLnRGDP	25.4232*** (0.0000)	-	3.2597 (0.1960)	37.1770*** (0.0000)	1.7277 (0.4215)	17.3251*** (0.0002)	84.4476*** (0.0000)
ΔLnCPI	7.4618** (0.0240)	26.7555*** (0.0000)	-	2.1629 (0.3391)	0.4409 (0.8022)	26.5185*** (0.0000)	72.4843*** (0.0000)
ΔLnFDI	0.0705 (0.9654)	11.7472*** (0.0028)	2.6293 (0.2686)	-	2.0322 (0.3620)	1.5409 (0.4628)	18.5454** (0.0464)
ΔLnREMI	10.6183*** (0.0049)	3.4165 (0.1812)	11.1792*** (0.0037)	12.9150*** (0.0016)	-	3.5633 (0.1684)	46.3949*** (0.0000)
ΔLnREER	1.4371 (0.4875)	2.5334 (0.2818)	55.3306*** (0.0000)	45.7042*** (0.0000)	1.6975 (0.4280)	-	105.1711*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnRGDP↔ΔLnSPI; ΔLnSPI→ΔLnREMI; ΔLnSPI→ΔLnCPI

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnRGDP	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	All
ΔLnSPI	-	7.1106** (0.0286)	3.7248 (0.1553)	43.6529*** (0.0000)	2.1220 (0.3461)	32.0736*** (0.0000)	88.4347*** (0.0000)
ΔLnRGDP	25.1799*** (0.0000)	-	1.4397 (0.4868)	37.8158*** (0.0000)	1.5093 (0.4702)	17.4080*** (0.0002)	82.5754*** (0.0000)
ΔLnCPI	6.4074** (0.0406)	40.4120*** (0.0000)	-	2.5351 (0.2815)	0.3537 (0.8379)	26.4722*** (0.0000)	83.2227*** (0.0000)
ΔLnFDI	0.1158 (0.9437)	9.6740*** (0.0079)	2.8362 (0.2422)	-	1.9727 (0.3729)	1.7711 (0.4125)	16.1695* (0.0949)
ΔLnREMI	10.7273*** (0.0047)	3.6880 (0.1582)	8.3261** (0.0156)	12.9840*** (0.0015)	-	3.8299 (0.1473)	43.0601*** (0.0000)
ΔLnREER	1.2510 (0.5350)	2.2495 (0.3247)	56.1179*** (0.0000)	45.4783*** (0.0000)	1.7930 (0.4080)	-	106.3011*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnRGDP↔ΔLnSPI; ΔLnSPI→ΔLnREMI; ΔLnSPI→ΔLnCPI

Table 5.21 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately. It can be seen in panel A, economic growth, Inflation, ΔLnFDI and ΔLnREER and separately Granger cause share price growth, again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger cause share price growth. Similarly, share price growth, Inflation, ΔLnFDI, and ΔLnREER separately Granger cause economic growth, again, share price growth, Inflation, ΔLnFDI, ΔLnREMI, and ΔLnREER jointly Granger cause economic growth. Similarly, share price growth, economic growth and ΔLnREER separately Granger cause inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger causes Inflation. Economic growth Granger causes ΔLnFDI, again, share price growth, economic growth, inflation, ΔLnREMI and ΔLnREER jointly Granger causes ΔLnFDI. Share price growth, inflation and ΔLnFDI separately Granger cause ΔLnREMI, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREER jointly Granger causes ΔLnREMI. Inflation and ΔLnFDI separately Granger cause ΔLnREER, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnREER in a multivariate framework while interest rate considered as an exogenous variable.

A similar result can be seen in panels B and C.

Table 5.22: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 4 of Developed and Emerging markets

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnIPI	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	All
ΔLnSPI	-	5.8159* (0.0546)	29.2723*** (0.0000)	52.5168*** (0.0000)	1.2025 (0.5481)	41.8367*** (0.0000)	120.0510*** (0.0000)
ΔLnIPI	27.6746*** (0.0000)	-	2.8494 (0.2406)	30.9356*** (0.0000)	0.9233 (0.6302)	24.2666*** (0.0000)	84.2035*** (0.0000)
ΔLnCPI	7.7958** (0.0203)	11.7800*** (0.0028)	-	1.7332 (0.4204)	0.3468 (0.8408)	30.2794*** (0.0000)	44.4477*** (0.0000)
ΔLnFDI	0.7929 (0.6727)	9.3098*** (0.0095)	1.2220 (0.5428)	-	2.7242 (0.2561)	1.1406 (0.5654)	19.7151** (0.0321)
ΔLnREMI	9.4658*** (0.0088)	3.5609 (0.1686)	5.5669* (0.0618)	13.9525*** (0.0009)	-	5.6881* (0.0582)	45.5422*** (0.0000)
ΔLnREER	1.9229 (0.3823)	0.2738 (0.8720)	174.2617*** (0.0000)	56.1570*** (0.0000)	1.4750 (0.4783)	-	220.7940*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnIPI↔ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnIPI	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	All
ΔLnSPI	-	6.17950** (0.0455)	3.49714 (0.1740)	46.2588*** (0.0000)	3.24415 (0.1975)	37.2423*** (0.0000)	88.8567*** (0.0000)
ΔLnIPI	29.5873*** (0.0000)	-	13.5800*** (0.0011)	33.2692*** (0.0000)	1.6300 (0.4426)	31.3559*** (0.0000)	105.8310*** (0.0000)
ΔLnCPI	12.6496*** (0.0018)	5.1540* (0.0760)	-	1.2156 (0.5445)	1.3652 (0.5053)	23.6794*** (0.0000)	45.6847*** (0.0000)
ΔLnFDI	0.0223 (0.9889)	9.0917** (0.0106)	0.8396 (0.6572)	-	2.1665 (0.3385)	0.8749 (0.6457)	14.9983 (0.1321)
ΔLnREMI	9.6270*** (0.0081)	2.6429 (0.2668)	8.7018** (0.0129)	13.1740*** (0.0014)	-	4.9620* (0.0837)	44.5934*** (0.0000)
ΔLnREER	0.4835 (0.7853)	0.5609 (0.7554)	67.0200*** (0.0000)	46.6546*** (0.0000)	1.9840 (0.3708)	-	111.6566*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnIPI↔ΔLnSPI; ΔLnSPI→ΔLnREMI; ΔLnSPI→ΔLnCPI

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnIPI	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	All
ΔLnSPI	-	6.3542** (0.0417)	3.3019 (0.1919)	45.6328*** (0.0000)	3.6486 (0.1613)	37.2283*** (0.0000)	89.6288*** (0.0000)
ΔLnIPI	28.7985*** (0.0000)	-	8.7324** (0.0127)	34.0418*** (0.0000)	1.3495 (0.5093)	30.2925*** (0.0000)	100.2265*** (0.0000)
ΔLnCPI	10.4208*** (0.0055)	10.5755*** (0.0051)	-	1.6860 (0.4304)	1.3692 (0.5043)	24.9603*** (0.0000)	47.6113*** (0.0000)
ΔLnFDI	0.0015 (0.9992)	6.7306** (0.0346)	1.0673 (0.5865)	-	2.2680 (0.3217)	1.1772 (0.5551)	12.5921 (0.2474)
ΔLnREMI	10.0115*** (0.0067)	3.4605 (0.1772)	6.1950** (0.0452)	13.4219*** (0.0012)	-	5.4118* (0.0668)	42.1056*** (0.0000)
ΔLnREER	0.2870 (0.8663	0.2444 (0.8850)	69.0777*** (0.0000)	45.8034*** (0.0000)	2.1796 (0.3363)	-	113.5968*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnIPI↔ΔLnSPI; ΔLnSPI→ΔLnREMI; ΔLnSPI→ΔLnCPI

Table 5.22 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, ΔLnIPI, Inflation, ΔLnFDI and ΔLnREER and separately Granger cause share price growth, again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger cause share price growth.

Similarly, share price growth, Inflation, ΔLnFDI, and ΔLnREER separately Granger cause ΔLnIPI, again, share price growth, Inflation, ΔLnFDI, ΔLnREMI, and ΔLnREER jointly Granger cause ΔLnIPI.

Share price growth, ΔLnIPI and ΔLnREER separately Granger cause inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger causes Inflation.

ΔLnIPI Granger causes ΔLnFDI, again, share price growth, ΔLnIPI, inflation, ΔLnREMI and ΔLnREER jointly Granger causes ΔLnFDI.

Share price growth, inflation ΔLnFDI and ΔLnREER separately Granger cause ΔLnREMI, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREER jointly Granger causes ΔLnREMI.

Inflation and ΔLnFDI separately Granger cause ΔLnREER, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnREER.

A similar result can be seen in panels B and C.

Table 5.23: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 5 of Developed and Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnOPEN**	**All**
ΔLnSPI	-	7.1075** (0.0286)	26.3875*** (0.0000)	48.7967*** (0.0000)	0.5139 (0.7734)	6.1787** (0.0455)	88.4754*** (0.0000)
ΔLnRGDP	10.7682*** (0.0046)	-	9.2479*** (0.0098)	36.6797*** (0.0000)	1.7429 (0.4183)	6.6157** (0.0366)	81.1357*** (0.0000)
ΔLnCPI	5.0846* (0.0787)	13.4500*** (0.0012)	-	3.4685 (0.1765)	1.0758 (0.5840)	8.0122** (0.0182)	24.0069*** (0.0076)
ΔLnFDI	0.4218 (0.8099)	15.7129*** (0.0004)	1.0826 (0.5820)	-	2.2784 (0.3201)	0.4824 (0.7857)	25.6652*** (0.0042)
ΔLnREMI	7.3073** (0.0259)	4 9887* (0.0826)	5.9993** (0.0498)	15.8456*** (0.0004)	-	1.7618 (0.4144)	45.0083*** (0.0000)
ΔLnOPEN	20.5368*** (0.0000)	18.3834*** (0.0001)	136.3647*** (0.0000)	3.3235 (0.1898)	9.9880*** (0.0068)	-	244.0917*** (0.0000)

ΔLnRGDP→ΔLnSPI; ΔLnFDI→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnOPEN**	**All**
ΔLnSPI	-	10.1786*** (0.0062)	1.7732 (0.4120)	41.5560*** (0.0000)	2.0892 (0.3518)	4.1197 (0.1275)	57.0574*** (0.0000)
ΔLnRGDP	12.5881*** (0.0018)	-	4.5996 (0.1003)	32.0284*** (0.0000)	2.2677 (0.3218)	3.3646 (0.1859)	71.3558*** (0.0000)
ΔLnCPI	3.0964 (0.2126)	19.5471*** (0.0001)	-	1.9404 (0.3790)	0.8478 (0.6545)	13.2612*** (0.0013)	50.5295*** (0.0000)
ΔLnFDI	0.4001 (0.8187)	9.6725*** (0.0079)	4.3562 (0.1133)	-	2.5532 (0.2790)	2.6137 (0.2707)	19.7468** (0.0317)
ΔLnREMI	7.9274** (0.0190)	4 9816* (0.0828)	10.0282*** (0.0066)	13.7558*** (0.0010)	-	2.9282 (0.2313)	44.8273*** (0.0000)
ΔLnOPEN	16.7965*** (0.0002)	20.4151*** (0.0000)	65.9748*** (0.0000)	6.5208** (0.0384)	12.2592*** (0.0022)	-	164.6540*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnRGDP↔ΔLnSPI; ΔLnSPI→ΔLnREMI; ΔLnSPI→ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnOPEN**	**All**
ΔLnSPI	-	10.1086*** (0.0064)	1.7430 (0.4183)	41.4155*** (0.0000)	2.4045 (0.3005)	4.6802* (0.0963)	58.2500*** (0.0000)
ΔLnRGDP	12.6407*** (0.0018)	-	2.4713 (0.2906)	33.0287*** (0.0000)	1.9866 (0.3703)	2.9985 (0.2233)	69.0082*** (0.0000)
ΔLnCPI	1.3062 (0.5204)	28.2931*** (0.0000)	-	2.2472 (0.3251)	0.8008 (0.6700)	11.0372*** (0.0040)	52.5883*** (0.0000)
ΔLnFDI	0.2672 (0.8749)	7.0887** (0.0289)	3.9100 (0.1416)	-	2.6761 (0.2624)	2.6173 (0.2702)	16.2943* (0.0915)
ΔLnREMI	7.8576** (0.0197)	5 1909* (0.0746)	5.4653* (0.0650)	14.4518*** (0.0007)	-	2.9579 (0.2279)	40.5145*** (0.0000)
ΔLnOPEN	15.2949*** (0.0005)	16.5292*** (0.0003)	62.8308*** (0.0000)	6.6683** (0.0356)	12.0260*** (0.0024)	-	159.9263*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnRGDP↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnREMI

Table 5.23 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that economic growth, Inflation, ΔLnFDI and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth.

Similarly, share price growth, Inflation, ΔLnFDI, and ΔLnOPEN separately Granger cause economic growth, share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause economic growth.

Share price growth, economic growth and ΔLnOPEN separately Granger cause inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation.

Economic growth Granger causes ΔLnFDI. Again, share price growth, economic growth, inflation, ΔLnREMI and ΔLnOPEN jointly Granger causes ΔLnFDI.

Share price growth, economic growth, inflation and ΔLnFDI separately Granger cause ΔLnREMI, also share price growth, economic growth, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI.

Share price growth, economic growth, inflation and ΔLnREMI separately Granger cause ΔLnOPEN, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN.

A similar result can be seen in panels B and C.

Table 5.24: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 6 of Developed and Emerging Markets

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnOPEN**	**All**
ΔLnSPI	-	4.5812 (0.1012)	28.4688*** (0.0000)	47.2495*** (0.0000)	0.3569 (0.8366)	4.3248 (0.1150)	82.8349*** (0.0000)
ΔLnIPI	11.5509*** (0.0031)	-	0.9477 (0.6226)	28.9150*** (0.0000)	1.4991 (0.4726)	0.7197 (0.6978)	60.0583*** (0.0000)
ΔLnCPI	4.3879 (0.1115)	12.0306*** (0.0024)	-	3.6283 (0.1630)	0.9270 (0.6291)	9.8566*** (0.0072)	22.3672** (0.0133)
ΔLnFDI	1.3727 (0.5034)	8.3732** (0.0152)	1.4183 (0.4921)	-	1.8337 (0.3998)	0.1259 (0.9390)	18.5651** (0.0461)
ΔLnREMI	5.9412* (0.0513)	4.4034 (0.1106)	5.5177* (0.0634)	13.9560*** (0.0009)	-	2.6071 (0.2716)	41.8243*** (0.0000)
ΔLnOPEN	28.8779*** (0.0000)	4.9681* (0.0834)	140.4817*** (0.0000)	3.3361 (0.1886)	8.7082** (0.0129)	-	228.9388*** (0.0000)

ΔLnCPI→ΔLnSPI; ΔLnFDI→ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnOPEN

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnOPEN**	**All**
ΔLnSPI	-	6.3428** (0.0419)	1.5759 (0.4548)	43.2144*** (0.0000)	2.6236 (0.2693)	4.4743 (0.1068)	53.8310*** (0.0000)
ΔLnIPI	12.5412*** (0.0019)	-	16.3564*** (0.0003)	29.6655*** (0.0000)	2.0867 (0.3523)	0.3493 (0.8397)	77.5403*** (0.0000)
ΔLnCPI	7.1200** (0.0284)	3.9061 (0.1418)	-	0.8600 (0.6505)	1.4960 (0.4733)	13.7502*** (0.0010)	32.5377*** (0.0003)
ΔLnFDI	0.2251 (0.8936)	5.9684* (0.0506)	2.7485 (0.2530)	-	2.4690 (0.2910)	0.8075 (0.6678)	15.1138 (0.1280)
ΔLnREMI	6.1601** (0.0460)	3.7699 (0.1518)	8.5519** (0.0139)	13.2307*** (0.0013)	-	3.9124 (0.1414)	43.1649*** (0.0000)
ΔLnOPEN	24.9091*** (0.0000)	11.1840*** (0.0037)	71.5448*** (0.0000)	6.7318** (0.0345)	11.8047* (0.0027)	-	151.4706*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnIPI↔ΔLnSPI; ΔLnSPI→ΔLnCPI; ΔLnSPI→ΔLnREMI; ΔLnSPI→ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnOPEN**	**All**
ΔLnSPI	-	5.9933** (0.0500)	2.0193 (0.3644)	43.0529*** (0.0000)	3.1635 (0.2056)	4.5709 (0.1017)	55.2242*** (0.0000)
ΔLnIPI	13.0222*** (0.0015)	-	10.7620*** (0.0046)	30.8919*** (0.0000)	1.7376 (0.4194)	0.2839 (0.8677)	71.9544*** (0.0000)
ΔLnCPI	3.6376 (0.1622)	8.6165** (0.0135)	-	1.1517 (0.5622)	1.4588 (0.4822)	13.6093*** (0.0011)	31.0672*** (0.0006)
ΔLnFDI	0.1521 (0.9268)	4.3450 (0.1139)	2.3827 (0.3038)	-	2.7339 (0.2549)	0.9191 (0.6316)	12.5622 (0.2492)
ΔLnREMI	6.2488** (0.0440)	4.8675* (0.0877)	5.1122* (0.0776)	13.7146*** (0.0011)	-	4.2026 (0.1223)	40.1094*** (0.0000)
ΔLnOPEN	23.9465*** (0.0000)	7.5206** (0.0233)	66.3295*** (0.0000)	7.0720** (0.0291)	11.6214*** (0.0030)	-	145.1678*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnIPI↔ΔLnSPI; ΔLnSPI→ΔLnREMI; ΔLnSPI→ΔLnOPEN

Table 5.24 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, Inflation and ΔLnFDI separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth.

Similarly, share price growth and ΔLnFDI separately Granger cause ΔLnIPI, share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause ΔLnIPI.

ΔLnIPI and ΔLnOPEN separately Granger cause inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation.

ΔLnIPI Granger causes ΔLnFDI, again, share price growth, ΔLnIPI, inflation, ΔLnREMI and ΔLnOPEN jointly Granger causes ΔLnFDI.

Share price growth, inflation and ΔLnFDI separately Granger cause ΔLnREMI, share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI.

Share price growth, ΔLnIPI, inflation and ΔLnREMI separately Granger cause ΔLnOPEN, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN.

A similar result can be seen in panels B and C.

Table 5.25: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 7 of Developed and Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnRGDP**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnOPEN**	**All**
ΔLnSPI	-	7.1075** (0.0286)	26.3875*** (0.0000)	48.7967*** (0.0000)	0.5139 (0.7734)	6.1787** (0.0455)	88.4754*** (0.0000)
ΔLnRGDP	10.7682*** (0.0046)	-	9.2479*** (0.0098)	36.6797*** (0.0000)	1.7429 (0.4183)	6.6157** (0.0366)	81.1357*** (0.0000)
ΔLnCPI	5.0846* (0.0787)	13.4500*** (0.0012)	-	3.4685 (0.1765)	1.0758 (0.5840)	8.0122** (0.0182)	24.0069*** (0.0076)
ΔLnFDI	0.4218 (0.8099)	15.7129*** (0.0004)	1.0826 (0.5820)	-	2.2784 (0.3201)	0.4824 (0.7857)	25.6652*** (0.0042)
ΔLnREMI	7.3073** (0.0259)	4.9887* (0.0826)	5.9993** (0.0498)	15.8456*** (0.0004)	-	1.7618 (0.4144)	45.0083*** (0.0000)
ΔLnOPEN	20.5368*** (0.0000)	18.3834*** (0.0001)	136.3647*** (0.0000)	3.3235 (0.1898)	9.9880*** (0.0068)	-	244.0917*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnOPEN→ΔLnSPI; ΔLnRGDP↔ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnRGDP**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnOPEN**	**All**
ΔLnSPI	-	10.1786*** (0.0062)	1.7732 (0.4120)	41.5560*** (0.0000)	2.0892 (0.3518)	4.1197 (0.1275)	57.0574*** (0.0000)
ΔLnRGDP	12.5881*** (0.0018)	-	4.5996 (0.1003)	32.0284*** (0.0000)	2.2677 (0.3218)	3.3646 (0.1859)	71.3558*** (0.0000)
ΔLnCPI	3.0964 (0.2126)	19.5471*** (0.0001)	-	1.9404 (0.3790)	0.8478 (0.6545)	13.2612*** (0.0013)	50.5295*** (0.0000)
ΔLnFDI	0.4001 (0.8187)	9.6725*** (0.0079)	4.3562 (0.1133)	-	2.5532 (0.2790)	2.6137 (0.2707)	19.7468** (0.0317)
ΔLnREMI	7.9274** (0.0190)	4.9816* (0.0828)	10.0282*** (0.0066)	13.7558*** (0.0010)	-	2.9282 (0.2313)	44.8273*** (0.0000)
ΔLnOPEN	16.7965*** (0.0002)	20.4151*** (0.0000)	65.9748*** (0.0000)	6.5208** (0.0384)	12.2592*** (0.0022)	-	164.6540*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnOPEN→ΔLnSPI; ΔLnRGDP↔ΔLnSPI; ΔLnSPI→ΔLnREMI

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnRGDP**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnOPEN**	**All**
ΔLnSPI	-	10.1086*** (0.0064)	1.7430 (0.4183)	41.4155*** (0.0000)	2.4045 (0.3005)	4.6802* (0.0963)	58.2500*** (0.0000)
ΔLnRGDP	12.6407*** (0.0018)	-	2.4713 (0.2906)	33.0287*** (0.0000)	1.9866 (0.3703)	2.9985 (0.2233)	69.0082*** (0.0000)
ΔLnCPI	1.3062 (0.5204)	28.2931*** (0.0000)	-	2.2472 (0.3251)	0.8008 (0.6700)	11.0372*** (0.0040)	52.5883*** (0.0000)
ΔLnFDI	0.2672 (0.8749)	7.0887** (0.0289)	3.9100 (0.1416)	-	2.6761 (0.2624)	2.6173 (0.2702)	16.2943* (0.0915)
ΔLnREMI	7.8576** (0.0197)	5.1909* (0.0746)	5.4653* (0.0650)	14.4518*** (0.0007)	-	2.9579 (0.2279)	40.5145*** (0.0000)
ΔLnOPEN	15.2949*** (0.0005)	16.5292*** (0.0003)	62.8308*** (0.0000)	6.6683** (0.0356)	12.0260*** (0.0024)	-	159.9263*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnRGDP↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnREMI

Table 5.25 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, economic growth, Inflation, ΔLnFDI and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth.

Similarly, share price growth, inflation, ΔLnFDI and ΔLnOPEN separately Granger cause economic growth, also share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause economic growth.

Share price growth, economic growth and ΔLnOPEN separately Granger cause inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation.

Economic growth Granger causes ΔLnFDI. Again, share price growth, economic growth, inflation, ΔLnREMI and ΔLnOPEN jointly Granger causes ΔLnFDI.

Share price growth, economic growth, inflation and ΔLnFDI separately Granger cause ΔLnREMI, also share price growth, economic growth, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI.

Share price growth, economic growth, inflation and ΔLnREMI separately Granger cause ΔLnOPEN, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN.

A similar result can be seen in panels B and C.

Table 5.26: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 8 of Developed and Emerging Markets

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	0.2872 (0.8662)	35.4038*** (0.0000)	39.6604*** (0.0000)	53.7185*** (0.0000)	18.6586*** (0.0001)	137.7971*** (0.0000)
ΔLnIPI	31.1389*** (0.0000)	-	0.6861 (0.7096)	21.6114*** (0.0000)	50.3625*** (0.0000)	23.8218*** (0.0000)	112.2434*** (0.0000)
ΔLnCPI	5.1344* (0.0767)	17.2968*** (0.0002)	-	0.6172 (0.7345)	30.9321*** (0.0000)	9.6645*** (0.0080)	53.0674*** (0.0000)
ΔLnFDI	1.4097 (0.4942)	8.3262** (0.0156)	1.3783 (0.5020)	-	0.7427 (0.6898)	0.4339 (0.8050)	18.1781* (0.0520)
ΔLnREMI	3.1773 (0.2042)	2.8383 (0.2419)	177.0240*** (0.0000)	50.3233*** (0.0000)	-	8.5299** (0.0141)	225.2224*** (0.0000)
ΔLnOPEN	35.1880*** (0.0000)	4.8304* (0.0894)	135.9122*** (0.0000)	2.4135 (0.2992)	8.0932** (0.0175)	-	229.8584*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnOPEN→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	2.1259 (0.3454)	4.7672* (0.0922)	37.2565*** (0.0000)	44.6177*** (0.0000)	11.6945*** (0.0029)	100.1987*** (0.0000)
ΔLnIPI	32.1329*** (0.0000)	-	8.6285** (0.0134)	24.2019*** (0.0000)	58.7644*** (0.0000)	23.6565*** (0.0000)	131.1401*** (0.0000)
ΔLnCPI	13.3047*** (0.0013)	11.8357*** (0.0027)	-	0.4210 (0.8102)	24.0600*** (0.0000)	10.4614*** (0.0053)	55.5405*** (0.0000)
ΔLnFDI	0.0387 (0.9809)	7.2432** (0.0267)	0.1580 (0.9240)	-	0.3888 (0.8233)	0.2231 (0.8944)	13.0644 (0.2201)
ΔLnREMI	0.2484 (0.8832)	0.8503 (0.6537)	76.5317*** (0.0000)	45.8818*** (0.0000)	-	4.5224 (0.1042)	125.1742*** (0.0000)
ΔLnOPEN	29.7212*** (0.0000)	10.0850*** (0.0065)	71.8153*** (0.0000)	5.1548* (0.0760)	7.0723** (0.0291)	-	152.2826*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	1.7109 (0.4251)	4.1616 (0.1248)	36.7369*** (0.0000)	44.7912*** (0.0000)	12.5547*** (0.0019)	101.3266*** (0.0000)
ΔLnIPI	30.3408*** (0.0000)	-	3.1424 (0.2078)	24.8028*** (0.0000)	56.8033*** (0.0000)	23.2557*** (0.0000)	122.7584*** (0.0000)
ΔLnCPI	10.7944*** (0.0045)	21.4470*** (0.0000)	-	0.6586 (0.7194)	25.1689*** (0.0000)	10.1303*** (0.0063)	60.3304*** (0.0000)
ΔLnFDI	0.1694 (0.9188)	5.7908* (0.0553)	0.0027 (0.9987)	-	0.6056 (0.7388)	0.1309 (0.9367)	10.9633 (0.3604)
ΔLnREMI	0.3585 (0.8359)	0.1347 (0.9348)	78.9397*** (0.0000)	45.8397*** (0.0000)	-	4.9525* (0.0841)	128.4212*** (0.0000)
ΔLnOPEN	29.5616*** (0.0000)	6.2820** (0.0432)	61.4209*** (0.0000)	5.4860* (0.0644)	7.3645** (0.0252)	-	140.8990*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnCPI

Table 5.26 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth.

Similarly, share price growth, inflation, ΔLnFDI and ΔLnOPEN separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause ΔLnIPI.

Share price growth, ΔLnIPI, ΔLnREMI and ΔLnOPEN separately Granger cause inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation.

ΔLnIPI Granger causes ΔLnFDI, again, share price growth, ΔLnIPI, inflation, ΔLnREMI and ΔLnOPEN jointly Granger causes ΔLnFDI.

Inflation, ΔLnFDI and ΔLnOPEN separately Granger cause ΔLnREMI, also share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI.

Share price growth, ΔLnIPI, inflation and ΔLnREMI separately Granger cause ΔLnOPEN, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN.

A similar result can be seen in panels B and C.

Table 5.27: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 9 of Developed and Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	4.4449 (0.1083)	31.8617*** (0.0000)	0.9183 (0.6318)	60.0285*** (0.0000)	34.6043*** (0.0000)	101.7259*** (0.0000)
ΔLnRGDP	43.3192*** (0.0000)	-	11.3923*** (0.0034)	1.2318 (0.5402)	51.7142*** (0.0000)	50.7227*** (0.0000)	96.1593*** (0.0000)
ΔLnCPI	5.6111* (0.0605)	16.5174*** (0.0003)	-	0.2537 (0.8809)	33.2753*** (0.0000)	5.6667* (0.0588)	54.6573*** (0.0000)
ΔLnREMI	15.2126*** (0.0005)	4.4999 (0.1054)	8.4799** (0.0144)	-	2.7111 (0.2578)	0.0622 (0.9694)	32.3098*** (0.0004)
ΔLnREER	7.6948** (0.0213)	6.6671** (0.0357)	160.4466*** (0.0000)	2.8617 (0.2391)	-	14.7287*** (0.0006)	172.9994*** (0.0000)
ΔLnOPEN	31.4312*** (0.0000)	17.8605*** (0.0001)	130.6939*** (0.0000)	8.3697** (0.0152)	8.0954** (0.0175)	-	250.7964*** (0.0000)

ΔLnCPI↔ΔLnSPI; ΔLnREER↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	3.8809 (0.1436)	7.0835** (0.0290)	4.0408 (0.1326)	44.2826*** (0.0000)	21.6688*** (0.0000)	74.6078*** (0.0000)
ΔLnRGDP	38.6838*** (0.0000)	-	0.1283 (0.9379)	0.5401 (0.7633)	46.0201*** (0.0000)	40.1741*** (0.0000)	81.3021*** (0.0000)
ΔLnCPI	9.7571*** (0.0076)	30.5514*** (0.0000)	-	0.2409 (0.8865)	31.7906*** (0.0000)	12.6962*** (0.0018)	78.2419*** (0.0000)
ΔLnREMI	14.5883*** (0.0007)	4.9468* (0.0843)	6.1872** (0.0453)	-	1.8392 (0.3987)	0.8589 (0.6509)	27.5315*** (0.0021)
ΔLnREER	2.6840 (0.2613)	3.1149 (0.2107)	50.3459*** (0.0000)	2.1128 (0.3477)	-	4.4863 (0.1061)	65.2469*** (0.0000)
ΔLnOPEN	31.7365*** (0.0000)	20.1829*** (0.0000)	47.4781*** (0.0000)	8.0618** (0.0178)	12.2758*** (0.0022)	-	151.4303*** (0.0000)

ΔLnREER→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	2.8059 (0.2459)	8.4781** (0.0144)	3.8049 (0.1492)	44.7803*** (0.0000)	21.9216*** (0.0000)	74.5343*** (0.0000)
ΔLnRGDP	35.8316*** (0.0000)	-	0.8327 (0.6595)	0.4799 (0.7867)	45.4389*** (0.0000)	37.4524*** (0.0000)	79.3828*** (0.0000)
ΔLnCPI	8.3629** (0.0153)	37.5518*** (0.0000)	-	0.1919 (0.9085)	31.3170*** (0.0000)	11.5884*** (0.0030)	80.1054*** (0.0000)
ΔLnREMI	14.1716*** (0.0008)	5.8970* (0.0524)	4.1958 (0.1227)	-	1.9781 (0.3719)	0.7625 (0.6830)	26.1588*** (0.0035)
ΔLnREER	2.6942 (0.2600)	2.4154 (0.2989)	50.7691*** (0.0000)	1.9088 (0.3850)	-	4.2354 (0.1203)	64.5828*** (0.0000)
ΔLnOPEN	29.7526*** (0.0000)	17.8408*** (0.0001)	44.6397*** (0.0000)	7.4800** (0.0238)	11.6278*** (0.0030)	-	145.5510*** (0.0000)

ΔLnREER→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Table 5.27 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth.

Similarly, share price growth, inflation, ΔLnREER and ΔLnOPEN separately Granger cause economic growth, also share price growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause economic growth.

Share price growth, economic growth, ΔLnREER and ΔLnOPEN separately Granger cause inflation, again share price growth, economic growth, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes Inflation.

Share price growth and inflation Granger causes ΔLnREMI. Again, share price growth, economic growth, inflation, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI.

Share price growth, economic growth, inflation and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, economic growth, inflation, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER.

Share price growth, economic growth, inflation, ΔLnREMI and ΔLnREER separately and combinedly Granger cause ΔLnOPEN in a multivariate framework while considering IR as the exogenous variable in the model.

A similar result can be seen in panels B and C.

Table 5.28: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 10 of Developed and Emerging markets

Panel A: ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	0.7095 (0.7014)	33.4460*** (0.0000)	1.0827 (0.5820)	60.6605*** (0.0000)	31.7103*** (0.0000)	96.0125*** (0.0000)
ΔLnIPI	42.4378*** (0.0000)	-	0.9212 (0.6309)	1.5025 (0.4718)	58.2469*** (0.0000)	34.8873*** (0.0000)	90.7184*** (0.0000)
ΔLnCPI	5.3429* (0.0692)	12.9007*** (0.0016)	-	0.0440 (0.9782)	32.6446*** (0.0000)	9.3025*** (0.0095)	49.2573*** (0.0000)
ΔLnREMI	13.2030*** (0.0014)	6.2644** (0.0436)	7.7881** (0.0204)	-	3.5933 (0.1659)	0.6390 (0.7265)	32.5216*** (0.0003)
ΔLnREER	8.0628** (0.0177)	4.8931* (0.0866)	161.7752*** (0.0000)	3.0245 (0.2204)	-	16.2888*** (0.0003)	169.2411*** (0.0000)
ΔLnOPEN	39.1671*** (0.0000)	4.2443 (0.1198)	138.1288*** (0.0000)	7.5401** (0.0231)	7.9239** (0.0190)	-	236.1442*** (0.0000)

ΔLnCPI↔ΔLnSPI; ΔLnREER↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Panel B: ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	1.9552 (0.3762)	10.8888*** (0.0043)	4.0831 (0.1298)	49.7104*** (0.0000)	22.3709*** (0.0000)	74.2533*** (0.0000)
ΔLnIPI	42.7609*** (0.0000)	-	4.2670 (0.1184)	0.9285 (0.6286)	64.3534*** (0.0000)	35.7486*** (0.0000)	97.3348*** (0.0000)
ΔLnCPI	15.6036*** (0.0004)	11.1894*** (0.0037)	-	0.9989 (0.6069)	27.8757*** (0.0000)	13.3578*** (0.0013)	56.6980*** (0.0000)
ΔLnREMI	12.7062*** (0.0017)	6.6293** (0.0363)	5.8095* (0.0548)	-	3.1166 (0.2105)	2.1904 (0.3345)	29.1111*** (0.0012)
ΔLnREER	1.4899 (0.4747)	2.1173 (0.3469)	61.8846*** (0.0000)	2.5168 (0.2841)	-	7.0477** (0.0295)	70.4198*** (0.0000)
ΔLnOPEN	39.6987*** (0.0000)	7.1418** (0.0281)	61.2546*** (0.0000)	8.8205** (0.0122)	9.1064** (0.0105)	-	141.5826*** (0.0000)

ΔLnREER→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI, ΔLnSPI→ΔLnIPI; LnSPI→ΔLnREMI

Panel C: ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	0.6547 (0.7208)	9.8931*** (0.0071)	4.2070 (0.1220)	48.9151*** (0.0000)	21.9338*** (0.0000)	73.1840*** (0.0000)
ΔLnIPI	39.7945*** (0.0000)	-	1.7128 (0.4247)	0.7318 (0.6936)	62.0197*** (0.0000)	34.7429*** (0.0000)	91.8096*** (0.0000)
ΔLnCPI	13.0429*** (0.0015)	18.2882*** (0.0001)	-	0.8963 (0.6388)	28.2887*** (0.0000)	13.3381*** (0.0013)	59.3623*** (0.0000)
ΔLnREMI	12.4685*** (0.0020)	7.9684*** (0.0186)	4.4853 (0.1062)	-	3.2710 (0.1949)	2.2138 (0.3306)	28.2468*** (0.0016)
ΔLnREER	1.4297 (0.4893)	1.2401 (0.5379)	59.5055*** (0.0000)	2.3480 (0.3091)	-	6.4627** (0.0395)	67.6119*** (0.0000)
ΔLnOPEN	38.2700*** (0.0000)	4.8645* (0.0878)	54.1614*** (0.0000)	8.3519** (0.0154)	8.9716** (0.0113)	-	132.9700*** (0.0000)

ΔLnREER→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Table 5.28 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth.

Similarly, share price growth, ΔLnREER and ΔLnOPEN separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause ΔLnIPI.

Share price growth, ΔLnIPI, ΔLnREER and ΔLnOPEN separately Granger cause inflation, again share price growth, ΔLnIPI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation.

Share price growth, ΔLnIPI and inflation Granger cause ΔLnREMI. Again, share price growth, ΔLnIPI, inflation, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI.

Share price growth, ΔLnIPI, inflation and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, ΔLnIPI, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREER.

Share price growth, inflation, ΔLnREMI and ΔLnREER separately and combinedly Granger cause ΔLnOPEN, again Share price growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN in a multivariate framework while IR is the exogenous variable in the model.

A similar result can be seen in panels B and C.

Table 5.29: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 11 of Developed and Emerging Markets

Panel A: ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	3.2104 (0.2009)	37.3002*** (0.0000)	42.7475*** (0.0000)	1.2056 (0.5473)	55.7614*** (0.0000)	22.2992*** (0.0000)	149 5670*** (0.0000)
ΔLnRGDP	29.6822*** (0.0000)	-	14.0396*** (0.0009)	31.0761*** (0.0000)	1.0393 (0.5947)	46.8720*** (0.0000)	38.3594*** (0.0000)	131.7749*** (0.0000)
ΔLnCPI	4.6491* (0.0978)	17.4530*** (0.0002)	-	0.6821 (0.7110)	0.4365 (0.8039)	30.3115*** (0.0000)	5.0693* (0.0793)	55.5196*** (0.0000)
ΔLnFDI	0.1568 (0.9246)	15.1964*** (0.0005)	0.9557 (0.6201)	-	2.9091 (0.2335)	0.6394 (0.7264)	0.7000 (0.7047)	26.4871*** (0.0092)
ΔLnREMI	9.5060*** (0.0086)	3.3272 (0.1895)	5.8134* (0.0547)	15.6187*** (0.0004)	-	2.5274 (0.2826)	0.0085 (0.9957)	48.1383*** (0.0000)
ΔLnREER	1.8826 (0.3901)	5.5137* (0.0635)	182.9523*** (0.0000)	52.3718*** (0.0000)	2.2994 (0.3167)	-	8.7083** (0.0129)	237 9519*** (0.0000)
ΔLnOPEN	25.8183*** (0.0000)	19.2456*** (0.0001)	129.1161*** (0.0000)	3.9067 (0.1418)	9.3790** (0.0092)	8.6698** (0.0131)	-	257 3075*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Panel B: ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	2.9915 (0.2241)	2.0123 (0.3656)	36.7108*** (0.0000)	2.3504 (0.3088)	38.6574*** (0.0000)	9.7639*** (0.0076)	98.2450*** (0.0000)
ΔLnRGDP	27.5384*** (0.0000)	-	0.7128 (0.7002)	29.0238*** (0.0000)	1.0978 (0.5776)	43.6368*** (0.0000)	28.2874*** (0.0000)	114.6803*** (0.0000)
ΔLnCPI	8.9417** (0.0114)	31.0929*** (0.0000)	-	0.7355 (0.6923)	0.5909 (0.7442)	25.1536*** (0.0000)	9.0668** (0.0107)	80.8674*** (0.0000)
ΔLnFDI	0.2030 (0.9035)	11.3688*** (0.0034)	1.0636 (0.5876)	-	2.4370 (0.2957)	0.1463 (0.9295)	1.7019 (0.4270)	19.8271* (0.0704)
ΔLnREMI	9.5800*** (0.0083)	3.5765 (0.1673)	10.1139*** (0.0064)	13.4966*** (0.0012)	-	1.7021 (0.4270)	0.7038 (0.7034)	46.1937*** (0.0000)
ΔLnREER	0.8494 (0.6540)	1.5635 (0.4576)	65.9857*** (0.0000)	44.8629*** (0.0000)	2.1243 (0.3457)	-	2.9231 (0.2319)	119.7243*** (0.0000)
ΔLnOPEN	24.3473*** (0.0000)	21.3605*** (0.0000)	60.5031*** (0.0000)	6.6368** (0.0362)	12.0906*** (0.0024)	9.0287** (0.0110)	-	174.4071*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnCPI; ΔLnSPI→ΔLnREMI

Panel C: ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	3.0998 (0.2123)	1.9855 (0.3705)	36.1736*** (0.0000)	2.4349 (0.2960)	38.9413*** (0.0000)	10.4846*** (0.0053)	99.9874*** (0.0000)
ΔLnRGDP	25.9508*** (0.0000)	-	0.2893 (0.8653)	29.4772*** (0.0000)	0.7815 (0.6766)	42.2660*** (0.0000)	26.8783*** (0.0000)	111.8260*** (0.0000)
ΔLnCPI	7.2333** (0.0269)	46.0284*** (0.0000)	-	0.9953 (0.6079)	0.4598 (0.7946)	25.7475*** (0.0000)	7.8653** (0.0196)	91.1220*** (0.0000)
ΔLnFDI	0.1403 (0.9323)	9.2971*** (0.0096)	0.5819 (0.7475)	-	2.6192 (0.2699)	0.3159 (0.8539)	1.3901 (0.4991)	17.2722 (0.1396)
ΔLnREMI	9.6116*** (0.0082)	3.9110 (0.1415)	7.2515** (0.0266)	13.5774*** (0.0011)	-	1.7981 (0.4069)	0.6010 (0.7405)	42.7516**** (0.0000)
ΔLnREER	0.7092 (0.7014)	1.2469 (0.5361)	68.3069*** (0.0000)	45.4717*** (0.0000)	2.3733 (0.3052)	-	3.6599 (0.1604)	123.8763** (0.0000)
ΔLnOPEN	22.5088*** (0.0000)	16.5508*** (0.0003)	49.8296*** (0.0000)	6.6077** (0.0367)	11.5081*** (0.0032)	9.0543** (0.0108)	-	161 3194*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnCPI; ΔLnSPI→ΔLnREMI

Table 5.29 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth.

Similarly, share price growth, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause economic growth, share price growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause economic growth.

Share price growth, economic growth, ΔLnREER and ΔLnOPEN separately Granger cause inflation, share price growth, economic growth, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation.

Economic growth Granger causes ΔLnFDI. Again, share price growth, economic growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnFDI.

Share price growth, inflation and ΔLnFDI Granger cause ΔLnREMI, again, share price growth, economic growth, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI.

Economic growth, inflation, ΔLnFDI, and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, economic growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER.

Share price growth, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnREER separately Granger cause ΔLnOPEN, again Share price growth, inflation, economic growth, ΔLnFDI, ΔLnREMI, ΔLnREER combinedly Granger causes ΔLnOPEN in a multivariate framework while IR is the exogenous variable in the model. A similar result can be seen in panels B and C.

Table 5.30: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 12 of Developed and Emerging markets

Panel A: ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	0.2585 (0.8788)	37.1408*** (0.0000)	39.7559*** (0.0000)	1.1670 (0.5579)	53.8723*** (0.0000)	18.1096*** (0.0001)	141.0729 (0.0000)
ΔLnIPI	31.7825*** (0.0000)	-	0.5457 (0.7612)	20.6990*** (0.0000)	1.2393 (0.5381)	48.5498*** (0.0000)	24.2500*** (0.0000)	111.1464*** (0.0000)
ΔLnCPI	5.0201* (0.0813)	17.7862*** (0.0001)	-	0.8620 (0.6499)	0.1763 (0.9156)	31.0323*** (0.0000)	9.4606*** (0.0088)	54.2653*** (0.0000)
ΔLnFDI	0.6309 (0.7294)	7.8343** (0.0199)	1.3751 (0.5028)	-	2.5685 (0.2769)	1.2033 (0.5479)	0.4207 (0.8103)	19.9408* (0.0682)
ΔLnREMI	8.6399** (0.0133)	3.5850 (0.1665)	5.4157* (0.0667)	13.6155*** (0.0011)	-	3.2211 (0.1998)	0.3627 (0.8342)	45.6158*** (0.0000)
ΔLnREER	3.3459 (0.1877)	2.4792 (0.2895)	182.7884*** (0.0000)	48.3853*** (0.0000)	2.4478 (0.2941)	-	8.6365** (0.0133)	230.5202*** (0.0000)
ΔLnOPEN	33.6223*** (0.0000)	4.1647 (0.1246)	137.0640*** (0.0000)	3.3222 (0.1899)	8.1721** (0.0168)	8.0622** (0.0178)	-	241.6870*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Panel B: ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	1.9659 (0.3742)	4.5116 (0.1048)	37.8501*** (0.0000)	3.3157 (0.1905)	43.4931*** (0.0000)	10.5959*** (0.0050)	102.5502*** (0.0000)
ΔLnIPI	32.4555*** (0.0000)	-	8.1929** (0.0166)	24.1740*** (0.0000)	1.6209 (0.4447)	56.6552*** (0.0000)	23.7836*** (0.0000)	129.7740*** (0.0000)
ΔLnCPI	14.6139*** (0.0007)	10.5394*** (0.0051)	-	0.2712 (0.8732)	1.6320 (0.4422)	23.2623*** (0.0000)	10.1749*** (0.0062)	56.1500*** (0.0000)
ΔLnFDI	0.0432 (0.9786)	8.1831** (0.0167)	0.0765 (0.9625)	-	2.4699 (0.2909)	0.3234 (0.8507)	0.3037 (0.8591)	15.9787 (0.1922)
ΔLnREMI	8.5397** (0.0140)	3.6179 (0.1638)	7.8191*** (0.0200)	13.3342*** (0.0013)	-	2.9084 (0.2336)	1.4940 (0.4738)	45.5513*** (0.0000)
ΔLnREER	0.1784 (0.9146)	0.5628 (0.7547)	76.5224*** (0.0000)	43.3283*** (0.0000)	2.4207 (0.2981)	-	4.0033 (0.1351)	124.7061*** (0.0000)
ΔLnOPEN	31.5330*** (0.0000)	9.4060*** (0.0091)	72.7123*** (0.0000)	6.6986** (0.0351)	12.3163*** (0.0021)	7.0061** (0.0301)	-	163.4107*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnCPI; ΔLnSPI→ΔLnREMI

Panel C: ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	1.4130 (0.4934)	4.4117 (0.1102)	37.4323*** (0.0000)	3.8759 (0.1440)	43.7198*** (0.0000)	11.2280*** (0.0036)	104.3848*** (0.0000)
ΔLnIPI	30.3608*** (0.0000)	-	3.9335 (0.1399)	24.5086*** (0.0000)	1.2119 (0.5456)	54.4010*** (0.0000)	22.7661*** (0.0000)	122.6271*** (0.0000)
ΔLnCPI	11.5328*** (0.0031)	18.0522*** (0.0001)	-	0.5214 (0.7705)	1.6037 (0.4485)	23.8842*** (0.0000)	9.5765*** (0.0083)	58.1066*** (0.0000)
ΔLnFDI	0.0031 (0.9985)	6.2909** (0.0430)	0.0443 (0.9781)	-	2.8200 (0.2441)	0.4733 (0.7893)	0.2012 (0.9043)	13.6837 (0.3214)
ΔLnREMI	8.7356** (0.0127)	4.6748* (0.0966)	5.3702* (0.0682)	13.5584*** (0.0011)	-	3.0684 (0.2156)	1.5847 (0.4528)	43.3239*** (0.0000)
ΔLnREER	0.1263 (0.9388)	0.1682 (0.9194)	79.7660*** (0.0000)	42.3881*** (0.0000)	2.5808 (0.2752)	-	4.0979 (0.1289)	127.5925*** (0.0000)
ΔLnOPEN	30.3730*** (0.0000)	5.9505* (0.0510)	65.6028*** (0.0000)	6.7921** (0.0335)	12.1226*** (0.0023)	7.0553** (0.0294)	-	155.5917*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnCPI; Δ LnSPI→ΔLnREMI

Table 5.30 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth.

Similarly, share price growth, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause ΔLnIPI.

Share price growth, ΔLnIPI, ΔLnREER and ΔLnOPEN separately Granger cause inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation.

ΔLnIPI Granger causes ΔLnFDI, again, share price growth, ΔLnIPI, inflation, ΔLnREMI ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnFDI.

Share price growth, inflation and ΔLnFDI Granger cause ΔLnREMI, again, share price growth, ΔLnIPI, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI.

Inflation, ΔLnFDI, and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER.

Share price growth, inflation, ΔLnREMI and ΔLnREER separately Granger cause ΔLnOPEN, again Share price growth, inflation, ΔLnIPI, ΔLnFDI, ΔLnREMI, ΔLnREER combinedly Granger cause ΔLnOPEN in a multivariate framework, while IR is the exogenous variable in the model.

A similar result can be seen in panels B and C.

5.10 Important Findings and It's Interpretations

It can be seen that the long run estimated coefficients for LnRGDP, LnIPI, LnFDI, LnREMI, and LnREER are positive and significant, and the estimated coefficient for LnCPI is negative and significant for both FMOLS and DOLS estimation procedure. Therefore, it can be concluded higher the real GDP, industrial production index, foreign direct investment, workers' remittances and real effective exchange rate implies a higher Share Price Index, and a higher CPI lowers the Share price index. But the trade openness has an ambiguous effect on share price index as it can be seen that the long run estimated coefficients for LnOPEN are negative in some models and positive in other models.

This study finds that in developed and emerging markets combinedly, real GDP growth, FDI growth, REER growth, and government stability positively influence share price growth in the short run. But trade openness growth, interest rate growth, corruption risk rating, and global financial crisis negatively influence share price growth in the short run, which is theoretically consistent. Various previous research, including those of Waud (1970) , Nelson (1976), Fama and Schwert (1977), and Fama (1981), also indicated that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), and Ferrer et al. (2016) have also confirmed this trend of relationship.

5.11 Summary

This chapter discussed the data used in this study for 21 developed markets (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and the United States of America) and 9 emerging markets namely Brazil, Greece, India, Indonesia, Korea, Pakistan, South Africa, Thailand, and Turkey. In addition, five significant macroeconomic variables and two institutional-quality variables were selected for this study based on the recent studies using annual data from 1984 to 2019.

This chapter presents the results of econometric analysis and analysis of descriptive statistics of the selected variables followed by correlation analysis, unit root test, optimum lag length selection, cointegration test, vector Error Correction Model, and Granger causality test. Most of our results are theoretically and analytically consistent and supported by existing literature.

6 Chapter 6: Cointegration Analysis for Emerging Markets

6.1 Introduction

This chapter discusses the results of the cointegration analysis of selected 9 emerging markets separately in the world, followed by 21 developed markets in the next chapter. This chapter is consisting of 9 sections. Section 6.2 discusses which emerging markets are included in this study. Sections 6.3 and 6.4 present descriptive statistics and correlation analysis. Section 6.5 provides detailed results of the unit root test of the selected variables. As sequential steps in Vector Autoregressive method (VAR), after confirmation of descriptive statistics and correlation analysis, unit root has been undertaken. This chapter discusses VAR and Granger causality but also includes optimum lag length criteria and the panel cointegration test. Section 6.6 discusses the results for panel cointegration using Pedroni (Engle-Granger-based) techniques. Section 6.7 presents the results for short run coefficients using VAR, where Section 6.8 discusses the results on the panel Granger causality test. Section 6.9 presents a conclusion of the study.

6.2 Selection of Emerging Markets

The market classification of Morgan Stanley Capital International Inc. (MSCI) has been adopted for this study. MSCI has classified the world capital market into developed markets, emerging markets, and frontier markets. This study has considered 9 emerging markets: Brazil, Greece, India, Indonesia, Korea, Pakistan, South Africa, Thailand, and Turkey.

6.3 Descriptive Statistics

The descriptive statistics of variables (in natural logarithm) and growth variables (first difference in natural logarithm) in this study are presented in Table 6.1 (panel A and B, respectively).

Table 6.1 summarizes the basic summary statistics of the data under consideration that including the mean, median, maximum, minimum, and standard deviation for the variables in their levels as well as in first differences.

It can be seen that the mean of LnSPI is 4.0496, and the median is 4.2325. Based on the dispersion levels of the series obtained from the standard deviation statistics (Table 6.1 Panel A), LnSPI, LnRGDP, LnIPI, LnCPI, LnREER, LnOPEN, LnCR and LnGS are less volatile in comparison with LnFDI and LnREMI. The highest volatility is demonstrated in IR.

On average, the share price growth for all countries combined is 4% per annum, and the real GDP growth is 3.97%. The average inflation is 8.73%. Average IPI growth and FDI growth are 4.31% and 11.01%, respectively. The share price growth volatility is the highest, and the real GDP growth is the lowest.

Table 6.1: Descriptive Analysis of Emerging Market Data.

Panel A: For level variables											
	LnSPI	**LnRGDP**	**LnIPI**	**LnCPI**	**LnFDI**	**LnREMI**	**LnREER**	**LnOPEN**	**IR**	**LnCR**	**LnGS**
Mean	4.0496	26.8199	11.0328	4.0423	10.3281	21.4300	4.5699	3.8076	9.8975	0.9323	1.9553
Median	4.2325	26.7083	11.0182	4.2475	10.2878	21.4505	4.5759	3.8695	8.5000	0.9163	1.9694
Maximum	5.7992	28.7095	12.9662	5.4572	13.4064	25.1461	5.3233	4.9448	48.8451	1.8362	2.3979
Minimum	1.5023	24.7421	8.7887	0.0143	6.4625	17.2812	3.9351	2.5030	-0.3563	-1.0987	0.7732
Std. dev.	0.8122	0.8826	0.9621	0.8281	1.5613	1.4989	0.2183	0.5064	6.6350	0.4388	0.2510

Panel B: For growth variables										
	ΔLnSPI	**ΔLnRGDP**	**ΔLnIPI**	**ΔlnCPI**	**ΔlnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**ΔLnCR**	**ΔLnGS**
Mean	0.0400	0.0397	0.0431	0.0873	0.1101	0.0666	-0.0054	0.0110	0.0007	0.0026
Median	0.0468	0.0436	0.0438	0.0580	0.1082	0.0611	0.0008	0.0187	0.0000	0.0000
Maximum	1.5570	0.1248	0.1919	3.0800	1.1947	1.5634	0.3930	0.5410	1.7918	0.6642
Minimum	-1.6532	-0.1407	-0.1434	-0.0175	-0.8287	-0.9767	-0.7149	-0.4240	-1.0986	-0.6131
Std. dev.	0.3413	0.0353	0.0547	0.1953	0.2186	0.2528	0.0970	0.0957	0.2067	0.1740

Note: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; OPEN: Trade Openness; CR: Corruption risk rating; and GS: Government stability.

Source: The Table is constructed by the author using E-views 11.

6.4 Correlation Analysis

The correlation matrix (Table 6.2 and Table 6.3) shows the degree of association of variables (in natural logarithm) and growth variables (the 1st difference), respectively.

The result presented in Table 6.2 is the correlation coefficient among the variables in level reveals that the correlations between the variables under study are not very high except for LnRGDP and LnIPI. To avoid multicollinearity problems, this study will not use LnRGDP and LnIPI together for further econometric analysis.

Therefore, there is no sign of multicollinearity in the system, which causes difficulty estimating model parameters (Brooks, 2008: p.171). To detect the possible problem of multicollinearity, the data series are replaced into percentage changes by transforming level data into natural log form to their first differences (Table 6.3).

The correlation coefficients among the growth variables are presented in Table 6.3 are not very high (below 0.7) and, therefore, can be considered together in the analysis.

Table 6.2: Correlation matrix of variables in natural logarithm for emerging markets.

For variables in natural logarithm											
	LnSPI	**LnRGDP**	**LnIPI**	**LnCPI**	**LnFDI**	**LnREMI**	**LnREER**	**LnOPEN**	**IR**	**LnCR**	**LnGS**
LnSPI	1.0000										
LnRGDP	-0.0846 (-1.2309)	1.0000									
LnIPI	-0.0188 (-0.2723)	0.8722*** (25.8435)	1.0000								
LnCPI	0.3419*** (5.2715)	0.3144*** (4.7990)	0.2482*** (3.7132)	1.0000							
LnFDI	0.2348*** (3.5009)	0.7571*** (16.7953)	0.6552*** (12.5688)	0.6519*** (12.4566)	1.0000						
LnREMI	0.3369*** (5.1854)	0.4663*** (7.6386)	0.5571*** (9.7224)	0.5095*** (8.5798)	0.3989*** (6.3045)	1.0000					
LnREER	0.4380*** (7.0597)	-0.0951 (-1.3840)	-0.1271* (-1.8569)	0.0683 (0.9924)	0.1054 (1.5357)	0.0910 (1.3245)	1.0000				
LnOPEN	0.1294* (1.8913)	-0.3408*** (-5.2537)	-0.0097 (-0.1405)	0.0402 (0.5837)	-0.0722 (-1.0494)	-0.1187* (-1.7321)	-0.1718** (-2.5269)	1.0000			
IR	-0.3148*** (-4.8056)	-0.0202 (-0.2928)	-0.0459 (-0.6663)	-0.4733*** (-7.7855)	-0.2615*** (-3.9260)	-0.2468*** (-3.6904)	-0.2679*** (-4.0288)	-0.2691*** (-4.0487)	1.0000		
LnCR	0.0921 (1.3408)	0.0487 (0.7071)	-0.0107 (-0.1554)	-0.0216 (-0.3134)	-0.0454 (-0.6583)	-0.0771 (-1.1207)	0.1102 (1.6070)	-0.1433** (-2.0979)	-0.0017 (-0.0241)	1.0000	
LnGS	-0.1506** (-2.2078)	0.0370 (0.5367)	0.0175 (0.2542)	-0.1625** (-2.3863)	-0.0292 (-0.4229)	-0.1039 (-1.5133)	-0.2850*** (-4.3090)	-0.0136 (-0.1976)	0.1145* (1.6699)	0.0395 (0.5725)	1.0000

Source: The Table is constructed by the author using E-views 11.

Table 6.3 Correlation Matrix of Growth Variables For Emerging Markets

For growth variables (the 1st differences)										
	ΔLnSPI	**ΔLnRGDP**	**ΔLnIPI**	**ΔLnCPI**	**ΔlnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**ΔLnCR**	**ΔLnGS**
ΔLnSPI	1.0000									
ΔLnRGDP	0.5223*** (9.5862)	1.0000								
ΔLnIPI	0.4582*** (8.0683)	0.8634*** (26.7850)	1.0000							
ΔLnCPI	0.0589 (0.9238)	-0.0239 (-0.3748)	0.0058 (0.0903)	1.0000						
ΔlnFDI	0.2523*** (4.0808)	0.2124*** (3.4025)	0.1725*** (2.7405)	-0.0393 (-0.6150)	1.0000					
ΔLnREMI	0.2344*** (3.7749)	0.1775*** (2.8223)	0.1802*** (2.8676)	0.1153* (1.8166)	0.0981 (1.5433)	1.0000				
ΔLnREER	0.5620*** (10.6351)	0.3613*** (6.0646)	0.2712*** (4.4098)	0.0986 (1.5502)	0.1777*** (2.8260)	0.0681 (1.0687)	1.0000			
ΔLnOPEN	-0.1602** (-2.5406)	-0.0682 (-1.0692)	0.0590 (0.9244)	-0.0022 (-0.0348)	-0.1447** (-2.2893)	0.0558 (0.8752)	-0.5971*** (-11.6501)	1.0000		
ΔLnCR	0.0657 (1.0308)	0.1269** (2.0029)	0.1067* (1.6790)	-0.1145* (-1.8048)	0.0588 (0.9220)	-0.0347 (-0.5441)	0.0833 (1.3077)	-0.0448 (-0.7019)	1.0000	
ΔLnGS	0.0795 (1.2480)	0.0474 (0.7426)	-0.0101 (-0.1581)	0.0402 (0.6301)	0.0664 (1.0414)	-0.0000 (-0.0006)	0.1525** (2.4150)	-0.2017*** (-3.2234)	0.1368** (2.1614)	1.0000

Note 1: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; OPEN: Trade Openness; CR: Corruption risk rating; and GS: Government stability.
Note 2: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

Source: The Table is constructed by the author using E-views 11.

6.5 Unit Root Tests Results

In panel data analysis, particularly for cointegration and Granger causality, an essential first step is to identify the stationary properties of the variables (Pradhan et al., 2018). As a prerequisite of the cointegration analysis, the variables in level should be integrated at order one, i.e. I(1), and the corresponding 1st difference should be stationary of I(0).

For this purpose, while there are a number of panel unit root tests, this study performs three-panel unit root tests Levin Lin Chu (LLC) test, Augmented Dicky Fuller (ADF) Fischer Chi-square test and Phillips-Perron (PP) Fischer Chi-square test proposed by Levin et al., (2002), Maddala and Wu (1999) and Choi (2001) respectively. Many researchers widely use these tests. The null hypothesis of these unit root tests is that there exists a unit root in the series, i.e., the variables are non-stationary.

This study subsequently runs the LLC tests, ADF tests and PP tests on all of the variables individually in order to check stationarity for every data series under the research. Regarding the LLC, ADF and PP tests, the null hypothesis of a unit root cannot be accepted unless the computed t-statistic excesses the critical values at a 5 % level of significance (which is the preferable statistical significance level used in many econometric papers). The results of the ADF and PP tests are mostly consistent in all variables in level except IR.

Table 6.4: Unit Root Test For Panel Data. (Emerging Market)

	Level				1st Difference			
	LLC	**ADF**	**PP**	**Order**	**LLC**	**ADF**	**PP**	**Order**
LnSPI	0.89422	6.25416	5.10018	**I (1)**	-12.6527***	171.423***	185.529***	**I (0)**
LnRGDP	20.2767	0.38377	0.20807	**I (1)**	-5.71177***	61.4210***	64.2409***	**I (0)**
LnIPI	8.36818	1.13300	1.02145	**I (1)**	-7.06838***	96.4887***	100.821***	**I (0)**
LnCPI	6.82596	1.81552	0.54619	**I (1)**	-18.5916***	309.841***	314.379***	**I (0)**
LnFDI	7.66493	0.36864	0.20058	**I (1)**	-11.6953***	199.581***	199.186***	**I (0)**
LnREMI	5.53360	2.58719	2.76583	**I (1)**	-13.2207***	178.842***	183.186***	**I (0)**
LnREER	-0.63860	16.2254	17.2240	**I (1)**	-14.6095***	229.161***	269.841***	**I (0)**
LnOPEN	2.31541	3.98987	3.78468	**I (1)**	-16.5137***	264.699***	270.442***	**I (0)**
IR	-4.57436***	59.0559***	72.5026***	**I (0)**	N/A	N/A	N/A	
LnCR	-2.51951***	19.9108	20.3150	**I (1)**	-16.1126***	264.915***	290.854***	**I (0)**
LnGS	-0.45296	8.66794	7.70760	**I (1)**	-17.4338***	268.992***	389.246***	**I (0)**

Note 1: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; CR: Corruption risk rating; and GS: Government stability.
Note 2: LLC stands Levin–Lin–Chu test (Levine et al., 2002), ADF stands for ADF- Fischer Chi-square test (Maddala & Wu, 1999), PP stands PP-Fischer Chi-square test (Choi, 2001), I(1) stands for integrated of order one or non-stationary, and I(0) stands for integrated of order zero or stationary.
Note 3: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

Source: The Table is constructed by the author using E-views 11

The unit root test results are presented in Table 6.4 using LLC, Augmented Dicky-Fuller (ADF) and Philips Perron (PP). The result shows that LnSPI, LnRGDP, LnIPI, LnCPI, LnFDI, LnREMI, LnREER, LnOPEN, LnCR, LnGS are non-stationary and IR is stationary at levels of their natural logarithm value, and the variables are stationary at their first difference. This certainly meets the requirements of the cointegration, VAR and Granger Causality test.

Hence, the next step is to test whether there exists a long run equilibrium relationship among these variables under study. While there are a number of tests to serve this purpose, this study used the Pedroni cointegration test due to its popularity.

6.6 Cointegration Test

It is evident from the above section that all variables under study are integrated in order one, which satisfies the criteria of the cointegration test. The next step is then to test whether there is a long-term relationship among these variables under study. Although there are a variety of tests available here, such as Maddala and Wu (1999), Kao (1999) and Pedroni (1999), this analysis used Pedroni (1999) because of its popularity.

The null hypothesis under consideration is that there is no existence of cointegration and presents the number of cointegrating relationships. The results of the Pedroni cointegration tests are exhibited in Table 6.5 for twelve models.

Table 6.5: Results For Panel Cointegration Analysis (Emerging Market)

Panel A: Pedroni Cointegration Test Using AIC												
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**	**Model 10**	**Model 11**	**Model 12**
	LnSPI LnRGDP LnCPI	LnSPI LnIPI LnCPI	LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER	LnSPI LnIPI LnCPI LnFDI LnREMI LnREER	LnSPI LnRGDP LnCPI LnFDI LnREMI LnOPEN	LnSPI LnIPI LnCPI LnFDI LnREMI LnOPEN	LnSPI LnRGDP LnCPI LnFDI LnREER LnOPEN	LnSPI LnIPI LnCPI LnFDI LnREER LnOPEN	LnSPI LnRGDP LnCPI LnREMI LnREER LnOPEN	LnSPI LnIPI LnCPI LnREMI LnREER LnOPEN	LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER LnOPEN	LnSPI LnIPI LnCPI LnFDI LnREMI LnREER LnOPEN
Group PP	0.2215 (0.5877)	0.2820 (0.6110)	-1.0268 (0.1523)	-0.7631 (0.2227)	-0.6861 (0.2463)	-1.6748** (0.0470)	-0.3442 (0.3653)	-0.0446 (0.4822)	0.7384 (0.7699)	0.8225 (0.7946)	-0.1820 (0.4278)	-1.4207* (0.0777)
Group ADF	-1.9448** (0.0259)	-1.8763** (0.0303)	-1.8194** (0.0344)	-1.2916* (0.0982)	-1.1888 (0.1173)	-1.5690* (0.0583)	-1.7776** (0.0377)	-1.4787* (0.0696)	-1.0312 (0.1512)	-0.4196 (0.3374)	-1.4621* (0.0719)	-2.2115** (0.0135)
Panel B: Westerlund (2007) panel cointegration test												
Panel *v*-Statistic (G_τ)	-0.5207 (0.6987)	-0.4796 (0.6843)	-1.3758 (0.9156)	-1.7550 (0.9604)	-0.9406 (0.8265)	-1.6028 (0.9455)	-1.1110 (0.8667)	-2.8509 (0.9978)	-2.2070 (0.9863)	-2.4297 (0.9924)	-1.6339 (0.9489)	-2.6939 (0.9965)
Panel rho-Statistic (G_α)	-0.4810 (0.3153)	-0.1820 (0.4278)	1.4616 (0.9281)	1.2894 (0.9014)	1.4415 (0.9253)	1.1451 (0.8739)	0.9106 (0.8188)	1.8263 (0.9661)	1.5072 (0.9341)	1.4846 (0.9312)	2.0520 (0.9799)	1.2183 (0.8885)
Panel PP-Statistic (P_τ)	-0.9027 (0.1833)	-0.5824 (0.2801)	0.2065 (0.5818)	-0.3629 (0.3583)	0.3500 (0.6368)	-0.4040 (0.3431)	-0.8567 (0.1958)	0.4667 (0.6796)	0.3691 (0.6440)	0.1156 (0.5460)	0.3962 (0.6540)	-1.5108* (0.0654)
Panel ADF-Statistic (P_α)	-1.4947* (0.0675)	-1.6464** (0.0498)	-0.7155 (0.2372)	-1.0650 (0.1434)	-0.3880 (0.3490)	-0.9847 (0.1624)	-1.4097* (0.0793)	0.5063 (0.6937)	-1.1164 (0.1321)	-1.4145* (0.0786)	-0.6102 (0.2709)	-2.0568** (0.0199)

Source: The Table is constructed by the author using E-views 11

The results of the panel cointegration test, based on Group PP and Group ADF statistics, are shown in Table 6.5 (Panel A). It may be seen that the Group ADF statistics are significant, at least at a 1% level for most of the models, and most of them are insignificant for Group PP. This study also checked cointegration existing among the variables used in this study by implementing the four-panel cointegration tests (P_α, P_τ, G_α and G_τ) developed by Westerlund (2007). The results are shown in Panel B of Table 6.5. Similarly, the panel ADF statistics are insignificant for most of the models. Therefore, this study can conclude that the variables are not cointegrated at their level, and so, the null hypothesis of non-cointegration cannot be rejected. As the variables are not cointegrated, the results strongly support the non-existence of long run equilibrium relationships among the variables under study.

6.7 Vector Autoregressive (VAR) model

Since the variables do not have cointegrating relationship among variables under study, this study applied VAR models to check the short run dynamics, followed by the causality test. On the basis of unit root and cointegration test results cited above, the following VAR models were set up to study short run fluctuations and long run equilibrium.

Estimated VECM equations:

$$\Delta \mathrm{LnSPI_{it}} = \alpha_{31} + \sum_{k=1}^{p} \beta_{1ik} \Delta \mathrm{LnSPI_{(it-k)}} + \sum_{k=1}^{p} \gamma_{1ik} \Delta \mathrm{LnRGDP_{(it-k)}} + \sum_{k=1}^{p} \delta_{1ik} \Delta \mathrm{LnCPI_{(it-k)}} + \varphi_{1i} \mathrm{EX_{it}} + \xi_{1it} \cdots\cdots\cdots (\mathbf{6.1})$$

$$\Delta \mathrm{LnSPI_{it}} = \alpha_{32} + \sum_{k=1}^{p} \beta_{2ik} \Delta \mathrm{LnSPI_{(it-k)}} + \sum_{k=1}^{p} \gamma_{2ik} \Delta \mathrm{LnIPI_{(it-k)}} + \sum_{k=1}^{p} \delta_{2ik} \Delta \mathrm{LnCPI_{(it-k)}} + \varphi_{2i} \mathrm{EX_{it}} + \xi_{2it} \cdots\cdots\cdots (\mathbf{6.2})$$

$$\Delta LnSPI_{it} = \alpha_{33} + \sum_{k=1}^{p} \beta_{3ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{3ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{3ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{3ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{3ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{3ik}\Delta REER_{(it-k)} + \varphi_{3i}EX_{it} + \xi_{3it} \cdots\cdots \mathbf{(6.3)}$$

$$\Delta LnSPI_{it} = \alpha_{34} + \sum_{k=1}^{p} \beta_{4ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{4ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{4ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{4ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{4ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{4ik}\Delta REER_{(it-k)} + \varphi_{4i}EX_{it} + \xi_{4it} \cdots\cdots \mathbf{(6.4)}$$

$$\Delta LnSPI_{it} = \alpha_{35} + \sum_{k=1}^{p} \beta_{5ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{5ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{5ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{5ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{5ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \psi_{5ik}\Delta OPEN_{(it-k)} + \varphi_{5i}EX_{it} + \xi_{5it} \cdots\cdots \mathbf{(6.5)}$$

$$\Delta LnSPI_{it} = \alpha_{36} + \sum_{k=1}^{p} \beta_{6ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{6ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{6ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{6ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{6ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \psi_{6ik}\Delta OPEN_{(it-k)} + \varphi_{6i}EX_{it} + \xi_{6it} \cdots\cdots \mathbf{(6.6)}$$

$$\Delta LnSPI_{it} = \alpha_{37} + \sum_{k=1}^{p} \beta_{7ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{7ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{7ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{7ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \eta_{7ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{7ik}\Delta OPEN_{(it-k)} + \varphi_{7i}EX_{it} + \xi_{7it} \cdots\cdots \mathbf{(6.7)}$$

$$\Delta LnSPI_{it} = \alpha_{38} + \sum_{k=1}^{p} \beta_{8ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{8ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{8ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{8ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \eta_{8ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{8ik}\Delta OPEN_{(it-k)} + \varphi_{8i}EX_{it} + \xi_{8it} \cdots\cdots \mathbf{(6.8)}$$

$$\Delta LnSPI_{it} = \alpha_{39} + \sum_{k=1}^{p} \beta_{9ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{9ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{9ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \pi_{9ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{9ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{9ik}\Delta OPEN_{(it-k)} + \varphi_{9i}EX_{it} + \xi_{9it} \cdots\cdots\cdots \mathbf{(6.9)}$$

$$\Delta LnSPI_{it} = \alpha_{40} + \sum_{k=1}^{p} \beta_{10ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{10ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{10ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \pi_{10ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{10ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{10ik}\Delta OPEN_{(it-k)} + \varphi_{10i}EX_{it} + \xi_{10it} \cdots\cdots\cdots \mathbf{(6.10)}$$

$$\Delta LnSPI_{it} = \alpha_{41} + \sum_{k=1}^{p} \beta_{11ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{11ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{11ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{11ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{11ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{11ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{11ik}\Delta OPEN_{(it-k)} + \varphi_{11i}EX_{it} + \xi_{11it} \cdots\cdots\cdots \mathbf{(6.11)}$$

$$\Delta LnSPI_{it} = \alpha_{42} + \sum_{k=1}^{p} \beta_{12ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{12ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{12ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{12ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{12ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{12ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{12ik}\Delta OPEN_{(it-k)} + \varphi_{12i}EX_{it} + \xi_{12it} \cdots\cdots\cdots \mathbf{(6.12)}$$

Where,

- p = optimum lag length[21] is 2 in this study using SIC.
- $\beta_{ik}, \gamma_{ik}, \delta_{ik}, \theta_{ik}, \pi_{ik}, \eta_{I}, \psi_{ik}\varphi_{ik},$ =short run dynamic coefficients of the model's adjustment long run equilibrium.

[21] Selection of Optimal Lag Length (Emerging Markets) are presented in Table 6.1A of Appendix 6A.

- EX_{it} implies either IR, LnCR, LnGS and D_{GFC}. This study considers one exogenous variable at a time to avoid multicollinearity.

- ξ_{it}=residuals in the equations.

Importantly, this study also observed that there exists a known structural break in 2008 attributable to the global financial crisis (GFC). This study added the dummy variable D_{GFC} to capture the effect of GFC on the Share price index.

D_{GFC} = 0 from 1984 to 2008 and 1 after 2008[22].

[22] This study also used developed markets (DEV=1, 0 otherwise) dummy but the results were not significant. Results will be available upon request.

Panel VAR Short run Coefficients Results :

Table 6.6: Panel Error Correction Model (Model 1) of Emerging Markets.

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta LnSPI_{i(t-1)}$	0.2487*** (3.2688)	0.3854*** (4.6348)	0.2407*** (3.0951)	0.2373*** (3.0735)	0.2392*** (3.1300)
$\Delta LnSPI_{i(t-2)}$	-0.2391*** (-3.3746)	-0.2235*** (-3.0085)	-0.2410*** (-3.3186)	-0.2222*** (-3.0524)	-0.2388*** (-3.3739)
$\Delta LnRGDP_{i(t-1)}$	-1.3240* (-1.6830)	-0.9904 (-1.1880)	-1.2332 (-1.5332)	-1.3716* (-1.7156)	-1.4055* (-1.7815)
$\Delta LnRGDP_{i(t-2)}$	2.2627*** (2.9862)	2.0685*** (2.6517)	2.3184*** (2.9923)	2.1975*** (2.8513)	2.1805*** (2.8684)
ΔLnRGDP → ΔLnSPI	**4.8914*** **				
$\Delta LnCPI_{i(t-1)}$	0.1249 (0.4670)	2.4788*** (4.3246)	0.1177 (0.4309)	0.0752 (0.2761)	0.0661 (0.2434)
$\Delta LnCPI_{i(t-2)}$	0.0600 (0.5196)	-0.2981** (-2.2286)	0.0641 (0.5457)	0.0639 (0.5489)	0.0582 (0.5051)
ΔLnCPI → ΔLnSPI	**0.7606**				
Constant	-0.0404 (-1.0528)	0.0092 (0.2222)	0.0045 (0.0675)	-0.4264** (-2.0745)	-0.0085 (-0.1805)
IR		-0.0176*** (-4.4374)			
LnCR			-0.0520 (-0.8412)		
LnGS				0.1957* (1.9105)	
D_{GFC}					-0.0498 (-1.1880)
Sample size	238	214	229	229	238
R-squared	0.0823	0.2062	0.0832	0.0952	0.0879
Adj. R-squared	0.0585	0.1792	0.0542	0.0665	0.0602
Akaike AIC	0.4556	0.2933	0.4909	0.4777	0.4578
Schwarz SIC	0.5577	0.4192	0.6108	0.5977	0.5746
F-statistic	3.4548***	7.6431***	2.8650***	3.3220***	3.1681***

Note 1: ***, **and * represents significant at 1%, 5% and 10% level.
Note 2: Figures within brackets represent the t-statistics.
Note 3: ΔLnCPI → ΔLnSPI implies consumer price index growth Granger Cause share price index growth. If the F-Stat is significant (Calculated using Bi-variate Granger causality).

Table 6.6 reports estimated coefficients of panel VAR results using equation 6.1 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (6.1) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

The estimated coefficients for $\Delta LnSPI_{i(t-1)}$ are positive and significant, and $\Delta LnSPI_{i(t-2)}$ is negative and significant implying that in the short run, $\Delta LnSPI_{i(t-1)}$ does influence the $\Delta LnSPI_{it}$.

The estimated coefficients for $\Delta LnRGDP_{i(t-1)}$ is negative and significant at 10% level, and $\Delta LnRGDP_{i(t-2)}$ is positive and significant at the 1% level, which implies that in the short run, $\Delta LnRGDP_{i(t-2)}$ influence the $\Delta LnSPI_{it}$. It has been theoretically demonstrated that the productive capacity of an economy grows during economic growth, which successively contributes to the cash flow generation potential of the company. Jareno and Negrut (2016) carried out a time-evolution analysis of the US's Dow Jones (DJ) prices and GDP from 2008 to 2014. A positive relationship was observed between the DJ and GDP. Evidence from existing studies indicates that GDP positively impacts stock market performance (Fama, 1981; Mukherjee & Naka, 1995). This means that an increase in GDP leads to an increase in stock performance.

The estimated coefficients for $\Delta LnCPI_{i(t-1)}$ and $\Delta LnCPI_{i(t-2)}$ are positive and insignificant. Fama (1981) explains that higher inflation raises the production cost, which adversely affects the profitability and the level of real economic activity; since the real activity is positively associated with the stock return, an increase in inflation reduces the stock price. According to Malkiel (1982), the negative association between inflation rate and stock market price is due to the direct association of the inflation rate with the interest rate, which negatively influences equity prices and the negative effect of the inflation rate on the profit margins of companies in specific sectors which leads to decrease in stock prices. In the study by Gjerdea and Sættem (1999), the negative association between stock return and inflation measured as a change in CPI is insignificant.

The estimated coefficient of interest rate (IR) is negative and significant at a 1% level, implying that the stock price growth will be reduced when the interest rate will be higher, which is in line with the existing literature. In general, a lower the interest rate implies that the borrowers can borrow and invest money in the business and the stock market, which increases the Stock market movements and will affect the stock price (or the growth of SPI) positively and vice versa. With lower interest rates, consumers' disposable income increases and increases purchasing power, which positively influences the Stock market. Previous research, including those of Waud (1970) , Nelson (1976), Fama and Schwert (1977) and Fama (1981) indicate that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), and Ferrer et al. (2016), have also confirmed this trend of relationship. Arango et al. (2002) found some evidence of the non-linear and negative relationship between the stock market share prices for Bogota. Hsing (2004) adopts a structural VAR model allowing multiple endogenous variables such as output, real interest rate, exchange rate, and stock market index to find an inverse relationship between stock prices and interest rate. Similarly, Uddin and Alam (2009) also found a negative relationship.

The estimated coefficient for LnCR (that is, corruption risk rating) is negative but insignificant, which implies that the higher the risk of corruption[23] lower the share price index growth. Theoretically, corruption may assist the stock markets in the selected emerging countries. Early studies show that corruption has a positive impact on stock market development (Leff, 1964; Lui, 1985). Leff (1964) stated that corruption acts as the driving force for economic growth in

[23] Rating for corruption risk is from zero to six (0-6), the higher points indicating lower risk of corruption. Please see Table 4.2

situations where the government forces strict/ineffective regulations because bribery enables private agents to buy their way out of politically imposed inefficiencies. In addition, Chêne (2014) claims that in heavily controlled countries that do not have strong governance structures and governance processes, corruption can transcend red tape and systemic failures and "grease the wheels" of the economy. Nonetheless, corruption's influence is insignificant in these countries.

Similarly, the estimated coefficient for LnGS is positive and significant at the 10% level implies that the higher the government stability[24] index higher the share price index growth. Government stability is an assessment of the government's capacity to carry out its declared policies and its ability to continue in power. Three subcomponents, namely Government Unity, Legislative Power and Public Popularity, constitute the risk level applied to this variable. Each of these components will achieve a maximum four-point score and a minimum 0-point score.

Similarly, the estimated coefficient of the dummy variable (D_{GFC}) for the Global Finance Crisis (GFC) is negative and insignificant implying that the stock price index growth will be reduced when the D_{GFC} will be higher, which is in line with the existing literature. During the GFC, the affected countries had the experience of downfall in economic activities and production levels, which lead to decreased share price index growth.

Row 7 of Table 6.6 shows the bivariate Granger causality result, that is, the direction of causality. The F-stat is significant 1% level shows that economic growth Granger[25] causes SPI growth. Row 10 of Table 6.6 shows F statistics are insignificant and shows inflation does not Granger cause share price growth.

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[24] Government stability score of 4 points is a very low risk and a score of 0 points is a very high risk. Please see Table 4.2.

[25] In Table 6.18 this study found similar result in a multivariate framework.

Table 6.7: Panel Error Correction Model (Model 2) Of Emerging Markets

Variables	**Dependent variable:** Δ LnSPI_{it}				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta \text{LnSPI}_{i(t-1)}$	0.2278*** (3.1095)	0.3882*** (4.8520)	0.2316*** (3.1492)	0.2246*** (3.0856)	0.2197*** (2.9879)
$\Delta \text{LnSPI}_{i(t-2)}$	-0.1958*** (-2.8074)	-0.1659** (-2.2789)	-0.1935*** (-2.7677)	-0.1784** (-2.5559)	-0.1959*** (-2.8122)
$\Delta \text{LnIPI}_{i(t-1)}$	-0.7812* (-1.6818)	-0.7986* (-1.6822)	-0.7847* (-1.6873)	-0.8336* (-1.8039)	-0.8666* (-1.8457)
$\Delta \text{LnIPI}_{i(t-2)}$	0.9944** (2.1885)	0.8663* (1.8769)	0.9886** (2.1728)	0.9323** (2.0608)	0.9171** (2.0002)
ΔLnIPI → ΔLnSPI	**3.4845****				
$\Delta \text{LnCPI}_{i(t-1)}$	0.1705 (0.6255)	2.5552*** (4.4533)	0.1590 (0.5818)	0.1133 (0.4162)	0.1115 (0.4028)
$\Delta \text{LnCPI}_{i(t-2)}$	0.0308 (0.2630)	-0.3314** (-2.4708)	0.0360 (0.3065)	0.0379 (0.3257)	0.0294 (0.2508)
ΔLnCPI → ΔLnSPI	**0.7606**				
Constant	-0.0113 (-0.3438)	0.0443 (1.1439)	0.0293 (0.4403)	-0.4206** (-2.0337)	0.0213 (0.4994)
IR		-0.0171*** (-4.2603)			
LnCR			-0.0435 (-0.7015)		
LnGS				0.2061** (2.0042)	
D_{GFC}					-0.0536 (-1.1948)
Sample size	229	205	229	229	229
R-squared	0.0673	0.1935	0.0693	0.0839	0.0732
Adj. R-squared	0.0420	0.1649	0.0398	0.0549	0.0439
Akaike AIC	0.4994	0.3393	0.5059	0.4901	0.5017
Schwarz SIC	0.6044	0.4690	0.6259	0.6101	0.6216
F-statistic	2.6678***	6.7534***	2.3518***	2.8916***	2.4951***

Table 6.7 reports estimated coefficients of panel VAR results using equation 6.2 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (6.2) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

The estimated coefficients for $\Delta LnIPI_{i(t-1)}$ are negative and significant at the 10% level, and $\Delta LnIPI_{i(t-2)}$ is positive and significant at the 5% level implies that in the short run, $\Delta LnIPI_{i(t-2)}$ do influence the $\Delta LnSPI_{it}$. Industrial production growth will increase when the real output of manufacturing, mining, electricity and gas increases. Consequently, it creates more profit for those companies and thus creates demand for shares in the capital market for those companies. Hence it increases the share price through expected future cash flow (Fama, 1990). Kasman et al. (2005) and Burcu (2016) found IPI and stock returns share a positive correlation as an increase in the former leads to an increase in cash flows and profitability of the firms. Nasseh and Strauss (2000) argued that German industrial production not only had a positive effect on Germany's stock market but also on that of other European stock markets like the UK, Holland, France, Italy and Switzerland. Likewise, Jareño and Negrut 2016 reported a positive correlation between USDJ and IPI.

Table 6.7 demonstrates similar results of estimated coefficients of panel VAR for $\Delta LnCPI_{i(t-1)}$ and $\Delta LnCPI_{i(t-2)}$, which were presented in the preceding Table 6.6 of this chapter.

Row 6 of Table 6.7 shows the bivariate Granger causality result, and the direction of causality. The F-stat is significant 5% level shows that IPI growth Granger[26] causes SPI growth.

[26] In Table 6.19 this study found similar result in a multivariate framework.

Table 6.8: Panel Error Correction Model (Model 3) Of Emerging Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta LnSPI_{i(t-1)}$	0.2602*** (3.1105)	0.3794*** (4.2250)	0.2571*** (3.0072)	0.2495*** (2.9409)	0.2566*** (3.0526)
$\Delta LnSPI_{i(t-2)}$	-0.2773*** (-3.4974)	-0.2248*** (-2.7464)	-0.2755*** (-3.3931)	-0.2623*** (-3.2437)	-0.2786*** (-3.5061)
$\Delta LnRGDP_{i(t-1)}$	-0.5413 (-0.6716)	0.4826 (0.5840)	-0.4367 (-0.5271)	-0.5295 (-0.6430)	-0.5711 (-0.7056)
$\Delta LnRGDP_{i(t-2)}$	1.4788** (1.9486)	0.8219 (1.0863)	1.5259** (1.9532)	1.4061** (1.8158)	1.4520** (1.9059)
ΔLnRGDP → ΔLnSPI	**4.8914*** **				
$\Delta LnCPI_{i(t-1)}$	0.1655 (0.6376)	2.8850*** (5.2374)	0.1511 (0.5683)	0.1183 (0.4480)	0.1418 (0.5377)
$\Delta LnCPI_{i(t-2)}$	0.0810 (0.7009)	-0.3227** (-2.4534)	0.0904 (0.7641)	0.0800 (0.6852)	0.0772 (0.6662)
ΔLnCPI → ΔLnSPI	**0.7606**				
$\Delta lnFDI_{i(t-1)}$	0.3014*** (3.7148)	0.3367*** (4.2311)	0.2965*** (3.5416)	0.2839*** (3.4194)	0.2916*** (3.4990)
$\Delta lnFDI_{i(t-2)}$	-0.2006** (-2.3295)	-0.2564*** (-2.9772)	-0.1979** (-2.2238)	-0.2176** (-2.4727)	-0.2044** (-2.3615)
ΔLnFDI → ΔLnSPI	**9.0442*** **				
$\Delta LnREMI_{i(t-1)}$	0.0801 (0.9218)	0.1004 (1.2117)	0.0756 (0.8481)	0.0847 (0.9621)	0.0785 (0.9015)
$\Delta LnREMI_{i(t-2)}$	0.0115 (0.1349)	-0.0928 (-1.1829)	0.0064 (0.0728)	0.0107 (0.1236)	0.0109 (0.1274)
ΔLnREMI → ΔLnSPI	**1.1333**				
$\Delta LnREER_{i(t-1)}$	-0.4735* (-1.7874)	-0.5736** (-2.3169)	-0.5044* (-1.8406)	-0.4488 (-1.6434)	-0.4598* (-1.7244)
$\Delta LnREER_{i(t-2)}$	0.4622* (1.8332)	0.5223** (2.1967)	0.4265 (1.6231)	0.4806** (1.8591)	0.4737** (1.8690)
ΔLnREER → ΔLnSPI	**3.7941** **				
Constant	-0.0602 (-1.6040)	-0.0083 (-0.2135)	-0.0282 (-0.4299)	-0.4372** (-2.2020)	-0.0449 (-0.9489)
IR		-0.0200*** (-5.3987)			
LnCR			-0.0384 (-0.6315)		
LnGS				0.1917* (1.9305)	
D_{GFC}					-0.0221 (-0.5303)
Sample size	238	214	229	229	238
R-squared	0.1797	0.3432	0.1775	0.1900	0.1808
Adj. R-squared	0.1360	0.3005	0.1278	0.1410	0.1332
Akaike AIC	0.3938	0.1599	0.4348	0.4194	0.4010
Schwarz SIC	0.5835	0.3801	0.6447	0.6294	0.6052
F-statistic	4.1081***	8.0394***	3.5688***	3.8794***	3.8016***

Table 6.8 reports estimated coefficients of panel VAR results using equation 6.3 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (6.3) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5) respectively.

The estimated coefficients for $\Delta LnRGDP_{i(t-1)}$ are negative and insignificant, and $\Delta LnRGDP_{i(t-2)}$ is positive and significant at a 5% level implies that in the short run, $\Delta LnRGDP_{i(t-2)}$ does influence the $\Delta LnSPI_{it}$.

The estimated coefficients for $\Delta LnFDI_{i(t-1)}$ is positive and significant, and $\Delta LnFDI_{i(t-2)}$ is negative and significant at 1% level implies that in the short run, $\Delta LnFDI_{i(t-1)}$ do influence the $\Delta LnSPI_{it}$. FDI will make a substantial contribution to the economic growth and prosperity of the recipient country by reducing and amortising the shock generated by low domestic savings and investment. Several reports investigate the relationship between FDI, foreign portfolio investment (FPI), and financial markets in various countries. It is expected that an improvement in FDI would positively affect the liquidity and capitalisation of the stock exchange (Adam & Tweneboah, 2008). Clark and Berko (1996) find supporting evidence for the positive relationship between foreign direct investment and stock market return in Mexico as one of the earliest explorations. The positive relationship of FDI to Ghana stock returns was stated by Adam and Tweneboah (2009). Gümüs (2010) also concludes that the relationship between BIST 100 bond return and foreign direct investment exhibit is positive in Turkey.

The estimated coefficients for $\Delta LnREMI_{i(t-1)}$ and $\Delta LnREMI_{i(t-2)}$ is positive and insignificant. There is a growing agreement on a variety of consequences that generated by the increase of remittance such as consumption, increasing schooling and health care promoting investment in home and land property, etc., and thus increasing economic growth as well as share price index through economic activity within the country (Billmeier & Massa, 2009; Jansen et al., 2012). Gupta et al. (2009) indicate that remittances positively impact poverty mitigation by increasing income and higher living conditions in remittance-receiving households. Billmeier and Massa (2009) also found remittances have a positive and significant impact on market capitalization.

The estimated coefficients for $\Delta LnREER_{i(t-1)}$ are negative and significant, and $\Delta LnREER_{i(t-2)}$ is positive and significant at a 5% level implies that in the short run, $\Delta LnREER_{i(t-1)}$ does influence the $\Delta LnSPI_{it}$. The good market approach suggests that real exchange rates can affect the share price (Aggarwal, 1981). Depreciation of the real exchange rate would improve the attractiveness of firms' goods in terms of cheaper rates and increase their revenues from other countries if the elasticities of changes in exports are greater than the changes in the exchange rate (Dornbusch & Fischer, 1980). This higher export contributes to further income for the domestic firms and thus boosts the firm's values and share price. Therefore, real exchange rate depreciation will lift the real share price, whilst appreciation of the real exchange rate will decrease the real share price (Dornbusch & Fischer, 1980; Pan et al., 2007; Ülkü & Demirci, 2012). Using monthly data on U.S. stock markets from 1974 to1978, Aggarwal (1981) found that stock prices and real exchange rates are positive. According to Solnik (1987), there is only a weak positive relationship between stock returns and real exchange rates.

Row 12 of Table 6.8 shows the bivariate Granger causality result, that is, the direction of causality. The F-stat is significant 5% level shows that FDI growth Granger[27] causes share price growth. Similarly, Row 15 of Table 6.8 shows the bivariate Granger causality result, that is, the direction of causality. The F-stat is insignificant shows that REMI growth does not Granger cause share price growth. Similarly, row 18 of Table 6.8 shows that the F-stat is significant implies that REER growth Granger causes share price growth.

[27] In Table 6.20 this study found similar result in a multivariate framework.

Table 6.8 demonstrates similar results of estimated coefficients for $\Delta LnSPI_{i(t-1)}$, $\Delta LnSPI_{i(t-2)}$, $\Delta LnCPI_{i(t-1)}$, $\Delta LnCPI_{i(t-2)}$, IR, LnCR, LnGS and D_{GFC} of panel VAR, which were presented in preceding Tables of this chapter.

Table 6.9: Panel Error Correction Model (Model 4) Of Emerging Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta LnSPI_{i(t-1)}$	0.2652*** (3.1218)	0.4163*** (4.5318)	0.2677*** (3.1403)	0.2569*** (3.0413)	0.2614*** (3.0599)
$\Delta LnSPI_{i(t-2)}$	-0.2584*** (-3.2071)	-0.2058*** (-2.4430)	-0.2544*** (-3.1357)	-0.2426*** (-3.0165)	-0.2595*** (-3.2134)
$\Delta LnIPI_{i(t-1)}$	-0.3827 (-0.8106)	-0.1927 (-0.4112)	-0.3983 (-0.8403)	-0.4081 (-0.8700)	-0.4134 (-0.8668)
$\Delta LnIPI_{i(t-2)}$	0.6514 (1.4635)	0.4551 (1.0352)	0.6534 (1.4652)	0.5901 (1.3314)	0.6240 (1.3891)
ΔLnIPI → ΔLnSPI	**3.4845****				
$\Delta LnCPI_{i(t-1)}$	0.1797 (0.6795)	2.7670*** (5.0040)	0.1696 (0.6382)	0.1336 (0.5067)	0.1579 (0.5883)
$\Delta LnCPI_{i(t-2)}$	0.0707 (0.6015)	-0.3106** (-2.3391)	0.0769 (0.6492)	0.0689 (0.5901)	0.0669 (0.5672)
ΔLnCPI → ΔLnSPI	**0.7606**				
$\Delta lnFDI_{i(t-1)}$	0.3005*** (3.5983)	0.3311*** (4.0076)	0.3040*** (3.6203)	0.2904*** (3.4946)	0.2922*** (3.4255)
$\Delta lnFDI_{i(t-2)}$	-0.1850** (-2.0611)	-0.2277** (-2.5266)	-0.1784** (-1.9620)	-0.2003** (-2.2390)	-0.1877** (-2.0843)
ΔLnFDI → ΔLnSPI	**9.0442*****				
$\Delta LnREMI_{i(t-1)}$	0.0850 (0.9528)	0.1094 (1.2817)	0.0815 (0.9089)	0.0895 (1.0100)	0.0833 (0.9317)
$\Delta LnREMI_{i(t-2)}$	0.0146* (0.1680)	-0.0952 (-1.1817)	0.0110 (0.1254)	0.0144 (0.1667)	0.0145 (0.1668)
ΔLnREMI → ΔLnSPI	**1.1333**				
$\Delta LnREER_{i(t-1)}$	-0.5536** (-2.0706)	-0.5824** (-2.2986)	-0.5579** (-2.0820)	-0.5042* (-1.8906)	-0.5368** (-1.9890)
$\Delta LnREER_{i(t-2)}$	0.5008* (1.9414)	0.5405** (2.2180)	0.4832* (1.8516)	0.5287** (2.0604)	0.5112** (1.9718)
ΔLnREER → ΔLnSPI	**3.7941****				
Constant	-0.0358 (-1.0783)	0.0263 (0.7073)	-0.0086 (-0.1331)	-0.4273** (-2.1443)	-0.0212 (-0.4803)
IR		-0.0189*** (-5.0230)			
LnCR			-0.0297 (-0.4874)		
LnGS				0.1980** (1.9921)	
D_{GFC}					-0.0222 (-0.5005)
Sample size	229	205	229	229	229
R-squared	0.1694	0.3305	0.1703	0.1844	0.1703
Adj. R-squared	0.1232	0.2849	0.1201	0.1351	0.1202
Akaike AIC	0.4359	0.2118	0.4435	0.4263	0.4434
Schwarz SIC	0.6308	0.4387	0.6534	0.6362	0.6534
F-statistic	3.6701***	7.2516***	3.3941***	3.7396***	3.3953***

Table 6.9 reports estimated coefficients of panel VAR results using equation 6.4 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (6.4) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5) respectively.

Except for $\Delta LnIPI_{i(t-1)}$ and $\Delta LnIPI_{i(t-2)}$, Table 6.9 demonstrates similar results of estimated coefficients of panel VECM, which were presented in the preceding Tables of this chapter.

The estimated coefficients for $\Delta LnIPI_{i(t-1)}$ are negative and insignificant, and $\Delta LnIPI_{i(t-2)}$ is positive and insignificant.

Table 6.10: Panel Error Correction Model (Model 5) Of Emerging Markets

Variables	**Dependent variable:** Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta LnSPI_{i(t-1)}$	0.1943** (2.5090)	0.2789*** (3.2921)	0.1886** (2.3833)	0.1858** (2.3665)	0.1908** (2.4541)
$\Delta LnSPI_{i(t-2)}$	-0.2104*** (-2.8556)	-0.1183 (-1.5259)	-0.2132** (-2.8240)	-0.1926** (-2.5439)	-0.2096** (-2.8403)
$\Delta LnRGDP_{i(t-1)}$	-0.9587 (-1.1985)	-0.0680 (-0.0807)	-0.8658 (-1.0537)	-0.9570 (-1.1723)	-0.9987 (-1.2426)
$\Delta LnRGDP_{i(t-2)}$	1.9401*** (2.6043)	1.2917* (1.6982)	1.9983*** (2.6136)	1.8761** (2.4714)	1.9097** (2.5542)
ΔLnRGDP → ΔLnSPI	**4.8914*** **				
$\Delta LnCPI_{i(t-1)}$	0.1533 (0.5827)	2.8172*** (5.0354)	0.1452 (0.5387)	0.1081 (0.4030)	0.1276 (0.4782)
$\Delta LnCPI_{i(t-2)}$	0.0763 (0.6568)	-0.3340** (-2.5116)	0.0826 (0.6958)	0.0764 (0.6511)	0.0714 (0.6126)
ΔLnCPI → ΔLnSPI	**0.7606**				
$\Delta lnFDI_{i(t-1)}$	0.3027*** (3.6733)	0.3376*** (4.1171)	0.3007*** (3.5376)	0.2876*** (3.4107)	0.2912*** (3.4415)
$\Delta lnFDI_{i(t-2)}$	-0.2012** (-2.2203)	-0.2391*** (-2.6254)	-0.1961** (-2.0914)	-0.2138** (-2.3074)	-0.2038** (-2.2435)
ΔLnFDI → ΔLnSPI	**9.0442*** **				
$\Delta LnREMI_{i(t-1)}$	0.0719 (0.8214)	0.0937 (1.1082)	0.0669 (0.7471)	0.0749 (0.8443)	0.0703 (0.8010)
$\Delta LnREMI_{i(t-2)}$	-0.0038 (-0.0439)	-0.1126 (-1.3782)	-0.0102 (-0.1153)	-0.0058 (-0.0658)	-0.0049 (-0.0567)
ΔLnREMI → ΔLnSPI	**1.1333**				
$\Delta LnOPEN_{i(t-1)}$	0.0972 (0.4364)	-0.0114 (-0.0508)	0.0959 (0.4179)	0.0699 (0.3064)	0.0773 (0.3429)
$\Delta LnOPEN_{i(t-2)}$	-0.1527 (-0.7733)	-0.0876 (-0.4589)	-0.1321 (-0.6485)	-0.1557 (-0.7727)	-0.1726 (-0.8610)
ΔLnOPEN → ΔLnSPI	**0.3214**				
Constant	-0.0586 (-1.5387)	-0.0036 (-0.0894)	-0.0223 (-0.3373)	-0.4453** (-2.2251)	-0.0404 (-0.8317)
IR		-0.0196*** (-5.1663)			
LnCR			-0.0450 (-0.7365)		
LnGS				0.1958* (1.9572)	
$\mathbf{D_{GFC}}$					-0.0261 (-0.6089)
Sample Size	238	214	229	229	238
R-squared	0.1598	0.3105	0.1575	0.1702	0.1612
Adj. R-squared	0.1150	0.2657	0.1066	0.1200	0.1125
Akaike AIC	0.4178	0.2085	0.4587	0.4436	0.4245
Schwarz SIC	0.6074	0.4287	0.6686	0.6535	0.6288
F-statistic	3.5667***	6.9282***	3.0926***	3.3921***	3.3116***

Table 6.10 reports estimated coefficients of panel VAR results using equation 6.5 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (6.5) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

Except for $\Delta LnOPEN_{i(t-1)}$ and $\Delta LnOPEN_{i(t-2)}$, Table 6.10 demonstrates similar results of estimated coefficients of panel VAR from the preceding Tables presented in this chapter.

The estimated coefficients for $\Delta LnOPEN_{i(t-1)}$ are positive and insignificant, and $\Delta LnOPEN_{i(t-2)}$ is negative and insignificant. According to Basu and Morey's (2005) studies, a more open economy is predicted to enjoy real-economy growth due to more efficient resource utilisation. According to Fama (1990) and Ferson and Harvey (1997), growth in the real economy boosts future cash flow and profits, which leads to an increase in stock values. As a result, there is a positive link between trade openness and stock prices. Jaleel and Samarakoon (2009) discovered a link between stock market volatility and liberalisation in Sri Lanka. Kim, Lin, and Suen (2010) discovered that trade openness is an important factor in influencing financial development in a wide sample of both developed and emerging markets.

Row 18 of Table 6.10 shows the bivariate Granger causality result, that is, the direction of causality. The F-stat is significant 5% level shows that OPEN growth Granger[28] cause share price growth.

[28] In Table 6.22 this study found similar result in a multivariate framework.

Table 6.11: Panel Error Correction Model (Model 6) Of Emerging Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta LnSPI_{i(t-1)}$	0.1774** (2.3166)	0.2853*** (3.4208)	0.1799** (2.3419)	0.1745** (2.2944)	0.1737** (2.2595)
$\Delta LnSPI_{i(t-2)}$	-0.1809** (-2.4488)	-0.0771 (-0.9928)	-0.1783** (-2.4055)	-0.1607** (-2.1720)	-0.1806** (-2.4427)
$\Delta LnIPI_{i(t-1)}$	-0.5650 (-1.1826)	-0.2841 (-0.5905)	-0.5790 (-1.2085)	-0.5896 (-1.2425)	-0.6090 (-1.2616)
$\Delta LnIPI_{i(t-2)}$	0.8387* (1.8436)	0.5064 (1.1163)	0.8349* (1.8322)	0.7766* (1.7152)	0.8071* (1.7628)
ΔLnIPI → ΔLnSPI	**3.4845****				
$\Delta LnCPI_{i(t-1)}$	0.1893 (0.7022)	2.8096*** (4.9597)	0.1794 (0.6631)	0.1378 (0.5126)	0.1615 (0.5918)
$\Delta LnCPI_{i(t-2)}$	0.0569 (0.4804)	-0.3462** (-2.5649)	0.0625 (0.5249)	0.0590 (0.5017)	0.0514 (0.4322)
ΔLnCPI → ΔLnSPI	**0.7606**				
$\Delta lnFDI_{i(t-1)}$	0.3062*** (3.5977)	0.3413*** (4.0145)	0.3100*** (3.6260)	0.2958*** (3.4938)	0.2947*** (3.3917)
$\Delta lnFDI_{i(t-2)}$	-0.1887** (-2.0205)	-0.2183** (-2.3181)	-0.1810* (-1.9157)	-0.2013** (-2.1658)	-0.1906** (-2.0373)
ΔLnFDI → ΔLnSPI	**9.0442*****				
$\Delta LnREMI_{i(t-1)}$	0.0781 (0.8662)	0.1039 (1.1918)	0.0747 (0.8252)	0.0813 (0.9079)	0.0757 (0.8381)
$\Delta LnREMI_{i(t-2)}$	0.0010 (0.0114)	-0.1121 (-1.3355)	-0.0034 (-0.0379)	0.0002 (0.0024)	0.0006 (0.0067)
ΔLnREMI → ΔLnSPI	**1.1333**				
$\Delta LnOPEN_{i(t-1)}$	0.1311 (0.5735)	-0.0343 (-0.1494)	0.1294 (0.5651)	0.1073 (0.4722)	0.1069 (0.4614)
$\Delta LnOPEN_{i(t-2)}$	-0.1968 (-0.9545)	-0.1230 (-0.6181)	-0.1864 (-0.8992)	-0.2032 (-0.9923)	-0.2214 (-1.0562)
ΔLnOPEN → ΔLnSPI	**0.3214**				
Constant	-0.0345 (-1.0225)	0.0283 (0.7484)	-0.0018 (-0.0278)	-0.4361** (-2.1655)	-0.0142 (-0.3151)
IR		-0.0189*** (-4.8965)			
LnCR			-0.0357 (-0.5813)		
LnGS				0.2032** (2.0225)	
D_{GFC}					-0.0310 (-0.6787)
Sample size	229	205	229	229	229
R-squared	0.1436	0.2951	0.1450	0.1596	0.1455
Adj. R-squared	0.0961	0.2472	0.0933	0.1088	0.0938
Akaike AIC	0.4663	0.2632	0.4735	0.4562	0.4729
Schwarz SIC	0.6613	0.4901	0.6834	0.6662	0.6829
F-statistic	3.0194***	6.1520***	2.8046***	3.1417***	2.8156***

Table 6.12: Panel Error Correction Model (Model 7) Of Emerging Markets

Variables	Dependent variable: Δ $\mathrm{LnSPI_{it}}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta \mathrm{LnSPI_{i(t-1)}}$	0.2853*** (3.4107)	0.4299*** (4.6873)	0.2823*** (3.3061)	0.2760*** (3.2549)	0.2812*** (3.3477)
$\Delta \mathrm{LnSPI_{i(t-2)}}$	-0.2657*** (-3.2709)	-0.2394*** (-2.7836)	-0.2644*** (-3.1911)	-0.2512*** (-3.0415)	-0.2650*** (-3.2579)
$\Delta \mathrm{LnRGDP_{i(t-1)}}$	-0.5594 (-0.6924)	0.5570 (0.6719)	-0.4523 (-0.5450)	-0.5511 (-0.6681)	-0.5992 (-0.7383)
$\Delta \mathrm{LnRGDP_{i(t-2)}}$	1.4904* (1.9599)	0.6589 (0.8777)	1.5367** (1.9687)	1.4241* (1.8368)	1.4594* (1.9121)
ΔLnRGDP → ΔLnSPI	**4.8914***				
$\Delta \mathrm{LnCPI_{i(t-1)}}$	0.1823 (0.6981)	3.0202*** (5.4607)	0.1689 (0.6318)	0.1379 (0.5186)	0.1568 (0.5921)
$\Delta \mathrm{LnCPI_{i(t-2)}}$	0.0727 (0.6254)	-0.3783*** (-2.8411)	0.0818 (0.6878)	0.0710 (0.6038)	0.0677 (0.5796)
ΔLnCPI → ΔLnSPI	**0.7606**				
$\Delta \mathrm{lnFDI_{i(t-1)}}$	0.2993*** (3.7000)	0.3122*** (3.9225)	0.2941*** (3.5254)	0.2817*** (3.3999)	0.2878*** (3.4598)
$\Delta \mathrm{lnFDI_{i(t-2)}}$	-0.1695* (-1.8747)	-0.1974** (-2.2172)	-0.1644* (-1.7621)	-0.1840** (-1.9922)	-0.1724* (-1.9020)
ΔLnFDI → ΔLnSPI	**9.0442***				
$\Delta \mathrm{LnREER_{i(t-1)}}$	-0.6369* (-1.9242)	-0.9346*** (-2.9723)	-0.6772** (-1.9924)	-0.6189* (-1.8309)	-0.6342* (-1.9131)
$\Delta \mathrm{LnREER_{i(t-2)}}$	0.5134 (1.5917)	0.8007*** (2.5089)	0.4757 (1.4268)	0.5378 (1.6299)	0.5126 (1.5868)
ΔLnREER → ΔLnSPI	**3.7941**				
$\Delta \mathrm{LnOPEN_{i(t-1)}}$	-0.2133 (-0.7813)	-0.4566* (-1.6637)	-0.2261 (-0.8098)	-0.2237 (-0.8073)	-0.2315 (-0.8418)
$\Delta \mathrm{LnOPEN_{i(t-2)}}$	0.0827 (0.3295)	0.2849 (1.1359)	0.0823 (0.3196)	0.0939 (0.3674)	0.0623 (0.2455)
ΔLnOPEN → ΔLnSPI	**0.3214**				
Constant	-0.0579 (-1.5378)	-0.0085 (-0.2168)	-0.0203 (-0.3115)	-0.4336** (-2.1830)	-0.0398 (-0.8305)
IR		-0.0203*** (-5.5361)			
LnCR			-0.0454 (-0.7536)		
LnGS				0.1908* (1.9208)	
D_{GFC}					-0.0259 (-0.6117)
Sample size	238	214	229	229	238
R-squared	0.1791	0.3493	0.1776	0.1894	0.1805
Adj. R-squared	0.1353	0.3070	0.1279	0.1404	0.1329
Akaike AIC	0.3946	0.1507	0.4346	0.4202	0.4013
Schwarz SIC	0.5842	0.3709	0.6445	0.6301	0.6055
F-statistic	4.0909***	8.2568***	3.5725***	3.8637***	3.7945***

Table 6.13: Panel Error Correction Model (Model 8) Of Emerging Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta LnSPI_{i(t-1)}$	0.2887*** (3.4241)	0.4625*** (4.9858)	0.2915*** (3.4474)	0.2813*** (3.3560)	0.2840*** (3.3506)
$\Delta LnSPI_{i(t-2)}$	-0.2441*** (-2.9954)	-0.2148** (-2.4792)	-0.2399*** (-2.9297)	-0.2292** (-2.8196)	-0.2434*** (-2.9821)
$\Delta LnIPI_{i(t-1)}$	-0.3462 (-0.7215)	-0.0639 (-0.1358)	-0.3629 (-0.7541)	-0.3685 (-0.7729)	-0.3864 (-0.7965)
$\Delta LnIPI_{i(t-2)}$	0.6737 (1.4841)	0.3556 (0.8058)	0.6700 (1.4735)	0.6103 (1.3499)	0.6466 (1.4154)
ΔLnIPI → ΔLnSPI	**3.4845****				
$\Delta LnCPI_{i(t-1)}$	0.2040 (0.7659)	2.9323*** (5.2688)	0.1921 (0.7181)	0.1579 (0.5943)	0.1797 (0.6661)
$\Delta LnCPI_{i(t-2)}$	0.0617 (0.5214)	-0.3716*** (-2.7566)	0.0683 (0.5740)	0.0599 (0.5089)	0.0567 (0.4771)
ΔLnCPI → ΔLnSPI	**0.7606**				
$\Delta lnFDI_{i(t-1)}$	0.2986*** (3.5791)	0.3059*** (3.7046)	0.3020*** (3.6071)	0.2884*** (3.4738)	0.2885*** (3.3859)
$\Delta lnFDI_{i(t-2)}$	-0.1534* (-1.6488)	-0.1677* (-1.8230)	-0.1453 (-1.5453)	-0.1682* (-1.8148)	-0.1555* (-1.6683)
ΔLnFDI → ΔLnSPI	**9.0442*****				
$\Delta LnREER_{i(t-1)}$	-0.7408** (-2.2138)	-0.9818*** (-3.0481)	-0.7502** (-2.2362)	-0.6909** (-2.0722)	-0.7327** (-2.1846)
$\Delta LnREER_{i(t-2)}$	0.5267 (1.5791)	0.7905** (2.4042)	0.5074 (1.5122)	0.5652* (1.7027)	0.5219 (1.5620)
ΔLnREER → ΔLnSPI	**3.7941****				
$\Delta LnOPEN_{i(t-1)}$	-0.2442 (-0.8721)	-0.5215* (-1.8579)	-0.2492 (-0.8885)	-0.2418 (-0.8695)	-0.2612 (-0.9269)
$\Delta LnOPEN_{i(t-2)}$	0.0515 (0.1950)	0.2511 (0.9581)	0.0509 (0.1926)	0.0670 (0.2552)	0.0277 (0.1035)
ΔLnOPEN → ΔLnSPI	**0.32142**				
Constant	-0.0357 (-1.0741)	0.0229 (0.6203)	-0.0018 (-0.0276)	-0.4229** (-2.1209)	-0.0180 (-0.4052)
IR		-0.0194*** (-5.1977)			
LnCR			-0.0371 (-0.6142)		
LnGS				0.1959** (1.9692)	
D_{GFC}					-0.0271 (-0.6003)
Sample size	229	205	229	229	229
R-squared	0.1687	0.3373	0.1701	0.1834	0.1701
Adj. R-squared	0.1225	0.2922	0.1199	0.1340	0.1199
Akaike AIC	0.4367	0.2015	0.4437	0.4276	0.4438
Schwarz SIC	0.6316	0.4285	0.6536	0.6375	0.6537
F-statistic	3.6519***	7.4769***	3.3903***	3.7142***	3.3887***

Table 6.11 to Table 6.13 demonstrates similar results of estimated coefficients of panel VAR to the preceding Tables presented in this chapter.

Table 6.14: Panel Error Correction Model (Model 9) Of Emerging Markets

Variables	Dependent variable: Δ $\mathrm{LnSPI_{it}}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta \mathrm{LnSPI_{i(t-1)}}$	0.3241*** (3.7397)	0.5546*** (6.0819)	0.3212*** (3.6337)	0.3113*** (3.5505)	0.3123*** (3.5875)
$\Delta \mathrm{LnSPI_{i(t-2)}}$	-0.2985*** (-3.4867)	-0.2878*** (-3.2085)	-0.2938*** (-3.3637)	-0.2804*** (-3.2252)	-0.2946*** (-3.4442)
$\Delta \mathrm{LnRGDP_{i(t-1)}}$	-0.7493 (-0.9226)	-0.3365 (-0.4075)	-0.6426 (-0.7731)	-0.7889 (-0.9547)	-0.8589 (-1.0527)
$\Delta \mathrm{LnRGDP_{i(t-2)}}$	1.5260* (1.9134)	1.2176 (1.5663)	1.5661* (1.9118)	1.4374* (1.7691)	1.4600* (1.8289)
$\boldsymbol{\Delta \mathrm{LnRGDP} \rightarrow \Delta \mathrm{LnSPI}}$	**4.8914***				
$\Delta \mathrm{LnCPI_{i(t-1)}}$	0.1898 (0.7010)	2.9556*** (5.1286)	0.1730 (0.6249)	0.1404 (0.5105)	0.1376 (0.5029)
$\Delta \mathrm{LnCPI_{i(t-2)}}$	0.0318 (0.2636)	-0.3921*** (-2.8382)	0.0421 (0.3423)	0.0330 (0.2717)	0.0250 (0.2072)
$\boldsymbol{\Delta \mathrm{LnCPI} \rightarrow \Delta \mathrm{LnSPI}}$	**0.7606**				
$\Delta \mathrm{LnREMI_{i(t-1)}}$	0.0850 (0.9444)	0.1194 (1.3960)	0.0818 (0.8892)	0.0898 (0.9866)	0.0805 (0.8947)
$\Delta \mathrm{LnREMI_{i(t-2)}}$	0.0227 (0.2577)	-0.1340 (-1.6231)	0.0140 (0.1559)	0.0153 (0.1718)	0.0172 (0.1955)
$\boldsymbol{\Delta \mathrm{LnREMI} \rightarrow \Delta \mathrm{LnSPI}}$	**1.1333**				
$\Delta \mathrm{LnREER_{i(t-1)}}$	-0.7669** (-2.2695)	-1.1822*** (-3.6689)	-0.8169** (-2.3579)	-0.7688** (-2.2322)	-0.7632** (-2.2611)
$\Delta \mathrm{LnREER_{i(t-2)}}$	0.5929* (1.7641)	0.9118*** (2.7309)	0.5594 (1.6105)	0.6200* (1.8063)	0.5842* (1.7400)
$\boldsymbol{\Delta \mathrm{LnREER} \rightarrow \Delta \mathrm{LnSPI}}$	**3.7941****				
$\Delta \mathrm{LnOPEN_{i(t-1)}}$	-0.4804* (-1.7859)	-0.9033*** (-3.2924)	-0.4829* (-1.7607)	-0.4971* (-1.8257)	-0.5170* (-1.9129)
$\Delta \mathrm{LnOPEN_{i(t-2)}}$	0.1637 (0.6302)	0.4002 (1.5312)	0.1750 (0.6588)	0.1849 (0.7012)	0.1167 (0.4454)
$\boldsymbol{\Delta \mathrm{LnOPEN} \rightarrow \Delta \mathrm{LnSPI}}$	**0.3214**				
Constant	-0.0389 (-1.0145)	0.0125 (0.3088)	-0.0032 (-0.0479)	-0.4262** (-2.0768)	-0.0036 (-0.0763)
IR		-0.0189*** (-4.9418)			
LnCR			-0.0403 (-0.6464)		
LnGS				0.1971* (1.9247)	
$\mathbf{D_{GFC}}$					-0.0532 (-1.2478)
Sample size	238	214	229	229	238
R-squared	0.1175	0.2922	0.1187	0.1320	0.1236
Adj. R-squared	0.0705	0.2462	0.0655	0.0795	0.0728
Akaike AIC	0.4669	0.2347	0.5037	0.4886	0.4684
Schwarz SIC	0.6565	0.4549	0.7137	0.6985	0.6726
F-statistic	2.4973***	6.3522***	2.2285***	2.5148***	2.4306***

Table 6.14 presents estimated coefficients of panel VAR results using equation 6.9 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (6.9) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5) respectively.

Except for $\Delta LnOPEN_{i(t-1)}$ and $\Delta LnOPEN_{i(t-2)}$, Table 6.14 demonstrates similar results of estimated coefficients of panel VAR to the preceding Tables presented in this chapter.

The estimated coefficients for $\Delta LnOPEN_{i(t-1)}$ are negative and significant at a 10% level, and $\Delta LnOPEN_{i(t-2)}$ is positive and insignificant implying that in the short run, $\Delta LnOPEN_{i(t-1)}$ influence the $\Delta LnSPI_{it}$.

Table 6.15: Panel Error Correction Model (Model 10) Of Emerging Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta LnSPI_{i(t-1)}$	0.3273*** (3.7608)	0.5752*** (6.2859)	0.3308*** (3.7824)	0.3168*** (3.6586)	0.3156*** (3.6037)
$\Delta LnSPI_{i(t-2)}$	-0.2762*** (-3.2211)	-0.2595*** (-2.8949)	-0.2717*** (-3.1456)	-0.2609*** (-3.0507)	-0.2733*** (-3.1883)
$\Delta LnIPI_{i(t-1)}$	-0.4626 (-0.9697)	-0.4281 (-0.9208)	-0.4668 (-0.9767)	-0.5094 (-1.0737)	-0.5517 (-1.1420)
$\Delta LnIPI_{i(t-2)}$	0.6766 (1.4201)	0.5719 (1.2530)	0.6776 (1.4196)	0.6073 (1.2797)	0.6257 (1.3083)
$\Delta \mathbf{LnIPI} \rightarrow \Delta \mathbf{LnSPI}$	**3.4845****				
$\Delta LnCPI_{i(t-1)}$	0.2055 (0.7461)	2.9502*** (5.1069)	0.1951 (0.7052)	0.1588 (0.5784)	0.1594 (0.5731)
$\Delta LnCPI_{i(t-2)}$	0.0216 (0.1767)	-0.4001*** (-2.8797)	0.0271 (0.2204)	0.0212 (0.1749)	0.0150 (0.1223)
$\Delta \mathbf{LnCPI} \rightarrow \Delta \mathbf{LnSPI}$	**0.7606**				
$\Delta LnREMI_{i(t-1)}$	0.0919 (0.9970)	0.1309 (1.4993)	0.0889 (0.9603)	0.0955 (1.0421)	0.0867 (0.9401)
$\Delta LnREMI_{i(t-2)}$	0.0246 (0.2741)	-0.1371 (-1.6274)	0.0215 (0.2390)	0.0219 (0.2458)	0.0215 (0.2395)
$\Delta \mathbf{LnREMI} \rightarrow \Delta \mathbf{LnSPI}$	**1.1333**				
$\Delta LnREER_{i(t-1)}$	-0.8741** (-2.5670)	-1.2558*** (-3.8447)	-0.8782** (-2.5740)	-0.8303** (-2.4498)	-0.8588** (-2.5219)
$\Delta LnREER_{i(t-2)}$	0.6105* (1.7623)	0.9215*** (2.6985)	0.5941* (1.7041)	0.6473* (1.8785)	0.5941* (1.7146)
$\Delta \mathbf{LnREER} \rightarrow \Delta \mathbf{LnSPI}$	**3.7941****				
$\Delta LnOPEN_{i(t-1)}$	-0.4795* (-1.7227)	-0.9116*** (-3.2387)	-0.4796* (-1.7199)	-0.4880* (-1.7649)	-0.5097* (-1.8239)
$\Delta LnOPEN_{i(t-2)}$	0.1421 (0.5216)	0.3778 (1.3918)	0.1421 (0.5207)	0.1568 (0.5791)	0.0913 (0.3310)
$\Delta \mathbf{LnOPEN} \rightarrow \Delta \mathbf{LnSPI}$	**0.3214**				
Constant	-0.0149 (-0.4553)	0.0410 (1.0916)	0.0143 (0.2140)	-0.4187** (-2.0335)	0.0169 (0.3945)
IR		-0.0184*** (-4.7636)			
LnCR			-0.0311 (-0.4998)		
LnGS				0.2033** (1.9861)	
$\mathbf{D_{GFC}}$					-0.0520 (-1.1378)
Sample size	229	205	229	229	229
R-squared	0.1114	0.2894	0.1124	0.1274	0.1167
Adj. R-squared	0.0620	0.2410	0.0587	0.0746	0.0633
Akaike AIC	0.5033	0.2713	0.5109	0.4939	0.5061
Schwarz SIC	0.6983	0.4982	0.7208	0.7038	0.7160
F-statistic	2.2562***	5.9840***	2.0946***	2.4144***	2.1850***

Table 6.16: Panel Error Correction Model (Model 11) Of Emerging Markets

Variables	**Dependent variable:** Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta LnSPI_{i(t-1)}$	0.2721*** (3.2035)	0.4343*** (4.7320)	0.2697*** (3.1060)	0.2620*** (3.0429)	0.2686*** (3.1485)
$\Delta LnSPI_{i(t-2)}$	-0.2714*** (-3.2684)	-0.2270*** (-2.6204)	-0.2689*** (-3.1679)	-0.2566*** (-3.0391)	-0.2704*** (-3.2518)
$\Delta LnRGDP_{i(t-1)}$	-0.5125 (-0.6308)	0.4774 (0.5771)	-0.4109 (-0.4921)	-0.5008 (-0.6037)	-0.5516 (-0.6756)
$\Delta LnRGDP_{i(t-2)}$	1.3797* (1.7876)	0.6500 (0.8627)	1.4281* (1.7977)	1.3016* (1.6524)	1.3531* (1.7475)
$\Delta \mathbf{LnRGDP} \rightarrow \Delta \mathbf{LnSPI}$	**4.8914***				
$\Delta LnCPI_{i(t-1)}$	0.1881 (0.7185)	3.0810*** (5.5859)	0.1747 (0.6513)	0.1417 (0.5317)	0.1639 (0.6173)
$\Delta LnCPI_{i(t-2)}$	0.0659 (0.5632)	-0.3837*** (-2.8928)	0.0750 (0.6254)	0.0639 (0.5406)	0.0614 (0.5224)
$\Delta \mathbf{LnCPI} \rightarrow \Delta \mathbf{LnSPI}$	**0.7606**				
$\Delta lnFDI_{i(t-1)}$	0.2949*** (3.6074)	0.3102*** (3.8989)	0.2897*** (3.4326)	0.2766*** (3.3042)	0.2842*** (3.3853)
$\Delta lnFDI_{i(t-2)}$	-0.1759* (-1.9283)	-0.1959** (-2.1846)	-0.1711* (-1.8112)	-0.1912** (-2.0499)	-0.1784* (-1.9511)
$\Delta \mathbf{LnFDI} \rightarrow \Delta \mathbf{LnSPI}$	**9.0442***				
$\Delta LnREMI_{i(t-1)}$	0.0842 (0.9654)	0.1152 (1.4004)	0.0796 (0.8894)	0.0890 (1.0070)	0.0826 (0.9454)
$\Delta LnREMI_{i(t-2)}$	0.0023 (0.0269)	-0.1295 (-1.6350)	-0.0036 (-0.0410)	0.0008 (0.0093)	0.0012 (0.0145)
$\Delta \mathbf{LnREMI} \rightarrow \Delta \mathbf{LnSPI}$	**1.1333**				
$\Delta LnREER_{i(t-1)}$	-0.6330* (-1.9078)	-0.9655*** (-3.0778)	-0.6720** (-1.9712)	-0.6140* (-1.8122)	-0.6305* (-1.8970)
$\Delta LnREER_{i(t-2)}$	0.5484* (1.6852)	0.8410*** (2.6318)	0.5132 (1.5206)	0.5778* (1.7340)	0.5468* (1.6776)
$\Delta \mathbf{LnREER} \rightarrow \Delta \mathbf{LnSPI}$	**3.7941**				
$\Delta LnOPEN_{i(t-1)}$	-0.2219 (-0.8052)	-0.5527** (-1.9876)	-0.2340 (-0.8298)	-0.2316 (-0.8282)	-0.2393 (-0.8617)
$\Delta LnOPEN_{i(t-2)}$	0.0849 (0.3374)	0.3153 (1.2614)	0.0872 (0.3376)	0.0989 (0.3856)	0.0656 (0.2581)
$\Delta \mathbf{LnOPEN} \rightarrow \Delta \mathbf{LnSPI}$	**0.3214**				
Constant	-0.0585 (-1.5478)	-0.0059 (-0.1516)	-0.0249 (-0.3789)	-0.4383** (-2.2013)	-0.0413 (-0.8591)
IR		-0.0204*** (-5.5601)			
LnCR			-0.0400 (-0.6554)		
LnGS				0.1932* (1.9401)	
$\mathbf{D_{GFC}}$					-0.0244 (-0.5760)
Sample size	238	214	229	229	238
R-squared	0.1826	0.3623	0.1807	0.1933	0.1838
Adj. R-squared	0.1313	0.3140	0.1230	0.1365	0.1287
Akaike AIC	0.4071	0.1490	0.4483	0.4328	0.4140
Schwarz SIC	0.6259	0.4007	0.6882	0.6727	0.6474
F-statistic	3.5588***	7.5009***	3.1320***	3.4027***	3.3337***

Table 6.17: Panel error correction model (Model 12) of emerging markets

Variables	Dependent variable: $\Delta\ LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\Delta LnSPI_{i(t-1)}$	0.2745*** (3.2004)	0.4632*** (4.9935)	0.2774*** (3.2218)	0.2663*** (3.1226)	0.2705*** (3.1382)
$\Delta LnSPI_{i(t-2)}$	-0.2504*** (-3.0031)	-0.2020** (-2.3135)	-0.2458*** (-2.9272)	-0.2355*** (-2.8330)	-0.2495*** (-2.9876)
$\Delta LnIPI_{i(t-1)}$	-0.3194 (-0.6633)	-0.0692 (-0.1477)	-0.3353 (-0.6936)	-0.3407 (-0.7122)	-0.3575 (-0.7337)
$\Delta LnIPI_{i(t-2)}$	0.5914 (1.2789)	0.3226 (0.7274)	0.5930 (1.2802)	0.5229 (1.13533	0.5682 (1.2218)
$\Delta LnIPI \rightarrow \Delta LnSPI$	**3.4845****				
$\Delta LnCPI_{i(t-1)}$	0.2073 (0.7763)	3.0036*** (5.4100)	0.1972 (0.7350)	0.1607 (0.6036)	0.1847 (0.6825)
$\Delta LnCPI_{i(t-2)}$	0.0548 (0.4601)	-0.3790*** (-2.8258)	0.0611 (0.5096)	0.0526 (0.4447)	0.0503 (0.4210)
$\Delta LnCPI \rightarrow \Delta LnSPI$	**0.7606**				
$\Delta lnFDI_{i(t-1)}$	0.2931*** (3.4793)	0.3023*** (3.6634)	0.2967*** (3.5042)	0.2826*** (3.3711)	0.2839** (3.3019)
$\Delta lnFDI_{i(t-2)}$	-0.1610* (-1.7159)	-0.1689* (-1.8225)	-0.1534 (-1.6133)	-0.1765* (-1.8870)	-0.1628* (-1.7313)
$\Delta LnFDI \rightarrow \Delta LnSPI$	**9.0442*****				
$\Delta LnREMI_{i(t-1)}$	0.0894 (0.9974)	0.1247 (1.4728)	0.0857 (0.9517)	0.0942 (1.0575)	0.0873 (0.9722)
$\Delta LnREMI_{i(t-2)}$	0.0048 (0.0543)	-0.1345* (-1.6552)	0.0007 (0.0077)	0.0044 (0.0507)	0.0044 (0.0499)
$\Delta LnREMI \rightarrow \Delta LnSPI$	**1.1333**				
$\Delta LnREER_{i(t-1)}$	-0.7305** (-2.1772)	-1.0160*** (-3.1595)	-0.7391** (-2.1963)	-0.6793** (-2.0326)	-0.7233** (-2.1504)
$\Delta LnREER_{i(t-2)}$	0.5681* (1.6863)	0.8387** (2.5479)	0.5491 (1.6177)	0.6092* (1.8174)	0.5626* (1.6667)
$\Delta LnREER \rightarrow \Delta LnSPI$	**3.7941****				
$\Delta LnOPEN_{i(t-1)}$	-0.2496 (-0.8832)	-0.6144** (-2.1644)	-0.2551 (-0.9005)	-0.2477 (-0.8826)	-0.2654 (-0.9330)
$\Delta LnOPEN_{i(t-2)}$	0.0619 (0.2336)	0.2937 (1.1238)	0.0613 (0.2310)	0.0782 (0.2970)	0.0395 (0.1473)
$\Delta LnOPEN \rightarrow \Delta LnSPI$	**0.3214**				
Constant	-0.0363 (-1.0899)	0.0248 (0.6749)	-0.0073 (-0.1121)	-0.4292** (-2.1475)	-0.0198 (-0.4454)
IR		-0.0196*** (-5.2517)			
LnCR			-0.0317 (-0.5188)		
LnGS				0.1988** (1.9934)	
D_{GFC}					-0.0251 (-0.5560)
Sample size	229	205	229	229	229
R-squared	0.1727	0.3520	0.1737	0.1878	0.1739
Adj. R-squared	0.1185	0.3006	0.1155	0.1306	0.1157
Akaike AIC	0.4493	0.1985	0.4568	0.4396	0.4566
Schwarz SIC	0.6743	0.4579	0.6967	0.6795	0.6965
F-statistic	3.1900***	6.8451***	2.9851***	3.2837***	2.9884***

Table 6.15 - 6.17 demonstrates similar results of estimated coefficients of panel VAR from the preceding Tables presented in this chapter.

Panel VAR Short run Coefficients

Above 12 Tables (Table 6.6 - Table 6.17) report estimated coefficients of panel VECM results using equations (6.1 to 6.12) along with interest rates, corruption risk rating, government stability and dummy variables for Global Financial Crisis as exogenous variables considering $\Delta LnSPI_{i(t-1)}$ as dependent variables.

The estimated coefficients of $\Delta LnSPI_{i(t-1)}$ is positive and significant at 1% level, and $\Delta LnSPI_{i(t-2)}$ is negative and significant at 1% level.

Table 6.6 to Table 6.17 suggests that the estimated coefficients of $\Delta LnRGDP_{i(t-2)}$ are positive and significant at 10% level. This result is supported by evidence from existing studies that indicate that GDP positively impacts stock market performance (Fama, 1981; Mukherjee & Naka, 1995). This means that an increase in economic growth leads to an increase in share price.

Table 6.6 to Table 6.17 suggests that the estimated coefficients of $\Delta LnIPI_{i(t-2)}$ are positive. This result is consistent with previous literature, but this study finds the coefficient is insignificant. This result is supported by Mukherjee and Naka (1995), Liljeblom and Stenius (1997), Abdullah (1998), Gjerde and Saettem (1999), Maysami et al. (2004), Lobão and Levi (2016), which also found a positive and statistically significant relationship between industrial production and stock price.

The estimated coefficients are positive and insignificant for both $\Delta LnCPI_{i(t-1)}$ and $\Delta LnCPI_{i(t-2)}$. This can be evident from Table 6.6 to Table 6.17. This result is similar to previous literature.

For instance, a significant positive relationship was observed between inflation and stock returns in reports on the UK (Firth, 1979), Singapore (Maysami et al., 2004) and Ghana (Adam & Tweneboah, 2008). Similarly, In the study by Maysami and Sim (2001a), the Korean stock markets showed a positive association with inflation.

Results presented in Tables 6.6 to 6.17 show that the estimated coefficient of panel VECM of $\Delta LnFDI_{i(t-1)}$ is positive and significant at the 1% level, and $\Delta LnFDI_{i(t-2)}$ is negative and significant at the 10% level. Clark and Berko (1996) also find supporting evidence for the positive relationship between foreign direct investment and stock market return in Mexico.

Tables 6.6 to 6.17 also show that the estimated coefficient of panel VECM of both $\Delta LnREMI_{i(t-1)}$ and $\Delta LnREMI_{i(t-2)}$ is positive and insignificant. Gupta et al. (2009) indicate that remittances positively impact poverty mitigation by increasing income and higher living conditions in remittance-receiving households.

It can also be seen from Table 6.6 to Table 6.17 that the estimated coefficient of $\Delta LnREER_{i(t-1)}$ is negative and significant at the 5% level, and $\Delta LnREER_{i(t-2)}$ is positive and significant at the 10% level. The positive relations between stock prices and exchange rates have been found in research studies like Aggarwal (1981). For example, using monthly data on U.S. stock markets from 1974 to1978, Aggarwal (1981) found that stock prices and real exchange rates are positive.

Tables 6.6 to 6.17 reveal that the estimated coefficient of $\Delta LnOPEN_{i(t-1)}$ is negative and insignificant, and $\Delta LnOPEN_{i(t-2)}$ is positive and insignificant. According to Basu and Morey's (2005) studies, a more open economy is predicted to enjoy real-economy growth due to more efficient resource utilisation. Furthermore, according to Fama (1990) and Ferson and Harvey (1997), growth in the real economy boosts future cash flow and profits, which leads to an increase in stock values.

Tables 6.6 to 6.17 also reveals that estimated coefficients of IR of panel VECM are negative and significant at 1% level. Previous research, including those of Waud (1970), Nelson (1976), Fama and Schwert (1977) and Fama (1981), indicate that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), Ferrer et al. (2016) have also confirmed this trend of relationship.

The estimated coefficients for LnCR presented in Table 6.6 to 6.17 also reveal that a negative and insignificant. Theoretically, corruption is not necessarily bad for stock markets. Early studies show that corruption has a positive impact on stock market development (Leff, 1964; Lui, 1985). Leff (1964) stated that corruption acts as the driving force for economic growth in situations where the government forces strict/ineffective regulations because bribery enables private agents to buy their way out of politically imposed inefficiencies.

The estimated coefficients for LnGS presented in Table 6.6 to 6.17 suggest a positive and significant 5% level. Yartey (2008) also supports a positive relationship between government stability and share price. The results highlighted that political risk, law, order, and bureaucratic quality are important determinants of stock market development as they enhance the viability of external finance.

This finding presented in Table 6.6 to 6.17 also indicates that the estimated coefficients for the dummy variable (D_{GFC}), global financial crisis (GFC), is negative and insignificant.

6.8 Granger Causality Test

The results of the Pedroni panel cointegration test (1999, 2004) showed evidence that variables are not cointegrated. Therefore, a dynamic panel data model using the VAR Granger causality was estimated under the multivariate framework. Before the panel VAR estimation, the optimal lags were established as two, using the Schwarz information criteria under the unrestricted panel VAR model. Based on the panel VAR framework, the panel Granger causality test results are shown in Tables 6.19 to Table 6.30.

Table 6.18: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 1 of Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent	Independent	Independent	
	ΔLNSPI	**Δ LNRGDP**	**Δ LNCPI**	**All**
ΔLNSPI	-	7.1443** (0.0281)	21.2075*** (0.0000)	32.6796*** (0.0000)
ΔLNRGDP	8.4599 ** (0.0146)	-	18.0906*** (0.0001)	27.7545*** (0.0000)
ΔLNCPI	2.2762 (0.3204)	1.4198 (0.4917)	-	7.4959 (0.1119)

ΔLnCPI → ΔLnSPI; ΔLnSPI ↔ ΔLnRGDP

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI (considering LNCR as an exogenous variable in the VAR model)

Dependent	Independent	Independent	Independent	
	ΔLNSPI	**Δ LNRGDP**	**Δ LNCPI**	**All**
ΔLNSPI	-	8.9554** (0.0114)	1.2665 (0.5309)	10.3680** (0.0347)
ΔLNRGDP	8.0072** (0.0182)	-	0.1504 (0.9276)	8.3800* (0.0786)
ΔLNCPI	4.3652 (0.1127)	6.8099** (0.0332)	-	22.9857*** (0.0001)

ΔLnSPI ↔ ΔLnRGDP

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI (considering LNGS as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	
	ΔLNSPI	**Δ LNRGDP**	**Δ LNCPI**	**All**
ΔLNSPI	-	8.2472** (0.0162)	0.9187 (0.6317)	9.2317* (0.0556)
ΔLNRGDP	7.2993** (0.0260)	-	0.1255 (0.9392)	7.6411 (0.1056)
ΔLNCPI	3.7723 (0.1517)	6.3891** (0.0410)	-	21.2721*** (0.0003)

ΔLnSPI ↔ ΔLnRGDP

Note 1: Chi-square values are provided, along with p values in parenthesis.
Note 2: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.
Note 3: ΔLnSPI↔ΔLnRGDP implies SPI growth, and real GDP growth both Granger causes each other. ΔLnCPI→ΔLnSPI implies CPI growth Granger causes SPI growth.

Table 6.18 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen clearly in panel A that economic growth and Inflation Granger cause share price growth, and they also jointly Granger cause share price growth. Similarly, share price growth and inflation Granger cause economic growth separately. They also jointly Granger cause economic growth in a multivariate framework while the interest rate is considered an exogenous variable.

It can be seen clearly in panel B that economic growth Granger causes share price growth. Again, economic growth and inflation jointly Granger cause share price growth. Similarly, share price growth Granger causes economic growth separately and share price growth and inflation jointly Granger causes economic growth. Economic growth Granger causes inflation separately and shares price growth and economic growth jointly Granger causes inflation in a multivariate framework while corruption risk rating is considered as an exogenous variable.

A similar result can be seen in panel C in a multivariate framework while considering government stability as the exogenous variable in the model.

Table 6.19: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 2 of Emerging Markets

Panel A:
ΔLnSPI, ΔLnIPI, Δ LnCPI (considering IR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnIPI	ΔLnCPI	All
ΔLnSPI	-	4.5227 (0.1042)	21.4542*** (0.0000)	28.5054*** (0.0000)
ΔLnIPI	8.2108** (0.0165)	-	4.0393 (0.1327)	12.1839** (0.0160)
ΔLnCPI	2.6963 (0.2597)	1.2963 (0.5230)	-	7.0167 (0.1350)

ΔLnCPI → ΔLnSPI; ΔLnIPI → ΔLnSPI

Panel B:
ΔLnSPI, ΔLnIPI, Δ LnCPI (considering LnCR as an exogenous variable in the VAR model)

Dependent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnIPI	ΔLnCPI	All
ΔLnSPI	-	5.5285* (0.0630)	1.0561 (0.5898)	6.9200 (0.1402)
ΔLnIPI	7.7965** (0.0203)	-	0.6201 (0.7334)	8.7239* (0.0684)
ΔLnCPI	7.2315** (0.0269)	3.4798 (0.1755)	-	19.4191*** (0.0007)

ΔLnIPI ↔ΔLnSPI; ΔLnSPI → ΔLnCPI

Panel C:
ΔLnSPI, ΔLnIPI, Δ LnCPI (considering LNGS as an exogenous variable in the VAR model)

Dependent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnIPI	ΔLnCPI	All
ΔLnSPI	-	5.4197* (0.0665)	0.7193 (0.6979)	6.3921 (0.1717)
ΔLnIPI	6.8489** (0.0326)	-	0.7542 (0.6858)	7.9604* (0.0930)
ΔLnCPI	6.1644** (0.0459)	3.8291 (0.1474)	-	18.5446*** (0.0010)

ΔLnIPI ↔ΔLnSPI; ΔLnSPI →ΔLnCPI

Table 6.19 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

In panel A, it can be seen that inflation Granger causes share price growth, again ∆LnIPI and inflation also jointly Granger cause share price growth. Similarly, share price growth Granger causes ∆LnIPI, share price growth and inflation also jointly Granger cause ∆LnIPI in a multivariate framework while the interest rate is considered an exogenous variable.

It can also be seen in panel B that ∆LnIPI Granger causes share price growth. Again, share price growth and inflation jointly Granger causes share price growth. Similarly, share price growth Granger cause ∆LnIPI and share price growth and inflation jointly Granger cause ∆LnIPI. Similarly, share price growth Granger cause inflation separately, and share price growth and ∆LnIPI jointly Granger cause inflation in a multivariate framework while corruption risk rating is considered as an exogenous variable.

A similar result can be seen in panel C in a multivariate framework while considering government stability as the exogenous variable in the model.

Table 6.20: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 3 of Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering IR as an exogenous variable in the VECM model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnRGDP**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnREER**	**All**
ΔLNSPI	-	3.4575 (0.1775)	33.3206*** (0.0000)	30.9299*** (0.0000)	2.5362 (0.2814)	10.1814*** (0.0062)	80.0786*** (0.0000)
ΔLNRGDP	1.9312 (0.3808)	-	27.3118*** (0.0000)	49.2314*** (0.0000)	0.6740 (0.7139)	2.9876 (0.2245	85.7490*** (0.0000)
ΔLNCPI	0.0824 (0.9596)	1.4725 (0.4789)	-	0.2023 (0.9038)	3.1028 (0.2120)	7.9998** (0.0183)	17.9270* (0.0562)
ΔLnFDI	0.2240 (0.8940)	3.1407 (0.2080)	0.2533 (0.8810)	-	2.0094 (0.3661)	0.0276 (0.9863)	7.6124 (0.6666)
ΔLnREMI	4.1987 (0.1225)	3.0234 (0.2205)	5.1038* (0.0779)	2.6407 (0.2670)	-	2.1423 (0.3426)	23.6814*** (0.0085)
ΔLnREER	0.3205 (0.8519)	0.9431 (0.6240)	70.1241*** (0.0000)	15.0483*** (0.0005)	2.5167 (0.2841)	-	85.0408*** (0.0000)

ΔLnCPI → ΔLnSPI; ΔLnFDI → ΔLnSPI; ΔLnREER→ΔLnSPI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering LnCR as an exogenous variable in the VAR model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnRGDP**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnREER**	**All**
ΔLNSPI	-	4.1325 (0.1267)	2.3999 (0.3012)	19.3456*** (0.0001)	0.7527 (0.6864)	5.8605* (0.0534)	35.8898*** (0.0001)
ΔLNRGDP	4.7787* (0.0917)	-	0.2312 (0.8908)	30.2043*** (0.0000)	0.2911 (0.8645)	3.7438 (0.1538)	43.4989*** (0.0000)
ΔLNCPI	1.9544 (0.3764)	8.5570** (0.0139)	-	0.5837 (0.7469)	0.4972 (0.7799)	9.5367*** (0.0085)	33.3544*** (0.0002)
ΔLnFDI	0.0211 (0.9895)	2.6458 (0.2664)	0.0335 (0.9834)	-	3.1255 (0.2096)	0.0704 (0.9654)	8.6169 (0.5688)
ΔLnREMI	3.5192 (0.1721)	6.4062** (0.0406)	4.7105* (0.0949)	1.7236 (0.4224)	-	2.7435 (0.2537)	22.9428** (0.0110)
ΔLnREER	0.5674 (0.7530)	2.0389 (0.3608)	8.0291** (0.0181)	6.7765** (0.0338)	1.6932 (0.4289)	-	20.7463** (0.0229)

ΔLnFDI→ ΔLnSPI; ΔLnREER→ ΔLnSPI; ΔLnSPI → ΔLnRGDP

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering LnGS as an exogenous variable in the VAR model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnRGDP**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnREER**	**All**
ΔLNSPI	-	3.4126 (0.1815)	1.7157 (0.4241)	19.7210*** (0.0001)	0.9924 (0.6088)	5.9985** (0.0498)	35.1947*** (0.0001)
ΔLNRGDP	4.3708 (0.1124)	-	0.1712 (0.9180)	30.1548*** (0.0000)	0.2911 (0.8646)	3.4399 (0.1791)	42.2663*** (0.0000)
ΔLNCPI	1.7709 (0.4125)	8.5068** (0.0142)	-	0.7482 (0.6879)	0.7012 (0.7043)	10.5301*** (0.0052)	32.8523*** (0.0003)
ΔLnFDI	0.0126 (0.9937)	2.2746 (0.3207)	0.1381 (0.9333)	-	3.0635 (0.2162)	0.0079 (0.9960)	8.5925 (0.5712)
ΔLnREMI	3.6431 (0.1618)	5.8691* (0.0532)	4.8619* (0.0880)	1.7157 (0.4241)	-	2.8796 (0.2370)	21.8449** (0.0159)
ΔLnREER	0.6109 (0.7368)	2.0399 (0.3606)	7.9548** (0.0187)	6.7301** (0.0346)	1.8328 (0.4000)	-	21.1962** (0.0198)

ΔLnFDI→ΔLnSPI; ΔLnREER→ ΔLnSPI

Table 6.20 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, Inflation, ΔLnFDI and ΔLnREER and separately Granger cause share price growth, again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger cause share price growth. Similarly, inflation and ΔLnFDI separately Granger cause economic growth. Again, share price growth, Inflation, ΔLnFDI, ΔLnREMI, and ΔLnREER jointly Granger cause economic growth. Similarly, ΔLnREER separately Granger causes inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger causes Inflation. Inflation Granger causes ΔLnREMI, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREER jointly Granger causes ΔLnREMI. Inflation and ΔLnFDI separately Granger cause ΔLnREER, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnREER in a multivariate framework while interest rate considered as an exogenous variable.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability respectively as the exogenous variable in the model.

Table 6.21: Multivariate Panel Granger Causality/Block Exogeneity Wald Test For Model 4 Of Emerging Markets

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering IR as an exogenous variable in the VAR model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnIPI**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnREER**	**All**
ΔLnSPI	-	1.0737 (0.5846)	30.0359*** (0.0000)	25.8142*** (0.0000)	2.6866 (0.2610)	10.4873*** (0.0053)	72.3533*** (0.0000)
ΔLnIPI	0.8602 (0.6504)	-	5.1855* (0.0748)	44.5790*** (0.0000)	0 2992 (0.8611)	2.4349 (0.2960)	62.4243*** (0.0000)
ΔLnCPI	0.1250 (0.9394)	1.2601 (0.5326)	-	0.1697 (0.9186)	2.8612 (0.2392)	7.3529** (0.0253)	16.6383* (0.0828)
ΔLnFDI	0.2024 (0.9038)	2.3977 (0.3015)	0.2212 (0.8953)	-	2.0349 (0.3615)	0.1722 (0.9175)	6.8434 (0.7401)
ΔLnREMI	5.7688* (0.0559)	6.3558** (0.0417)	5.1547* (0.0760)	1.8489 (0.3967)	-	2.9724 (0.2262)	26.1383*** (0.0036)
ΔLnREER	0.5839 (0.7468)	1.7800 (0.4107)	68.6486*** (0.0000)	14.5275*** (0.0007)	2.6453 (0.2664)	-	81.9265*** (0.0000)

ΔLnCPI→ΔLnSPI; ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering LnCR as an exogenous variable in the VAR model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnIPI**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnREER**	**All**
ΔLnSPI	-	2.2285 (0.3282)	2.2166 (0.3301)	18.5656*** (0.0001)	0.8860 (0.6421)	7.7736** (0.0205)	33.7098*** (0.0002)
ΔLnIPI	2.8398 (0.2417)	-	0.0995 (0.9515)	39.4869*** (0.0000)	0 3043 (0.8589)	5.3248* (0.0698)	55.7541*** (0.0000)
ΔLnCPI	3.4814 (0.1754)	4.3360 (0.1144)	-	0.3536 (0.8379)	0 3521 (0.8386)	8.6710** (0.0131)	28.6651*** (0.0014)
ΔLnFDI	0.0166 (0.9917)	2.3649 (0.3065)	0.0121 (0.9940)	-	3 1200 (0.2101)	0.1632 (0.9216)	8.3284 (0.5968)
ΔLnREMI	3.6036 (0.1650)	7.0977** (0.0288)	5.2047* (0.0741)	1.9400 (0.3791)	-	3.0168 (0.2213)	23.6860*** (0.0085)
ΔLnREER	0.3541 (0.8377)	0.7395 (0.6909)	8.7837** (0.0124)	6.9704** (0.0306)	2.0191 (0.3644)	-	19.3349** (0.0362)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER (Considering LnGS as an exogenous variable in the VAR model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnIPI**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnREER**	**All**
ΔLnSPI	-	1.9162 (0.3836)	1.5856 (0.4526)	18.8554*** (0.0001)	1 1150 (0.5726)	7.8336** (0.0199)	33.4806*** (0.0002)
ΔLnIPI	2.4632 (0.2918)	-	0.1693 (0.9188)	39.4340*** (0.0000)	0 2816 (0.8687)	4.8246* (0.0896)	54.2695*** (0.0000)
ΔLnCPI	3.2176 (0.2001)	4.7861* (0.0914)	-	0.4937 (0.7812)	0.4621 (0.7937)	9.4532*** (0.0089)	28.7263*** (0.0014)
ΔLnFDI	0.0509 (0.9749)	1.8367 (0.3992)	0.1204 (0.9416)	-	3.0225 (0.2206)	0.0681 (0.9665)	8.1420 (0.6150)
ΔLnREMI	3.7254 (0.1553)	7.6597** (0.0217)	5.2805* (0.0713)	1.9862 (0.3704)	-	3.2338 (0.1985)	23.7651*** (0.0082)
ΔLnREER	0.4643 (0.7928)	0.6695 (0.7155)	8.7447** (0.0126)	6.9433** (0.0311)	2 1809 (0.3361)	-	19.7048** (0.0322)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI

Table 6.21 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, Inflation, ΔLnFDI and ΔLnREER and separately Granger cause share price growth, again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger cause share price growth. Similarly, Inflation and ΔLnFDI separately Granger cause ΔLnIPI, again, share price growth, Inflation, ΔLnFDI, ΔLnREMI, and ΔLnREER jointly Granger cause ΔLnIPI. ΔLnREER Granger causes inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger causes Inflation. Share price growth, ΔLnIPI and inflation separately Granger cause ΔLnREMI, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREER jointly Granger causes ΔLnREMI. Inflation and ΔLnFDI separately Granger cause ΔLnREER, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnREER in a multivariate framework while interest rate considered as an exogenous variable.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability respectively as the exogenous variable in the model.

Table 6.22: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 5 of Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	4.0414 (0.1326)	29.5860*** (0.0000)	26.3521*** (0.0000)	2.7439 (0.2536)	0.2106 (0.9001)	66.7919*** (0.0000)
ΔLnRGDP	0.3837 (0.8254)	-	27.5886*** (0.0000)	42.7897*** (0.0000)	1.2109 (0.5458)	1.9645 (0.3745)	84.3087*** (0.0000)
ΔLnCPI	1.4781 (0.4776)	1.0262 (0.5986)	-	0 1483 (0.9285)	2.6293 (0.2686)	1.9074 (0.3853)	11.5439 (0.3167)
ΔLnFDI	0.1673 (0.9197)	3.2753 (0.1944)	0.2297 (0.8915)	-	1.9436 (0.3784)	0.0293 (0.9854)	7.6143 (0.6665)
ΔLnREMI	2.7849 (0.2485)	3.4862 (0.1750)	5.5633* (0.0619)	2.8139 (0.2449)	-	0.4873 (0.7837)	21.8501** (0.0159)
ΔLnOPEN	9.6413*** (0.0081)	1.6483 (0.4386)	45.3725*** (0.0000)	6.3181** (0.0425)	6.5056** (0.0387)	-	95.9407*** (0.0000)

ΔLnCPI→ΔLnSPI; ΔLnFDI→ΔLnSPI; ΔLnSPI→ΔLnOPEN

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnCR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	6.8979** (0.0318)	2.0636 (0.3564)	18.1471*** (0.0001)	0.5582 (0.7565)	0.6305 (0.7296)	29.9487*** (0.0009)
ΔLnRGDP	3.5556 (0.1690)	-	0.0918 (0.9551)	27.5302*** (0.0000)	0.1569 (0.9246)	0.6210 (0.7331)	39.8085*** (0.0000)
ΔLnCPI	3.4251 (0.1804)	6.4104** (0.0406)	-	0 2522 (0.8815)	0.2229 (0.8945)	2.4980 (0.2868)	25.5690*** (0.0044)
ΔLnFDI	0.0630 (0.9690)	2.8608 (0.2392)	0.0732 (0.9641)	-	3.1545 (0.2065)	0.3812 (0.8265)	8.9401 (0.5378)
ΔLnREMI	2.2664 (0.3220)	6.7271** (0.0346)	5.3824* (0.0678)	2.0500 (0.3588)	-	1.0982 (0.5775)	21.1448** (0.0201)
ΔLnOPEN	7.2951** (0.0261)	3.2709 (0.1949)	5.0637* (0.0795)	8.5453** (0.0139)	4.3493 (0.1136)	-	45.2871*** (0.0000)

ΔLnRGDP→ ΔLnSPI; ΔLnFDI → ΔLnSPI; ΔLnSPI→ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnGS as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	6.1089** (0.0471)	1.5012 (0.4721)	18.2296*** (0.0001)	0.7164 (0.6989)	0.7238 (0.6963)	29.2233*** (0.0011)
ΔLnRGDP	3.0084 (0.2222)	-	0.0298 (0.9852)	27.3464*** (0.0000)	0.1712 (0.9180)	0.6491 (0.7228)	38.9794*** (0.0000)
ΔLnCPI	2.8511 (0.2404)	6.2345** (0.0443)	-	0 3974 (0.8198)	0.3251 (0.8500)	2.8476 (0.2408)	24.4094*** (0.0066)
ΔLnFDI	0.0040 (0.9980)	2.4212 (0.2980)	0.2048 (0.9027)	-	3.0489 (0.2177)	0.2602 (0.8780)	8.8549 (0.5459)
ΔLnREMI	2.3071 (0.3155)	6.2361** (0.0442)	5.4809* (0.0645)	2 1035 (0.3493)	-	1.3802 (0.5015)	20.2150** (0.0273)
ΔLnOPEN	7.3569** (0.0253)	3.3009 (0.1920)	5.1926* (0.0745)	8.5129** (0.0142)	4.4179 (0.1098)	-	46.0106*** (0.0000)

ΔLnRGDP→ ΔLnSPI; ΔLnFDI → ΔLnSPI; ΔLnSPI→ΔLnOPEN

Table 6.22 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, Inflation and ΔLnFDI separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, inflation and ΔLnFDI separately Granger cause economic growth. Also, share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause economic growth. Inflation Granger causes ΔLnREMI, also share price growth, economic growth, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI. Share price growth, inflation ΔLnFDI and ΔLnREMI separately Granger cause ΔLnOPEN, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN in a multivariate framework while interest rate is considered as an exogenous variable.

A similar result can be seen in panels B and C, and additionally, it can be seen in panels B and C that economic growth Granger causes inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation.

Table 6.23: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 6 of emerging markets.

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	1.2584 (0.5330)	27.9533*** (0.0000)	23.9648*** (0.0000)	2.8014 (0.2464)	0.3908 (0.8225)	59.1567*** (0.0000)
ΔLnIPI	0.1567 (0.9246)	-	6.5803** (0.0372)	40.8199*** (0.0000)	0.3992 (0.8191)	4.6541* (0.0976)	65.3317*** (0.0000)
ΔLnCPI	1.5132 (0.4692)	1.2047 (0.5475)	-	0.0998 (0.9513)	2.4746 (0.2902)	2.2634 (0.3225)	11.3105 (0.3338)
ΔLnFDI	0.0670 (0.9671)	2.4053 (0.3004)	0.2141 (0.8985)	-	1.9814 (0.3713)	0.0185 (0.9908)	6.6844 (0.7549)
ΔLnREMI	3.5320 (0.1710)	6.3867** (0.0410)	5.6903* (0.0581)	2.1596 (0.3397)	-	0.6205 (0.7333)	23.5056*** (0.0090)
ΔLnOPEN	10.6140*** (0.0050)	0.1814 (0.9133)	44.8484*** (0.0000)	5.4305* (0.0662)	6.2885** (0.0431)	-	92.1694*** (0.0000)

ΔLnCPI→ ΔLnSPI; ΔLnFDI→ ΔLnSPI; ΔLnSPI→ΔLnOPEN

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnCR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	3.6421 (0.1619)	1.8987 (0.3870)	17.9436*** (0.0001)	0.6872 (0.7092)	1.1855 (0.5528)	26.3547*** (0.0033)
ΔLnIPI	2.2437 (0.3257)	-	0.2174 (0.8970)	35.7130*** (0.0000)	0.0920 (0.9551)	2.3623 (0.3069)	52.1135*** (0.0000)
ΔLnCPI	5.5419** (0.0626)	3.8039 (0.1493)	-	0.0762 (0.9626)	0.1803 (0.9138)	3.2293 (0.1990)	22.7369** (0.0118)
ΔLnFDI	0.0077 (0.9961)	2.3921 (0.3024)	0.0335 (0.9834)	-	3.1391 (0.2081)	0.2884 (0.8657)	8.4583 (0.5842)
ΔLnREMI	1.8152 (0.4035)	7.4573** (0.0240)	5.9588* (0.0508)	2.2345 (0.3272)	-	1.4060 (0.4951)	21.9225** (0.0155)
ΔLnOPEN	9.8063*** (0.0074)	0.7221 (0.6969)	5.4999* (0.0639)	8.1109** (0.0173)	4.7885* (0.0912)	-	42.2476*** (0.0000)

ΔLnFDI→ ΔLnSPI; ΔLnSPI → ΔLnCPI; ΔLnSPI → ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnGS as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	3.3302 (0.1892)	1.3657 (0.5052)	18.0080*** (0.0001)	0.8432 (0.6560)	1.2633 (0.5317)	26.1542*** (0.0035)
ΔLnIPI	1.6724 (0.4334)	-	0.3204 (0.8520)	35.5286*** (0.0000)	0.0883 (0.9568)	2.4394 (0.2953)	51.3479*** (0.0000)
ΔLnCPI	4.6990* (0.0954)	4.2755 (0.1179)	-	0.1684 (0.9192)	0.2241 (0.8940)	3.5253 (0.1716)	22.2894** (0.0137)
ΔLnFDI	0.0673 (0.9669)	1.8454 (0.3974)	0.1671 (0.9198)	-	3.0038 (0.2227)	0.1837 (0.9122)	8 2620 (0.6033)
ΔLnREMI	1.9091 (0.3850)	7.9898** (0.0184)	6.0202** (0.0493)	2.3284 (0.3122)	-	1.6932 (0.4289)	22.0795** (0.0147)
ΔLnOPEN	9.8301*** (0.0073)	0.7414 (0.6902)	5.5885* (0.0612)	8.0780** (0.0176)	4.8223* (0.0897)	-	42.9504*** (0.0000)

ΔLnFDI→ ΔLnSPI; ΔLnSPI → ΔLnCPI; ΔLnSPI → ΔLnOPEN

Table 6.23 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, Inflation and ΔLnFDI separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, inflation, ΔLnFDI and ΔLnOPEN separately Granger cause ΔLnIPI, also, share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause ΔLnIPI. ΔLnIPI and inflation separately Granger cause ΔLnREMI, also share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI. Share price growth, inflation, ΔLnFDI and ΔLnREMI separately Granger cause ΔLnOPEN, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN in a multivariate framework while interest rate is considered as an exogenous variable.

It can be seen in panel B, ΔLnFDI separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, ΔLnFDI Granger cause ΔLnIPI, also, share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause ΔLnIPI. Share price growth Granger causes inflation. Again, share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes inflation in a multivariate framework while corruption risk rating is considered as an exogenous variable.

A similar result can be seen in panel C in a multivariate framework while considering government stability as the exogenous variable in the model.

Table 6.24: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 7 of Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	2.8978 (0.2348)	34.6839*** (0.0000)	21.8415*** (0.0000)	14.8164*** (0.0006)	4.4160 (0.1099)	82.6781*** (0.0000)
ΔLnRGDP	4.0760 (0.1303)	-	30.4141*** (0.0000)	38.1463*** (0.0000)	9.9214*** (0.0070)	8.3060** (0.0157)	96.6165*** (0.0000)
ΔLnCPI	0.4096 (0.8148)	0.9897 (0.6097)	-	0.3606 (0.8350)	8.5008** (0.0143)	2.8667 (0.2385)	17.6737* (0.0607)
ΔLnFDI	0.2950 (0.8628)	3.6821 (0.1587)	0.3955 (0.8206)	-	0.0736 (0.9639)	0.1406 (0.9321)	5.6918 (0.8405)
ΔLnREMI	1.1012 (0.5766)	1.1202 (0.5711)	73.0997*** (0.0000)	9.6133** (0.0082)	-	3.9308 (0.1401)	87.0312*** (0.0000)
ΔLnOPEN	5.5618* (0.0620)	2.2142 (0.3305)	44.3451*** (0.0000)	5.1912* (0.0746)	0.1681 (0.9194)	-	86.8585*** (0.0000)

ΔLnCPI→ ΔLnSPI; ΔLnFDI→ ΔLnSPI; ΔLnREMI → ΔLnSPI; ΔLnSPI → ΔLnOPEN

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	4.1811 (0.1236)	2.3764 (0.3048)	16.3340*** (0.0003)	5.8269* (0.0543)	0.7922 (0.6729)	35.9358*** (0.0001)
ΔLnRGDP	4.9574* (0.0839)	-	0.1632 (0.9216)	26.2520*** (0.0000)	5.5353* (0.0628)	2.5225 (0.2833)	46.1781*** (0.0000)
ΔLnCPI	2.8260 (0.2434)	8.2802** (0.0159)	-	0.1012 (0.9507)	8.2656** (0.0160)	1.5423 (0.4625)	34.5589*** (0.0001)
ΔLnFDI	0.0476 (0.9765)	3.6575 (0.1606)	0.1551 (0.9254)	-	0.0089 (0.9955)	0.2910 (0.8646)	5.7111 (0.8389)
ΔLnREMI	0.6614 (0.7184)	2.0396 (0.3607)	8.1050** (0.0174)	5.3566* (0.0687)	-	1.1874 (0.5523)	20.1960** (0.0275)
ΔLnOPEN	3.9111 (0.1415)	3.7372 (0.1543)	5.0701* (0.0793)	8.0666** (0.0177)	0.0770 (0.9622)	-	40.2174*** (0.0000)

ΔLnFDI→ ΔLnSPI, ΔLnREMI → ΔLnSPI ΔLnSPI→ΔLnRGDP

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	3.4781 (0.1757)	1.6939 (0.4287)	16.3780*** (0.0003)	5.8201* (0.0545)	0.8256 (0.6618)	35.0015*** (0.0001)
ΔLnRGDP	4.6102* (0.0998)	-	0.0801 (0.9607)	26.0433*** (0.0000)	5.2912* (0.0710)	2.5979 (0.2728)	45.0229*** (0.0000)
ΔLnCPI	2.5689 (0.2768)	8.1638** (0.0169)	-	0.1740 (0.9167)	8.6762** (0.0131)	1.4342 (0.4882)	33.6946*** (0.0002)
ΔLnFDI	0.0826 (0.9596)	3.1416 (0.2079)	0.2273 (0.8925)	-	0.0341 (0.9831)	0.3008 (0.8604)	5.7598 (0.8350)
ΔLnREMI	0.6655 (0.7170	2.0652 (0.3561)	8.0885** (0.0175)	5.2629* (0.0720)	-	1.1531 (0.5618)	20.4558** (0.0252)
ΔLnOPEN	3.9342 (0.1399	3.7468 (0.1536)	5.2539* (0.0723)	8.0386** (0.0180)	0.0836 (0.9591)	-	40.8546*** (0.0000)

ΔLnFDI→Δ LnSPI; ΔLnREMI → ΔLnSPI; ΔLnSPI→ΔLnRGDP

Table 6.24 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, inflation, ΔLnFDI and ΔLnREMI separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN separately Granger cause economic growth, also share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause economic growth. ΔLnREMI Granger causes inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation. Inflation and ΔLnFDI separately Granger cause ΔLnREMI, also share price growth, economic growth, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI. Share price growth, inflation and ΔLnFDI separately Granger cause ΔLnOPEN, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN in a multivariate framework while the interest rate is considered as an exogenous variable.

It can be seen in panel B that ΔLnFDI and ΔLnREMI separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price index, ΔLnFDI, and ΔLnREMI separately Granger cause economic growth, also share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause economic growth. Economic growth and ΔLnREMI separately Granger cause inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation. Inflation and ΔLnFDI separately Granger cause ΔLnREMI, also share price growth, economic growth, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation and ΔLnFDI separately Granger cause ΔLnOPEN, again share price growth, economic growth, inflation, ΔLnFDI and

ΔLnREMI jointly Granger causes ΔLnOPEN in a multivariate framework while corruption risk rating considered as an exogenous variable.

A similar result can be seen in panel C in a multivariate framework while considering government stability as the exogenous variable in the model.

Table 6.25: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 8 of emerging markets.

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnIPI**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnOPEN**	**All**
ΔLnSPI	-	0.7141 (0.6997)	31.8966*** (0.0000)	18.3292*** (0.0001)	15.1192*** (0.0005)	4.6746* (0.0966)	75.0563*** (0.0000)
ΔLnIPI	2.0409 (0.3604)	-	6.6788** (0.0355)	35.5584*** (0.0000)	5.7639* (0.0560)	7.9173** (0.0191)	72.5164*** (0.0000)
ΔLnCPI	0.4977 (0.7797)	1.5682 (0.4565)	-	0.3288 (0.8484)	7.9953** (0.0184)	3.2767 (0.1943)	17.0833* (0.0725)
ΔLnFDI	0.3753 (0.8289)	2.9227 (0.2319)	0.3770 (0.8282)	-	0.2628 (0.8769)	0.1620 (0.9222)	4.9239 (0.8962)
ΔLnREMI	1.1495 (0.5628)	2.4639 (0.2917)	72.3752*** (0.0000)	9.4500*** (0.0089)	-	4.4142 (0.1100)	84.4196*** (0.0000)
ΔLnOPEN	5.7584* (0.0562)	0.3992 (0.8191)	43.9109*** (0.0000)	4.5410 (0.1033)	0.1935 (0.9078)	-	83.4211*** (0.0000)

ΔLnCPI→ΔLnSPI; ΔLnFDI→ΔLnSPI; ΔLnREMI→ΔLnSPI; ΔLnSPI↔ΔLnOPEN

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VAR model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnIPI**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnOPEN**	**All**
ΔLnSPI	-	2.1954 (0.3336)	2.2755 (0.3205)	16.0956*** (0.0003)	7.2177** (0.0271)	0.8448 (0.6555)	33.6623*** (0.0002)
ΔLnIPI	3.1090 (0.2113)	-	0.0284 (0.9859)	34.1297*** (0.0000)	6.7769** (0.0338)	4.0109 (0.1346)	60.4153*** (0.0000)
ΔLnCPI	4.5594 (0.1023)	4.8077* (0.0904)	-	0.0353 (0.9825)	7.3677** (0.0251)	2.1309 (0.3446)	30.6777*** (0.0007)
ΔLnFDI	0.1199 (0.9418)	3.2088 (0.2010)	0.0890 (0.9565)	-	0.0152 (0.9924)	0.1214 (0.9411)	5.2582 (0.8733)
ΔLnREMI	0.2333 (0.8899)	0.5343 (0.7655)	8.8978** (0.0117)	5.5110* (0.0636)	-	1.3060 (0.5205)	18.5649** (0.0461)
ΔLnOPEN	4.4993 (0.1054)	1.0541 (0.5904)	5.5424* (0.0626)	7.6826** (0.0215)	0.3791 (0.8273)	-	37.0867** (0.0001)

ΔLnFDI→ΔLnSPI; ΔLnREMI→ΔLnSPI

PanelA:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VAR model)

Dependent	**Independent ΔLnSPI**	**Independent ΔLnIPI**	**Independent ΔLnCPI**	**Independent ΔLnFDI**	**Independent ΔLnREMI**	**Independent ΔLnOPEN**	**All**
ΔLnSPI	-	1.8769 (0.3912)	1.6320 (0.4422)	16.0848*** (0.0003)	7.1220** (0.0284)	0.8442 (0.6557)	33.1693*** (0.0003)
ΔLnIPI	2.7607 (0.2515)	-	0.0986 (0.9519)	33.8715*** (0.0000)	6.3081** (0.0427)	4.1035 (0.1285)	59.0499*** (0.0000)
ΔLnCPI	4.1906 (0.1230)	5.2998** (0.0707)	-	0.0859 (0.9579)	7.6739** (0.0216)	2.0326 (0.3619)	30.5029*** (0.0007)
ΔLnFDI	0.2252 (0.8935)	2.5762 (0.2758)	0.1676 (0.9196)	-	0.0019 (0.9991)	0.1359 (0.9343)	5.1876 (0.8783)
ΔLnREMI	0.2776 (0.8704)	0.4563 (0.7960)	8.9242** (0.0115)	5.4215* (0.0665)	-	1.2609 (0.5323)	18.7106** (0.0441)
ΔLnOPEN	4.4935 (0.1057)	1.0970 (0.5778)	5.6996* (0.0579)	7.6608** (0.0217)	0.3951 (0.8207)	-	37.7554*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREMI→ΔLnSPI

Table 6.25 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause ΔLnIPI. ΔLnREMI Granger causes inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation. Inflation and ΔLnFDI separately Granger cause ΔLnREMI, also share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI. Share price growth and inflation separately Granger cause ΔLnOPEN, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN in a multivariate framework while interest rate considered as an exogenous variable.

It can be seen in panel B, ΔLnFDI and ΔLnREMI separately Granger causes share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, ΔLnFDI and ΔLnREMI separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause ΔLnIPI. ΔLnIPI and ΔLnREMI Granger cause inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation. Inflation and ΔLnFDI separately Granger cause ΔLnREMI, also share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation and ΔLnFDI separately Granger cause ΔLnOPEN, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN in a multivariate framework while corruption risk rating considered as an exogenous variable.

A similar result can be seen in panel C in a multivariate framework while considering government stability as the exogenous variable in the model.

Table 6.26: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 9 of Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	2.8031 (0.2462)	29.4409*** (0.0000)	3.9693 (0.1374)	20.5089*** (0.0000)	14.2962*** (0.0008)	59.9048*** (0.0000)
ΔLnRGDP	14.9388*** (0.0006)	-	23.7741*** (0.0000)	1.0731 (0.5848)	13.8680*** (0.0010)	18.4357*** (0.0001)	50.4411*** (0.0000)
ΔLnCPI	0.0470 (0.9768)	1.2038 (0.5478)	-	2.3740 (0.3051)	8.0174** (0.0182)	1.9791 (0.3717)	19.8611** (0.0306)
ΔLnREMI	6.8658** (0.0323)	3.2261 (0.1993)	6.0075** (0.0496)	-	2.1439 (0.3423)	0.3176 (0.8531)	21.1172** (0.0203)
ΔLnREER	3.6262 (0.1631)	0.2336 (0.8898)	69.4618*** (0.0000)	3.8877 (0.1432)	-	10.6350*** (0.0049)	79.1910*** (0.0000)
ΔLnOPEN	10.7335*** (0.0047)	1.3155 (0.5180)	44.4625*** (0.0000)	5.3864* (0.0677)	0.1766 (0.9155)	-	87.1313*** (0.0000)

ΔLnCPI →ΔLnSPI; ΔLnREER →ΔLnSPI; ΔLnOPEN ↔ΔLnSPI; ΔLnSPI→ ΔLnRGDP; ΔLnSPI→ ΔLnREMI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	3.7407 (0.1541)	1.3062 (0.5204)	0.8746 (0.6458)	7.8844** (0.0194)	3.7250 (0.1553)	19.1665** (0.0382)
ΔLnRGDP	8.7063** (0.0129)	-	0.1259 (0.9390)	0.2649 (0.8759)	6.8150** (0.0331)	6.0591** (0.0483)	18.0446* (0.0542)
ΔLnCPI	2.5430 (0.2804)	8.5045** (0.0142)	-	0.2552 (0.8802)	8.4558** (0.0146)	1.7843 (0.4098)	34.7375*** (0.0001)
ΔLnREMI	4.0012 (0.1353)	6.8268** (0.0329)	5.0490* (0.0801)	-	2.7255 (0.2560)	0.7553 (0.6855)	21.8797** (0.0157)
ΔLnREER	1.0365 (0.5956)	2.0269 (0.3630)	7.3734** (0.0251)	1.9497 (0.3772)	-	2.8379 (0.2420)	16.5597* (0.0847)
ΔLnOPEN	7.7272** (0.0210)	2.3025 (0.3162)	5.8246* (0.0544)	3.8347 (0.1470)	0.0329 (0.9837)	-	35.3755*** (0.0001)

ΔLnREER →ΔLnSPI; ΔLnSPI→Δ LnRGDP; ΔLnSPI→ ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	3.1298 (0.2091)	0.8437 (0.6558)	1.0809 (0.5825)	7.9633** (0.0187)	4.0335 (0.1331)	18.4731** (0.0475)
ΔLnRGDP	8.2061** (0.0165)	-	0.1113 (0.9459)	0.2318 (0.8906)	6.5445** (0.0379)	6.2486** (0.0440)	17.1790* (0.0705)
ΔLnCPI	2.2407 (0.3262)	8.2419** (0.0162)	-	0.4095 (0.8148)	8.9963** (0.0111)	1.7184 (0.4235)	33.9669*** (0.0002)
ΔLnREMI	3.9684 (0.1375)	6.0602** (0.0483)	5.1336* (0.0768)	-	2.6157 (0.2704)	0.7321 (0.6935)	20.7700** (0.0228)
ΔLnREER	1.0127 (0.6027)	2.1238 (0.3458)	7.3314** (0.0256)	2.0901 (0.3517)	-	2.8511 (0.2404)	17.0641* (0.0730)
ΔLnOPEN	7.7595** (0.0207)	2.3056 (0.3158)	6.0585** (0.0484)	3.9095 (0.1416)	0.0415 (0.9795)	-	36.1180*** (0.0001)

ΔLnREER →ΔLnSPI; ΔLnSPI→ ΔLnRGDP; ΔLnSPI→ ΔLnOPEN

Table 6.26 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, inflation, ΔLnREER and ΔLnOPEN separately Granger cause economic growth, also share price growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause economic growth. ΔLnREER Granger causes inflation, again share price growth, economic growth, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes Inflation. Share price growth and inflation Granger causes ΔLnREMI. Again, share price growth, economic growth, inflation, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, economic growth, inflation, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth, inflation and ΔLnREMI separately Granger cause ΔLnOPEN, again share price growth, economic growth, inflation, ΔLnREMI, and ΔLnREER jointly Granger causes ΔLnOPEN in a multivariate framework while considering interest rate as the exogenous variable in the model.

It can be seen in panel B, ΔLnREER Granger causes share price growth. Again, economic growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, ΔLnREER and ΔLnOPEN separately Granger cause economic growth, also share price growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause economic growth. Economic growth and ΔLnREER separately Granger cause inflation, again share price growth, economic growth, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes Inflation. Economic growth and inflation Granger causes ΔLnREMI. Again, share price growth, economic growth, inflation, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation Granger causes ΔLnREER, also share price growth, economic growth, inflation, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth and inflation separately Granger cause ΔLnOPEN, again share price growth, economic growth, inflation, ΔLnREMI, and ΔLnREER jointly Granger causes ΔLnOPEN in a multivariate framework while considering corruption risk rating as the exogenous variable in the model.

A similar result can be seen in panel C in a multivariate framework while considering government stability as the exogenous variable in the model.

Table 6.27: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 10 Of Emerging Markets

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	1.7451 (0.4179)	28.7184*** (0.0000)	4.2325 (0.1205)	22.2315*** (0.0000)	13.2890*** (0.0013)	57.1396*** (0.0000)
ΔLnIPI	10.1879*** (0.0061)	-	5.4279* (0.0663)	0.3577 (0.8362)	10.2898*** (0.0058)	15.9005*** (0.0004)	31.5734*** (0.0005)
ΔLnCPI	0.0936 (0.9543)	1.4828 (0.4764)	-	2.1006 (0.3498)	7.3728** (0.0251)	2.3535 (0.3083)	19.0102** (0.0401)
ΔLnREMI	8.1356** (0.0171)	6.7261** (0.0346)	5.8478* (0.0537)	-	3.3016 (0.1919)	0.6369 (0.7273)	24.7737*** (0.0058)
ΔLnREER	2.9716 (0.2263)	1.3294 (0.5144)	69.6281*** (0.0000)	4.0707 (0.1306)	-	10.8390*** (0.0044)	77.0285*** (0.0000)
ΔLnOPEN	10.4151*** (0.0055)	0.1905 (0.9091)	43.8854*** (0.0000)	5.2958* (0.0708)	0.0967 (0.9528)	-	84.4804*** (0.0000)

ΔLnCPI →ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnOPEN ↔ΔLnSPI; ΔLnSPI→ ΔLnIPI; ΔLnSPI→ ΔLnREMI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	2.1798 (0.3363)	1.2419 (0.5374)	1.0708 (0.5854)	9.3931*** (0.0091)	3.3385 (0.1884)	17.4954* (0.0641)
ΔLnIPI	6.7983** (0.0334)	-	0.5092 (0.7752)	0.2178 (0.8968)	8.3169** (0.0156)	8.6306** (0.0134)	22.9253** (0.0110)
ΔLnCPI	4.3130 (0.1157)	4.9909* (0.0825)	-	0.1524 (0.9266)	7.3811** (0.0250)	2.2507 (0.3245)	30.8115*** (0.0006)
ΔLnREMI	4.3304 (0.1147)	8.0193** (0.0181)	5.5804* (0.0614)	-	3.3629 (0.1861)	1.4557 (0.4829)	23.1531** (0.0102)
ΔLnREER	0.4845 (0.7849)	0.7411 (0.6903)	8.1570** (0.0169)	2.3226 (0.3131)	-	3.0421 (0.2185)	15.1878 (0.1254)
ΔLnOPEN	8.9157** (0.0116)	0.4121 (0.8138)	6.2500** (0.0439)	4.2469 (0.1196)	0.2616 (0.8774)	-	33.1974*** (0.0003)

ΔLnREER →ΔLnSPI; ΔLnSPI→ ΔLnIPI; ΔLnSPI→ ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	1.9804 (0.3715)	0.8147 (0.6654)	1.2547 (0.5340)	9.3977*** (0.0091)	3.5733 (0.1675)	17.2428* (0.0692)
ΔLnIPI	6.2395** (0.0442)	-	0.6797 (0.7119)	0.1893 (0.9097)	7.8862** (0.0194)	8.9046** (0.0117)	21.9600** (0.0153)
ΔLnCPI	3.8991 (0.1423)	5.2797* (0.0714)	-	0.2265 (0.8929)	7.7617** (0.0206)	2.2064 (0.3318)	30.6633*** (0.0007)
ΔLnREMI	4.2544 (0.1192)	8.3189** (0.0156)	5.5773* (0.0615)	-	3.3362 (0.1886)	1.4535 (0.4835)	23.1790** (0.0101)
ΔLnREER	0.5266 (0.7685)	0.7378 (0.6915)	8.1725** (0.0168)	2.4715 (0.2906)	-	3.0453 (0.2181)	15.5827 (0.1122)
ΔLnOPEN	8.9229** (0.0115)	0.4160 (0.8122)	6.4693** (0.0394)	4.2948 (0.1168)	0.2809 (0.8690)	-	33.9344*** (0.0002)

ΔLnREER →ΔLnSPI; ΔLnSPI→ ΔLnIPI; ΔLnSPI→ ΔLnOPEN

Table 6.27 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, inflation, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, ΔLnREER and ΔLnOPEN separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause ΔLnIPI. ΔLnREER Granger causes inflation, again share price growth, ΔLnIPI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger Cause Inflation. Share price growth, ΔLnIPI and inflation Granger cause ΔLnREMI. Again, share price growth, ΔLnIPI, inflation, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, ΔLnIPI, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth, inflation and ΔLnREMI separately Granger cause ΔLnOPEN, again Share price growth, ΔLnIPI, inflation, ΔLnREMI and ΔLnREER jointly Granger cause ΔLnOPEN in a multivariate framework while the interest rate is the exogenous variable in the model.

It can be seen in panel B, ΔLnREER Granger causes share price growth. Again, ΔLnIPI, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, ΔLnREER and ΔLnOPEN separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause ΔLnIPI. ΔLnIPI and ΔLnREER Granger cause inflation, again share price growth, ΔLnIPI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation. ΔLnIPI and inflation Granger causes ΔLnREMI, again, share price growth, ΔLnIPI, inflation, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation Granger causes ΔLnREER, also share price growth, ΔLnIPI, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth and inflation separately Granger cause ΔLnOPEN, again Share price growth, ∆LnIPI, inflation, ∆LnREMI and ∆LnREER jointly Granger cause ∆LnOPEN in a multivariate framework while corruption risk rating is the exogenous variable in the model.

A similar result can be seen in panel C in a multivariate framework, while government stability is the exogenous variable in the model.

Table 6.28: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 11 Of Emerging Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnRGDP	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	ΔLnOPEN	All
ΔLnSPI	-	2.5202 (0.2836)	36.1763*** (0.0000)	21.7721*** (0.0000)	4.0667 (0.1309)	16.0988*** (0.0003)	5.9421* (0.0512)	87.5991*** (0.0000)
ΔLnRGDP	4.1831 (0.1235)	-	31.3321*** (0.0000)	38.3201*** (0.0000)	1.5312 (0.4651)	10.1690*** (0.0062)	9.1198** (0.0105)	97.9213*** (0.0000)
ΔLnCPI	0.1084 (0.9473)	0.9730 (0.6148)	-	0.3438 (0.8420)	2.3370 (0.3108)	8 1420** (0.0171)	2.1041 (0.3492)	20.0405* (0.0663)
ΔLnFDI	0.2861 (0.8667)	2.9474 (0.2291)	0.2617 (0.8773)	-	1.9868 (0.3703)	0 1349 (0.9348)	0.1367 (0.9339)	7.6782 (0.8097)
ΔLnREMI	4.1543 (0.1253)	2.8216 (0.2439)	5.1130* (0.0776)	2.3993 (0.3013)	-	1.7372 (0.4195)	0.1019 (0.9503)	23.5586** (0.0233)
ΔLnREER	1.2175 (0.5440)	1.0926 (0.5791)	74.8519*** (0.0000)	9.4932*** (0.0087)	3.8255 (0.1477)	-	5.2349* (0.0730)	91.6511*** (0.0000)
ΔLnOPEN	5.8977* (0.0524)	1.6309 (0.4425)	44.7797*** (0.0000)	6.4383** (0.0400)	6.6328** (0.0363)	0 3527 (0.8383)	-	95.5032*** (0.0000)

ΔLnCPI →ΔLnSPI; ΔLnFDI →ΔLnSPI; ΔLnREER →ΔLnSPI; ΔLnOPEN ↔ΔLnSPI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VAR model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnRGDP	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	ΔLnOPEN	All
ΔLnSPI	-	3.5023 (0.1736)	2.2108 (0.3311)	16.1077*** (0.0003)	0.7971 (0.6713)	6.0228** (0.0492)	0.8363 (0.6583)	36.5319*** (0.0003)
ΔLnRGDP	4 9705* (0.0833)	-	0.1679 (0.9195)	25.9204*** (0.0000)	0.1845 (0.9119)	5.5136* (0.0635)	2.3940 (0.3021)	45.9726*** (0.0000)
ΔLnCPI	2.5652 (0.2773)	8.3494** (0.0154)	-	0.1609 (0.9227)	0.3135 (0.8549)	8 2848** (0.0159)	1.3480 (0.5097)	34.6012*** (0.0005)
ΔLnFDI	0.0932 (0.9545)	2.6168 (0.2703)	0.0538 (0.9735)	-	3.1510 (0.2069)	0.0344 (0.9830)	0.3422 (0.8427)	8.8927 (0.7121)
ΔLnREMI	3.0851 (0.2138)	6.3506** (0.0418)	4.3915 (0.1113)	1.6514 (0.4379)	-	2 3194 (0.3136)	0.6923 0.7074)	23.4956** (0.0238)
ΔLnREER	0.4639 (0.7930)	1.8567 (0.3952)	8.1358** (0.0171)	5.2792* (0.0714)	1.9044 (0.3859)	-	1.4027 (0.4959)	22.0914** (0.0365)
ΔLnOPEN	5 3647* (0.0684)	2.5738 (0.2761)	5.0759* (0.0790)	8.5727** (0.0138)	4.3691 (0.1125)	0 1353 (0.9346)	-	45.0296*** (0.0000)

ΔLnFDI →ΔLnSPI; ΔLnREER →ΔLnSPI; ΔLnSPI→ ΔLnRGDP; ΔLnSPI→ ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VAR model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnRGDP	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	ΔLnOPEN	All
ΔLnSPI	-	2.8178 (0.2444)	1.5337 (0.4645)	16.1905*** (0.0003)	1.0380 (0.5951)	6 1020** (0.0473)	0.8727 (0.6464)	35.8829*** (0.0003)
ΔLnRGDP	4.6299* (0.0988)	-	0.0877 (0.9571)	25.7579*** (0.0000)	0.1912 (0.9088)	5.2641* (0.0719)	2.4755 (0.2900)	44.8353*** (0.0000)
ΔLnCPI	2.2950 (0.3174)	8.3066** (0.0157)	-	0.2699 (0.8738)	0.5034 (0.7775)	8.7838** (0.0124)	1.2289 (0.5409)	33.9634*** (0.0007)
ΔLnFDI	0.0066 (0.9967)	2.2183 (0.3298)	0.1817 (0.9132)	-	3.0758 (0.2148)	0.0883 (0.9568)	0.3383 (0.8444)	8.8644 (0.7145)
ΔLnREMI	3.1232 (0.2098)	5.8396* (0.0539)	4.5273 (0.1040)	1.6251 (0.4437)	-	2 1314 (0.3445)	0.6509 (0.7222)	22.3588** (0.0337)
ΔLnREER	0.4882 (0.7834)	1.8796 (0.3907)	8.0671** (0.0177)	5.1780* (0.0751)	2.0352 (0.3615)	-	1.3612 (0.5063)	22.4944** (0.0323)
ΔLnOPEN	5 3911* (0.0675)	2.6015 (0.2723)	5.2027* (0.0742)	8.5395** (0.0140)	4.4382 (0.1087)	0 1429 (0.9310)	-	45.7561*** (0.0000)

ΔLnFDI →ΔLnSPI; ΔLnREER →ΔLnSPI; ΔLnSPI→ ΔLnRGDP; ΔLnSPI→ ΔLnOPEN

Table 6.28 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause economic growth, also share price growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause economic growth. ΔLnREER separately Granger causes inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation. Inflation Granger causes ΔLnREMI. Again, share price growth, economic growth, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation, ΔLnFDI, and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, economic growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth, inflation, ΔLnFDI and ΔLnREMI separately Granger cause ΔLnOPEN, again Share price growth, inflation, economic growth, ΔLnFDI, ΔLnREMI, ΔLnREER combinedly Granger causes ΔLnOPEN in a multivariate framework while the interest rate is the exogenous variable in the model.

It can be seen in panel B, ΔLnFDI and ΔLnREER separately Granger causes share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, ΔLnFDI and ΔLnREER separately Granger cause economic growth, also share price growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause economic growth. Economic growth and ΔLnREER separately Granger cause inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation.

Economic growth Granger causes ΔLnREMI, again, share price growth, economic growth, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation and ΔLnFDI separately Granger cause ΔLnREER, also share price growth, economic growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth, inflation and ΔLnFDI separately Granger cause ΔLnOPEN, again Share price growth, inflation, economic growth, ΔLnFDI, ΔLnREMI, ΔLnREER combinedly Granger causes ΔLnOPEN in a multivariate framework while corruption risk rating is the exogenous variable in the model.

A similar result can be seen in panel C in a multivariate framework, while government stability is the exogenous variable in the model.

Table 6.29: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 12 of Emerging Markets

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	0.5703 (0.7519)	33.4654*** (0.0000)	18.2624*** (0.0001)	4.3049 (0.1162)	16.5911*** (0.0002)	6.2889** (0.0431)	80.2670*** (0.0000)
ΔLnIPI	2.0619 (0.3567)	-	6.9650** (0.0307)	35.5134*** (0.0000)	0.6303 (0.7297)	5.9455* (0.0512)	8.1820** (0.0167)	72.6267*** (0.0000)
ΔLnCPI	0.1910 (0.9089)	1.3426 (0.5110)	-	0.3119 (0.8556)	2.0650 (0.3561)	7.5169** (0.0233)	2.4745 (0.2902)	19.1541* (0.0849)
ΔLnFDI)	0.2461 (0.8842)	2.2076 (0.3316)	0.2568 (0.8795)	-	1.9948 (0.3688)	0.2940 (0.8633)	0.1418 (0.9316)	6.9186 (0.8629)
ΔLnREMI	5.4870* (0.0643)	6.2655** (0.0436)	5.0612* (0.0796)	1.6084 (0.4474)	-	2.7353 (0.2547)	0.4105 (0.8144)	26.3313*** (0.0096)
ΔLnREER	1.2109 (0.5458)	2.7318 (0.2552)	74.1607*** (0.0000)	9.3389*** (0.0094)	4.0163 (0.1342)	-	5.7795* (0.0556)	89.3271*** (0.0000)
ΔLnOPEN	6.0029** (0.0497)	0.2097 (0.9004)	44.1319*** (0.0000)	5.6079* (0.0606)	6.3590* (0.0416)	0.3236 (0.8506)	-	91.6840*** (0.0000)

ΔLnCPI → ΔLnSPI; ΔLnFDI → ΔLnSPI; ΔLnREER → ΔLnSPI; ΔLnOPEN ↔ ΔLnSPI; ΔLnSPI →ΔLnREMI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	1.6685 (0.4342)	2.1065 (0.3488)	15.7999*** (0.0004)	0.9244 (0.6299)	7.4015** (0.0247)	0.8835 (0.6429)	34.4183*** (0.0006)
ΔLnIPI	3.1193 (0.2102)	-	0.0220 (0.9891)	33.7816*** (0.0000)	0.1893 (0.9097)	6.8151** (0.0331)	3.8595 (0.1452)	60.0958*** (0.0000)
ΔLnCPI	4.2940 (0.1168)	4.7654* (0.0923)	-	0.0588 (0.9710)	0.1748 (0.9163)	7.2952** (0.0261)	1.9357 (0.3799)	30.5921*** (0.0023)
ΔLnFDI)	0.0347 (0.9828)	2.1701 (0.3379)	0.0238 (0.9882)	-	3.1468 (0.2073)	0.0514 (0.9746)	0.1753 (0.9161)	8.4330 (0.7504)
ΔLnREMI	3.3363 (0.1886)	7.5905** (0.0225)	4.8686* (0.0877)	1.7104 (0.4252)	-	2.8256 (0.2435)	1.2311 (0.5404)	24.8323** (0.0156)
ΔLnREER	0.2292 (0.8917)	0.7108 (0.7009)	8.9008** (0.0117)	5.4090* (0.0669)	2.2510 (0.3245)	-	1.5437 (0.4622)	20.8376* (0.0528)
ΔLnOPEN	6.1660** (0.0458)	0.4257 (0.8083)	5.5550* (0.0622)	8.2899** (0.0158)	4.8757* (0.0873)	0.5047 (0.7770)	-	42.4585*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnREER → ΔLnSPI; ΔLnSPI → ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VAR model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	1.3579 (0.5072)	1.4681 (0.4800)	15.8459*** (0.0004)	1.1595 (0.5600)	7.3894** (0.0249)	0.8912 (0.6404)	34.1992*** (0.0006)
ΔLnIPI	2.7788 (0.2492)	-	0.0863 (0.9578)	33.5339*** (0.0000)	0.1680 (0.9194)	6.3322** (0.0422)	3.9524 (0.1386)	58.7147*** (0.0000)
ΔLnCPI	3.9286 (0.1403)	5.2269* (0.0733)	-	0.1300 (0.9371)	0.2692 (0.8740)	7.6513** (0.0218)	1.8238 (0.4018)	30.5266*** (0.0023)
ΔLnFDI)	0.0102 (0.9949)	1.6294 (0.4428)	0.1508 (0.9274)	-	3.0445 (0.2182)	0.0695 (0.9658)	0.1841 (0.9121)	8.2573 (0.7647)
ΔLnREMI	3.3328 (0.1889)	8.1682** (0.0168)	4.9364* (0.0847)	1.7150 (0.4242)	-	2.7107 (0.2579)	1.1879 (0.5521)	24.8632** (0.0155)
ΔLnREER	0.3166 (0.8536)	0.6543 (0.7210)	8.8649** (0.0119)	5.3276* (0.0697)	2.4056 (0.3004)	-	1.4931 (0.4740)	21.1514** (0.0482)
ΔLnOPEN	6.1503** (0.0462)	0.4439 (0.8009)	5.6439* (0.0595)	8.2464** (0.0162)	4.9018* (0.0862)	0.5133 (0.7736)	-	43.1667*** (0.0000)

ΔLnFDI →ΔLnSPI; ΔLnREER → ΔLnSPI; ΔLnSPI → ΔLnOPEN

Table 6.29 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause ΔLnIPI. ΔLnREER separately Granger causes inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes Inflation. Share price growth, ΔLnIPI and inflation Granger causes ΔLnREMI, again, share price growth, ΔLnIPI, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation, ΔLnFDI, and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth, inflation, ΔLnFDI and ΔLnREMI separately Granger cause ΔLnOPEN, again Share price growth, inflation, ΔLnIPI, ΔLnFDI, ΔLnREMI, ΔLnREER combinedly Granger cause ΔLnOPEN in a multivariate framework while IR is the exogenous variable in the model.

It can be seen in panel B, ΔLnFDI and ΔLnREER separately Granger causes share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, ΔLnFDI and ΔLnREER separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause ΔLnIPI. ΔLnIPI, ΔLnREER separately Granger cause inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation. ΔLnIPI and inflation Granger causes ΔLnREMI, again, share price growth, ΔLnIPI, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation and

ΔLnFDI separately Granger cause ΔLnREER, also share price growth, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER.

Share price growth, inflation, ΔLnFDI and ΔLnREMI separately Granger cause ΔLnOPEN, again Share price growth, inflation, ΔLnIPI, ΔLnFDI, ΔLnREMI, ΔLnREER combinedly Granger cause ΔLnOPEN in a multivariate framework while LnCR is the exogenous variable in the model.

A similar result can be seen in panel C in a multivariate framework, while LnGS is the exogenous variable in the model.

Bivariate Granger Causality Test

This study applied bivariate Granger causality to check the direction of causality. These results presented in 12 Tables numbered Tables 6.6 to 6.17 confirm the presence of causality. It can be seen that ΔLnRGDP, ΔLnIPI, ΔLnFDI, ΔLnREER Granger causes ΔLnSPI. These results are highly significant at the 1% level. This result is supported by Abbes et al. (2015). Abbes et al. (2015) find that ΔLnFDI Granger causes economic growth in the long run (Abbes et al., 2015). If there is a one-way causality from economic growth to ΔLnFDI, this means that national income growth can be viewed as a mechanism for attracting FDI inflows. Conversely, if the unidirectional causality ranges from ΔLnFDI to economic output, this would clearly imply that ΔLnFDI promotes economic growth and contributes to fixed capital formation and a rise in jobs (Borensztein et al., 1998; Zhang, 2001). Finally, ΔLnCPI, ΔLnREMI, and ΔLnOPEN do not Granger cause ΔLnSPI.

6.9 Important Findings and It's Interpretations:

This study finds that, in emerging markets, real GDP growth, FDI growth, REER growth, corruption risk rating, and government stability positively influence share price growth in the short run. But interest rate negatively influences share price growth in the short run, which is theoretically consistent. Various previous research, including those of Waud (1970) , Nelson (1976), Fama and Schwert (1977), and Fama (1981), also indicated that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), and Ferrer et al. (2016) have also confirmed this trend of relationship. Several studies suggest that corruption has a positive impact on the development of the stock market. Pastor and Veronesi (2012) claim that if investors regard bribery as an enterprise resource, it removes confusion regarding government policy and tends to solve the country's inefficiencies. In this context, especially in emerging markets, bribery can reduce stock volatility (Pastor & Veronesi 2012). Yartey (2008), Perotti and Pieter (2001), Winful et al. (2016), Gani and Ngassam (2008) also support a positive relationship between government stability and share price. The results highlighted that political risk, law and order, and bureaucratic quality is important determinants of stock market development as they enhance the viability of external finance.

6.10 Summary

This chapter discussed the data used in this study for 9 emerging markets: Brazil, Greece, India, Indonesia, Korea, Pakistan, South Africa, Thailand, and Turkey. Eight significant macroeconomic variables and two institutional-quality variables were selected for this study based on the recent studies using annual data from 1984 to 2019. The majority of the results using different methodologies are theoretically consistent and conform with the existing literature.

This chapter demonstrated econometric analysis of descriptive statistics of the selected variables followed by correlation analysis, unit root test, optimum lag length selection, cointegration test, VAR model, and Granger causality test.

7 Chapter 7: Cointegration Analysis for Developed Markets

7.1 Introduction

This chapter discusses the results of the cointegration analysis of selected 21 developed markets in the world used in this study. This chapter is consisting of 10 sections as follows. Section 7.2 discusses which developed markets are included in this study. Sections 6.3 and 6.4 present descriptive statistics and correlation analysis. Section 7.5 provides detailed results of the unit root test of the selected variables. After confirmation of descriptive statistics and correlation analysis, the unit Root test is done as successive steps in Vector Error Correction Model (VECM). This chapter also discusses VECM and Granger causality but also includes optimum lag length criteria and panel cointegration test. Section 7.6 discusses the results for panel cointegration with Pedroni cointegration techniques. Section 7.7 presents the long run coefficient using fully modified ordinary least square (FMOLS) and dynamic ordinary least square (DOLS) method. Section 7.8 presents the results for short run coefficients using VECM, where Section 7.9 discusses the results on panel causality. Lastly the conclusion of the study is provided in section 7.10.

7.2 Selection of Developed Market

Morgan Stanley Capital International Inc. (MSCI) classified the world capital market into three categories: developed markets, emerging markets, and frontier markets. The market classification of MSCI has been adopted for this study. This study has considered 21 developed markets.

7.3 Descriptive Statistics

The descriptive statistics of variables (in natural logarithm) and growth variables (first difference in natural logarithm) in this study are presented in Table 7.1 (panel A and B, respectively).

Table 7.1 summarizes the basic summary statistics of the data under consideration including the mean, median, maximum, minimum, and standard deviation for the variables in their levels as well as in first differences.

It can be seen that the mean of LnSPI is 4.2264, and the median is 4.4509. Based on the dispersion levels of the series obtained from the standard deviation statistics (Table 7.1 Panel A), LnSPI, LnCPI, LnREER, LnOPEN, LnCR, and LnGS are less volatile in comparison with the remaining variables. The highest volatility is demonstrated in IR.

On average, the share price growth for all countries combined is 6.08% per annum, and the real GDP growth is 2.34%. The average inflation is 2.79%. Average IP growth and FDI growth are 1.96% and 11.09%, respectively. The workers' remittances growth volatility is the highest, and the real GDP growth is the lowest.

Table 7.1: Summary Statistics for Developed Markets

Panel A: For level variables											
	LnSPI	**LnRGDP**	**LnIPI**	**LnCPI**	**LnFDI**	**LnREMI**	**LnREER**	**LnOPEN**	**IR**	**LnCR**	**LnGS**
Mean	4.2264	27.2720	11.3871	4.3962	11.6101	21.0107	4.5816	4.1541	4.7733	1.5487	2.0462
Median	4.4509	26.9652	11.1508	4.4652	11.6354	20.9671	4.5806	4.1650	3.7352	1.6094	2.0680
Maximum	6.1601	30.5379	14.6486	4.7897	16.0632	24.0146	5.0754	5.4774	24.9000	1.7918	2.4054
Minimum	1.5900	24.9108	9.2594	1.0077	6.6966	16.7298	4.2566	2.7735	-0.7838	0.6931	1.1527
Std. dev.	0.7699	1.2584	1.2623	0.3134	1.6775	1.2612	0.1188	0.4974	4.4776	0.2162	0.2066

Panel B: For growth variables										
	ΔLnSPI	**ΔLnRGDP**	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**ΔLnCR**	**ΔLnGS**
Mean	0.0608	0.0234	0.0196	0.0279	0.1109	0.0808	0.0023	0.0087	-0.0045	-0.0080
Median	0.0713	0.0236	0.0214	0.0208	0.0988	0.0422	0.0050	0.0135	0.0000	-0.0051
Maximum	0.9722	0.2244	0.6514	1.4080	0.9896	20.0026	0.2659	0.1556	0.4418	0.5900
Minimum	-0.9313	-0.0842	-0.2641	-0.0458	-1.1763	-2.6555	-0.2188	-0.3397	-0.7122	-0.5010
Std. dev.	0.2064	0.0230	0.0526	0.0585	0.1735	0.7885	0.0475	0.0592	0.0740	0.1418

Note: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; OPEN: Trade Openness; CR: Corruption risk rating; and GS: Government stability.

7.4 Correlation Analysis

The correlation matrix (Table 7.2 and Table 7.3) shows the degree of association of variables (in natural logarithm) and growth variables (the 1st difference), respectively.

The result presented in Table 7.2 is the correlation coefficient among the variables in level reveals that the correlations between the variables under study are not very high except for LnRGDP and LnIPI. To avoid multicollinearity problems, this study will not use LnRGDP and LnIPI together for further econometric analysis.

Therefore, there is no sign of multicollinearity in the system, which causes difficulty estimating model parameters. To detect the possible problem of multicollinearity, the data series are replaced with percentage changes by transforming level data into natural log form to their first differences (Table 7.3).

The correlation coefficients among the growth variables presented in Table 7.3 are not very high (below 0.7) and, therefore, can be considered together in the analysis.

Table 7.2: Correlation Matrix of Log Variables for Developed Markets

For level variables											
	LnSPI	**LnCPI**	**LnRGDP**	**LnIPI**	**LnFDI**	**LnREMI**	**LnREER**	**IR**	**LnOPEN**	**LnCR**	**LnGS**
LnSPI	1.0000										
LnCPI	0.6604*** (23.0515)	1.0000									
LnRGDP	0.1314*** (3.4752)	0.2128*** (5.7089)	1.0000								
LnIPI	0.1715*** (4.5633)	0.1942*** (5.1898)	0.9709*** (106.2946)	1.0000							
LnFDI	0.5291*** (16.3448)	0.6053*** (19.9318)	0.6314*** (21.3431)	0.6117*** (20.2673)	1.0000						
LnREMI	0.3884*** (11.0482)	0.2977*** (8.1728)	0.5558*** (17.5257)	0.5542*** (17.4509)	0.6613*** (23.1047)	1.0000					
LnREER	0.0743* (1.9535)	0.2792*** (7.6213)	0.2008*** (5.3717)	0.2100*** (5.6291)	-0.001 (-0.0265)	-0.0545 (-1.4305)	1.0000				
IR	-0.574*** (-18.3717)	-0.864*** (-44.9862)	-0.2763*** (-7.5345)	-0.2724*** (-7.4192)	-0.631*** (-21.3198)	-0.3362*** (-9.3564)	-0.1743*** (-4.6409)	1.0000			
LnOPEN	0.2136*** (5.7295)	0.2212*** (5.9441)	-0.5938*** (-19.3423)	-0.5519*** (-17.3451)	0.0458 (1.2013)	-0.0296 (-0.7770)	-0.2737*** (-7.4574)	-0.235*** (-6.3365)	1.0000		
LnCR	-0.3623*** (-10.1871)	-0.2355*** (-6.3504)	-0.2812*** (-7.6813)	-0.3135*** (-8.6547)	-0.2953*** (-8.1022)	-0.3093*** (-8.5262)	-0.0922** (-2.4257)	0.2639*** (7.1700)	0.1004*** (2.6462)	1.0000	
LnGS	-0.0733* (-1.9260)	-0.1256*** (-3.3190)	-0.0077 (-0.2016)	0.016 (0.4188)	-0.0539 (-1.4155)	-0.1721*** (-4.5796)	-0.0315 (-0.8270)	-0.007 (-0.1838)	0.0344 (0.9023)	0.0436 (1.1449)	1.0000

Note 1: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; OPEN: Trade Openness; CR: Corruption risk rating; and GS: Government stability.
Note 2: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

Table 7.3: Correlation Matrix of Growth Variables for Developed Markets

For growth variables										
	ΔLnSPI	**ΔLnCPI**	**ΔLnRGDP**	**ΔLnIPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**ΔLnCR**	**ΔLnGS**
ΔLnSPI	1.0000									
ΔLnCPI	0.0395 (1.0328)	1.0000								
ΔLnRGDP	0.3851*** (10.9125)	0.1095*** (2.8810)	1.0000							
ΔLnIPI	0.3909*** (11.1077)	-0.0299 (-0.7831)	0.7685*** (31.4131)	1.0000						
ΔLnFDI	0.3119*** (8.5850)	0.1014*** (2.6649)	0.2184*** (5.8546)	0.2198*** (5.8925)	1.0000					
ΔLnREMI	0.0521 (1.3642)	-0.0058 (-0.1509)	0.0001 (0.0026)	0.0247 (0.6454)	0.0430 (1.1244)	1.0000				
ΔLnREER	0.2407*** (6.4855)	0.1230*** (3.2423)	0.0473 (1.2378)	-0.0453 (-1.1870)	0.2599*** (7.0389)	0.0434 (1.1372)	1.0000			
ΔLnOPEN	0.0935** (2.4572)	-0.0589 (-1.5422)	0.2701*** (7.3358)	0.4675*** (13.8327)	-0.1144*** (-3.0108)	0.0168 (0.4400)	-0.5105*** (-15.5260)	1.0000		
ΔLnCR	-0.0097 (-0.2538)	-0.0237 (-0.6208)	-0.0280 (-0.7320)	-0.0016 (-0.0410)	-0.0251 (-0.6577)	0.0219 (0.5740)	0.0716* (1.8778)	-0.0383 (-1.0030)	1.0000	
ΔLnGS	0.0303 (0.7940)	-0.1051*** (-2.7642)	0.0552 (1.4446)	0.0265 (0.6946)	-0.0232 (-0.6070)	-0.0011 (-0.0278)	0.0303 (0.7937)	-0.0554 (-1.4510)	0.1091*** (2.8702)	1.0000

Note 1: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: interest rate; OPEN: Trade Openness; CR: Corruption risk rating; and GS: Government stability.
Note 2: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

7.5 Unit Root Test Results

In panel data analysis, particularly for cointegration and Granger causality, an essential first step is to identify the stationary properties of the variables (Pradhan et al., 2018). As a prerequisite of the cointegration analysis, the variables in level should be integrated at order one, i.e. I(1), and the corresponding 1st difference should be stationary of I(0).

This study subsequently runs the LLC tests, ADF tests and PP tests on all of the variables individually in order to check stationarity for every data series under the research. Regarding the LLC, ADF and PP tests, the null hypothesis of a unit root cannot be accepted unless the computed t-statistic excesses the critical values at a 5 % level of significance (which is the preferable statistical significance level used in many econometric papers). The results of the ADF and PP tests are mostly consistent in all variables in level except IR.

The unit root test results are presented in Table 7.4 using LLC, Augmented Dicky-Fuller (ADF) and Philips Perron (PP). The result shows that LnSPI, LnCPI, LnRGDP, LnIPI, LnFDI, LnREMI, LnREER, LnOPEN, LnCR, LnGS are non-stationary and IR is stationary at levels of their natural logarithm value, and the variables are stationary at their first difference. This certainly meets the requirements of the cointegration, VECM and Granger Causality test.

Hence, the next step is to test whether there exists a long run equilibrium relationship among these variables under study. While there is a number of tests to serve this purpose, this study used the Pedroni cointegration test due to its popularity.

Table 7.4: Unit Root Test for Panel Data of Developed Markets

	Level				1st Difference			
	LLC	**ADF**	**PP**	**Order**	**LLC**	**ADF**	**PP**	**Order**
LnSPI	5.7985	5.2102	4.6311	**I (1)**	-17.8001***	356.3960***	339.9639***	**I (0)**
LnCPI	15.1107	1.8560	0.2170	**I (1)**	-9.3713***	146.8193***	313.0099***	**I (0)**
LnRGDP	23.8205	0.1617	0.0188	**I (1)**	-9.3953***	159.8506***	158.6893***	**I (0)**
LnIPI	10.0299	0.9851	0.9226	**I (1)**	-18.6005***	390.2407***	408.3533***	**I (0)**
LnFDI	16.1744	1.0485	0.0735	**I (1)**	-15.5315***	311.6471***	377.8942***	**I (0)**
LnREMI	7.3393	4.6830	4.5025	**I (1)**	-20.0464***	440.0341***	471.2496***	**I (0)**
LnREER	1.9803	14.0449	15.6529	**I (1)**	-21.6683***	485.0078***	478.5473***	**I (0)**
IR	-10.6722***	167.0492***	180.7658***	**I (0)**	N/A	N/A	N/A	
LnOPEN	3.8735	7.8417	7.4069	**I (1)**	-24.2659***	561.4822***	568.4846***	**I (0)**
LnCR	-2.4200***	34.9486	41.5532	**I (1)**	-19.4280***	420.1021***	475.1601***	**I (0)**
LnGS	-2.23547***	31.8794	34.7967	**I (1)**	-23.7500***	536.0697***	625.5857***	**I (0)**

Note 1: SPI: Share price index; CPI: Consumer price index; RGDP: Real gross domestic product; IPI: Industrial production index; FDI: Foreign direct investment; REMI: Workers' remittances; REER: Real effective exchange rate; IR: Interest rate; CR: Corruption risk rating; and GS: Government stability.

Note 2: LLC stands Levin–Lin–Chu test (Levine et al., 2002), ADF stands for ADF- Fischer Chi-square test (Maddala & Wu, 1999), PP stands PP-Fischer Chi-square test (Choi, 2001), I(1) stands for integrated of order one or non-stationary, and I(0) stands for integrated of order zero or stationary.

Note 3: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

7.6 Cointegration Test

It is evident from the above sections that all variables under study are integrated into order one, which satisfies the criteria of the cointegration test. The next step is then to test whether there is a long-term relationship among these variables. Although there are a variety of tests available here, such as Maddala and Wu (1999), Kao (1999) and Pedroni (1999), this analysis used Pedroni (1999) because of its popularity.

The null hypothesis under consideration is that there is no existence of cointegration and presents the number of cointegrating relationships. The results of the Pedroni cointegration tests are exhibited in Table 7.5 for twelve models[29].

The results of the panel cointegration test, based on Group PP and Group ADF statistics, are shown in Table 7.5 (Panel A). It may be seen that the Group ADF statistics are significant, at least at a 1% level for most of the models, and some of them are significant for Group PP. This study also checked cointegration existing among the variables used in this study by implementing the four-panel cointegration tests $(P_\alpha, P_\tau,\ G_\alpha\ and\ G_\tau)$ developed by Westerlund (2007). The results are shown in Panel B of Table 7.5. Similarly, the panel ADF statistics are significant for all models at the 1% level. Therefore, this study concludes that the variables are cointegrated at their level, and the null hypothesis of non-cointegration can be rejected. As the variables are cointegrated, the results support the existence of a long run relationship among variables under study.

[29] This study has considered 32 different models with different combinations of variables. These models are presented in Table 4.1A Appendix 4A but 12 models are reported in this chapter.

Table 7.5: Results for Panel Cointegration Analysis of Developed Markets

Panel A: Pedroni cointegration test												
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**	**Model 10**	**Model 11**	**Model 12**
	LnSPI LnRGDP LnCPI	LnSPI LnIPI LnCPI	LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER	LnSPI LnIPI LnCPI LnFDI LnREMI LnREER	LnSPI LnRGDP LnCPI LnFDI LnREMI LnOPEN	LnSPI LnIPI LnCPI LnFDI LnREMI LnOPEN	LnSPI LnRGDP LnCPI LnFDI LnREER LnOPEN	LnSPI LnIPI LnCPI LnFDI LnREER LnOPEN	LnSPI LnRGDP LnCPI LnREMI LnREER LnOPEN	LnSPI LnIPI LnCPI LnREMI LnREER LnOPEN	LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER LnOPEN	LnSPI LnIPI LnCPI LnFDI LnREMI LnREER LnOPEN
Group PP	-3.8884*** (0.0001)	-3.3254*** (0.0004)	-1.0435 (0.1484)	-0.7677 (0.2213)	-1.6235* (0.0522)	-0.7303 (0.2326)	-0.7725 (0.2199)	-1.1562 (0.1238)	-1.3638* (0.0863)	-0.0605 (0.4759)	0.5191 (0.6982)	0.7943 (0.7865)
Group ADF	-7.3272*** (0.0000)	-6.0981*** (0.0000)	-8.6820*** (0.0000)	-8.4210*** (0.0000)	-7.7616*** (0.0000)	-7.4915*** (0.0000)	-7.2228*** (0.0000)	-8.1851*** (0.0000)	-3.8117*** (0.0001)	-6.1943*** (0.0000)	-7.5840*** (0.0000)	-6.3652*** (0.0000)
Panel B: Westerlund (2007) panel cointegration test												
G_τ	2.3662*** (0.0090)	-0.1064 (0.5424)	0.0288 (0.4885)	-0.7131 (0.7621)	0.3587 (0.3599)	-0.5573 (0.7113)	-0.2409 (0.5952)	-0.5812 (0.7194)	-0.7114 (0.7616)	-2.3387 (0.9903)	-0.9930 (0.8396)	-1.4455 (0.9258)
G_α	-2.5596*** (0.0052)	-0.9309 (0.1759)	1.5140 (0.9350)	1.4594 (0.9278)	0.8246 (0.7952)	1.5531 (0.9398)	0.7980 (0.7876)	0.6666 (0.7475)	0.8912 (0.8136)	1.6141 (0.9467)	2.4580 (0.9930)	2.7854 (0.9973)
P_τ	-3.5421*** (0.0002)	-2.1558** (0.0156)	-1.1560 (0.1238)	-1.2286 (0.1096)	-1.8705** (0.0307)	-0.8957 (0.1852)	-1.6194* (0.0527)	-1.9126** (0.0279)	-1.8627** (0.0313)	-0.9057 (0.1825)	-0.3048 (0.3803)	-0.0185 (0.4926)
P_α	-5.1688*** (0.0000)	-2.6887*** (0.0036)	-4.9690*** (0.0000)	-4.2664*** (0.0000)	-5.0799*** (0.0000)	-4.6757*** (0.0000)	-5.5753*** (0.0000)	-5.5349*** (0.0000)	-3.6460*** (0.0001)	-5.4056*** (0.0000)	-4.9007*** (0.0000)	-4.8129*** (0.0000)

7.7 Estimation of Long run Coefficients

Having confirmed the existence of cointegration of proposed panels, the next step is to estimate the associated long run cointegration parameters. In the presence of cointegration, the OLS estimator is known to yield biased (that is, spurious) and inconsistent results (Pradhan et al., 2018). For this reason, several other methods have been proposed (Nasreen & Anwar, 2014). In this study, the long run equilibrium relationship was estimated using Panel DOLS and Panel FMOLS. This study estimated twelve variants of a long run equation in which LnSPI is "explained" by LnRGDP, LnIPI, LnCPI, LnFDI, LnREMI, LnREER and LnOPEN in different specifications. The results of these tests are presented in Table 7.6.

This study aims to identify the nature of the relationship (positive or negative) of the variables, such as LnRGDP, LnIPI, LnCPI, LnFDI, LnREMI, LnREER and LnOPEN. This observation could allow this study to argue that these variables may have influenced the share price index. This study investigates the long run (LR) relationship among the variables taking either LnRGDP or LnIPI separately because LnIPI is the proxy of LnRGDP. To estimate the long run relationship, this study considered FMOLS and DOLS methods. The results are presented in Table 7.6.

Panel A of Table 7.6 shows the long run relationship results using LnRGDP for different specifications, and Panel B shows the results using LnIPI for FMOLS and DOLS.

Table 7.6: Estimation of the long run coefficients (dependent variable: LnSPI) of Developed markets

	Model 1		**Model 3**		**Model 5**		**Model 7**		**Model 9**		**Model 11**	
Panel A	LnSPI LnRGDP LnCPI		LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER		LnSPI LnRGDP LnCPI LnFDI LnREMI LnOPEN		LnSPI LnRGDP LnCPI LnFDI LnREER LnOPEN		LnSPI LnRGDP LnCPI LnREMI LnREER LnOPEN		LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER LnOPEN	
	Panel FMOLS	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**
LnRGDP	3.1879*** (10.5367)	2.9439*** (8.8180)	2.8026*** (8.6698)	2.6253*** (5.3449)	2.8092*** (8.7762)	2.5857*** (5.6014)	2.5830*** (8.0742)	2.1695*** (4.6028)	3.2308*** (10.7987)	2.9097*** (7.3933)	2.7784*** (8.5945)	2.1871*** (4.5373)
LnCPI	1.3710*** (5.1785)	1.1495*** (3.6768)	1.0132*** (3.7562)	1.4262*** (3.5122)	0.9781*** (3.6048)	1.6795*** (3.7093)	1.0573*** (3.9094)	1.1831** (2.5799)	1.3347*** (5.2343)	2.3001*** (5.7340)	1.0043*** (3.6982)	1.8878*** (4.2357)
LnFDI			0.1871*** (3.4877)	0.2553*** (3.3788)	0.1937*** (3.5673)	0.2433*** (3.1082)	0.1992*** (3.7789)	0.1738** (2.4019)			0.1873*** (3.3685)	0.2419*** (2.9610)
LnREMI			0.1081*** (2.9858)	0.1220** (2.4178)	0.1071*** (3.0133)	0.1356*** (2.7765)			0.1477*** (4.2831)	0.1979*** (4.5862)	0.1038*** (2.8797)	0.1092** (2.1921)
LnREER			0.0745 (0.3601)	0.5146 (1.6077)			0.3790 (1.3454)	1.3143*** (3.2101)	0.4077 (1.5026)	0.8496** (2.2644)	0.1764 (0.6368)	1.1351*** (2.6430)
LnOPEN					-0.0024 (-0.0134)	-0.2861 (-1.0011)	0.2318 (0.9884)	1.0247*** (2.8429)	0.3488 (1.5179)	0.7759** (2.4188)	0.1003 (0.4233)	0.4936 (1.2641)
	Model 2		**Model 4**		**Model 6**		**Model 8**		**Model 10**		**Model 12**	
Panel B	LnSPI LnIPI LnCPI		LnSPI LnIPI LnCPI LnFDI LnREMI LnREER		LnSPI LnIPI LnCPI LnFDI LnREMI LnOPEN		LnSPI LnIPI LnCPI LnFDI LnREER LnOPEN		LnSPI LnIPI LnCPI LnREMI LnREER LnOPEN		LnSPI LnIPI LnCPI LnFDI LnREMI LnREER LnOPEN	
	Panel FMOLS	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**	**Panel FMOLS**	**Panel DOLS**
LnIPI	1.7051*** (9.7661)	1.5380*** (7.9146)	1.6353*** (8.5464)	1.3747*** (4.6153)	1.7088*** (8.3991)	1.7708*** (5.7859)	1.7087*** (8.6402)	1.5818*** (5.5417)	1.9860*** (10.6709)	1.9034*** (7.1715)	1.7124*** (8.5073)	1.6825*** (4.4306)
LnCPI	1.5562*** (5.5476)	1.2071*** (3.5838)	1.1270*** (3.9016)	1.1116*** (2.6976)	0.9563*** (3.2376)	0.7133 (1.4111)	0.9925*** (3.5016)	0.7567 (1.6480)	1.3647*** (4.9976)	1.3099*** (2.7670)	1.0110*** (3.4524)	0.8553 (1.4988)
LnFDI			0.1777*** (2.9654)	0.2311*** (2.6966)	0.2153*** (3.6471)	0.2353** (2.3893)	0.1867*** (3.3007)	0.1323 (1.5852)			0.1896*** (3.1261)	0.2686** (2.3351)
LnREMI			0.0684* (1.7941)	0.1141** (2.1432)	0.0762** (1.9992)	0.1125** (1.9905)			0.1049*** (2.8198)	0.1852*** (3.4105)	0.0689* (1.8067)	0.0868 (1.4112)
LnREER			0.8006*** (3.5410)	0.9377*** (3.0205)			0.5934** (2.0297)	1.6827*** (3.7481)	0.7699*** (2.7010)	0.8280* (1.7843)	0.4990* (1.7016)	0.7945 (1.4490)
LnOPEN					-0.6840*** (-3.2998)	-0.6248* (-1.7199)	-0.4270 (-1.6412)	0.4675 (1.2619)	-0.2436 (-0.9187)	0.3513 (0.8521)	-0.3978 (-1.4968)	-0.3251 (-0.6450)

It can be seen (Panel A Model 1 of Table 7.6) that the long run estimated coefficients for LnRGDP and LnCPI are positive and significant for both FMOLS and DOLS estimation procedures. A similar result can be seen for model 2 in Panel B of Table 7.6, while LnIPI was considered in place of LnRGDP. The estimated coefficients for the LnRGDP/LnIPI and LnCPI are positive and significant for all models. Therefore, it can be concluded higher the real GDP, LnIPI and LnCPI imply a higher Share price index.

Mansor (2011) conducted a cointegration analysis based on the VAR model to study the impact of stock market development in Thailand. GDP, aggregate price level and the investment ratio was identified as the key controllers of the stock market in Thailand (Mansor, 2011). Another study conducted by Singh et al. (2011) in Taiwan exampled the influence of GDP and employment rate on the Taiwan index and found that these variables positively affect the Taiwan Index of all portfolios.

Kasman et al. (2005) and Burcu (2016) found IPI and stock returns share a positive correlation as an increase in former leads to an increase in cash flows and profitability of the firms. Nasseh and Strauss (2000) argued that German industrial production had a positive effect on Germany's stock market and that of other European stock markets like the UK, Holland, France, Italy, and Switzerland. Likewise, Jareño and Negrut 2016 reported a positive correlation between USDJ and IPI.

A significant positive relationship was observed between inflation and stock returns in reports on the UK (Firth, 1979), Singapore (Maysami et al., 2004) and Ghana (Adam & Tweneboah, 2008). Similarly, In the study by Maysami and Sim (2001a), the Korean stock markets showed a positive association with inflation.

It can be seen (Panel A Model 3 of Table 7.6) that the long run estimated coefficients for LnFDI, LnREMI and LnREER are positive and significant for both FMOLS and DOLS estimation procedures. A similar result can be seen for model 4 in Panel B of Table 7.6, while LnIPI was considered in lieu of LnRGDP. The estimated coefficients for the LnFDI, LnREMI and LnREER are positive and significant for all FMOLS and DOLS estimation procedures, except model 6 for the DOLS estimation procedure. Therefore, it can be concluded higher FDI, REMI, and REEER implies higher Share Price Index.

The positive relationship of FDI to Ghana stock returns was stated by Adam and Tweneboah (2009). Gümüs (2010) also concludes that the relationship between BIST 100 bond return and foreign direct investment exhibit is positive in Turkey. Investigating the relationship between foreign direct investment and stock market performance for Turkey, Okuyan and Erbaykal (2011) find positive long-term interaction between these variables, whereas no short-term relationship is stated. The US economy has been analysed by Egly et al. (2010) using the VAR framework and has reported a positive relationship between foreign direct investment and USA stock market results from 1997 to 2007.

Gupta et al. (2009) indicate that remittances positively impact poverty mitigation by increasing income and higher living conditions by remittance-receiving households. Billmeier and Massa (2009) also found remittances have a positive and significant impact on market capitalisation.

Using monthly data on U.S. stock markets from 1974 to1978, Aggarwal (1981) found that stock prices and real exchange rates are positive. The relationships between foreign exchange and the stock market are being checked by Katechos (2011). The higher-yielding currencies positively relate to global stock returns, while the less-yielding currency has a negative connection (Katechos, 2011).

It can be seen that the long run estimated coefficients for LnOPEN are negative in some models and positive in other models. The long run estimated coefficients for LnOPEN are found negative and significant in Table 7.6 Panel A model 5, Panel B model 6 and model 8. In Table 7.6, Panel A model 9 and Panel B model 10, the long run estimated coefficients are found positive and significant in both FMOLS and DOLS estimation procedures.

According to Basu and Morey's (2005) studies, a more open economy is predicted to enjoy real-economy growth due to more efficient resource utilisation. According to Fama (1990) and Ferson and Harvey (1997), growth in the real economy boosts future cash flow and profits, which leads to an increase in stock values. As a result, there is a positive link between trade openness and stock prices. Lida (2016) discovered that trade openness has a positive effect on stock market volatility in Indonesia and Malaysia but has a negative effect in Thailand. Although the effect of trade openness on Philippine and Singaporean stock market volatility is not significant across the whole sample period, trade openness is shown to influence stock market volatility in the Philippines and Singapore in subsamples.

7.8 Vector Error Correction Model (VECM)

Since the variables have cointegrated relationships between macroeconomic indicators and the share price index, this study applied VECM to check the speed of adjustment, followed by the causality test with the coefficient of ECT to check the causal relationship.

Based on unit root and cointegration test results cited above, the following VECMs were set up to study short run fluctuations and long run equilibrium.

Estimated VECM equations:

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{51} + \sum_{k=1}^{p} \beta_{1ik} \Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik} \Delta \mathrm{LnRGDP}_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik} \Delta \mathrm{LnCPI}_{(it-k)} + \varphi_{1i} \mathrm{EX}_{it} + \lambda_{ki} \mathrm{ECT}_{1it-1} + \xi_{1it} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (\mathbf{7.1})$$

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{52} + \sum_{k=1}^{p} \beta_{1ik} \Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik} \Delta \mathrm{LnIPI}_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik} \Delta \mathrm{LnCPI}_{(it-k)} + \varphi_{1i} \mathrm{EX}_{it} + \lambda_{ki} \mathrm{ECT}_{1it-1} + \xi_{1it} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (\mathbf{7.2})$$

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{53} + \sum_{k=1}^{p} \beta_{1ik} \Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik} \Delta \mathrm{LnRGDP}_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik} \Delta \mathrm{LnCPI}_{(it-k)} + \sum_{k=1}^{p} \theta_{1ik} \Delta \mathrm{FDI}_{(it-k)} + \sum_{k=1}^{p} \pi_{1ik} \Delta \mathrm{REMI}_{(it-k)} + \sum_{k=1}^{p} \eta_{1ik} \Delta \mathrm{REER}_{(it-k)} + \varphi_{1i} \mathrm{EX}_{it} + \lambda_{ki} \mathrm{ECT}_{1it-1} + \xi_{1it} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (\mathbf{7.3})$$

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{54} + \sum_{k=1}^{p} \beta_{1ik} \Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik} \Delta \mathrm{LnIPI}_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik} \Delta \mathrm{LnCPI}_{(it-k)} + \sum_{k=1}^{p} \theta_{1ik} \Delta \mathrm{FDI}_{(it-k)} + \sum_{k=1}^{p} \pi_{1ik} \Delta \mathrm{REMI}_{(it-k)} + \sum_{k=1}^{p} \eta_{1ik} \Delta \mathrm{REER}_{(it-k)} + \varphi_{1i} \mathrm{EX}_{it} + \lambda_{ki} \mathrm{ECT}_{1it-1} + \xi_{1it} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (\mathbf{7.4})$$

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{55} + \sum_{k=1}^{p} \beta_{1ik} \Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik} \Delta \mathrm{LnRGDP}_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik} \Delta \mathrm{LnCPI}_{(it-k)} + \sum_{k=1}^{p} \theta_{1ik} \Delta \mathrm{FDI}_{(it-k)} + \sum_{k=1}^{p} \pi_{1ik} \Delta \mathrm{REMI}_{(it-k)} + \sum_{k=1}^{p} \psi_{1ik} \Delta \mathrm{OPEN}_{(it-k)} + \varphi_{1i} \mathrm{EX}_{it} + \lambda_{ki} \mathrm{ECT}_{1it-1} + \xi_{1it} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (\mathbf{7.5})$$

$$\Delta \mathrm{LnSPI}_{it} = \alpha_{56} + \sum_{k=1}^{p} \beta_{1ik} \Delta \mathrm{LnSPI}_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik} \Delta \mathrm{LnIPI}_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik} \Delta \mathrm{LnCPI}_{(it-k)} + \sum_{k=1}^{p=2} \theta_{1ik} \Delta \mathrm{FDI}_{(it-k)} + \sum_{k=1}^{p} \pi_{1ik} \Delta \mathrm{REMI}_{(it-k)} + \sum_{k=1}^{p} \psi_{1ik} \Delta \mathrm{OPEN}_{(it-k)} + \varphi_{1i} \mathrm{EX}_{it} + \lambda_{ki} \mathrm{ECT}_{1it-1} + \xi_{1it} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (\mathbf{7.6})$$

$$\Delta LnSPI_{it} = \alpha_{57} + \sum_{k=1}^{p} \beta_{1ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{1ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \eta_{1ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{1ik}\Delta OPEN_{(it-k)} + \varphi_{1i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{1it} \cdots\cdots (\mathbf{7.7})$$

$$\Delta LnSPI_{it} = \alpha_{58} + \sum_{k=1}^{p} \beta_{1ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{1ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \eta_{1ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{1ik}\Delta OPEN_{(it-k)} + \varphi_{1i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{1it} \cdots\cdots (\mathbf{7.8})$$

$$\Delta LnSPI_{it} = \alpha_{59} + \sum_{k=1}^{p} \beta_{1ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \pi_{1ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{1ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{1ik}\Delta OPEN_{(it-k)} + \varphi_{1i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{1it} \cdots\cdots (\mathbf{7.9})$$

$$\Delta LnSPI_{it} = \alpha_{600} + \sum_{k=1}^{p} \beta_{1ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \pi_{1ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{1ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{1ik}\Delta OPEN_{(it-k)} + \varphi_{1i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{1it} \cdots\cdots (\mathbf{7.10})$$

$$\Delta LnSPI_{it} = \alpha_{61} + \sum_{k=1}^{p} \beta_{1ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik}\Delta LnRGDP_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{1ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{1ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{1ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{1ik}\Delta OPEN_{(it-k)} + \varphi_{1i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{1it} \cdots\cdots (\mathbf{7.11})$$

$$\Delta LnSPI_{it} = \alpha_{62} + \sum_{k=1}^{p} \beta_{1ik}\Delta LnSPI_{(it-k)} + \sum_{k=1}^{p} \gamma_{1ik}\Delta LnIPI_{(it-k)} + \sum_{k=1}^{p} \delta_{1ik}\Delta LnCPI_{(it-k)} + \sum_{k=1}^{p} \theta_{1ik}\Delta FDI_{(it-k)} + \sum_{k=1}^{p} \pi_{1ik}\Delta REMI_{(it-k)} + \sum_{k=1}^{p} \eta_{1ik}\Delta REER_{(it-k)} + \sum_{k=1}^{p} \psi_{1ik}\Delta OPEN_{(it-k)} + \varphi_{1i}EX_{it} + \lambda_{ki}ECT_{1it-1} + \xi_{1it} \cdots\cdots\cdots (\mathbf{7.12})$$

Where,

- p = optimum lag length[30] is 2 in this study using SIC.
- $\beta_{ik}, \gamma_{ik}, \delta_{ik}, \theta_{ik}, \pi_{ik}, \varphi_i, \eta_i$ =short run dynamic coefficients of the model's adjustment long run equilibrium.
- λ_{ki}= speed of adjustment parameter with a negative sign. For all k=1,2, -----, 12
- EX_{it} Implies either IR, LnCR, LnGS and D_{GFC}. This study considers one exogenous variable at a time to avoid multicollinearity.
- ECT_{it-1}= the error correction term is the lagged value of the residuals obtained from the cointegrating regression of the dependent variable on the regressors that contains long run information derived from the long run cointegrating relationship.
- ξ_{it}=residuals in the equations.

[30] Selection of Optimal Lag Length (Developed Markets) are presented in Table 7.1A of Appendix 7A.

Importantly, this study also observed that there exists a known structural break in 2008 attributable to the global financial crisis (GFC). This study added the dummy variable D_{GFC} to capture the effect of GFC on SPI.

D_{GFC} = 0 from 1984 to 2008 and 1 after 2008[31].

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[31] This study also used developed markets (DEV=1, 0 otherwise) dummy but the results were not significant. Results will be available upon request.

Table 7.7: Panel Error Correction Model 1 of Developed Markets

Variables	**Dependent variable:** Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM_{i(t-1)}}$	-0.0140*** (-6.2678)	-0.0980*** (-8.1050)	0.0039*** (4.0475)	-0.0094*** (-5.6958)	-0.0233** (-2.4706)
$\Delta LnSPI_{i(t-1)}$	0.3416*** (9.3568)	0.3550*** (9.9138)	0.3430*** (9.1526)	0.3430*** (9.21719)	0.3414*** (9.2081)
$\Delta LnSPI_{i(t-2)}$	-0.2571*** (-7.3066)	-0.2237*** (-6.4362)	-0.2611*** (-7.1594)	-0.2590*** (-7.15508)	-0.2377*** (-6.6781)
$\Delta LnRGDP_{i(t-1)}$	-0.5429 (-1.4959)	0.0746 (0.2029)	-0.5286 (-1.4008)	-0.5878 (-1.57938)	-0.2632 (-0.6985)
$\Delta LnRGDP_{i(t-2)}$	0.1261 (0.3573)	0.4489 (1.2931)	0.1267 (0.3492)	0.0770 (0.20968)	0.0026 (0.0074)
$\mathbf{\Delta LnRGDP \rightarrow \Delta LnSPI}$	**2.1096**				
$\Delta LnCPI_{i(t-1)}$	-3.0056*** (-5.3227)	-2.6483*** (-4.5349)	-2.8973*** (-4.9986)	-2.9671*** (-5.13200)	-2.2310*** (-3.9223)
$\Delta LnCPI_{i(t-2)}$	0.9674* (1.7881)	1.73421*** (3.2073)	1.1734** (2.0962)	1.0059* (1.81376)	1.8882*** (3.4556)
$\mathbf{\Delta LnCPI \rightarrow \Delta LnSPI}$	**6.7426*** **				
Constant	0.0974*** (6.6289)	0.06175*** (5.0798)	-0.0285 (-0.5524)	0.0508 (0.70213)	0.0855*** (4.9373)
IR		-0.0038 (-1.2753)			
LnCR			0.0782** (2.4876)		
LnGS				0.0240 (0.68983)	
$\mathbf{D_{GFC}}$					-0.0979*** (-5.4246)
Sample size	679	675	658	658	679
R-squared	0.2362	0.2739	0.2213	0.2290	0.2255
Adj. R-squared	0.2282	0.2652	0.2117	0.2195	0.2162
Akaike AIC	-0.7237	-0.7706	-0.6788	-0.6888	-0.7068
Schwarz SIC	-0.6704	-0.7104	-0.6174	-0.6274	-0.6469
F-statistic	29.6377	31.4022	23.0489	24.0964	24.3825

Note 1: ***, **and * represents significant at 1%, 5% and 10% level
Note 2: Figures within brackets represents the t-stats

Table 7.7 reports estimated coefficients of panel VECM results using equation 7.1 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (7.1) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

In general, the ECT term should be negative and significant and should lie between zero and (-1). It can be seen that the estimated coefficients of the ECT are negative and significant for all specifications suggesting that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. For example, the ECT in column 1 for the model without having exogenous variables are -0.0140 suggests that approximately 1.40% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

The estimated coefficients for $\Delta LnSPI_{i(t-1)}$ are positive and significant, and $\Delta LnSPI_{i(t-2)}$ is negative and significant implying that in the short run, $\Delta LnSPI_{i(t-1)}$ influences the $\Delta LnSPI_{it}$.

The estimated coefficients for $\Delta LnRGDP_{i(t-1)}$ are negative and insignificant, and $\Delta LnRGDP_{i(t-2)}$ is positive and insignificant. It has been theoretically demonstrated that the productive capacity of an economy grows during economic growth, which successively contributes to the cash flow generation potential of the company. Jareno and Negrut (2016) carried out a time-evolution analysis of the USA's Dow Jones (DJ) prices and GDP from 2008 to 2014. A positive relationship was observed between the DJ and GDP. Evidence from existing studies indicates that GDP positively impacts stock market performance (Fama, 1981; Mukherjee & Naka, 1995). This means that an increase in GDP leads to an increase in stock performance.

The estimated coefficients for $\Delta LnCPI_{i(t-1)}$ are negative and significant at the 1% level, and $\Delta LnCPI_{i(t-2)}$ is positive and significant at the 10% level implying that in the short run, $\Delta LnCPI_{i(t-1)}$ influence the $\Delta LnSPI_{it}$. Fama (1981) explains that higher inflation raises the production cost, which adversely affects the profitability and the level of real economic activity; since the real activity is positively associated with the stock return, an increase in inflation reduces the stock price.

According to Malkiel (1982), the negative association between inflation rate and stock market price is due to the direct association of the inflation rate with the interest rate, which negatively influences equity prices and the negative effect of the inflation rate on the profit margins of companies in specific sectors which leads to decrease in stock prices. In the study by Gjerdea and Sættem (1999), the negative association between stock return and inflation measured as a change in CPI is insignificant.

The estimated coefficient for LnCR (that is, corruption risk rating) is positive and significant at a 5% level, which implies that a higher risk of corruption[32] lowers the share price index growth. Mashal (2011) argues that corruption spoils economic growth by dwindling domestic competition that undermines domestic and foreign companies' efficiency. In addition, corruption makes it more difficult and costly to conduct foreign operations by obtaining licenses and permits (Habib and Zurawicki, 2002, Voyer and Beamish, 2004, Cuervo-Cazurra, 2008). Ng (2006) claims that managers might participate in projects otherwise not only accept bribes that create waste and increase transaction costs in the economy. In addition, corruption can have a negative effect on the growth of the stock market through its adverse effects on FDI. Wei (2000), Lambsdorff (2003), and Voyer and Beamish (2004) find a negative association between the corruption of the host country and the received FDI (Wei, 2000, Lambsdorff, 2003, Voyer and Beamish, 2004).

Similarly, the estimated coefficient for LnGS is positive, implying that the higher the government stability[33] index, the higher the share price index growth. This result is consistent with previous literature, but this study finds the coefficient of LnGS is insignificant. Government stability is an

[32] Rating for corruption risk is from zero to six (0-6), the higher points indicating lower risk of corruption. Please see Table 4.2.
[33] Government stability score of 4 points is a very low risk and a score of 0 points is a very high risk. Please see Table 4.2.

assessment of the government's capacity to carry out its declared policies and its ability to continue in power. Three subcomponents, namely Government Unity, Legislative Power, and Public Popularity, constitute the risk level applied to this variable. Each of these components will achieve a maximum four-point score and a minimum 0-point score.

Similarly, the estimated coefficient of the dummy variable (D_{GFC}) for the Global Finance Crisis (GFC) is negative and significant at a 1% level, implying that the stock price index growth was reduced during GFC, which is in line with the existing literature. During the GFC, the affected countries had the experience of downfall in economic activities and production levels, which lead to decreased share price index growth.

Row 8 of Table 7.7 shows the bivariate Granger causality result and the direction of causality. The F-stat is insignificant shows that economic growth does not Granger cause share price growth. Similarly, row 11 of Table 7.7 shows that the F-stat is significant 5% level indicating that inflation Granger[34] causes SPI growth.

[34] In Table 7.19 this study found similar result in a multivariate framework.

Table 7.8: Panel Error Correction Model 2 of Developed Markets

Variables	Dependent variable: $\Delta\, lnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM_{i(t-1)}}$	0.0056*** (4.2900)	-0.0948*** (-8.1370)	0.0084*** (3.2335)	0.0061*** (4.1368)	-0.0267*** (-2.7598)
$\Delta LnSPI_{i(t-1)}$	0.3544*** (9.5974)	0.3612*** (10.1181)	0.3495*** (9.4366)	0.3541*** (9.5721)	0.3508*** (9.5114)
$\Delta LnSPI_{i(t-2)}$	-0.2591*** (-7.0413)	-0.2128*** (-5.9345)	-0.2636*** (-7.1382)	-0.2606*** (-7.0503)	-0.2346*** (-6.3777)
$\Delta LnIPI_{i(t-1)}$	-0.2529* (-1.7469)	-0.0987 (-0.7026)	-0.2184 (-1.5029)	-0.2519* (-1.7376)	-0.1941 (-1.3363)
$\Delta LnIPI_{i(t-2)}$	0.0127 (0.0924)	0.1062 (0.8010)	0.0381 (0.2763)	-0.0000 (-0.0004)	-0.0176 (-0.1280)
ΔLnIPI → ΔLnSPI	**1.4297**				
$\Delta LnCPI_{i(t-1)}$	-2.8782*** (-5.0049)	-2.4017*** (-4.0646)	-2.8067*** (-4.8807)	-2.8565*** (-4.9576)	-2.1403*** (-3.7451)
$\Delta LnCPI_{i(t-2)}$	1.1421** (2.0197)	1.4776*** (2.6936)	1.2816** (2.2683)	1.1905** (2.0925)	1.7968*** (3.2419)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
Constant	0.0865*** (6.1186)	0.0803*** (6.9369)	-0.0501 (-0.9931)	0.0428 (0.5845)	0.0827*** (5.4269)
IR		-0.0050 (-1.6260)			
LnCR			0.0853*** (2.7106)		
LnGS				0.0207 (0.5998)	
$\mathbf{D_{GFC}}$					-0.0992*** (-5.3492)
Sample size	658	654	658	658	658
R-squared	0.2125	0.2741	0.2150	0.2122	0.2245
Adj. R-squared	0.2041	0.2650	0.2054	0.2025	0.2150
Akaike AIC	-0.6707	-0.7481	-0.6709	-0.6672	-0.6830
Schwarz SIC	-0.6161	-0.6864	-0.6095	-0.6058	-0.6216
F-statistic	25.0632***	30.4364***	22.2245***	21.8475***	23.4905***

Table 7.8 reports estimated coefficients of panel VECM results using equation 7.2 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (7.2) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant for all specifications suggesting that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. For example, the ECT in column 1 for the model without exogenous variables is -0.0056, suggesting that approximately 0.56% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

Except for $\Delta LnIPI_{i(t-1)}$ and $\Delta LnIPI_{i(t-2)}$, Table 7.8 demonstrates similar results of estimated coefficients presented in the preceding Tables of this chapter.

Table 7.8 presents the estimated coefficients for $\Delta LnIPI_{i(t-1)}$ is negative and insignificant, and $\Delta LnIPI_{i(t-2)}$ is positive and insignificant. Industrial production growth will increase when the real output of manufacturing, mining, electricity and gas increases. Consequently, it creates more profit for those companies and thus creates demand for shares in the capital market for those companies. Hence it increases the share price through expected future cash flow (Fama, 1990). Kasman et al. (2005) and Burcu (2016) found IPI and stock returns share a positive correlation as an increase in the former leads to an increase in cash flows and profitability of the firms. Nasseh and Strauss (2000) argued that German industrial production had a positive effect on Germany's stock market and other European stock markets like the UK, Holland, France, Italy, and Switzerland. Likewise, Jareño and Negrut 2016 reported a positive correlation between USD and IPI.

Row 8 of Table 7.8 shows the bivariate Granger causality result, that is, the direction of causality. The F-stat is insignificant shows that IPI growth does not Granger cause share price growth.

Similarly, row 11 of Table 7.8 shows that the F-stat is significant 5% level indicating that inflation Granger[35] causes SPI growth.

[35] In Table 7.20 this study found similar result in a multivariate framework.

Table 7.9: Panel Error Correction Model 3 of Developed Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM_{i(t-1)}}$	-0.0234*** (-6.6383)	-0.0918*** (-8.4312)	-0.0142*** (-5.4291)	-0.0174*** (-5.9494)	0.0034* (1.9286)
$\Delta LnSPI_{i(t-1)}$	0.3672*** (9.4723)	0.3771*** (9.8968)	0.3649*** (9.1909)	0.3693*** (9.3204)	0.3660*** (9.2539)
$\Delta LnSPI_{i(t-2)}$	-0.2575*** (-6.9568)	-0.2361*** (-6.4688)	-0.2632*** (-6.9075)	-0.2612*** (-6.8436)	-0.2575*** (-6.8455)
$\Delta LnRGDP_{i(t-1)}$	-0.5354 (-1.4334)	0.0227 (0.0605)	-0.5443 (-1.4166)	-0.5609 (-1.4617)	-0.5786 (-1.5084)
$\Delta LnRGDP_{i(t-2)}$	0.3324 (0.9233)	0.6016* (1.7012)	0.3450 (0.9356)	0.3084 (0.8221)	0.1653 (0.4495)
ΔLnRGDP → ΔLnSPI	**2.1096**				
$\Delta LnCPI_{i(t-1)}$	-2.7195*** (-4.7263)	-2.1125*** (-3.4919)	-2.6846*** (-4.5654)	-2.6761*** (-4.5323)	-2.4055*** (-4.0958)
$\Delta LnCPI_{i(t-2)}$	0.6541 (1.1551)	1.3146** (2.3168)	0.7133 (1.2239)	0.6957 (1.1903)	1.0412* (1.7902)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
$\Delta lnFDI_{i(t-1)}$	0.0316 (0.7672)	0.0498 (1.2347)	0.0395 (0.9335)	0.0351 (0.8286)	0.0328 (0.7761)
$\Delta lnFDI_{i(t-2)}$	-0.1884*** (-4.5143)	-0.1754*** (-4.3070)	-0.1853*** (-4.3227)	-0.1894*** (-4.4186)	-0.1779*** (-4.1875)
ΔLnFDI → ΔLnSPI	**2.9442***				
$\Delta LnREMI_{i(t-1)}$	0.0099 (0.3945)	0.0055 (0.2214)	0.0115 (0.4497)	0.0104 (0.4034)	0.0145 (0.5672)
$\Delta LnREMI_{i(t-2)}$	0.0166 (0.66634	0.0142 (0.5857)	0.0167 (0.6608)	0.0175 (0.6890)	0.0215 (0.8540)
ΔLnREMI → ΔLnSPI	**1.1018**				
$\Delta LnREER_{i(t-1)}$	-0.1992 (-1.2803)	-0.2260 (-1.4809)	-0.2193 (-1.3790)	-0.2181) (-1.3696)	-0.2542 (-1.6090)
$\Delta LnREER_{i(t-2)}$	0.4895*** (3.3496)	0.5411*** (3.7658)	0.4631*** (3.0947)	0.4675*** (3.1224)	0.4583*** (3.0931)
ΔLnREER → ΔLnSPI	**3.2370****				
Constant	0.1062*** (6.5891)	0.0915*** (6.5913)	0.0275*** (0.5156)	0.0762*** (1.0269)	0.1124*** (5.8926)
IR		-0.0099*** (-2.7685)			
LnCR			0.0507 (1.5842)		
LnGS				0.0150 (0.4283)	
$\mathbf{D_{GFC}}$					-0.0552*** (-2.7133)
Sample size	654	650	633	633	654
R-squared	0.2789	0.3133	0.2709	0.2692	0.2588
Adj. R-squared	0.2643	0.2982	0.2544	0.2527	0.2425
Akaike AIC	-0.7452	-0.7900	-0.7066	-0.7043	-0.7146
Schwarz SIC	-0.6493	-0.6867	-0.6011	-0.5989	-0.6118
F-statistic	19.0434***	20.6933***	16.4017***	16.2646***	15.9346***

Table 7.9 reports estimated coefficients of panel VECM results using equation 7.3 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (7.3) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5) respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant for all specifications suggesting that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. The ECT in column 1 for the model without having exogenous variables is -0.0234 suggests that approximately 2.34% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

Except $\Delta LnFDI_{i(t-1)}$, $\Delta LnFDI_{i(t-2)}$, $\Delta LnREMI_{i(t-1)}$, $\Delta LnREMI_{i(t-2)}$, $\Delta LnREER_{i(t-1)}$, and $\Delta LnREER_{i(t-2)}$, Table 7.9 demonstrates similar results of estimated coefficients which were presented in the preceding Tables of this chapter.

The estimated coefficients for $\Delta LnFDI_{i(t-1)}$ is positive and insignificant, and $\Delta LnFDI_{i(t-2)}$ is negative and significant at a 1% level implies that in the short run, $\Delta LnFDI_{i(t-2)}$ do influence the $\Delta LnSPI_{it}$. FDI will substantially contribute to the economic growth and prosperity of the recipient country by reducing and amortising the shock generated by low domestic savings and investment. Several reports investigate the relationship between FDI, foreign portfolio investment (FPI) and financial markets in various countries. It is expected that an improvement in FDI would positively affect the liquidity and capitalisation of the stock exchange (Adam & Tweneboah, 2008). Clark and Berko (1996) find supporting evidence for the positive relationship between foreign direct investment and stock market return in Mexico as one of the earliest explorations. The positive relationship of FDI to Ghana stock returns was stated by Adam and Tweneboah (2009). Gümüs (2010) also concludes that the relationship between BIST 100 bond return and foreign direct investment exhibit is positive in Turkey.

The estimated coefficients for $\Delta LnREMI_{i(t-1)}$ and $\Delta LnREMI_{i(t-2)}$ are positive. This result is consistent with previous literature. But this study finds the coefficients insignificant. There is a growing agreement on a variety of consequences that generated by the increase of remittance such as consumption, increasing schooling and health care promoting investment in home and land property, etc., and thus increasing economic growth as well as share price index through economic activity within the country (Billmeier & Massa, 2009; Jansen et al., 2012). Gupta et al. (2009) indicate that remittances positively impact poverty mitigation by increasing income and higher living conditions in remittance-receiving households. Billmeier and Massa (2009) also found remittances have a positive and significant impact on market capitalization.

The estimated coefficients for $\Delta LnREER_{i(t-1)}$ are negative and insignificant, and $\Delta LnFDI_{i(t-2)}$ is positive and significant at a 1% level implies that in the short run, $\Delta LnFDI_{i(t-2)}$ do influence the $\Delta LnSPI_{it}$. The good market approach suggests that real exchange rates can affect the share price (Aggarwal, 1981). Depreciation of the real exchange rate would improve the attractiveness of firms' goods in terms of cheaper rates and increase their revenues from other countries if the elasticities of changes in exports are greater than the changes in the exchange rate (Dornbusch & Fischer, 1980). This higher export contributes to further income for the domestic firms and thus boosts the firm’s values and share price. Therefore, real exchange rate depreciation will lift the real share price, whilst appreciation of the real exchange rate will decrease the real share price (Dornbusch & Fischer, 1980; Pan et al., 2007; Ülkü & Demirci, 2012). Using monthly data on

U.S. stock markets from 1974 to1978, Aggarwal (1981) found that stock prices and real exchange rates are positive. According to Solnik (1987), there is only a weak positive relationship between stock returns and real exchange rates.

The estimated coefficient of interest rate (IR) is negative and significant at the 1% level implies that the stock price index growth will be reduced when the interest rate will be higher, which is in line with the existing literature. In general, a lower interest rate implies that the borrowers can borrow and invest money in the business and the stock market, which increases the Stock market movements and will affect the stock price (or the growth of SPI) positively and vice versa. In addition, with lower interest rates, consumers' disposable income increases and increases purchasing power, which positively influences the Stock market. Previous research, including those of Waud (1970) , Nelson (1976), Fama and Schwert (1977) and Fama (1981), indicate that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), and Ferrer et al. (2016) have also confirmed this trend of relationship. Arango et al. (2002) found some evidence of the non-linear and negative relationship between Bogota's stock market share prices. Hsing (2004) adopts a structural VAR model allowing multiple endogenous variables such as output, real interest rate, exchange rate, and stock market index to find an inverse relationship between stock prices and interest rate. Similarly, Uddin and Alam (2009) also found a negative relationship.

Row 14 of Table 7.9 shows the bivariate Granger causality result, that is, the direction of causality. The F-stat is significant 10% level shows that FDI growth Granger[36] causes share price growth. Row 17 of Table 7.9 shows that the F-stat is insignificant and shows that REMI growth does not

[36] In Table 7.21 this study found similar result in a multivariate framework.

Granger cause share price growth. Similarly, row 20 of Table 7.9 shows that the F-stat is significant at the 5% level, which implies that REER growth Granger causes share price growth.

Table 7.10: Panel Error Correction Model 4 of Developed Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM_{i(t-1)}}$	-0.0130*** (-5.6136)	-0.0931*** (-8.4338)	-0.0081*** (-4.8555)	-0.0117*** (-5.3976)	-0.0131* (-1.9303)
$\Delta LnSPI_{i(t-1)}$	0.3728*** (9.5872)	0.3840*** (10.145)	0.3679*** (9.4226)	0.3733*** (9.5825)	0.3795*** (9.6566)
$\Delta LnSPI_{i(t-2)}$	-0.2725*** (-7.0402)	-0.2324*** (-6.1295)	-0.2761*** (-7.1167)	-0.2735*** (-7.0291)	-0.2537*** (-6.4581)
$\Delta LnIPI_{i(t-1)}$	-0.2069 (-1.3912)	-0.1016 (-0.6986)	-0.1980 (-1.3286)	-0.2063 (-1.3848)	-0.2127 (-1.4155)
$\Delta LnIPI_{i(t-2)}$	0.1866 (1.3256)	0.2206 (1.6125)	0.1948 (1.3820)	0.1790 (1.2570)	0.1039 (0.7298)
ΔLnIPI → ΔLnSPI	**1.4297**				
$\Delta LnCPI_{i(t-1)}$	-2.6609*** (-4.5933)	-1.9277*** (-3.1517)	-2.6347*** (-4.5436)	-2.6433*** (-4.5516)	-1.9822*** (-3.3863)
$\Delta LnCPI_{i(t-2)}$	0.7617 (1.3150)	1.1006* (1.9327)	0.8391 (1.4451)	0.8135 (1.3915)	1.6227*** (2.8050)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
$\Delta lnFDI_{i(t-1)}$	0.0370 (0.8625)	0.0524 (1.2585)	0.0425 (0.9894)	0.0372 (0.8658)	0.0455 (1.0461)
$\Delta lnFDI_{i(t-2)}$	-0.1891*** (-4.3517)	-0.1771*** (-4.2268)	-0.1835*** (-4.2163)	-0.1882*** (-4.3205)	-0.1588*** (-3.6292)
ΔLnFDI → ΔLnSPI	**2.9442***				
$\Delta LnREMI_{i(t-1)}$	0.0122 (0.4757)	0.0036 (0.1443)	0.0137 (0.5340)	0.0128 (0.4980)	0.0187 (0.7257)
$\Delta LnREMI_{i(t-2)}$	0.0176 (0.6947)	0.0119 (0.4856)	0.0170 (0.6707)	0.0184 (0.7222)	0.0270 (1.0588)
ΔLnREMI → ΔLnSPI	**1.1018**				
$\Delta LnREER_{i(t-1)}$	-0.2529 (-1.5896)	-0.2055 (-1.3233)	-0.2659* (-1.6708)	-0.2639* (-1.6533)	-0.3159** (-1.9827)
$\Delta LnREER_{i(t-2)}$	0.4554*** (2.9670)	0.5691*** (3.7972)	0.4434*** (2.8869)	0.4474*** (2.9074)	0.4922*** (3.1559)
ΔLnREER → ΔLnSPI	**3.2370****				
Constant	0.0999*** (6.5058)	0.1006*** (7.5948)	0.0038 (0.0738)	0.0698 (0.9413)	0.0892*** (5.1219)
IR		-0.0084** (-2.4262)			
LnCR			0.0606* (1.9008)		
LnGS				0.0139 (0.4010)	
$\mathbf{D_{GFC}}$					-0.0940*** (-4.8887)
Sample size	633	629	633	633	633
R-squared	0.2653	0.3140	0.2660	0.2639	0.2568
Adj. R-squared	0.2499	0.2983	0.2494	0.2472	0.2399
Akaike AIC	-0.7021	-0.7663	-0.6999	-0.6970	-0.6874
Schwarz SIC	-0.6037	-0.6603	-0.5944	-0.5916	-0.5820
F-statistic	17.1962***	20.0704***	15.9973***	15.8255***	15.2508***

Table 7.10 reports estimated coefficients of panel VECM results using equation 7.4 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (7.4) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant for all specifications suggesting that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. The ECT in column 1 for the model without having exogenous variables is -0.0130 suggests that approximately 1.30% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

Table 7.10 demonstrates similar results of estimated coefficients of panel VECM, which were presented in the preceding Tables of this chapter.

Table 7.11: Panel Error Correction Model 5 of Developed Markets

Variables	Dependent variable: Δ LnSPI$_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
ECM$_{i(t-1)}$	-0.0085*** (-6.046)	-0.0917*** (-8.0279)	-0.0029*** (-5.0513)	-0.0032*** (-5.4217)	-0.0048 (-0.7089)
ΔLnSPI$_{i(t-1)}$	0.3470*** (9.0362)	0.3538*** (9.3946)	0.3436*** (8.7669)	0.3484*** (8.8933)	0.3394*** (8.7411)
ΔLnSPI$_{i(t-2)}$	-0.2273*** (-6.1576)	-0.2033*** (-5.5960)	-0.2335*** (-6.1700)	-0.2304*** (-6.0759)	-0.2201*** (-5.9167)
ΔLnRGDP$_{i(t-1)}$	-0.4230 (-1.0499)	0.1544 (0.3851)	-0.4242 (-1.0269)	-0.4506 (-1.0894)	-0.1902 (-0.4611)
ΔLnRGDP$_{i(t-2)}$	0.1100 (0.2732)	0.5031 (1.2745)	0.1367 (0.3323)	0.0930 (0.2236)	-0.0537 (-0.1316)
ΔLnRGDP → ΔLnSPI	**2.1096**				
ΔLnCPI$_{i(t-1)}$	-2.6164*** (-4.3070)	-2.2872*** (-3.6527)	-2.6155*** (-4.2300)	-2.5932*** (-4.1744)	-1.9396*** (-3.1600)
ΔLnCPI$_{i(t-2)}$	0.5708 (0.9566)	1.2790** (2.1483)	0.6473 (1.0592)	0.6201 (1.0094)	1.0778* (1.7705)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
ΔlnFDI$_{i(t-1)}$	0.0181 (0.4409)	0.0324 (0.8065)	0.0245 (0.5830)	0.0210 (0.4980)	0.0087 (0.2085)
ΔlnFDI$_{i(t-2)}$	-0.1734*** (-4.2414)	-0.1623*** (-4.0753)	-0.1708*** (-4.0899)	-0.1738*** (-4.1561)	-0.1683*** (-4.0827)
ΔLnFDI → ΔLnSPI	**2.9442***				
ΔLnREMI$_{i(t-1)}$	0.0068 (0.2667)	-0.0001 (-0.0042)	0.0090 (0.3482)	0.0081 (0.3141)	0.0074 (0.2908)
ΔLnREMI$_{i(t-2)}$	0.0249 (0.9917)	0.0213 (0.8713)	0.0255 (1.0029)	0.0269 (1.0513)	0.0277 (1.0996)
ΔLnREMI → ΔLnSPI	**1.1018**				
ΔLnOPEN$_{i(t-1)}$	-0.2285* (-1.7238)	-0.2021 (-1.5589)	-0.2065 (-1.5250)	-0.2232 (-1.6480)	-0.3101** (-2.2993)
ΔLnOPEN$_{i(t-2)}$	-0.1346 (-1.1247)	-0.1711 (-1.4618)	-0.1206 (-0.9847)	-0.1404 (-1.1467)	-0.1958 (-1.6180)
ΔLnOPEN → ΔLnSPI	**4.2997***				
Constant	0.1115*** (6.8442)	0.0849*** (6.3464)	0.0245 (0.4558)	0.0793 (1.0565)	0.1178*** (6.1621)
IR		-0.0061* (-1.7955)			
LnCR			0.0557* (1.7251)		
LnGS				0.0160 (0.4501)	
D$_{GFC}$					-0.0968*** (-4.8827)
Sample Size	652	648	633	633	652
R-squared	0.2608	0.3011	0.2555	0.2521	0.2525
Adj. R-squared	0.2458	0.2857	0.2386	0.2352	0.2361
Akaike AIC	-0.7179	-0.7699	-0.6857	-0.6812	-0.7037
Schwarz SIC	-0.6217	-0.6663	-0.5802	-0.5757	-0.6006
F-statistic	17.3192***	19.4816***	15.1476***	14.8800***	15.3730***

Table 7.11 reports estimated coefficients of panel VECM results using equation 7.5 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (7.5) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5) respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant for all specifications suggesting that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. For example, the ECT in column 1 for the model without exogenous variables is -0.0085, suggesting that approximately 0.85% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

Except for $\Delta LnOPEN_{i(t-1)}$ and $\Delta LnOPEN_{i(t-2)}$, Table 7.11 demonstrates similar results of estimated coefficients presented in the preceding Table of this chapter.

The estimated coefficients for $\Delta LnOPEN_{i(t-1)}$ and $\Delta LnOPEN_{i(t-2)}$ are negative and insignificant. Opening up an economy for the cross-border flows of goods and services creates a highly competitive environment, which will drive down the revenue of existing firms and diminish their profits, requiring them to search for external sources of finance (Quy-Toan and Levchenko, 2004).

Row 20 of Table 7.11 shows the bivariate Granger causality result, that is, the direction of causality. The F-stat is significant 5% level shows that OPEN growth Granger[37] causes share price growth.

[37] In Table 7.23 this study found similar result in a multivariate framework.

Table 7.12: Panel Error Correction Model 6 of Developed Markets

Variables	Dependent variable: Δ LnSPI$_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM_{i(t-1)}}$	-0.0008*** (-5.2582)	-0.0852*** (-7.9693)	-0.0004*** (-4.8206)	0.0003*** (5.0690)	-0.0206** (-2.2421)
$\Delta LnSPI_{i(t-1)}$	0.3512*** (9.1343)	0.3625*** (9.6695)	0.3455*** (8.9745)	0.3512*** (9.1185)	0.3465*** (8.9968)
$\Delta LnSPI_{i(t-2)}$	-0.2437*** (-6.4381)	-0.2005*** (-5.3946)	-0.2479*** (-6.5511)	-0.2448*** (-6.4278)	-0.2270*** (-5.9581)
$\Delta LnIPI_{i(t-1)}$	-0.1830 (-1.1149)	-0.0978 (-0.6155)	-0.1770 (-1.0797)	-0.1815 (-1.1042)	-0.0683 (-0.4140)
$\Delta LnIPI_{i(t-2)}$	0.1572 (0.9683)	0.2026 (1.2885)	0.1636 (1.0092)	0.1538 (0.9427)	0.1754 (1.0798)
ΔLnIPI → ΔLnSPI	**1.4297**				
$\Delta LnCPI_{i(t-1)}$	-2.6817*** (-4.4608)	-2.0766*** (-3.3122)	-2.6793*** (-4.4667)	-2.6730*** (-4.4364)	-1.8901*** (-3.1358)
$\Delta LnCPI_{i(t-2)}$	0.7435 (1.2353)	1.0543* (1.7830)	0.7938 (1.3201)	0.7825 (1.2861)	1.3860** (2.3151)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
$\Delta lnFDI_{i(t-1)}$	0.0209 (0.4896)	0.0329 (0.7910)	0.0246 (0.5769)	0.0210 (0.4908)	0.0070 (0.1615)
$\Delta lnFDI_{i(t-2)}$	-0.1796*** (-4.2402)	-0.1691*** (-4.1211)	-0.1764*** (-4.1713)	-0.1794*** (-4.2277)	-0.1755*** (-4.1418)
ΔLnFDI → ΔLnSPI	**2.9442***				
$\Delta LnREMI_{i(t-1)}$	0.0104 (0.4029)	-0.0002 (-0.0081)	0.0112 (0.4368)	0.0108 (0.4203)	0.0072 (0.2781)
$\Delta LnREMI_{i(t-2)}$	0.0283 (1.11208)	0.0204 (0.8263)	0.0270 (1.0625)	0.0290 (1.1351)	0.0289 (1.1397)
ΔLnREMI → ΔLnSPI	**1.1018**				
$\Delta LnOPEN_{i(t-1)}$	-0.1856 (-1.3249)	-0.1803 (-1.3252)	-0.1651 (-1.1779)	-0.1822 (-1.2951)	-0.2757* (-1.9549)
$\Delta LnOPEN_{i(t-2)}$	-0.1891 (-1.4261)	-0.2005 (-1.5586)	-0.1707 (-1.2871)	-0.1911 (-1.4382)	-0.2833** (-2.1268)
ΔLnOPEN → ΔLnSPI	**4.2997** **				
Constant	0.1046*** (6.8840)	0.1038*** (7.9022)	0.0085*** (0.1630)	0.0801*** (1.0672)	0.1078*** (6.3526)
IR		-0.0069** (-1.9783)			
LnCR			0.0616* (1.9148)		
LnGS				0.0114 (0.3244)	
$\mathbf{D_{GFC}}$					-0.1130*** (-5.5301)
Sample size	633	629	633	633	633
R-squared	0.2503	0.2999	0.2544	0.2493	0.2548
Adj. R-squared	0.2346	0.2839	0.2375	0.2322	0.2379
Akaike AIC	-0.6819	-0.7460	-0.6842	-0.6773	-0.6847
Schwarz SIC	-0.5835	-0.6400	-0.5788	-0.5719	-0.5793
F-statistic	15.8992***	18.7873***	15.0626***	14.6555***	15.0909***

Table 7.12 reports estimated coefficients of panel VECM results using equation 7.6 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (7.6) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5), respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant for all specifications suggests that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. The ECT in column 1 for the model without having exogenous variables is -0.0008 suggests that approximately 0.08% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

Table 7.12 demonstrates similar results of estimated coefficients of panel VECM from the preceding Tables in this chapter.

Table 7.13: Panel Error Correction Model 7 of Developed Markets

Variables	Model 7	Dependent variable: Δ LnSPI$_{it}$			
	Column 1	Column 2	Column 3	Column 4	Column 5
ECM$_{i(t-1)}$	-0.0389*** (-7.1192)	-0.0748*** (-7.6338)	-0.0222*** (-5.6548)	-0.0330*** (-6.5656)	-0.0478*** (-5.5921)
ΔLnSPI$_{i(t-1)}$	0.3772*** (9.9595)	0.3868*** (10.249)	0.3762*** (9.6853)	0.3784*** (9.8019)	0.3711*** (9.7939)
ΔLnSPI$_{i(t-2)}$	-0.2528*** (-6.8584)	-0.2324*** (-6.3054)	-0.2584*** (-6.8002)	-0.2557*** (-6.7684)	-0.2496*** (-6.8151)
ΔLnRGDP$_{i(t-1)}$	-0.1005 (-0.2663)	0.2836 (0.7319)	-0.1802 (-0.4645)	-0.1523 (-0.3937)	-0.0055 (-0.0145)
ΔLnRGDP$_{i(t-2)}$	0.1202 (0.3114)	0.2973 (0.7728)	0.0934 (0.2362)	0.0840 (0.2111)	0.0884 (0.2269)
ΔLnRGDP → ΔLnSPI	**2.1096**				
ΔLnCPI$_{i(t-1)}$	-2.1716*** (-3.6760)	-1.6191*** (-2.6030)	-2.1651*** (-3.5793)	-2.1533*** (-3.5708)	-1.9958*** (-3.3981)
ΔLnCPI$_{i(t-2)}$	0.2710 (0.4784)	0.8990 (1.5469)	0.2719 (0.4642)	0.2906 (0.4994)	0.3543 (0.6307)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
ΔlnFDI$_{i(t-1)}$	0.0310 (0.7794)	0.0485 (1.2240)	0.0386 (0.9408)	0.0325 (0.7960)	0.0190 (0.4732)
ΔlnFDI$_{i(t-2)}$	-0.1657*** (-4.0799)	-0.1533*** (-3.8083)	-0.1617*** (-3.8694)	-0.1670*** (-4.0158)	-0.1702*** (-4.2081)
ΔLnFDI → ΔLnSPI	**2.9442***				
ΔLnREER$_{i(t-1)}$	-0.4384** (-2.5245)	-0.4934*** (-2.8600)	-0.4522** (-2.5393)	-0.4535** (-2.5581)	-0.4601*** (-2.6794)
ΔLnREER$_{i(t-2)}$	0.4995*** (2.9089)	0.4900*** (2.8745)	0.4820*** (2.7440)	0.4783*** (2.7252)	0.4627*** (2.7098)
ΔLnREER → ΔLnSPI	**3.2370****				
ΔLnOPEN$_{i(t-1)}$	-0.3652** (-2.4743)	-0.3723** (-2.5420)	-0.3575** (-2.3587)	-0.3622** (-2.4036)	-0.4066*** (-2.7447)
ΔLnOPEN$_{i(t-2)}$	0.0781 (0.1391)	0.0542 (0.3925)	0.0859 (0.6007)	0.0693 (0.4853)	0.0444 (0.3197)
ΔLnOPEN → ΔLnSPI	**4.2997****				
Constant	0.1016*** (6.9957)	0.0893*** (6.6442)	0.0403 (0.7735)	0.0597 (0.8454)	0.1090*** (6.2169)
IR		-0.0081** (-2.4096)			
LnCR			0.0418 (1.3338)		
LnGS				0.0220 (0.6484)	
D$_{GFC}$					-0.0359** (-1.9775)
Sample size	677	673	658	658	677
R-squared	0.2896	0.3041	0.2767	0.2810	0.2974
Adj. R-squared	0.2757	0.2893	0.2609	0.2653	0.2825
Akaike AIC	-0.7761	-0.7928	-0.7344	-0.7404	-0.7841
Schwarz SIC	-0.6826	-0.6923	-0.6321	-0.6380	-0.6840
F-statistic	20.7913***	20.5374***	17.5680***	17.9495***	20.0123***

Table 7.13 reports estimated coefficients of panel VECM results using equation 7.7 along with different exogenous variables considering $\Delta LnSPI_{it}$ as dependent variables. This study first estimates the coefficients as mentioned in equation (7.7) for different specifications, that is, considering interest rates, corruption risk rating, government stability and a dummy variable for the Global Financial Crisis (GFC) in columns (2) to (5) respectively.

It can be seen that the estimated coefficients of the ECT are negative and significant for all specifications suggesting that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium. The ECT in column 1 for the model without having exogenous variables is -0.0389 suggests that approximately 3.89% of the short run disequilibrium is adjusted to the long run equilibrium per annum.

Except for $\Delta LnOPEN_{i(t-1)}$ and $\Delta LnOPEN_{i(t-2)}$, Table 7.13 demonstrates similar results of estimated coefficients of panel VECM from the preceding Tables in this chapter. The estimated coefficients for $\Delta LnOPEN_{i(t-1)}$ are negative and significant at a 5% level, and $\Delta LnOPEN_{i(t-2)}$ is positive but insignificant, implying that in the short run, $\Delta LnOPEN_{i(t-1)}$ does influence the $\Delta LnSPI_{it}$.

Table 7.14: Panel Error Correction Model 8 of Developed Markets

Variables	Model 8	Dependent variable: Δ $LnSPI_{it}$			
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM_{i(t-1)}}$	-0.0162*** (-5.5770)	-0.0707*** (-7.6252)	-0.0093*** (-4.6724)	-0.0158*** (-5.4776)	-0.0018* (-1.6916)
$\Delta LnSPI_{i(t-1)}$	0.3812*** (9.9680)	0.3889*** (10.3484)	0.3772*** (9.8089)	0.3809*** (9.9486)	0.3774 (9.7836)
$\Delta LnSPI_{i(t-2)}$	-0.2637*** (-6.9165)	-0.2338*** (-6.2080)	-0.2676*** (-6.9817)	-0.2649*** (-6.9251)	-0.2588*** (-6.7439)
$\Delta LnIPI_{i(t-1)}$	-0.0313 (-0.1956)	0.0693 (0.4383)	-0.0333 (-0.2075)	-0.0332 (-0.2071)	-0.0376 (-0.2337)
$\Delta LnIPI_{i(t-2)}$	0.1505 (0.9496)	0.1814 (1.1690)	0.1485 (0.9354)	0.1441 (0.9051)	0.1225 (0.7679)
ΔLnIPI → ΔLnSPI	**1.4297**				
$\Delta LnCPI_{i(t-1)}$	-2.2369*** (-3.8135)	-1.5119** (-2.4372)	-2.2151*** (-3.7649)	-2.2319*** (-3.8013)	-1.9416*** (-3.2925)
$\Delta LnCPI_{i(t-2)}$	0.3936 (0.6752)	0.7390 (1.2780)	0.4792 (0.8177)	0.4447 (0.7562)	0.6056 (1.0353)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
$\Delta lnFDI_{i(t-1)}$	0.0337 (0.8105)	0.0453 (1.1092)	0.0403 (0.9664)	0.0331 (0.7947)	0.0240 (0.5687)
$\Delta lnFDI_{i(t-2)}$	-0.1658*** (-3.9169)	-0.1610*** (-3.8998)	-0.1591*** (-3.7515)	-0.1655*** (-3.9074)	-0.1600*** (-3.7508)
ΔLnFDI → ΔLnSPI	**2.9442***				
$\Delta LnREER_{i(t-1)}$	-0.5006*** (-2.7931)	-0.4827*** (-2.7426)	-0.5027*** (-2.7973)	-0.5073*** (-2.8287)	-0.5720*** (-3.2051)
$\Delta LnREER_{i(t-2)}$	0.4379** (2.4599)	0.4992*** (2.8528)	0.4365** (2.4480)	0.4271** (2.3913)	0.3661** (2.0504)
ΔLnREER → ΔLnSPI	**3.2370****				
$\Delta LnOPEN_{i(t-1)}$	-0.3858** (-2.4479)	-0.3742** (-2.4277)	-0.3720** (-2.3499)	-0.3829** (-2.4249)	-0.4840*** (-3.0450)
$\Delta LnOPEN_{i(t-2)}$	0.0054 (0.0348)	0.0242 (0.1598)	0.0164 (0.1057)	-0.0024 (-0.0153)	-0.0847 (-0.5434)
ΔLnOPEN → ΔLnSPI	**4.2997****				
Constant	0.1012*** (6.8626)	0.1085*** (7.9224)	0.0132 (0.2572)	0.0614 (0.8622)	0.1129*** (6.7148)
IR		-0.0094*** (-2.7266)			
LnCR			0.0548* (1.7525)		
LnGS				0.0190 (0.5651)	
$\mathbf{D_{GFC}}$					-0.0653*** (-3.3871)
Sample size	658	654	658	658	658
R-squared	0.2681	0.3023	0.2667	0.2678	0.2628
Adj. R-squared	0.2534	0.2870	0.2508	0.2519	0.2467
Akaike AIC	-0.7257	-0.7694	-0.7207	-0.7222	-0.7154
Schwarz SIC	-0.6302	-0.6666	-0.6184	-0.6199	-0.6130
F-statistic	18.1490***	19.7777***	16.7068***	16.8005***	16.3712***

Table 7.15: Panel Error Correction Model 9 of Developed Markets

Variables	Model 9	Dependent variable: Δ LnSPI$_{it}$			
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$ECM_{i(t-1)}$	-0.0505*** (-7.3956)	-0.0986*** (-7.8018)	-0.0266*** (-5.9074)	-0.0500** (-7.0566)	-0.0941**** (-6.8663)
$\Delta LnSPI_{i(t-1)}$	0.3752*** (9.8002)	0.3960*** (10.341)	0.3737*** (9.4925)	0.3746*** (9.6165)	0.3736*** (9.7825)
$\Delta LnSPI_{i(t-2)}$	-0.2743*** (-7.3473)	-0.2479*** (-6.6089)	-0.2818*** (-7.2973)	-0.2771*** (-7.2511)	-0.2536*** (-6.8735)
$\Delta LnRGDP_{i(t-1)}$	-0.0249 (-0.0638)	0.4725 (1.1803)	-0.1152 (-0.2856)	-0.0153 (-0.0384)	0.3967 (1.0139)
$\Delta LnRGDP_{i(t-2)}$	-0.1473 (-0.3712)	0.1367 (0.3451)	-0.1909 (-0.4677)	-0.1180 (-0.2889)	-0.0293 (-0.0737)
ΔLnRGDP → ΔLnSPI	**2.1096**				
$\Delta LnCPI_{i(t-1)}$	-2.2976*** (-3.8051)	-1.8341*** (-2.8858)	-2.3194*** (-3.7424)	-2.3222*** (-3.7725)	-1.7861*** (-3.0109)
$\Delta LnCPI_{i(t-2)}$	0.4103 (0.7095)	1.1123* (1.8486)	0.3923 (0.6534)	0.4058 (0.6857)	1.0098* (1.7641)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
$\Delta LnREMI_{i(t-1)}$	-0.0020 (-0.0818)	-0.0042 (-0.1698)	0.0021 (0.0843)	-0.0027 (-0.1052)	-0.0061 (-0.2484)
$\Delta LnREMI_{i(t-2)}$	0.0022 (0.0898)	-0.0002 (-0.0086)	0.0045 (0.1786)	0.0019 (0.0748)	0.0001 (0.0027)
ΔLnREMI → ΔLnSPI	**1.1018**				
$\Delta LnREER_{i(t-1)}$	-0.5158*** (-2.9855)	-0.5920*** (-3.4611)	-0.5212*** (-2.9318)	-0.5190*** (-2.9464)	-0.6304*** (-3.7494)
$\Delta LnREER_{i(t-2)}$	0.4921*** (2.7853)	0.4267** (2.4388)	0.4762*** (2.6271)	0.4818*** (2.6706)	0.4070** (2.3417)
ΔLnREER → ΔLnSPI	**3.2370****				
$\Delta LnOPEN_{i(t-1)}$	-0.4562*** (-3.0449)	-0.4619*** (-3.1001)	-0.4537*** (-2.9418)	-0.4518*** (-2.9599)	-0.5369*** (-3.6201)
$\Delta LnOPEN_{i(t-2)}$	0.1161 (0.8141)	0.0927 (0.6533)	0.1245 (0.8474)	0.1171 (0.8015)	0.0235 (0.1669)
ΔLnOPEN → ΔLnSPI	**4.2997****				
Constant	0.0894*** (6.3715)	0.0682*** (5.2571)	0.0427 (0.8066)	0.0884 (1.2068)	0.0758*** (4.3896)
IR		-0.0066** (-1.9885)			
LnCR			0.0346 (1.0697)		
LnGS				0.0014 (0.0408)	
D_{GFC}					-0.0668*** (-4.2610)
Sample size	652	648	633	633	652
R-squared	0.2880	0.2999	0.2728	0.2830	0.3052
Adj. R-squared	0.2735	0.2844	0.2563	0.2668	0.2899
Akaike AIC	-0.7554	-0.7680	-0.7092	-0.7234	-0.7767
Schwarz SIC	-0.6592	-0.6645	-0.6038	-0.6179	-0.6736
F-statistic	19.8537***	19.3639***	16.5600***	17.4266***	19.9829***

Table 7.16: Panel Error Correction Model 10 of Developed Markets

Variables	Dependent variable: Δ LnSPI$_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM_{i(t-1)}}$	-0.0213*** (-5.6315)	-0.0957*** (-7.8031)	0.0019*** (3.2852)	-0.0149*** (-5.1014)	-0.0698*** (-5.7374)
$\Delta LnSPI_{i(t-1)}$	0.3808*** (9.8205)	0.4001*** (10.4927)	0.3858*** (9.7796)	0.3828*** (9.8197)	0.3903*** (10.159)
$\Delta LnSPI_{i(t-2)}$	-0.2882*** (-7.4382)	-0.2464*** (-6.4248)	-0.2905*** (-7.3452)	-0.2889*** (-7.3980)	-0.2406*** (-6.2398)
$\Delta LnIPI_{i(t-1)}$	-0.0366 (-0.2260)	0.1168 (0.7326)	-0.0080 (-0.0487)	-0.0351 (-0.2154)	0.0993 (0.6193)
$\Delta LnIPI_{i(t-2)}$	0.0266 (0.1656)	0.1120 (0.7168)	0.0541 (0.3330)	0.0269 (0.1663)	0.0747 (0.4720)
ΔLnIPI → ΔLnSPI	**1.4297**				
$\Delta LnCPI_{i(t-1)}$	-2.4091*** (-4.0012)	-1.7270*** (-2.7251)	-2.2884*** (-3.7370)	-2.3817*** (-3.9337)	-1.3977** (-2.3612)
$\Delta LnCPI_{i(t-2)}$	0.4634 (0.7729)	0.9875* (1.6556)	0.8076 (1.3210)	0.5348 (0.8778)	1.4704** (2.5209)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
$\Delta LnREMI_{i(t-1)}$	0.0008 (0.0321)	-0.0059 (-0.2375)	0.0071 (0.2757)	0.0021 (0.0833)	0.0049 (0.1973)
$\Delta LnREMI_{i(t-2)}$	0.0046 (0.1798)	-0.0010 (-0.0410)	0.0072 (0.2801)	0.0057 (0.2231)	0.0116 (0.4673)
ΔLnREMI → ΔLnSPI	**1.1018**				
$\Delta LnREER_{i(t-1)}$	-0.5863*** (-3.2616)	-0.5743*** (-3.2716)	-0.6479*** (-3.5697)	-0.6087*** (-3.3705)	-0.7108*** (-4.0817)
$\Delta LnREER_{i(t-2)}$	0.3974** (2.1663)	0.4592** (2.5497)	0.3524* (1.9010)	0.3773** (2.0413)	0.3927** (2.1679)
ΔLnREER → ΔLnSPI	**3.2370** **				
$\Delta LnOPEN_{i(t-1)}$	-0.4674*** (-2.9079)	-0.4593**** (-2.9260)	-0.4795*** (-2.9397)	-0.4751*** (-2.9415)	-0.6184*** (-3.9240)
$\Delta LnOPEN_{i(t-2)}$	0.0717 (0.4531)	0.0783 (0.5064)	0.0589 (0.3668)	0.0617 (0.3867)	-0.1046 (-0.6726)
ΔLnOPEN → ΔLnSPI	**4.2997** **				
Constant	0.0900*** (6.5523)	0.0823*** (6.7895)	-0.0248 (-0.4815)	0.0713 (0.9549)	0.0741*** (4.8258)
IR		-0.0070** (-2.1260)			
LnCR			0.0671** (2.0824)		
LnGS				0.0080 (0.2278)	
$\mathbf{D_{GFC}}$					-0.1092*** (-6.2826)
Sample size	633	629	633	633	633
R-squared	0.2624	0.2986	0.2454	0.2569	0.2861
Adj. R-squared	0.2469	0.2826	0.2283	0.2401	0.2700
Akaike AIC	-0.6981	-0.7441	-0.6723	-0.6876	-0.7277
Schwarz SIC	-0.5997	-0.6381	-0.5668	-0.5821	-0.6223
F-statistic	16.9352***	18.6681***	14.3571***	15.2604***	17.6933***

Table 7.17: Panel Error Correction Model 11 of Developed Markets

Variables	Dependent variable Δ LnSPI_{it}				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$\mathbf{ECM_{i(t-1)}}$	-0.0345*** (-6.8565)	-0.0830*** (-7.8198)	-0.0205*** (-5.6083)	-0.0275*** (-6.2129)	-0.0416*** (-5.3428)
$\Delta\text{LnSPI}_{i(t-1)}$	0.3760*** (9.6879)	0.3872*** (10.046)	0.3746*** (9.4162)	0.3778*** (9.5349)	0.3706*** (9.5431)
$\Delta\text{LnSPI}_{i(t-2)}$	-0.2577*** (-6.8172)	-0.2371*** (-6.2955)	-0.2635*** (-6.7693)	-0.2603*** (-6.7084)	-0.2560*** (-6.8095)
$\Delta\text{LnRGDP}_{i(t-1)}$	-0.1360 (-0.3449)	0.3065 (0.7657)	-0.1834 (-0.4519)	-0.1698 (-0.4194)	-0.0829 (-0.2109)
$\Delta\text{LnRGDP}_{i(t-2)}$	0.0117 (0.0294)	0.2328 (0.5893)	0.0075 (0.0183)	0.0056 (0.0136)	-0.0104 (-0.0259)
ΔLnRGDP → ΔLnSPI	**2.1096**				
$\Delta\text{LnCPI}_{i(t-1)}$	-2.1921*** (-3.6129)	-1.6377** (-2.5624)	-2.1887*** (-3.5260)	-2.1825*** (-3.5157)	-2.0886*** (-3.4491)
$\Delta\text{LnCPI}_{i(t-2)}$	0.2491 (0.4249)	0.9158 (1.5296)	0.2764 (0.4569)	0.2534 (0.4190)	0.2491 (0.4277)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
$\Delta\text{lnFDI}_{i(t-1)}$	0.0273 (0.6672)	0.0477 (1.1751)	0.0340 (0.8072)	0.0298 (0.7096)	0.0167 (0.4055)
$\Delta\text{lnFDI}_{i(t-2)}$	-0.1737*** (-4.1377)	-0.1588*** (-3.8341)	-0.1714*** (-3.9700)	-0.1752*** (-4.0675)	-0.1786*** (-4.2678)
ΔLnFDI → ΔLnSPI	**2.9442***				
$\Delta\text{LnREMI}_{i(t-1)}$	0.0085 (0.3414)	0.0061 (0.2484)	0.0109 (0.4265)	0.0091 (0.3577)	0.0069 (0.2780)
$\Delta\text{LnREMI}_{i(t-2)}$	0.0101 (0.4098)	0.0095 (0.3880)	0.0113 (0.4467)	0.0111 (0.4379)	0.0085 (0.3442)
ΔLnREMI → ΔLnSPI	**1.1018**				
$\Delta\text{LnREER}_{i(t-1)}$	-0.4063** (-2.2533)	-0.4525** (-2.5417)	-0.4224** (-2.2867)	-0.4263** (-2.3116)	-0.4139** (-2.3151)
$\Delta\text{LnREER}_{i(t-2)}$	0.5392*** (3.0387)	0.5468*** (3.1163)	0.5196*** (2.8646)	0.5136*** (2.8275)	0.5125*** (2.8979)
ΔLnREER → ΔLnSPI	**3.2370****				
$\Delta\text{LnOPEN}_{i(t-1)}$	-0.3688** (-2.4334)	-0.3655** (-2.4390)	-0.3604** (-2.3164)	-0.3709** (-2.3936)	-0.3960*** (-2.5953)
$\Delta\text{LnOPEN}_{i(t-2)}$	0.0984 (0.6887)	0.0807 (0.5715)	0.1035 (0.7053)	0.0897 (0.6111)	0.0770 (0.5388)
ΔLnOPEN → ΔLnSPI	**4.2997****				
Constant	0.1040*** (6.7624)	0.0888*** (6.4268)	0.0442 (0.8295)	0.0879 (1.1929)	0.1135*** (6.2769)
IR		-0.0086** (-2.4410)			
LnCR			0.0400 (1.2465)		
LnGS				0.0090 (0.2574)	
$\mathbf{D_{GFC}}$					-0.0281 (-1.4611)
Sample size	652	648	633	633	652
R-squared	0.2935	0.3140	0.2823	0.2838	0.3007
Adj. R-squared	0.2769	0.2966	0.2637	0.2652	0.2831
Akaike AIC	-0.7570	-0.7823	-0.7161	-0.7181	-0.7641
Schwarz SIC	-0.6471	-0.6649	-0.5966	-0.5986	-0.6473
F-statistic	17.6175***	18.0520***	15.1472***	15.2558***	17.0653***

Table 7.18: Panel Error Correction Model 12 of Developed Markets

Variables	Dependent variable: Δ $LnSPI_{it}$				
	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
$ECM_{i(t-1)}$	-0.0156*** (-5.4420)	-0.0820*** (-7.8830)	-0.0097*** (-4.7002)	-0.0138*** (-5.2058)	-0.0006 (-0.2008)
$\Delta LnSPI_{i(t-1)}$	0.3815*** (9.7636)	0.3932*** (10.2696)	0.3773*** (9.6092)	0.3819*** (9.7523)	0.3808*** (9.6340)
$\Delta LnSPI_{i(t-2)}$	-0.2700*** (-6.9242)	-0.2357*** (-6.1384)	-0.2739*** (-6.9943)	-0.2704*** (-6.9030)	-0.2590*** (-6.5626)
$\Delta LnIPI_{i(t-1)}$	-0.0482 (-0.2937)	0.0200 (0.1248)	-0.0473 (-0.2876)	-0.0461 (-0.2805)	-0.0248 (-0.1499)
$\Delta LnIPI_{i(t-2)}$	0.1403 (0.8671)	0.1392 (0.8828)	0.1411 (0.8703)	0.1399 (0.8601)	0.1227 (0.7526)
ΔLnIPI → ΔLnSPI	**1.4297**				
$\Delta LnCPI_{i(t-1)}$	-2.2619*** (-3.7562)	-1.5424** (-2.4213)	-2.2480*** (-3.7246)	-2.2496*** (-3.7266)	-1.7717*** (-2.9091)
$\Delta LnCPI_{i(t-2)}$	0.4181 (0.6970)	0.7573 (1.2756)	0.5021 (0.8338)	0.4649 (0.7659)	0.8888 (1.4691)
ΔLnCPI → ΔLnSPI	**6.7426*** **				
$\Delta lnFDI_{i(t-1)}$	0.0305 (0.71286)	0.0459 (1.09669)	0.0362 (0.84322)	0.0312 (0.72663)	0.0293 (0.67414)
$\Delta lnFDI_{i(t-2)}$	-0.1765*** (-4.0326)	-0.1659*** (-3.9060)	-0.1711*** (-3.8993)	-0.1754*** (-3.9966)	-0.1571*** (-3.5582)
ΔLnFDI → ΔLnSPI	**2.9442***				
$\Delta LnREMI_{i(t-1)}$	0.0119 (0.4654)	0.0055 (0.2197)	0.0134 (0.5270)	0.0123 (0.4828)	0.0174 (0.6787)
$\Delta LnREMI_{i(t-2)}$	0.0133 (0.5279)	0.0095 (0.3868)	0.0132 (0.5203)	0.0139 (0.5491)	0.0196 (0.7706)
ΔLnREMI → ΔLnSPI	**1.1018**				
$\Delta LnREER_{i(t-1)}$	-0.4782** (-2.5763)	-0.4203** (-2.3128)	-0.4816*** (-2.5897)	-0.4911*** (-2.6409)	-0.6092*** (-3.3060)
$\Delta LnREER_{i(t-2)}$	0.4542** (2.4746)	0.5683*** (3.1524)	0.4521** (2.4601)	0.4416** (2.3938)	0.3729** (2.0211)
ΔLnREER → ΔLnSPI	**3.2370****				
$\Delta LnOPEN_{i(t-1)}$	-0.3796** (-2.3489)	-0.3458** (-2.1951)	-0.3648** (-2.2470)	-0.3821** (-2.3586)	-0.5183*** (-3.1818)
$\Delta LnOPEN_{i(t-2)}$	0.0152 (0.0964)	0.0535 (0.3476)	0.0276 (0.1740)	0.0078 (0.0489)	-0.1119 (-0.7018)
ΔLnOPEN → ΔLnSPI	**4.2997****				
Constant	0.0999*** (6.5940)	0.1036*** (7.6652)	0.0155 (0.2973)	0.0776 (1.0471)	0.1039*** (5.9692)
IR		-0.0089** (-2.5041)			
LnCR			0.0529* (1.6540)		
LnGS				0.0101 (0.2911)	
D_{GFC}					-0.0825*** (-4.1681)
Sample size	633	629	633	633	633
R-squared	0.2738	0.3141	0.2730	0.2720	0.2653
Adj. R-squared	0.2561	0.2962	0.2541	0.2531	0.2462
Akaike AIC	-0.7074	-0.7602	-0.7031	-0.7018	-0.6926
Schwarz SIC	-0.5949	-0.6401	-0.5836	-0.5822	-0.5731
F-statistic	15.5073***	17.5201***	14.4545***	14.3825***	13.8996***

Table 7.14 to Table 7.18 demonstrates similar results of estimated coefficients of panel VECM from preceding Tables in this chapter.

Error Correction Terms (ECT) and Panel VECM Short run Coefficients

Above 12 Tables (Table 7.7 - Table 7.18) report estimated coefficients of panel VECM results using equations (7.1-7.12) along with interest rates, corruption risk rating, government stability and dummy variables for Global Financial Crisis as exogenous variables considering $\Delta LnSPI_{i(t-1)}$ as dependent variables.

It can be seen that the $ECT_{i(t-1)}$ is negative and significant at a 1% level suggests that through ECT, a short run disequilibrium may eventually be turned into equilibrium. The estimated coefficient of the ECT represents the speed of adjustment to the long run equilibrium.

ΔLnSPIi(t-1) estimated coefficients are positive and significant at a 1% significant level, and $\Delta LnSPI_{i(t-2)}$ is negative and significant at a 1% significant level. Table 7.7 to Table 7.18 suggests that the estimated coefficients of $\Delta LnRGDP_{i(t-1)}$ are negative, and $\Delta LnRGDP_{i(t-2)}$ is positive. This result is supported by evidence from existing studies that indicate that GDP positively impacts stock market performance (Fama, 1981; Mukherjee & Naka, 1995). This means that an increase in economic growth leads to an increase in share price. This study finds these estimated coefficients insignificant.

The estimated coefficients of $\Delta LnIPI_{i(t-1)}$ is negative, and $\Delta LnIPI_{i(t-2)}$ is positive. This result is supported by Mukherjee and Naka (1995), Liljeblom and Stenius (1997), Abdullah (1998), Gjerde and Saettem (1999), Maysami et al. (2004), Lobão and Levi (2016), which also found a positive and statistically significant relationship between industrial production and stock price. However, this study finds these estimated coefficients insignificant.

The estimated coefficients are negative and significant at 1% level for $\Delta LnCPI_{i(t-1)}$. This can be evident from Table 7.7 to Table 7.18. This result is similar to previous literature. For instance, a significant positive relationship was observed between inflation and stock returns in reports on UK (Firth, 1979), Singapore (Maysami et al., 2004) and Ghana (Adam & Tweneboah, 2008). Similarly, In the study by Maysami and Sim (2001a), the Korean stock markets showed a positive association with inflation.

Results presented in Tables 7.7 to 7.18 show that the estimated coefficient of panel VECM of $\Delta LnFDI_{i(t-2)}$ is negative and significant at a 1% level. Clark and Berko (1996) also find supporting evidence for the positive relationship between foreign direct investment and stock market return in Mexico.

Tables 7.7 to 7.18 also show that the estimated coefficient of panel VECM of both $\Delta LnREMI_{i(t-1)}$ and $\Delta LnREMI_{i(t-2)}$ is positive. Gupta et al. (2009) indicate that remittances have a positive impact on poverty mitigation by increased income and higher living conditions by remittance-receiving households. However, this study finds these estimated coefficients insignificant in developed markets.

It can also be seen from Table 7.7 to Table 7.18 that the estimated coefficient of $\Delta LnREER_{i(t-1)}$ is negative and significant at the 1% level, and $\Delta LnREER_{i(t-2)}$ is positive and significant at the 5% level. The positive relations between stock prices and exchange rates have been found in research studies like Aggarwal (1981). Using monthly data on U.S. stock markets from 1974 to1978, Aggarwal (1981) found that stock prices and real exchange rates are positive.

Tables 7.7 to 7.18 reveal that the estimated coefficient of $\Delta LnOPEN_{i(t-1)}$ is negative and significant at the 5% level. According to Basu and Morey's (2005) studies, a more open economy is predicted to enjoy real-economy growth due to more efficient resource utilisation. According to Fama (1990) and Ferson and Harvey (1997), growth in the real economy boosts future cash flow and profits, which leads to an increase in stock values. As a result, there is a positive link between trade openness and stock prices.

Tables 7.7 to 7.18 also reveal that estimated coefficients of IR of panel VECM are negative and significant at a 5% level. Previous research, including those of Waud (1970), Nelson (1976), Fama and Schwert (1977) and Fama (1981), indicate that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), Ferrer et al. (2016) have also confirmed this trend of relationship.

The estimated coefficients for LnCR presented in Tables 7.7 to 7.18 also reveal a positive and significant at the 10% level. Mashal (2011) argues that corruption spoils economic growth by dwindling domestic competition that undermines domestic and foreign companies' efficiency. In addition, corruption makes it more difficult and costly to conduct foreign operations by obtaining licenses and permits (Habib and Zurawicki, 2002, Voyer and Beamish, 2004, Cuervo-Cazurra, 2008). Ng (2006) claims that managers might participate in projects otherwise accept bribes that create waste and increase transaction costs in the economy.

The estimated coefficients for LnGS presented in Tables 7.7 to 7.18 suggest that a positive and insignificant. Yartey (2008) also supports a positive relationship between government stability and share price. The results highlighted that political risk, law and order, and bureaucratic quality is important determinants of stock market development as they enhance the viability of external finance.

This finding presented in Tables 7.7 to 7.18 also indicates that the estimated coefficients for the dummy variable (D_{GFC}), global financial crisis (GFC), are negative and significant at a 1% level in developed markets.

7.9 Granger Causality Test

The results of the Pedroni panel cointegration test (1991, 1995) showed evidence that variables are cointegrated. Therefore, a dynamic panel data model using the VECM Granger causality framework was estimated. Before the panel VECM estimation, the optimal lags were established as two, using the Schwarz information criteria under the unrestricted panel VAR model. Based on the panel VECM framework, the panel Granger causality test results are shown in 12 Tables starting from Table 7.19 to Table 7.30.

Table 7.19: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 1 of developed markets.

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	
	ΔLNSPI	**Δ LNRGDP**	**Δ LNCPI**	**All**
ΔLNSPI	-	2.3378 (0.3107)	21.1972*** (0.0000)	21.8079*** (0.0002)
ΔLNRGDP	17.9311*** (0.0001)	-	73.0055*** (0.0000)	93.9911*** (0.0000)
ΔLNCPI	27.6437*** (0.0000)	21.4386*** (0.0000)	-	51.5683*** (0.0000)

ΔLnSPI → ΔLnRGDP; ΔLnCPI ↔ ΔLnSPI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	
	ΔLNSPI	**Δ LNRGDP**	**Δ LNCPI**	**All**
ΔLNSPI	-	2.0441 (0.3599)	28.1259*** (0.0000)	32.5275*** (0.0000)
ΔLNRGDP	16.4446*** (0.0003)	-	88.0635*** (0.0000)	106.2065*** (0.0000)
ΔLNCPI	21.6729*** (0.0000)	35.5311*** (0.0000)	-	58.9938*** (0.0000)

ΔLnSPI → ΔLnRGDP; ΔLnCPI ↔ ΔLnSPI

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	
	ΔLNSPI	**Δ LNRGDP**	**Δ LNCPI**	**All**
ΔLNSPI	-	2.7663 (0.2508)	31.5609*** (0.0000)	38.4622*** (0.0000)
ΔLNRGDP	15.7808*** (0.0004)	-	81.7284*** (0.0000)	99.5784*** (0.0000)
ΔLNCPI	19.5755*** (0.0001)	44.6282*** (0.0000)	-	65.6343*** (0.0000)

ΔLnSPI → ΔLnRGDP; ΔLnCPI ↔ ΔLnSPI

Note 1: Chi-square values are provided, along with p values in parenthesis.
Note 2: ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.
Note 3: ΔLnSPI↔ΔLnRGDP implies SPI growth, and real GDP growth both Granger causes each other.
ΔLnCPI→ΔLnSPI implies CPI growth Granger causes SPI growth.

Table 7.19 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen clearly in panel A that inflation Granger causes share price growth and economic growth and inflation also jointly Granger causes share price growth. Similarly, share price growth and inflation Granger cause economic growth separately. They also jointly Granger cause economic growth in a multivariate framework while the interest rate is considered an exogenous variable.

It can be seen clearly in panel B that economic growth Granger causes share price growth. Again, economic growth and inflation jointly Granger cause share price growth. Similarly, share price growth Granger causes economic growth separately and share price growth and inflation jointly Granger causes economic growth. Economic growth Granger causes inflation separately, and share price growth and economic growth jointly Granger cause inflation in a multivariate framework while the interest rate is considered as an exogenous variable.

A similar result can be seen in Panel B and C in a multivariate framework while considering LnCR and LnGS, respectively, as the exogenous variable in the model.

Table 7.20: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 2 of Developed Markets

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**All**
ΔLnSPI	-	1.0265 (0.5985)	16.7456*** (0.0002)	18.6545*** (0.0009)
ΔLnIPI	18.5730*** (0.0001)	-	60.6540*** (0.0000)	83.3004*** (0.0000)
ΔLnCPI	22.0580*** (0.0000)	2.5289 (0.2824)	-	32.3042*** (0.0000)

ΔLnSPI → ΔLnIPI; ΔLnCPI ↔ ΔLnSPI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**All**
ΔLnSPI	-	2.2744 (0.3207)	25.7474*** (0.0000)	29.7562*** (0.0000)
ΔLnIPI	19.5539*** (0.0001)	-	78.9326*** (0.0000)	102.5330*** (0.0000)
ΔLnCPI	15.1924*** (0.0005)	5.2441* (0.0727)	-	29.0301*** (0.0000)

ΔLnSPI → ΔLnIPI; ΔLnCPI ↔ ΔLnSPI

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**All**
ΔLnSPI	-	3.0548 (0.2171)	27.2671*** (0.0000)	32.5106*** (0.0000)
ΔLnIPI	19.2548*** (0.0001)	-	76.6162*** (0.0000)	100.4455*** (0.0000)
ΔLnCPI	14.3116*** (0.0008)	5.5554* (0.0622)	-	27.6064*** (0.0000)

ΔLnSPI → ΔLnIPI; ΔLnCPI ↔ ΔLnSPI

Table 7.20 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

In panel A, it can be seen that inflation Granger causes share price growth, again ∆LnIPI and inflation also jointly Granger cause share price growth. Similarly, share price growth Granger causes ∆LnIPI, again share price growth and inflation also jointly Granger causes ∆LnIPI. Share price growth Granger causes inflation. Again, share price and ∆LnIPI jointly Granger causes inflation in a multivariate framework while the interest rate is considered as an exogenous variable.

In panel B, it can be seen that inflation Granger causes share price growth, again ∆LnIPI and inflation also jointly Granger cause share price growth. Similarly, share price growth Granger causes ∆LnIPI, again share price growth and inflation also jointly Granger causes ∆LnIPI. Share price growth and ∆LnIPI separately and combinedly Granger causes inflation in a multivariate framework while corruption risk rating is considered an exogenous variable.

A similar result can be seen in panel C in a multivariate framework while considering government stability as the exogenous variable in the model.

Table 7.21: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 3 of developed markets.

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnRGDP	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	All
ΔLNSPI	-	3.6118 (0.1643)	12.3934*** (0.0020)	21.3011*** (0.0000)	0.3866 (0.8242)	15.0005*** (0.0006)	52.5384*** (0.0000)
ΔLNRGDP	23.2698*** (0.0000)	-	68.6697*** (0.0000)	9.3195*** (0.0095)	1.5948 (0.4505)	8.5814** (0.0137)	120.2631*** (0.0000)
ΔLNCPI	25.5521*** (0.0000)	17.1420*** (0.0002)	-	0.9094 (0.6346)	0.2726 (0.8726)	5.2358* (0.0730)	59.6259*** (0.0000)
ΔLnFDI	0.1480 (0.9287)	8.4026** (0.0150)	0.5214 (0.7705)	-	1.7052 (0.4263)	0.5333 (0.7659)	13.0356 (0.2217)
ΔLnREMI	6.4754** (0.0393)	2.7372 (0.2545)	2.3023 (0.3163)	14.9677*** (0.0006)	-	2.8605 (0.2393)	33.2325*** (0.0002)
ΔLnREER	3.2921 (0.1928)	4.8839* (0.0870)	26.0987*** (0.0000)	35.2063*** (0.0000)	0.2852 (0.8671)	-	70.6522*** (0.0000)

ΔLnFDI →ΔLnSPI; ΔLnREMI→ ΔLnSPI; ΔLnCPI ↔ ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnRGDP	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	All
ΔLNSPI	-	2.1389 (0.3432)	28.5832*** (0.0000)	20.5890*** (0.0000)	0.6268 (0.7310)	10.3913*** (0.0055)	67.4199*** (0.0000)
ΔLNRGDP	21.3791*** (0.0000)	-	85.8920*** (0.0000)	12.8507*** (0.0016)	1.7847 (0.4097)	8.3022** (0.0157)	136.5200*** (0.0000)
ΔLNCPI	18.5334*** (0.0001)	35.1730*** (0.0000)	-	0.8427 (0.6562)	0.2928 (0.8638)	7.5428** (0.0230)	72.4039*** (0.0000)
ΔLnFDI	0.3153 (0.8541)	2.9425 (0.2296)	1.3266 (0.5151)	-	1.9436 (0.3784)	0.8254 (0.6619)	8.0853 (0.6205)
ΔLnREMI	6.8879** (0.0319)	3.0897 (0.2133)	2.6854 (0.2611)	14.9830*** (0.0006)	-	2.4806 (0.2893)	33.2899*** (0.0002)
ΔLnREER	2.9183 (0.2324)	5.2422* (0.0727)	31.0526*** (0.0000)	33.9037*** (0.0000)	0.2603 (0.8780)	-	79.1051*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnREMI→ ΔLnSPI; ΔLnCPI ↔ ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	ΔLnRGDP	ΔLnCPI	ΔLnFDI	ΔLnREMI	ΔLnREER	All
ΔLNSPI	-	2.1880 (0.3349)	27.8129*** (0.0000)	21.1434*** (0.0000)	0.6245 (0.7318)	10.5365*** (0.0052)	69.2901*** (0.0000)
ΔLNRGDP	21.0593*** (0.0000)	-	81.1405*** (0.0000)	12.2759*** (0.0022)	1.8236 (0.4018)	8.1951** (0.0166)	131.3798*** (0.0000)
ΔLNCPI	17.9530*** (0.0001)	38.6677*** (0.0000)	-	0.9177 (0.6320)	0.3904 (0.8227)	7.2808** (0.0262)	75.5917*** (0.0000)
ΔLnFDI	0.6035 (0.7395)	2.4977 (0.2868)	0.5937 (0.7432)	-	1.9835 (0.3709)	1.1733 (0.5562)	7.1712 (0.7092)
ΔLnREMI	7.0160** (0.0300)	3.0200 (0.2209)	1.8956 (0.3876)	15.0372*** (0.0005)	-	2.3127 (0.3146)	32.6098*** 0.0003)
ΔLnREER	3.2492 (0.1970)	4.2905 (0.1170)	34.7202*** (0.0000)	33.6816*** (0.0000)	0.1274 (0.9383)	-	82.3772*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnREMI→ ΔLnSPI; ΔLnCPI ↔ ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Table 7.21 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, Inflation, ΔLnFDI and ΔLnREER and separately Granger cause share price growth, again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger cause share price growth. Similarly, share price growth, inflation and ΔLnFDI separately Granger cause economic growth. Again, share price growth, Inflation, ΔLnFDI and ΔLnREER jointly Granger cause economic growth. Similarly, share price growth, economic growth and ΔLnREER separately Granger cause inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger causes Inflation. Economic growth Granger causes ΔLnFDI. Share price growth and inflation Granger cause ΔLnREMI, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREER jointly Granger causes ΔLnREMI. Economic growth, inflation and ΔLnFDI separately Granger cause ΔLnREER, again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnREER in a multivariate framework while interest rate considered as an exogenous variable.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability respectively as the exogenous variable in the model.

Table 7.22: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 4 of developed markets.

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnREER	All
ΔLnSPI	-	2 9713 (0.2264)	9.9739*** (0.0068)	20.9707**** (0.0000)	0.2546 (0.8805)	15.0686*** (0.0005)	50.8545*** (0.0000)
ΔLnIPI	24.7193*** (0.0000)	-	49.3172*** (0.0000)	9.5805*** (0.0083)	2.3996 (0.3012)	21.1638*** (0.0000)	123.1351*** (0.0000)
ΔLnCPI	21.3477*** (0.0000)	0 9709 (0.6154)	-	1.0504 (0.5914)	1.0939 0.5787)	4.8564* (0.0882)	43.3148*** (0.0000)
ΔLnFDI	0.7372 (0.6917)	11.4967*** (0.0032)	0.6904 (0.7081)	-	1.5465 (0.4615)	0.1137 (0.9447)	16.1389* (0.0957)
ΔLnREMI	5.8410* (0.0539)	0.8201 (0.6636)	1.3143 (0.5183)	12.3989*** (0.0020)	-	3.1864 (0.2033)	29.7074*** (0.0010)
ΔLnREER	2.6935 (0.2601)	0.6008 (0.7405)	26.2706*** (0.0000)	34.6532*** (0.0000)	0.7082 (0.7018)	-	63.9017*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnREMI→ ΔLnSPI; ΔLnCPI ↔ ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnREER	All
ΔLnSPI	-	3.4806 (0.1755)	26.3263*** (0.0000)	20.0817*** (0.0000)	0.7260 (0.6956)	9.9066*** (0.0071)	65.4081** (0.0000)
ΔLnIPI	23.5813*** (0.0000)	-	62.2705*** (0.0000)	11.1965*** (0.0037)	2.5753 (0.2759)	21.3965*** (0.0000)	140.7432**** (0.0000)
ΔLnCPI	14.1569*** (0.0008)	3 5969 (0.1656)	-	1.8254 (0.4014)	1.8886 (0.3890)	6.5428** (0.0380)	40.9899*** (0.0000)
ΔLnFDI	1.4773 (0.4778)	8.3056** (0.0157)	0.3891 (0.8232)	-	1.9484 (0.3775)	0.2781 (0.8702)	13.4891 (0.1976)
ΔLnREMI	6.5476** (0.0379)	0.8702 (0.6472)	1.5215 (0.4673)	13.6802*** (0.0011)	-	2.4010 (0.3010)	30.9543*** (0.0006)
ΔLnREER	2.8590 (0.2394)	0.7227 (0.6967)	37.7327** (0.0000)	36.6952**** (0.0000)	0.5809 (0.7479)	-	78.8187*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnREMI→ΔLnSPI; ΔLnCPI ↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnREER	All
ΔLnSPI	-	3 3046 (0.1916)	26.5233*** (0.0000)	20.6260*** (0.0000)	0.7577 (0.6847)	9.9907*** (0.0068)	67.2090*** (0.0000)
ΔLnIPI	23.3860*** (0.0000)	-	58.8523*** (0.0000)	10.9133*** (0.0043)	2.5363 (0.2814)	21.9054*** (0.0000)	137.5448*** (0.0000)
ΔLnCPI	13.6785*** (0.0011)	3.8459 (0.1462)	-	1.9392 (0.3792	2.1235 (0.3458)	6.5047** (0.0387)	40.5035*** (0.0000)
ΔLnFDI	2.0015 (0.3676)	8.1837** (0.0167)	0.2170 (0.8972)	-	2.1138 (0.3475)	0.3880 (0.8237)	13.1936 (0.2130)
ΔLnREMI	6.7677** (0.0339)	0.7130 (0.7001)	1.1954 (0.5501)	13.4945*** (0.0012)	-	2.2785 (0.3201)	30.2296*** (0.0008)
ΔLnREER	3.2797 (0.1940)	0 3901 (0.8228)	41.4580*** (0.0000)	36.2440*** (0.0000)	0.3203 (0.8520)	-	82.5129*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnREMI→ ΔLnSPI; ΔLnCPI ↔ ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Table 7.22 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, Inflation, ΔLnFDI and ΔLnREER and separately Granger cause share price growth, again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger cause share price growth. Similarly, share price growth, Inflation, ΔLnFDI and ΔLnREER separately Granger cause ΔLnIPI. Again, share price growth, Inflation, ΔLnFDI, ΔLnREMI, and ΔLnREER jointly Granger cause ΔLnIPI. Share price growth and ΔLnREER Granger cause inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI and ΔLnREER jointly Granger causes Inflation. ΔLnIPI Granger cause ΔLnFDI, again share price growth, ΔLnIPI, inflation, ΔLnREMI and ΔLnREER jointly Granger causes ΔLnFDI. Share price growth and ΔLnFDI separately Granger cause ΔLnREMI, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREER jointly Granger causes ΔLnREMI. Inflation and ΔLnFDI separately Granger cause ΔLnREER, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnREER in a multivariate framework while interest rate considered as an exogenous variable.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability, respectively, as the exogenous variable in the model.

Table 7.23: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 5 of developed markets.

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	2.9155 (0.2328)	13.3437*** (0.0013)	17.6121*** (0.0001)	0.7598 (0.6839)	5.5012* (0.0639)	43.4821*** (0.0000)
ΔLnRGDP	17.1997*** (0.0002)	-	68.4312*** (0.0000)	11.5255*** (0.0031)	2.4619 (0.2920)	10.6761*** (0.0048)	124.5922*** (0.0000)
ΔLnCPI	22.7671*** (0.0000)	20.3870*** (0.0000)	-	2.8686 (0.2383)	0.8587 (0.6509)	7.1191** (0.0285)	60.8052*** (0.0000)
ΔLnFDI	0.2017 (0.9041)	7.7979** (0.0203)	0.5869 (0.7457)	-	1.7889 (0.4088)	2.2689 (0.3216)	15.2135 (0.1245)
ΔLnREMI	4.9252* (0.0852)	2.8425 (0.2414)	2.1458 (0.3420)	15.8462*** (0.0004)	-	1.3143 (0.5183)	31.2645*** (0.0005)
ΔLnOPEN	6.8342** (0.0328)	15.3390*** (0.0005)	85.5893*** (0.0000)	0.7695 (0.6806)	5.3507* (0.0689)	-	142.1825*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnOPEN↔ ΔLnSPI; ΔLnSPI → ΔLnRGDP; ΔLnSPI → ΔLnREMI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	1.0930 (0.5790)	26.6104*** (0.0000)	17.3449*** (0.0002)	1.1104 (0.5740)	3.8719 (0.1443)	57.0000*** (0.0000)
ΔLnRGDP	15.5709*** (0.0004)	-	91.9244*** (0.0000)	16.0488*** (0.0003)	2.3946 (0.3020)	11.8514*** (0.0027)	146.0424*** (0.0000)
ΔLnCPI	16.1516*** (0.0003)	33.5506*** (0.0000)	-	1.5073 (0.4707)	0.7583 (0.6844)	5.8910* (0.0526)	65.4039*** (0.0000)
ΔLnFDI	0.7874 (0.6746)	1.1803 (0.5543)	1.1826 (0.5536)	-	2.2550 (0.3238)	2.3750 (0.3050)	8.7861 (0.5525)
ΔLnREMI	5.4047* (0.0670)	3.1747 (0.2045)	2.7040 (0.2587)	15.8663*** (0.0004)	-	1.2754 (0.5285)	32.1634*** (0.0004)
ΔLnOPEN	6.1155** (0.0470)	17.0179*** (0.0002)	72.7810*** (0.0000)	1.0627 (0.5878)	5.3719* (0.0682)	-	140.0774*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnSPI → ΔLnRGDP; ΔLnSPI → ΔLnREMI; ΔLnSPI→ ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	1.3072 (0.5202)	25.5077*** (0.0000)	17.7598*** (0.0001)	1.1867 (0.5525)	4.8060* (0.0904)	59.2721*** (0.0000)
ΔLnRGDP	15.1349*** (0.0005)	-	87.9861*** (0.0000)	15.4392*** (0.0004)	2.4463 (0.2943)	11.1691** (0.0038)	141.4111*** (0.0000)
ΔLnCPI	15.7948*** (0.0004)	36.5565*** (0.0000)	-	1.3862 (0.5000)	0.8894 (0.6410)	6.0190** (0.0493)	67.3511*** (0.0000)
ΔLnFDI	1.2375 0.5386)	0.9489 (0.6222)	0.5756 (0.7499)	-	2.3138 (0.3145)	2.7234 (0.2562)	8.0831 (0.6207)
ΔLnREMI	5.5182* (0.0633)	3.1424 (0.2078)	1.8211 (0.4023)	15.9167*** (0.0003)	-	1.2944 (0.5235)	31.7144*** (0.0004)
ΔLnOPEN	5.7691* (0.0559)	13.9649*** (0.0009)	73.4503*** (0.0000)	0.9155 (0.6327)	5.5453* (0.0625)	-	137.9085*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ ΔLnSPI; ΔLnSPI → ΔLnRGDP; ΔLnSPI → ΔLnREMI

Table 7.23 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, Inflation, ΔLnFDI and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth.

Similarly, share price growth, inflation and ΔLnFDI and ΔLnOPEN separately Granger cause economic growth. Also, share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause economic growth.

Share price growth, economic growth and ΔLnOPEN Granger cause inflation, also share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause inflation. Economic growth Granger causes ΔLnFDI.

Share price growth and ΔLnFDI Granger cause ΔLnREMI, also share price growth, economic growth, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI.

Share price growth, economic growth, inflation and ΔLnREMI separately Granger cause ΔLnOPEN. Again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN in a multivariate framework while the interest rate is considered as an exogenous variable.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability, respectively, as the exogenous variable in the model.

Table 7.24: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 6 of developed markets.

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	1.8727 (0.3921)	11.0175*** (0.0041)	18.1104*** (0.0001)	0.6833 (0.7106)	4.7231* (0.0943)	40.7111*** (0.0000)
ΔLnIPI	15.9562*** (0.0003)	-	55.5507*** (0.0000)	13.2494*** (0.0013)	3.0726 (0.2152)	0.7069 (0.7023)	98.7015*** (0.0000)
ΔLnCPI	20.5799*** (0.0000)	5.3704* (0.0682)	-	2.2916 (0.3180)	1.9717 (0.3731)	7.3217** (0.0257)	45.7137*** (0.0000)
ΔLnFDI	0.5418 (0.7627)	7.9769** (0.0185)	1.0358 (0.5958)	-	1.5930 (0.4509)	0.7459 (0.6887)	16.0521* (0.0981)
ΔLnREMI	4.3075 (0.1160)	1.0974 (0.5777)	1.3014 (0.5217)	12.9309*** (0.0016)	-	1.4883 (0.4751)	27.5698*** (0.0021)
ΔLnOPEN	8.8375** (0.0120)	4.5175 (0.1045)	89.5819*** (0.0000)	1.0052 (0.6050)	4.0101 (0.1347)	-	126.6995*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnOPEN↔ ΔLnSPI; ΔLnSPI → ΔLnIPI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	1.9605 (0.3752)	27.3800*** (0.0000)	18.1369*** (0.0001)	1.3042 (0.5209)	3.4161 (0.1812)	56.7997*** (0.0000)
ΔLnIPI	15.6060*** (0.0004)	-	77.4388*** (0.0000)	15.7643*** (0.0004)	2.5646 (0.2774)	0.6684 (0.7159)	123.4959*** (0.0000)
ΔLnCPI	12.0015*** (0.0025)	5.9614* (0.0508)	-	1.1887 (0.5519)	2.2123 (0.3308)	4.6353* (0.0985)	37.0384*** (0.0001)
ΔLnFDI	1.7867 (0.4093)	4.2314 (0.1206)	0.7832 (0.6760)	-	2.3998 (0.3012)	0.9323 (0.6274)	12.0468 (0.2819)
ΔLnREMI	5.0959* (0.0782)	1.1166 (0.5722)	1.9986 (0.3681)	13.6883*** (0.0011)	-	1.4942 (0.4737)	30.0266*** (0.0008)
ΔLnOPEN	8.2412** (0.0162)	6.1096** (0.0471)	87.3492*** (0.0000)	1.0311 (0.5972)	4.0559 (0.1316)	-	126.4841*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnSPI → ΔLnIPI; ΔLnSPI → ΔLnREMI; ΔLnSPI→ ΔLnOPEN

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	1.8933 (0.3880)	26.5909*** (0.0000)	18.4710*** (0.0001)	1.4463 (0.4852)	4.2404 (0.1200)	58.2545*** (0.0000)
ΔLnIPI	15.3958*** (0.0005)	-	74.8251*** (0.0000)	15.4575*** (0.0004)	2.6230 (0.2694)	0.5800 (0.7482)	120.7953*** (0.0000)
ΔLnCPI	11.6538*** (0.0029)	6.0674** (0.0481)	-	1.1718 (0.5566)	2.4707 (0.2907)	4.7416* (0.0934)	36.0460*** (0.0001)
ΔLnFDI	2.4882 (0.2882)	4.2940 (0.1168)	0.3356 (0.8455)	-	2.5522 (0.2791)	0.8947 (0.6393)	11.6428 (0.3097)
ΔLnREMI	5.3069* (0.0704)	0.9943 (0.6083)	1.3656 (0.5052)	13.6876*** (0.0011)	-	1.4984 (0.4727)	29.5095*** (0.0010)
ΔLnOPEN	7.7338** (0.0209)	5.1662* (0.0755)	89.6769*** (0.0000)	0.9083 (0.6350)	4.3325 (0.1146)	-	127.1914*** (0.0000)

ΔLnFDI →ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnSPI → ΔLnIPI; ΔLnSPI → ΔLnREMI; ΔLnSPI→ ΔLnOPEN

Table 7.24 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, Inflation, ΔLnFDI and ΔLnOPEN separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, inflation and ΔLnFDI separately Granger cause ΔLnIPI. Also, share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause ΔLnIPI. Share price growth, ΔLnIPI and ΔLnOPEN separately Granger cause inflation, also share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes inflation. ΔLnIPI Granger causes ΔLnFDI, also share price growth, ΔLnIPI, inflation, ΔLnREMI and ΔLnOPEN jointly Granger causes ΔLnFDI. ΔLnFDI Granger causes ΔLnREMI, also share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI. Share price growth and inflation separately Granger cause ΔLnOPEN, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN in a multivariate framework while interest rate considered as an exogenous variable.

It can be seen in panel B, that inflation and ΔLnFDI separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, inflation and ΔLnFDI Granger cause ΔLnIPI. Also, share price growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger cause ΔLnIPI. Share price growth, ΔLnIPI and ΔLnOPEN separately Granger cause inflation, also share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes inflation. Share price growth and ΔLnFDI Granger cause ΔLnREMI, also share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI. Share price growth and inflation separately Granger cause ΔLnOPEN, again share price growth, ΔLnIPI, inflation, ΔLnFDI and ΔLnREMI jointly

Granger causes ΔLnOPEN in a multivariate framework while corruption risk rating considered as an exogenous variable.

A similar result can be seen in panel C in a multivariate framework while considering government stability as the exogenous variable in the model.

Table 7.25: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 7 of Developed Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	2.2124 (0.3308)	6.7779** (0.0337)	16.7762*** (0.0002)	15.4845*** (0.0004)	6.4989** (0.0388)	57.3731*** (0.0000)
ΔLnRGDP	25.1884*** (0.0000)	-	50.0535*** (0.0000)	6.8744** (0.0322)	20.9678*** (0.0000)	19.7823*** (0.0001)	140.9902*** (0.0000)
ΔLnCPI	19.1302*** (0.0001)	26.6607*** (0.0000)	-	0.0940 (0.9541)	19.6094*** (0.0001)	22.1259*** (0.0000)	80.2803*** (0.0000)
ΔLnFDI	0.0499 (0.9754)	6.4243** (0.0403)	1.0666 (0.5867)	-	0.0352 (0.9826)	1.7681 (0.4131)	13.5661 (0.1937)
ΔLnREMI	2.7655 (0.2509)	5.7328* (0.0569)	27.4565*** (0.0000)	36.6462*** (0.0000)	-	6.0969** (0.0474)	77.4178*** (0.0000)
ΔLnOPEN	15.3210*** (0.0005)	13.9118*** (0.0010)	62.9039*** (0.0000)	0 3370 (0.8449)	29.6192*** (0.0000)	-	171.2670*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLNREER→ ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnOPEN↔ ΔLnSPI; ΔLnSPI → ΔLnRGDP

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	0.2158 (0.8977)	23.5127*** (0.0000)	16.5109*** (0.0003)	13.2215*** (0.0013)	5.7623* (0.0561)	73.3816*** (0.0000)
ΔLnRGDP	22.5491*** (0.0000)	-	55.5259*** (0.0000)	8 9687** (0.0113)	19.8639*** (0.0000)	17.8501*** (0.0001)	142.0756*** (0.0000)
ΔLnCPI	13.9361*** (0.0009)	60.0050*** (0.0000)	-	0.7360 (0.6921)	22.8859*** (0.0000)	19.2194*** (0.0001)	105.3030*** (0.0000)
ΔLnFDI	0.2285 (0.8920)	2.3808 (0.3041)	0.4538 (0.7970)	-	0.0569 (0.9719)	1.9001 (0.3867)	8.8484 (0.5466)
ΔLnREMI	2.4020 (0.3009)	7.2671** (0.0264)	38.7018*** (0.0000)	36.1078*** (0.0000)	-	6.7359** (0.0345)	95.9693*** (0.0000)
ΔLnOPEN	14.8078*** (0.0006)	12.4617*** (0.0020)	54.0924*** (0.0000)	0.7170 (0.6987)	31.9901*** (0.0000)	-	176.0209*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLNREER→ ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnOPEN↔ ΔLnSPI; ΔLnSPI → ΔLnRGDP

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnRGDP	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	0.1552 (0.9253)	23.2967*** (0.0000)	17.3230*** (0.0002)	13.2271*** (0.0013)	5.8730** (0.0531)	75.8241*** (0.0000)
ΔLnRGDP	22.0586*** (0.0000)	-	49.9936*** (0.0000)	8.0345** (0.0180)	20.6290*** (0.0000)	17.5344*** (0.0002)	135.2121*** (0.0000)
ΔLnCPI	13.5081*** (0.0012)	65.2966*** (0.0000)	-	1.0247 (0.5991)	23.2717*** (0.0000)	19.0621*** (0.0001)	111.4448*** (0.0000)
ΔLnFDI	0.4346 (0.8047)	2.2280 (0.3282)	0.1548 (0.9255)	-	0.0687 (0.9662)	1.9581 (0.3757)	8.3774 (0.5920)
ΔLnREMI	2.6042 (0.2720)	5.2463* (0.0726)	40.7011*** (0.0000)	35.4992*** (0.0000)	-	6.7580** (0.0341)	96.6142*** (0.0000)
ΔLnOPEN	14.2913*** (0.0008)	9.4647*** (0.0088)	52.0825*** (0.0000)	0.7948 (0.6721)	32.0494*** (0.0000)	-	168.4413*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLNREER→ ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnOPEN↔ ΔLnSPI; ΔLnSPI → ΔLnRGDP

Table 7.25 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, inflation, ΔLnFDI, ΔLnREMI and ΔLnOPEN separately and also combinedly Granger cause economic growth. Share price growth, economic growth, ΔLnREMI and ΔLnOPEN separately Granger cause inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI and ΔLnOPEN jointly Granger causes Inflation. Economic growth Granger causes ΔLnFDI. Economic growth, Inflation, ΔLnFDI and ΔLnOPEN separately Granger cause ΔLnREMI, also share price growth, economic growth, inflation, ΔLnFDI and ΔLnOPEN jointly Granger causes ΔLnREMI. Share price growth, economic growth, inflation and ΔLnREMI separately Granger cause ΔLnOPEN. Again share price growth, economic growth, inflation, ΔLnFDI and ΔLnREMI jointly Granger causes ΔLnOPEN in a multivariate framework while the interest rate is considered as an exogenous variable.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption rate and government stability, respectively, as the exogenous variable in the model.

Table 7.26: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 8 of Developed Markets

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	1.7510 (0.4167)	5.9964** (0.0499)	17.2874*** (0.0002)	14.7190*** (0.0006)	5.8952** (0.0525)	53.9406*** (0.0000)
ΔLnIPI	26.6006*** (0.0000)	-	41.8407*** (0.0000)	8.4582** (0.0146)	34.4380*** (0.0000)	11.5450*** (0.0031)	139.5209*** (0.0000)
ΔLnCPI	18.6155*** (0.0001)	7.6458** (0.0219)	-	0.3102 (0.8563)	18.7680*** (0.0001)	22.2834*** (0.0000)	60.9404*** (0.0000)
ΔLnFDI	0.2873 (0.8662)	8 2576** (0.0161)	1.3521 (0.5086)	-	0.0377 (0.9813)	0.9015 (0.6372)	16.0505* (0.0982)
ΔLnREMI	2.8564 (0.2397)	2.4998 (0.2865)	25.9511*** (0.0000)	34.7561*** (0.0000)	-	6.3581** (0.0416)	70.8492*** (0.0000)
ΔLnOPEN	17.7905*** (0.0001)	3.5543 (0.1691)	67.8104*** (0.0000)	0.4623 (0.7936)	28.0546*** (0.0000)	-	155.0866*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnREER→ ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnOPEN↔ ΔLnSPI; ΔLnSPI → ΔLnIPI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	0.8794 (0.6442)	21.6063*** (0.0000)	15.7840*** (0.0004)	12.9559*** (0.0015)	5.5221* (0.0632)	69.7134*** (0.0000)
ΔLnIPI	25.1616*** (0.0000)	-	51.5270*** (0.0000)	10.0715*** (0.0065)	34.4730*** (0.0000)	10.6671*** (0.0048)	153.5767*** (0.0000)
ΔLnCPI	12.3852*** (0.0020)	14.0226*** (0.0009)	-	1.1719 (0.5566)	19.7823*** (0.0001)	17.1412*** (0.0002)	56.7861*** (0.0000)
ΔLnFDI	0.5809 (0.7479)	5.6367* (0.0597)	0.2475 (0.8836)	-	0.0218 (0.9892)	0.8383 (0.6576)	12.1131 (0.2776)
ΔLnREMI	2.8791 (0.2370)	3.6568 (0.1607)	46.8542*** (0.0000)	37.3224*** (0.0000)	-	7.3960** (0.0248)	95.8471*** (0.0000)
ΔLnOPEN	17.5115*** (0.0002)	3.9890 (0.1361)	73.2490*** (0.0000)	0.6593 (0.7192)	29.6826*** (0.0000)	-	168.4460*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnREER→ ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnOPEN↔ ΔLnSPI; ΔLnSPI → ΔLnIPI

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnFDI	Independent ΔLnREMI	Independent ΔLnOPEN	All
ΔLnSPI	-	0.8246 (0.6621)	22.6933*** (0.0000)	16.5780*** (0.0003)	12.8797*** (0.0016)	5.9008* (0.0523)	72.8796*** (0.0000)
ΔLnIPI	24.6757*** (0.0000)	-	47.4837*** (0.0000)	9.6457*** (0.0080)	34.9431*** (0.0000)	10.2384*** (0.0060)	148.9649*** (0.0000)
ΔLnCPI	11.9713*** (0.0025)	15.0859*** (0.0005)	-	1.3598 (0.5067)	19.9871*** (0.0000)	16.8193*** (0.0002)	56.9295*** (0.0000)
ΔLnFDI	0.9282 (0.6287)	5.5571* (0.0621)	0.3529 (0.8382)	-	0.0557 (0.9725)	0.6432 (0.7250)	11.7700 (0.3007)
ΔLnREMI	3.0889 (0.2134)	2.7695 (0.2504)	50.2518*** (0.0000)	36.8622*** (0.0000)	-	7.4092** (0.0246)	99.0989*** (0.0000)
ΔLnOPEN	16.8254*** (0.0002)	3.0940 (0.2129)	73.0990*** (0.0000)	0.6939 (0.7068)	29.4466*** (0.0000)	-	164.9128*** (0.0000)

ΔLnFDI → ΔLnSPI; ΔLnREER→ ΔLnSPI; ΔLnCPI↔ ΔLnSPI; ΔLnOPEN↔ ΔLnSPI; ΔLnSPI → ΔLnRGDP

Table 7.26 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ∆LnFDI, ∆LnREMI and ∆LnOPEN separately Granger cause share price growth. Again, ∆LnIPI, inflation, ∆LnFDI, ∆LnREMI and ∆LnOPEN jointly Granger cause share price growth. Similarly, share price growth, inflation, ∆LnFDI, ∆LnREMI, and ∆LnOPEN separately and also jointly Granger cause ∆LnIPI. Share price growth, ∆LnIPI, ∆LnREMI and ∆LnOPEN Granger cause inflation, again share price growth, ∆LnIPI, ∆LnFDI, ∆LnREMI and ∆LnOPEN jointly Granger causes Inflation. ∆LnIPI Granger causes ∆LnFDI, again share price growth, ∆LnIPI, inflation, ∆LnREMI and ∆LnOPEN jointly Granger causes ∆LnFDI. Inflation, ∆LnFDI and ∆LnOPEN separately Granger cause ∆LnREMI, also share price growth, ∆LnIPI, inflation, ∆LnFDI and ∆LnOPEN jointly Granger causes ∆LnREMI. Share price growth, inflation and ∆LnREMI separately Granger cause ∆LnOPEN, again share price growth, ∆LnIPI, inflation, ∆LnFDI and ∆LnREMI jointly Granger causes ∆LnOPEN in a multivariate framework while interest rate is considered as an exogenous variable.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability, respectively, as the exogenous variable in the model.

Table 7.27: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for Model 9 of Developed Markets

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	2.5171 (0.2841)	8.3501** (0.0154)	0.0289 (0.9857)	16.3288*** (0.0003)	9.7934*** (0.0075)	41.3383*** (0.0000)
ΔLnRGDP	25.6124*** (0.0000)	-	53.3226*** (0.0000)	2.8980 (0.2348)	23.2479*** (0.0000)	22.6446*** (0.0000)	138.7470*** (0.0000)
ΔLnCPI	21.7678*** (0.0000)	24.1776*** (0.0000)	-	0.4402 (0.8024)	21.2278*** (0.0000)	21.9874*** (0.0000)	81.7301*** (0.0000)
ΔLnREMI	9.6991*** (0.0078)	1.3894 (0.4992)	3.6021 (0.1651)	-	2.4081 (0.3000)	0.0046 (0.9977)	17.6120* (0.0619)
ΔLnREER	6.4315** (0.0401)	10.9549*** (0.0042)	21.6857*** (0.0000)	0.3648 (0.8333)	-	6.9387** (0.0311)	40.4938*** (0.0000)
ΔLnOPEN	16.8312*** (0.0002)	14.9179*** (0.0006)	66.2538*** (0.0000)	4.4013 (0.1107)	31.0371*** (0.0000)	-	177.5103*** (0.0000)

ΔLnCPI↔ΔLnSPI; ΔLnREER↔ ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	0.5881 (0.7453)	24.7934*** (0.0000)	0.0388 (0.9808)	14.2687*** (0.0008)	9.1066** (0.0105)	60.9541*** (0.0000)
ΔLnRGDP	22.5799*** (0.0000)	-	66.2579*** (0.0000)	3.3171 (0.1904)	19.7407*** (0.0001)	20.6767*** (0.0000)	144.2673*** (0.0000)
ΔLnCPI	15.4252*** (0.0004)	51.1530*** (0.0000)	-	0.1576 (0.9242)	20.2701*** (0.0000)	18.8019*** (0.0001)	93.1337*** (0.0000)
ΔLnREMI	10.0023*** (0.0067)	1.6434 (0.4397)	5.9860* (0.0501)	-	3.0678 (0.2157)	0.0037 (0.9982)	20.7508** (0.0229)
ΔLnREER	6.0593** (0.0483)	10.0449*** (0.0066)	20.8971*** (0.0000)	0.5785 (0.7488)	-	6.5884** (0.0371)	41.0984*** (0.0000)
ΔLnOPEN	17.4631*** (0.0002)	13.4500*** (0.0012)	48.7323*** (0.0000)	4.0128 (0.1345)	33.8185*** (0.0000)	-	168.9305*** (0.0000)

ΔLnCPI↔ΔLnSPI; ΔLnREER↔ ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	0.1295 (0.9373)	25.3704*** (0.0000)	0.0169 (0.9916)	14.5737*** (0.0007)	9.1240** (0.0104)	61.8561*** (0.0000)
ΔLnRGDP	22.7787*** (0.0000)	-	55.7424*** (0.0000)	3.1319 (0.2089)	21.3199*** (0.0000)	20.1616*** (0.0000)	132.6735*** (0.0000)
ΔLnCPI	14.9215*** (0.0006)	62.3604*** (0.0000)	-	0.2171 (0.8971)	21.1388*** (0.0000)	18.5037*** (0.0001)	105.3569*** (0.0000)
ΔLnREMI	9.9573*** (0.0069)	1.3932 (0.4983)	4.5151 (0.1046)	-	2.7604 (0.2515)	0.0107 (0.9947)	19.1989** (0.0378)
ΔLnREER	6.4932** (0.0389)	9.1543** (0.0103)	24.3693*** (0.0000)	0.3939 (0.8212)	-	6.3616** (0.0416)	45.1169*** (0.0000)
ΔLnOPEN	17.1392*** (0.0002)	9.5849*** (0.0083)	46.5776*** (0.0000)	4.0899 (0.1294)	33.7556*** (0.0000)	-	161.8397*** (0.0000)

ΔLnCPI↔ΔLnSPI; ΔLnREER↔ ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Table 7.27 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, inflation, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, inflation, ΔLnREER and ΔLnOPEN separately Granger cause economic growth, also share price growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause economic growth. Share price growth, economic growth, ΔLnREER and ΔLnOPEN Granger cause inflation, again share price growth, economic growth, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes Inflation. Share price growth Granger causes ΔLnREMI. Again, share price growth, economic growth, inflation, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Share price growth, economic growth, Inflation and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, economic growth, inflation, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth, economic growth, inflation and ΔLnREER separately Granger cause ΔLnOPEN. Again share price growth, economic growth, inflation, ΔLnREMI, and ΔLnREER jointly Granger causes ΔLnOPEN in a multivariate framework while considering interest rate as the exogenous variable in the model.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability, respectively, as the model's exogenous variable.

Table 7.28: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 10 of developed markets.

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	1.2455 (0.5365)	7.4295** (0.0244)	0.0580 (0.9714)	15.6077*** (0.0004)	8.7294** (0.0127)	37.9191*** (0.0000)
ΔLnIPI	29.6565*** (0.0000)	-	43.0183*** (0.0000)	3.6530 (0.1610)	39.5966*** (0.0000)	14.3339*** (0.0008)	131.9703*** (0.0000)
ΔLnCPI	21.9313*** (0.0000)	6.6895** (0.0353)	-	1.3656 (0.5052)	19.6476*** (0.0001)	21.2552*** (0.0000)	64.3667*** (0.0000)
ΔLnREMI	8.6887** (0.0130)	1.7876 (0.4091)	2.3184 (0.3137)	-	2.2619 (0.3227)	0.2391 (0.8873)	17.2024* (0.0700)
ΔLnREER	6.7766** (0.0338)	5.5721* (0.0617)	20.7704*** (0.0000)	0.6747 (0.7137)	-	6.8152** (0.0331)	34.2133*** (0.0002)
ΔLnOPEN	19.1773*** (0.0001)	3.4442 (0.1787)	71.8050*** (0.0000)	3.0877 (0.2136)	29.9384*** (0.0000)	-	160.7706*** (0.0000)

ΔLnCPI↔ΔLnSPI; ΔLnREER↔ ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	0.1109 (0.9461)	17.5542*** (0.0002)	0.1543 (0.9257)	15.0301*** (0.0005)	8.7247** (0.0127)	50.7002*** (0.0000)
ΔLnIPI	28.2010*** (0.0000)	-	55.2830*** (0.0000)	4.1869 (0.1233)	38.7663*** (0.0000)	13.2915*** (0.0013)	146.7112*** (0.0000)
ΔLnCPI	16.8730*** (0.0002)	10.2549*** (0.0059)	-	1.9495 (0.3773)	17.5641*** (0.0002)	16.1643*** (0.0003)	56.3857*** (0.0000)
ΔLnREMI	9.7080*** (0.0078)	1.6532 (0.4375)	1.3337 (0.5133)	-	1.3941 (0.4981)	0.5261 (0.7687)	16.7926* (0.0791)
ΔLnREER	7.0838** (0.0290)	7.1204** (0.0284)	31.5752*** (0.0000)	0.6640 (0.7175)	-	7.5780** (0.0226)	45.6523*** (0.0000)
ΔLnOPEN	19.3374*** (0.0001)	4.7123* (0.0948)	71.6688*** (0.0000)	3.4024 (0.1825)	31.7040*** (0.0000)	-	167.0272*** (0.0000)

ΔLnCPI↔ΔLnSPI; ΔLnREER↔ ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent ΔLnSPI	Independent ΔLnIPI	Independent ΔLnCPI	Independent ΔLnREMI	Independent ΔLnREER	Independent ΔLnOPEN	All
ΔLnSPI	-	0.0648 (0.9681)	23.1906*** (0.0000)	0.0565 (0.9722)	14.2759*** (0.0008)	8.7338** (0.0127)	57.4771*** (0.0000)
ΔLnIPI	27.6013*** (0.0000)	-	50.9096*** (0.0000)	4.2077 (0.1220)	37.6107*** (0.0000)	12.4971*** (0.0019)	140.7570*** (0.0000)
ΔLnCPI	15.7234*** (0.0004)	12.3161*** (0.0021)	-	2.0904 (0.3516)	16.5972*** (0.0002)	15.6520*** (0.0004)	52.9976*** (0.0000)
ΔLnREMI	9.8327*** (0.0073)	1.2668 (0.5308)	2.0459 (0.3595)	-	1.4809 (0.4769)	0.3532 (0.8381)	17.0812** (0.0726)
ΔLnREER	7.5735** (0.0227)	6.1205** (0.0469)	32.6380*** (0.0000)	0.4236 (0.8091)	-	7.1132** (0.0285)	46.4980*** (0.0000)
ΔLnOPEN	18.4567*** (0.0001)	3.6099 (0.1645)	70.3407*** (0.0000)	3.8417 (0.1465)	30.9552*** (0.0000)	-	162.4337*** (0.0000)

ΔLnCPI↔ΔLnSPI; ΔLnREER↔ ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Table 7.28 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, inflation, ΔLnREER and ΔLnOPEN separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause ΔLnIPI. Share price growth ΔLnIPI, ΔLnREER, and ΔLnOPEN Granger cause inflation, again share price growth, ΔLnIPI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation. Share price growth Granger causes ΔLnREMI. Again, share price growth, ΔLnIPI, inflation, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Share price growth, ΔLnIPI, Inflation and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, ΔLnIPI, inflation, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth, inflation and ΔLnREER separately Granger cause ΔLnOPEN, again Share price growth, ΔLnIPI, inflation, ΔLnREMI and ΔLnREER jointly Granger cause ΔLnOPEN a multivariate framework while the interest rate is the exogenous variable in the model.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability, respectively, as the exogenous variable in the model.

Table 7.29: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 11 of developed markets.

Panel A:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	1.8224 (0.4020)	6.5658** (0.0375)	17.0674*** (0.0002)	0.2083 (0.9011)	15.2007*** (0.0005)	6.0981** (0.0474)	57.8357*** (0.0000)
ΔLnRGDP	24.6907*** (0.0000)	-	52.1477*** (0.0000)	5.5889* (0.0611)	1.9126 (0.3843)	16.5969*** (0.0002)	18.6899*** (0.0001)	142.1977*** (0.0000)
ΔLnCPI	20.1791*** (0.0000)	23.5041*** (0.0000)	-	0.0598 (0.9706)	0.4040 (0.8171)	19.5505*** (0.0001)	21.7917*** (0.0000)	82.0146*** (0.0000)
ΔLnFDI	0.3406 (0.8434)	7.1108** (0.0286)	0 5899 (0.7446)	-	1.7594 (0.4149)	0.2311 (0.8909)	2.2539 (0.3240)	15.4079 (0.2199)
ΔLnREMI	5.9954** (0.0499)	2.2823 (0.3194)	2.0516 (0.3585)	14.6628*** (0.0007)	-	1.7083 (0.4256)	0.0228 (0.9886)	32.3793*** (0.0012)
ΔLnREER	2.4581 (0.2926)	6.6482** (0.0360)	28.8264*** (0.0000)	33.4511*** (0.0000)	0.4165 (0.8120)	-	5.2595* (0.0721)	75.7382*** (0.0000)
ΔLnOPEN	15.1093*** (0.0005)	15.3806*** (0.0005)	62.8816*** (0.0000)	0.7119 (0.7005)	4.6421* (0.0982)	30.9680*** (0.0000)	-	178.2895*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	0.2633 (0.8766)	23.0686*** (0.0000)	17.2013*** (0.0002)	0.3739 (0.8295)	12.6974*** (0.0017)	5.6786* (0.0585)	74.9081*** (0.0000)
ΔLnRGDP	22.4653*** (0.0000)	-	64.9196*** (0.0000)	8.0296** (0.0180)	2.1732 (0.3374)	14.8459*** (0.0006)	16.9141*** (0.0002)	151.0678*** (0.0000)
ΔLnCPI	14.5773*** (0.0007)	47.8209*** (0.0000)	-	0.6296 (0.7299)	0.3632 (0.8339)	21.3288*** (0.0000)	18.4963*** (0.0001)	96.3749*** (0.0000)
ΔLnFDI	0.8679 (0.6479)	2.1055 (0.3490)	1 1559 (0.5610)	-	1.9146 (0.3839)	0.3571 (0.8365)	2.2372 (0.3267)	10.4449 (0.5770)
ΔLnREMI	6.4211** (0.0403)	2.8296 (0.2430)	3.8026 (0.1494)	14.2266*** (0.0008)	-	1.4335 (0.4883)	0.0423 (0.9791)	33.4841*** (0.0008)
ΔLnREER	2.1910 (0.3344)	6.9333** (0.0312)	33.6717*** (0.0000)	32.0676*** (0.0000)	0.4171 (0.8118)	-	5.6876* (0.0582)	84.4640*** (0.0000)
ΔLnOPEN	15.0480*** (0.0005)	14.7677*** (0.0006)	50.6341*** (0.0000)	1.0700 (0.5857)	4.8996* (0.0863)	33.4253*** (0.0000)	-	176.0866*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Panel C:
ΔLnSPI, ΔLnRGDP, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	Independent	Independent	Independent	Independent	Independent	Independent	Independent	
	ΔLnSPI	**ΔLnRGDP**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	0.2267 (0.8928)	22.8878*** (0.0000)	17.7581 (90.0001)	0.3125 (0.8554)	12.6208*** (0.0018)	5.9255* (0.0517)	77.3214 (0.0000)
ΔLnRGDP	21.9009*** (0.0000)	-	59.4101*** (0.0000)	7.3382** (0.0255)	2.1608 (0.3395)	15.2839*** (0.0005)	16.3332*** (0.0003)	144.1798*** (0.0000)
ΔLnCPI	14.2767*** (0.0008)	52.6731*** (0.0000)	-	0.8015 (0.6698)	0.5039 (0.7773)	21.0777*** (0.0000)	18.0617*** (0.0001)	100.8173*** (0.0000)
ΔLnFDI	1.2321 (0.5401)	2.1652 (0.3387)	0 3599 (0.8353)	-	1.9336 (0.3803)	0.2488 (0.8830)	2.3998 (0.3012)	9.9567 (0.6198)
ΔLnREMI	6.4767** (0.0392)	2.8188 (0.2443)	2.8830 (0.2366)	14.3328*** (0.0008)	-	1.2690 (0.5302)	0.0556 (0.9726)	32.6645*** (0.0011)
ΔLnREER	2.4014 (0.3010)	5.8307* (0.0542)	37.1106*** (0.0000)	32.0814*** (0.0000)	0.2357 (0.8888)	-	5.8200* (0.0545)	87.7318*** (0.0000)
ΔLnOPEN	14.3310*** (0.0008)	11.6406*** (0.0030)	50.1886*** (0.0000)	1.3356 (0.5128)	5.1619* (0.0757)	33.0531*** (0.0000)	-	171.3148*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ ΔLnSPI; ΔLnCPI↔LnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnRGDP; ΔLnSPI→ΔLnREMI

Table 7.29 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, economic growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause economic growth, also share price growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause economic growth. Share price growth, economic growth, ΔLnREER and ΔLnOPEN separately Granger cause inflation, again share price growth, economic growth, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation. Share price growth and ΔLnFDI Granger causes ΔLnREMI, again, share price growth, economic growth, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Economic growth, Inflation, ΔLnFDI, and ΔLnOPEN separately Granger cause ΔLnREER, also share price growth, economic growth, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth, economic growth, inflation, ΔLnREMI and ΔLnREER separately Granger cause ΔLnOPEN, again Share price growth, inflation, economic growth, ΔLnFDI, ΔLnREMI, ΔLnREER combinedly Granger causes ΔLnOPEN in a multivariate framework while the interest rate is the exogenous variable in the model.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability respectively as the exogenous variable in the model.

Table 7.30: Multivariate Panel Granger Causality/Block Exogeneity Wald Test for model 12 of developed markets.

Panel A:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering IR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	0.8421 (0.6564)	5.9018* (0.0523)	17.5619*** (0.0002)	0.1956 (0.9068)	14.3898*** (0.0008)	4.8846* (0.0870)	55.3398*** (0.0000)
ΔLnIPI	26.2569*** (0.0000)	-	39.6209*** (0.0000)	6.9500** (0.0310)	2.9460 (0.2292)	31.4716*** (0.0000)	10.8622*** (0.0044)	134.5308*** (0.0000)
ΔLnCPI	20.1650*** (0.0000)	7.1800** (0.0276)	-	0.2534 (0.8810)	1.3666 (0.5049)	19.0602*** (0.0001)	21.7690*** (0.0000)	65.9611*** (0.0000)
ΔLnFDI	0.6732 (0.7142)	7.7603** (0.0206)	0.9748 (0.6142)	-	1.5120 (0.4695)	0.4035 (0.8173)	1.0971 (0.5778)	16.7441 (0.1595)
ΔLnREMI	5.5658* (0.0619)	0.6139 (0.7357)	1.2266 (0.5416)	12.1605*** (0.0023)	-	1.7971 (0.4072)	0.0918 (0.9551)	29.2422*** (0.0036)
ΔLnREER	2.4646 (0.2916)	2.1123 (0.3478)	27.7460*** (0.0000)	32.2673*** (0.0000)	0.8041 (0.6690)	-	4.5598 (0.1023)	68.2768*** (0.0000)
ΔLnOPEN	17.2988*** (0.0002)	3.5376 (0.1705)	68.1340*** (0.0000)	0.6293 (0.7300)	3.1473 (0.2073)	29.5055*** (0.0000)	-	161.3712*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Panel B:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnCR as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	0.7873 (0.6746)	21.2889*** (0.0000)	16.8688*** (0.0002)	0.5420 (0.7626)	11.8628*** (0.0027)	5.0576* (0.0798)	70.9828*** (0.0000)
ΔLnIPI	25.2073*** (0.0000)	-	52.5399*** (0.0000)	8.3121** (0.0157)	3.1286 (0.2092)	31.5012*** (0.0000)	10.2303*** (0.0060)	153.0086*** (0.0000)
ΔLnCPI	14.0896*** (0.0009)	9.9545*** (0.0069)	-	1.2297 (0.5407)	2.1894 (0.3346)	18.4061*** (0.0001)	15.4673*** (0.0004)	57.5749*** (0.0000)
ΔLnFDI	1.5603 (0.4583)	5.5459* (0.0625)	0.5867 (0.7458)	-	1.8136 (0.4038)	0.0268 (0.9867)	0.8455 (0.6552)	13.8904 (0.3078)
ΔLnREMI	6.1696** (0.0457)	0.6954 (0.7063)	1.8423 (0.3981)	13.1215*** (0.0014)	-	1.2464 (0.5362)	0.2841 (0.8676)	31.0627*** (0.0019)
ΔLnREER	2.6856 (0.2611)	2.7118 (0.2577)	41.2648*** (0.0000)	34.4074*** (0.0000)	0.6971 (0.7057)	-	5.6927* (0.0581)	85.4717*** (0.0000)
ΔLnOPEN	17.1692*** (0.0002)	4.4505 (0.1080)	68.9004*** (0.0000)	0.6822 (0.7110)	3.6133 (0.1642)	31.1352*** (0.0000)	-	166.8053*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Panel C:
ΔLnSPI, ΔLnIPI, ΔLnCPI, ΔLnFDI, ΔLnREMI, ΔLnREER, ΔLnOPEN (Considering LnGS as an exogenous variable in the VECM model)

Dependent	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	**Independent**	
	ΔLnSPI	**ΔLnIPI**	**ΔLnCPI**	**ΔLnFDI**	**ΔLnREMI**	**ΔLnREER**	**ΔLnOPEN**	**All**
ΔLnSPI	-	0.7676 (0.6813)	21.5871*** (0.0000)	17.3629*** (0.0002)	0.5259 (0.7688)	11.8364*** (0.0027)	5.5662* (0.0618)	73.3979*** (0.0000)
ΔLnIPI	24.7320*** (0.0000)	-	48.8560*** (0.0000)	8.0492** (0.0179)	3.0981 (0.2124)	31.8468*** (0.0000)	9.8311*** (0.0073)	148.7164*** (0.0000)
ΔLnCPI	13.6712*** (0.0011)	10.7069*** (0.0047)	-	1.4116 (0.4937)	2.4619 (0.2920)	18.2499*** (0.0001)	15.1559*** (0.0005)	56.9385*** (0.0000)
ΔLnFDI	2.0447 (0.3597)	5.7524* (0.0563)	0.3449 (0.8416)	-	1.9737 (0.3727)	0.0089 (0.9956)	0.7002 (0.7046)	13.7628 (0.3161)
ΔLnREMI	6.3336** (0.0421)	0.6271 (0.7308)	1.4058 (0.4951)	13.0596*** (0.0015)	-	1.1245 (0.5699)	0.2913 (0.8645)	30.3306*** (0.0025)
ΔLnREER	2.9354 (0.2305)	2.2259 (0.3286)	45.4088*** (0.0000)	34.3631*** (0.0000)	0.3840 (0.8253)	-	5.8137* (0.0546)	89.8726*** (0.0000)
ΔLnOPEN	16.3820*** (0.0003)	3.5835 (0.1667)	70.1509*** (0.0000)	0.8458 (0.6552)	4.1377 (0.1263)	30.6391*** (0.0000)	-	165.4599*** (0.0000)

ΔLnFDI→ΔLnSPI; ΔLnREER→ΔLnSPI; ΔLnCPI↔ΔLnSPI; ΔLnOPEN↔ΔLnSPI; ΔLnSPI→ΔLnIPI; ΔLnSPI→ΔLnREMI

Table 7.30 shows the Granger Causality results in a multivariate framework while considering IR, LnCR and LnGS as exogenous variables separately.

It can be seen in panel A, that inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause share price growth. Again, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause share price growth. Similarly, share price growth, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN separately Granger cause ΔLnIPI, also share price growth, inflation, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause ΔLnIPI. Share price growth, ΔLnIPI, ΔLnREER and ΔLnOPEN separately Granger cause inflation, again share price growth, ΔLnIPI, ΔLnFDI, ΔLnREMI, ΔLnREER and ΔLnOPEN jointly Granger cause Inflation. ΔLnIPI Granger causes ΔLnFDI. Share price growth and ΔLnFDI Granger causes ΔLnREMI, again, share price growth, ΔLnIPI, inflation, ΔLnFDI, ΔLnREER and ΔLnOPEN jointly Granger causes ΔLnREMI. Inflation and ΔLnFDI separately Granger cause ΔLnREER, also share price growth, ΔLnIPI, inflation, ΔLnFDI, ΔLnREMI, and ΔLnOPEN jointly Granger causes ΔLnREER. Share price growth, inflation and ΔLnREER separately Granger cause ΔLnOPEN, again Share price growth, inflation, ΔLnIPI, ΔLnFDI, ΔLnREMI, ΔLnREER combinedly Granger cause ΔLnOPEN in a multivariate framework while the interest rate is the exogenous variable in the model.

A similar result can be seen in panels B and C in a multivariate framework while considering corruption risk rating and government stability, respectively, as the exogenous variable in the model.

7.10 Important Findings and It's Interpretations

This study finds that in developed markets, real GDP, industrial production, foreign direct investment, worker's remittances, and real effective exchange rate positively influence the share price in the long run. In developed markets, Trade openness has a mixed influence on the share price index in the long run. Similar results are found for emerging and developed markets combinedly in the existing literature. Various studies found similar results (Billmeier & Massa, 2009; HatemiJ & Irandoust, 2002; Jareño & Negrut, 2016; Mansor, 2011; Mukherjee & Naka, 1995; Okuyan & Erbaykal, 2011). In developed markets, the consumer price index positively influences the share price index. The negative correlation between stock returns and inflation is well established in existing research (Barrows & Naka, 1994; Chen et al., 2005; Chen et al., 1986; Fama & Schwert, 1977). However, some studies identified a negative association between inflation and stock market returns. For instance, a significant positive relationship was observed between inflation and stock returns in reports on the UK (Firth, 1979), Singapore (Maysami et al., 2004), and Ghana (Adam & Tweneboah, 2008).

This study finds that, in developed markets, real GDP growth and REER growth positively influence share price growth in the short run. But inflation, trade openness growth, interest rate growth, corruption risk rating and global financial crisis negatively influence share price growth in the short run, which is theoretically consistent. Various previous research, including those of Waud (1970) , Nelson (1976), Fama and Schwert (1977), and Fama (1981), also indicated that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), and Ferrer et al. (2016) have also confirmed this trend of relationship.

7.11 Summary

This chapter discussed the data used in this study for 21 developed markets (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and the United States). Seven significant macroeconomic variables and two institutional-quality variables were selected for this study based on the recent studies using annual data from 1984 to 2019.

Several versions of the model showing the long run cointegration and short run dynamics between selected macroeconomic and institutional variables and the stock price index. The majority of the results are analytically consistent and supported by various studies.

This chapter demonstrated econometric analysis of descriptive statistics of the selected variables followed by correlation analysis, unit root test, optimum lag length selection, cointegration test, vector Error Correction Model, and Granger causality test.

8 Chapter 8: Conclusion and policy recommendation

8.1 Introduction

In the previous three chapters - chapters 5, 6, and 7, this study focused on the analysis, interpretations, and discussions of the empirical tests. This chapter concludes the investigation of the proposed twelve models to analyse the effects of macroeconomic and institutional quality variables on share price with particular reference to emerging, developed, and combined groups of emerging and developed countries together.

The global stock market has experienced unprecedented volatility in the last four decades. Hence an explanation behind these volatilities and an investigation became inevitable for policymakers, investors, researchers, and academics. Therefore, the objectives of this study were to investigate the relationship between the share price index and macroeconomic and institutional quality variables using various econometric techniques.

The remainder of this chapter is structured as follows. Section 8.2 of this chapter presents the summary of the findings of the study. Section 8.3 explains policy implications and recommendations. Section 8.4 discusses limitations and areas for further research, and lastly, Section 8.5 provides concluding remarks regarding this study.

8.2 Summary of the Findings of the Study

Since the objectives of this study were to investigate the relationship between the share price index and macroeconomic and institutional quality variables, this study has used panel data for econometric analysis.

Model parameters can be inferred more precisely using panel data. Panel data often have more degrees of freedom and sample variability than cross-sectional data (which may be regarded as a panel with T = 1) or time-series data (which can be viewed as a panel with N = 1), allowing econometric estimates to be more efficient (Hsiao, 2007). If individual behaviours are similar conditional on certain variables, panel data provide the possibility of learning an individual's behaviour by analysing the behaviour of others. As a result, by complementing observations of the individual in issue with data about other individuals, it is possible to gain a more precise picture of their behaviour using panel data (Hsiao, 2007).

This study has collected annual data for 36 years (1984-2019) of 21 developed countries and 9 emerging countries of selected macroeconomic and institutional quality variables under study and employed various econometric analyses such as panel unit root test (LLC, ADF- Fisher, ADF-PP) and Pedroni cointegration test.

An empirical analysis was conducted to shed light on the fluctuations in the share price index. This study found a cointegrating relationship among macroeconomic variables and share price index in emerging and developed markets combinedly and developed markets but not for emerging markets as the results show they are not cointegrated in the long run. The results produce the short run dynamic relationship between the share price and macroeconomic and institutional quality variables.

This study suggests that in developed markets, real GDP, industrial production, foreign direct investment, worker's remittances, and real effective exchange rate positively influence the share price in the long run. In developed markets, Trade openness has a mixed influence on the share price index in the long run. Similar results are found for emerging and developed markets combinedly in the existing literature. Various studies found similar results (Billmeier & Massa, 2009; HatemiJ & Irandoust, 2002; Jareño & Negrut, 2016; Mansor, 2011; Mukherjee & Naka, 1995; Okuyan & Erbaykal, 2011). In developed markets, the consumer price index positively influences the share price index, but the consumer price index has a negative effect on the share price index in emerging and developed markets combinedly. These results are consistent with existing literature (Díaz & Jareño, 2009; Saunders & Tress, 1981). The negative correlation between stock returns and inflation is well established in existing research (Barrows & Naka, 1994; Chen et al., 2005; Chen et al., 1986; Fama & Schwert, 1977). However, some studies identified a negative association between inflation and stock market returns. For instance, a significant positive relationship was observed between inflation and stock returns in reports on UK (Firth, 1979), Singapore (Maysami et al., 2004), and Ghana (Adam & Tweneboah, 2008). Similarly, In the study by Maysami and Sim (2001a), the Korean stock markets showed a positive association with inflation. Mansor (2011) conducted a cointegration analysis based on the VAR model to study the impact of stock market development in Thailand. GDP, aggregate price level, and the investment ratio were identified as the key controllers of the stock market in Thailand. Jareno and Negrut (2016) carried out a time-evolution analysis of the USA's Dow Jones (DJ) prices and GDP from 2008 -2014. A positive relationship was observed between the DJ and GDP. The study also revealed that contributions of DJ increased from the fourth quarter of 2009, while GDP rose from the second quarter of 2010. Therefore, pointing out that the DJ index is ahead of USA GDP by approximately six months. Thus, this evidence from existing studies indicates that GDP positively impacts stock market performance (Fama, 1981, Mukherjee and Naka, 1995). Mukherjee and Naka (1995), Liljeblom and Stenius (1997), Abdullah (1998), Gjerde and Saettem (1999), Maysami et al. (2004), Lobão and Levi (2016) also found a positive and statistically significant relationship between industrial production and stock price. For 20 developed countries, Paramati et al. (2016) analysed the relationship between macroeconomic variables from 1991 to 2012 and found that foreign investment had a positive long-term impact on the stock market. Billmeier and Massa (2009) found remittances positively and significantly impact market capitalization (Billmeier and Massa, 2009). In the analysis of share prices in Sweden, Hatemi-J and Irandoust (2002) used monthly data between 1993 and 1998. The findings revealed that Grange's causality is unidirectional from share price to exchange rates. The results also reveal that an increase in Swedish stock prices is associated with an appreciation of the Swedish krona.

This study also finds that, in emerging markets, real GDP growth, FDI growth, REER growth, corruption risk rating, and government stability positively influence share price growth in the short run. But interest rate negatively influences share price growth in the short run, which is theoretically consistent. Various previous research, including those of Waud (1970) , Nelson (1976), Fama and Schwert (1977), and Fama (1981), also indicated that the association between interest rates and stock returns is negative. More recent studies such as Chen and Chan (1989), Staikouras (2003), and Ferrer et al. (2016) have also confirmed this trend of relationship. Several studies suggest that corruption has a positive impact on the development of the stock market. Pastor and Veronesi (2012) claim that if investors regard bribery as an enterprise resource, it removes confusion regarding government policy and tends to solve the country's inefficiencies. In this context, especially in emerging markets, bribery can reduce stock volatility (Pastor & Veronesi 2012). Yartey (2008), Perotti and Pieter (2001), Winful et al. (2016), Gani and Ngassam (2008) also support a positive relationship between government stability and share price. The results highlighted that political risk, law and order, and bureaucratic quality is important determinants of stock market development as they enhance the viability of external finance.

8.3 Policy Recommendations

Financial crises are inescapable in modern economies. The business climate in which firms operate is shaped and constantly monitored by the financial authorities of a country. As a result, government involvement in the financial system is unavoidable. Stock markets and their corresponding indexes are among the most obvious ways to assess the health of modern economies. Therefore, over the last four decades, various policies have been enacted to reduce the volatility of share prices both in emerging and developed countries. These policies have a substantial impact on individual company performance and share prices. In developed countries, government policies such as laws and policies for taxation, interest rates, numerous monitoring compliances, monetary policy, and fiscal policy (expenditure programs) are observed.

In light of this study's findings, the following policy recommendation would be of interest to policymakers, stock market practitioners, stock market regulators, traders, and the Central Bank of specific emerging or developed countries. It should be noted that the following policy recommendations are based on the outcome of our quantitative analysis.

This study finds the real gross domestic product and industrial production index are positively related to the share price index; this study recommends that policymakers in developed and emerging markets promote the growth of the industrial sector by providing incentives and adopting various supply-side economic policies that will enhance productivity and competitiveness of the sector. Higher government spending on education, research, training, infrastructure, innovation, and technology will assist in enhancing productivity and accelerating economic growth. This, in turn, will generate employment, income, and long run potential for the country.

Since there is evidence of a positive relationship between foreign direct investment, workers' remittances, and the share price index, this study recommends that policymakers in emerging and developed countries promote foreign direct investment and export of labour force to accelerate economic growth. Thus, it appears that the export of labour force promotion is a feasible economic growth strategy. However, for this strategy to be attained, policymakers should guide policies to support expanding international trade. This recommendation can be achieved when policymakers of developed markets will encourage and facilitate foreign direct investment from other countries and the employment of citizens in foreign countries. These will accelerate economic growth and generate employment.

The findings of this study also indicate that there is evidence of a positive relationship between the real effective exchange rate and the share price index. Therefore, this study recommends that policymakers in developed markets maintain a stable real effective exchange rate to accelerate economic growth. Depreciation of the real exchange rate would improve the attractiveness of firms' goods in terms of cheaper rates and increase their revenues from other countries (Dornbusch & Fischer, 1980). This higher export contributes to further income for the domestic firms and thus boosts the firms' values and share price. Therefore, real exchange rate depreciation will lift the real share price.

This study also finds that trade openness has a mixed (positive and negative) but insignificant effect on the share price index in emerging and developed markets. This study recommends that policymakers can provide support to promote net exports in a more open trade regime set. Openness in international trade will facilitate economic growth further aided by adopting new policies that would enhance productivity gain, such as introducing better-advanced technologies to readily connect with the rest of the world. This would make domestic products cheaper and attract foreign countries to demand domestic products, which in turn will encourage investment and raise the share prices.

8.4 Maintaining Prevailing form of Stock Market Efficiency

Stock market serves as a valuable platform for channelling funds from savers to the borrowers of an economy (Alshogeathri, 2011). Thus, an efficient stock market can contribute to the economic growth and prosperity of a country by stabilising the financial sector by channelling the funds to the productive investment in the economy, thus creating economic prosperity through economic growth and higher employment. There are many factors that affect the stock market of a country, unfortunately, there is no such equation that would exactly define how the stock market will behave. Macroeconomic and institutional quality variables are vital in this regard. Therefore, this study has considered eight macroeconomic and 2 institutional quality variables to determine the effect of change in selected variables on the volatility of share price in selected countries. These macroeconomic indicators are studied: Real GDP, IPI, CPI, FDI, REMI, REER, OPEN, IR, and two institutional-quality variables are CR and GS as control variables and GFC as dummy variables as defined in the earlier chapters. These selected variables are major economic indicators of an economy.

This study finds that selected macroeconomic variables such as Real GDP, IPI, FDI, REMI, REER are positively related to the share price index, but CPI is negatively related to the share price index. This study also finds that OPEN has a mixed (positive and negative) but insignificant effect on the share price index in emerging and developed markets. All these findings are consistent with previous literature (Barrows & Naka, 1994; Billmeier & Massa, 2009; Chen et al., 2005; Chen et al., 1986; Chowdhury, 2011; Díaz & Jareño, 2009; Fama & Schwert, 1977; HatemiJ & Irandoust, 2002; Jareño & Negrut, 2016; Mansor, 2011; Mukherjee & Naka, 1995; Okuyan & Erbaykal, 2011; Saunders & Tress, 1981) and maintain the prevailing form of the stock market. The figure below demonstrates how macroeconomic variables affect the share price index

Figure 8.1: Effects of Macroeconomic Variables on Share Price Index

Inflation ↓ → Asset price↑ → Share Price Index ↑

Real GDP ↑ → Investment ↑ → Demand for Share ↑ → Share Price Index ↑

FDI ↑ → Investment ↑ → Demand for Share ↑ → Share Price Index ↑

REER ↑ → Investment ↑ → Demand for Share ↑ → Share Price Index ↑

IPI ↑ → Revenue ↑ → Future Cash Flow ↑ → Profit ↑ → Dividend ↑ → Demand for Share ↑ → Share Price Index ↑

REMI ↑ → IP ↑ → Future Cash Flow ↑ → Profit ↑ → Dividend ↑ → Demand for Share ↑ → Share Price Index ↑

OPEN ↑ → Economic activity↑ → Future Cash Flow ↑ → Profit ↑ → Dividend ↑ → Demand for Share ↑ → Share Price Index ↑

8.5 Limitations and Areas for Further Research

There were some limitations to the research in this thesis, like most other studies. The major one seems to be a concern with the statistical sample chosen for the research. The dataset of the study was relatively small due to the unavailability of data for the chosen variables for the countries chosen. Some indicators were obtainable, but only for the shorter term. There is no doubt that the significance of the results would be improved by applying a longer period. However, the study uses yearly intervals from 1984 to 2019 of 21 developed markets and 9 emerging markets observations for the research.

This study was limited to the emerging and developed market only. Future studies could consider extending by conducting similar research with a larger group of emerging markets.

Other major factors may jointly impact the price generating process, in addition to comprehending the stock market's pricing mechanism based on the contributions of chosen macroeconomic variables. The cost of equity capital, asset valuation, industry analysis, management and operational efficiency analysis, and so on are examples of these concerns.

Furthermore, because long-run relationships between macroeconomic variables and stock prices are predicted to differ by industry, a sectoral study of the issue would be more useful. It would also open up the possibility of future study into the effects of macroeconomic factors on real stock returns across industries.

Furthermore, by considering any structural breaks in the time series data, the study could empirically examine the relationship.

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Appendices

Appendix 3A

Table 3.8.1A: Summary of Empirical Studies on Developed Markets

Empirical studies on Developed Markets				
Study	**Independent Variable**	**Method**	**Major Results**	**Country**
Chaudhuri and Smiles (2004)	Dependent Variable: Real stock price Independent Variable: M3 Money supply, World Oil Price Index, Gross Domestic Product, Private Personal Consumption Expenditure.	Johansen Cointegration Test, Impulse Response Function (IRF) Analysis, and Forecast Error Variance Decomposition (FEVD) Analysis	- The analysis showed proof of a long run relationship between all the variables evaluated. - Analysis of the IRF and VDC showed weak evidence for the relationship between the actual stock price index in Australia and all variables used.	Australia
Ligocká, M & Stavárek, D (2018)	Dependent Variable: Independent Variable: Interest rates, the inflation, the gross domestic product, the money supply M3 and the unemployment rates.	Johansen cointegration test and the Vector Error Correction Model using quarterly data from 2005-2015.	Their primary observation is that the macroeconomic variables used have a predominantly negative effect on the chosen institutions' portfolio returns.	Austria
Maingi, G 2018	Dependent Variable: Independent Variable: Real Gross Domestic Product	multiple regression analysis using quarterly data from January 1997 to December 2016.	Global oil price and real GDP has a positive and significant relationship with stock returns but There is a negative and significant relationship between GDP and stock returns	Belgium

	interest rates and global oil price index			
Darrat A. F. (1990)	Dependent Variable: Independent Variable: Money Supply, Interest Rates and its Volatility, Inflation, Exchange Rates, Fiscal Deficits, Real Income	Akaike Final Prediction Error (FPE), and Causality Test using monthly data from January 1972 to February 1987.	- Results indicated that stock prices in Canada fully incorporated all available information from monetary policy instruments, and the stock returns are Granger - caused by lagged changes in fiscal deficits.	Canada
Liljeblom and Stenius (1997)	Dependent Variable: Independent Variable: M2, CPI, Trade Variable (measured as the Export Price Index Divided by the Import Price Index), Industrial Production.	VAR Model using monthly data for Finland from 1920 to 1991.	- With the exception of the growth of the stock market trading volume, this study concluded that the predictive power in both directions: from stock market volatility to macroeconomic volatility and from macroeconomic volatility to stock market volatility existed.	Finland
Thornton (1998)	Dependent Variable: Independent Variable: M1 Money Supply, Interest Rates, Real Income,	Johansen Cointegration Test, Causality Tests using data from 1960-89	The findings show that real stock prices have a positive and significant influence on long-term demand for real M1 balances on wealth, there are feedback effects between real money balances and interest rates; and unidirectional Granger -causality exists from real income to interest rates, from interest rates to real stock prices, and from real money balances to real income.	Germany
Kim, S. B. and Moreno, R. (1994)	Dependent Variable: Independent Variable: Bank Loans.	VAR Model	- This study established three important results. (i), there a positive response of Japanese bank lending to an increase in the stock price (ii) fluctuations in bank lending in Japan contributed significantly to the	Japan

			recent fluctuations in the Nikkei stock price. (iii) the historical relationship between stock prices and bank lending was not steady over all of the period.	
Mukherjee and Naka (1995)	Dependent Variable: Independent Variable: Money Supply, Long-Term Government Bond Rate, The Call Money Rate, Inflation, Exchange Rate, Industrial Production.	Johansen Cointegration Test, and Vector Error Correction Model (VECM) using 240 monthly data from January 1971 to December 1990	- the study confirmed that the proposed equilibrium relations are usually confirmed by the signs of long-term elasticity coefficients of macroeconomic variables on stock prices. In six-dimensional structures and two sub-periods, their results are stable for various configurations of macroeconomic variables.	Japan
Gan et al. (2006)	Dependent Variable: Independent Variable: M1 Money supply, Short-Term Interest Rate, Long-Term Interest Rates, Inflation Rate, CPI, Exchange Rates, Domestic Retail Oil Price, Gross Domestic Product.	Johansen Cointegration Test, Causality Test, and Forecast Error Variance Decomposition (FEVD) Analysis. Using from January 1990 to January 2003.	- In general, the interest rate, money supply and real GDP are regularly calculated by the NZSE40 and there is little proof that the New Zealand Stock Index is a leading indicator for shifts in macroeconomic variables.	New Zealand
Gjerde and Saettem (1999)	Dependent Variable: Independent Variable: Interest Rates, Inflation, Foreign Exchange Rate, Oil Price, Industrial Production, Consumption, the OECD Industrial Production	VAR Model using yearly data from 1974 to 1994.	- This study suggested that changes in real interest rate affected both stock returns and inflation, and the stock market responded significantly to the oil price changes. - There was no evidence that real economic activity responded to real stock return shocks. This study argues that this finding may be due to the difference in size and type of the companies listed in the developed stock market	Norway

			compared to companies in the domestic industry.	
Lobão and Levi (2016)	Dependent Variable: Independent Variable: Mutual funds flows, stock market index, GDP growth, industrial production growth, consumption growth and unemployment rate growth.	VAR Model using quarterly data from 2000Q2 to 2012Q2.	They found evidence of a statistically significant positive relationship between the flows of mutual funds and the return on the stock market, consistent with a typical approach to information on potential economic growth. In addition, their analysis shows that both mutual fund flows and returns on the stock market are forward-looking and help to predict the evolution of macroeconomic factors. For all decision-makers who need to predict economic growth, these observations have relevant consequences.	Portugal
Moya-Martínez et al. (2015)	Dependent Variable: Independent Variable: interest rates and the Spanish stock market	January 1993 to December 2012 using a wavelet-based approach.	The empirical findings suggest that Spanish businesses typically demonstrate considerable interest rate sensitivity, although the impact of interest rate exposure varies greatly across sectors and depends on the time period under consideration. In particular, the most vulnerable to interest rates are regulated sectors such as utilities, heavily indebted industries such as real estate, utilities, technology and telecommunications, and the banking sector. This result is consistent with the assumption that long-term investors are more likely to obey macroeconomic fundamentals in their investment choices, such as interest rates.	Spain

Maysami et al. (2004)	Dependent Variable: Independent Variable: M2 Money Supply, Long-Term of Interest rates, Short-Term of Interest rates, CPI, Exchange Rates, Industrial Production.	Monthly data from January 1989 to December 2001 using Johansen Cointegration Test and VECM	The finding suggests that the Singapore stock market and the property index are related to shifts in short and long-term interest rates, industrial productivity, price prices, exchange rates and the availability of capital. The index of the financial sector showed an important relationship with all the macroeconomic variables included in the analysis, with the exception of actual economic activity and the supply of money. The hotel index also displayed no major association with the supply of capital and short-term interest rates but showed important relationships with all the macroeconomic variables included in the report.	Singapore
Talla (2013)	Dependent Variable: Independent Variable: Share index. CPI Interest Rate Exchange Rate Money Supply	ADF unit root test, Multivariate OLS Regression Model, Granger causality test using monthly data from 1993-2012.	Inflation and currency deflation have been shown to have a significant negative impact on stock prices. Moreover, the interest rate is negatively linked to the share price but insignificant. On the other hand, though insignificant, money supply is positively related to share prices. Except for one unidirectional causal relationship from stock prices to inflation, no unidirectional Granger Causality is observed between stock prices and all the predictor variables under research.	Sweden
Cauchie et al. (2004)	Dependent Variable: Independent Variable: 19 firms	Statistical APT, Macroeconomic APT using monthly data from 1986-2002	The findings indicate that the statistically defined factors provide a stronger representation than the macroeconomic variables of the determinants of stock returns and that both global and local economic conditions affect stock returns. Thus, Swiss stock market is a market	Switzerland

			that is imperfectly integrated globally.	
Thornton (1993)	Dependent Variable: Independent Variable: M0 Money Supply, M5 Money Supply, Real Gross Domestic Product.	Causality Tests	The findings indicate that (i) stock prices tend to contribute to the M5 money supply, (ii) the monetary base tends to lead to real GDP, (iii) stock prices tend to lead to real GDP, (iv) there are feedback effects between volatility of money supply and volatility of stock prices, (v) real volatility of GDP tends to lead to volatility of stock prices, and (vi) real volatility of GDP leads to money supply.	UK
Abdullah (1998)	Dependent Variable: Independent Variable: M1 Money Supply, CPI, A Long-Term of Interest Rate, Budget Deficits and Surpluses, Industrial Production.	Forecast Error Variance Decompositions (FEVD) Analysis using monthly data from 1973M1 to 1995M12.	- The findings showed that the fluctuations in money growth accounted for 22.82% and 19.53% of the volatility in interest rates and equity returns, respectively. In describing the volatility of UK stock returns, the reminder of the variables used in the model was statistically significant.	UK
Hashemzadeh and Taylor (1998)	Dependent Variable: Independent Variable: Stock prices, M1 money Supply, US-Treasury bill.	Granger -Sims Causality Tests using weekly data ending 02 January 1980 to 04 July 1986.	This study suggest that a feedback system describes the relationship between the supply of money and stock prices, with the supply of money influencing some of the observed volatility in stock price levels and vice versa. The findings are not as conclusive with regard to the relationship between stock prices and interest rates. In this case, the causality appears to flow more from interest rates to stock prices, and not the other way around.	USA
Malliaris and Urrutia (1991)	Dependent Variable:	Causality Tests	Their observations reveal that: (i) Money Supply and S&P	USA

	Independent Variable: Standard and Poor 500 Index, Money supply, Industrial Production.		500 exhibit statistically significant causality; (ii) Money Supply appears to be leading the S&P 500 Index and (iii) the Industrial Production Index appears to be leading the S&P 500 Index. Their results appear to affirm the significant role that money supply plays in the economy and the popular theory that volatility in stock returns are a leading determinant of subsequent economic performance in the future.	
Abdullah and Hayworth (1993)	Dependent Variable: Independent Variable: M1 Money Supply, Short-Term Interest Rates, Inflation, Budget Deficits, Trade Deficits, Industrial Production.	VAR model, Granger Causality Test, and Forecast Error Variance Decomposition (FEVD) Analysis	- -This study showed that money growth, budget deficits, trade deficits, inflation, both short-term and long-term interest rates Granger cause U.S. stock market returns. -There is evidence that the returns on the U.S. stock market are positively related to inflation and money growth but are negatively related to short-term and long-term interest rates, budget deficits and trade deficits.	USA
Dhakal et al. (1993)	Dependent Variable: Independent Variable: Money Supply, A Short-Term of Interest Rate, The Price Level, Real Output.	VAR Model, Granger causality, using Monthly data from 1973M1 to 1991M1	-This study has shown that changes in the supply of money have a direct significant impact on changes in share prices and an indirect impact on share prices by affecting interest rates and inflation rates. - The results have suggested that volatility in share prices is causing real output fluctuations.	USA
Serletis (1993)	Dependent Variable: Independent Variable: Eight Definitions of Money Supply.	Johansen Cointegration Test, Causality	-This analysis provides evidence that because the S&P 500 did not cointegrate with all of the eight money suppliers over the sampling period, the U.S. capital market fulfilled the efficient market hypothesis (EMH).	USA

Darrat and Dickens (1999)	Dependent Variable: Independent Variable: S&P500, M1 Money Supply, Industrial Production.	VECM, Granger Causality Tests	-There is clear evidence that the IP, M1 and S&P 500 were interconnected and had causal interrelationships among them.	USA
Sadorsky (1999)	Dependent Variable: Independent Variable: Real Interest Rate, Real Oil Price, Industrial Production.	VAR Model, and Forecast Error Variance Decomposition (FEVD) Analysis	- This study finds that positive oil shocks have a negative effect on actual stock yields, while stock yields have a positive impact on interest rates and IP. -This study revealed evidence that a large portion of the forecast error variance in actual stock returns, especially after 1986, is explained by oil price movements.	USA
Ratanapakorn and Sharma (2007)	Dependent Variable: Independent Variable: Money Supply, A Short-Term of Interest Rate, Long-Term Interest Rate, Inflation, Exchange Rate, Industrial production.	Johansen Cointegration Test, Causality Test, and Forecast Error Variance Decomposition (FEVD) Analysis using monthly data over the period 1975:1-1999:4	- The analysis showed that stock prices were negatively related to the long-term interest rate and positively related to the availability of capital, Industrial Production, inflation, currency and short-term interest rates. - Each macroeconomic indicator used in the analysis was affected by Granger 's long-term, though not short-term stock prices. - The results showed that even after 24 months, the S&P 500 clarified 87% of its variance; thus, the S&P 500 is exogenous in comparison to the other macroeconomic variables included in the analysis.	USA
Rahman and Mustafa (2008)	Dependent Variable: Independent Variable: M2 Money Supply, Oil Price	Causality Test, and Vector Error Correction Model (VECM) Using monthly data from January 1974 to April 2006.	A cointegrating relationship is identified among the three variables above. Though short run interactive feedback interactions exist, the vector error-correction models do not show any converging long run causal flows.	USA

			The U.S. stock market was originally weakened by negative money and oil shocks.	
Errunza and Hogan (1998)	Dependent Variable: Independent Variable: Stock returns, Industrial production, money supply and inflation.	generalized autoregressive conditional heteroskedasticity (GARCH) models, VAR Model and OLS using monthly data from January 1959 to approximately March 1993	. They find that unlike the reported case of the US, in many countries, the period fluctuations in stock market volatility have been greatly influenced by the past instability in either monetary or real macroeconomic influences. Their results have significant consequences for the distribution of resources and portfolios.	UK, Germany, France, Italy, Switzerland, the Netherlands, and Belgium.
Keung et al. (2006)	Dependent Variable: Independent Variable: Money supply M1 and M2 Money Supply, Short term Interest Rate.	Johansen Cointegration Test, Fractional Cointegration Test, and Causality Test using daily data for the period January 1982 to December 2002.	The findings of numerous cointegration experiments indicate that share prices in Singapore typically exhibit a long-term equilibrium relationship with interest rate and money supply (M1), but the same kind of relationship does not hold for the United States. In the United States, asset markets were strongly cointegrated with macroeconomic factors prior to the 1987 stock market crisis, but the cointegrating relationship afterwards was compromised and ultimately vanished with the onset of the 1997 Asian crisis. Finally, the findings of Granger 's causal tests show some of the systemic causal relationships that suggest that the success of the stock market may be a strong predictor of the monetary policy change of the Central Bank.	Singapore and USA Developed Countries
Humpe and Macmillan (2009)	Dependent Variable: Independent Variable: Money Supply, Long-Term Interest	Johansen Cointegration Test, Causality Tests, Impulse Response Function (IRF) Analysis, and	For the US, the data are compatible with a single cointegrating vector, where market values are positively related to factory development and negatively related to both	USA and Japan Developed Countries

	Rate, Inflation, Industrial Production	Forecast Error Variance Decomposition (FEVD) Analysis	the CPI and the long-term interest rate. However, two cointegrating vectors were found for Japanese results. For the first cointegrating vector, they find that market values are positively affected by industrial production and negatively by the money supply. The second cointegrating vector found that industrial production was negatively affected by the CPI and the long-term interest rate.	
Christopoulos et al (2018)	Dependent Variable: Independent Variable: Influences of Money Supply and Oil Price on U.S. Stock Market.	ARMA (m, n) model, Granger causality test using quarterly data 1995-2013	According to the report, the authors found that the 2008-2009 recession had an impact on households and enterprises, which reduced their consumption and investment planning horizons. With respect to the second part of this analysis, the authors used the Granger causality test to find that shifts in macroeconomic variables are to some degree influenced by the stock market DAX of Germany.	Germany, Denmark, and Spain
Jareño et al. (2019)	Dependent Variable: Independent Variable: Gross domestic product, the CPI, the industrial development index and unemployment	quarterly data from 2000Q1 to 2014Q4	GDP and UNEMP have statistically significant positive and negative associations with these foreign stock markets, particularly in the sub-period of the crisis.	Germany, Italy, Spain, France, UK and USA
Muradoglu et al. (2000)	Dependent Variable: Independent Variable: Interest Rates, Inflation, Exchange Rate, Industrial Production.	Cointegration test, Causality Test using daily data from January 1988 to April 1995.	The findings of this study suggest that overall outcomes cannot be included in the formulation of investment strategies because they may be misleading in the sense that stock price variables can change over time. -In the case of the Istanbul Stock Exchange (ISE), the	Develope d Countries Greece, and Korea. Developin g Countries Argentina,

			effects of monetary expansion and interest rates vanished as the economy became more mature and foreign currency prices recovered their anticipated significance.	Brazil, Chile, Colombia, India, Indonesia, Jordan, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Portugal, Thailand, Turkey, Venezuela, and Zimbabwe.
Wenshwo (2002)	Dependent Variable: Independent Variable: Currency Depreciation	A GARCH Model	- This research presented clear evidence showing that during the Asian crisis, currency depreciation negatively impacted stock returns and/or increased market uncertainty.	Developed Countries Hong Kong, Singapore, South Korea. Developing Countries Taiwan, and Thailand

Table 3.8.2A: Summary of Empirical Studies on Emerging Markets

Empirical studies on emerging markets				
Study	**Independent Variable**	**Data and Method**	**Major Results**	**Country**
Dos Santos et al. (2013)	Dependent Variable: Independent Variable: Exchange rate, interest rate, Industrial production and the index of consumer prices	Data used from January 2001 to December 2011 and applied Vector Error Correction Model (VECM).	They found that IBOVESPA responded negatively to interest rate differential, SELIC rate and exchange rate volatility, and positively to the IPCA price index. Moreover, a significant result archived from the decomposition analysis of the variance show that the differential interest rate that reflects the foreign investor's risk perception explains a considerable variation of the IBOVESPA index during the period.	Brazil
Hondroyiannis and Papapetrou (2001)	Dependent Variable: Independent Variable: Industrial Production, Interest Rates, the Exchange Rates, Real Oil Price, S&P 500.	Multivariate Vector Autoregressive VAR Model using monthly data from 1984:1 to 1999:9.	This study finds stock returns do not correspond to shifts in real economic activity while macroeconomic activity and changes in the international stock market justify only partial fluctuations in the stock market. Changes in oil prices illustrate the fluctuations in stock prices which have a negative effect on macroeconomic activity.	Greece
Patra and Poshakwale (2006)	Dependent Variable: Independent Variable: Money Supply, Inflation, Exchange Rate,	Causality Test, and Vector Error Correction Model (VECM) using monthly data for the period 1990 to 1999.	- With the exception of the exchange rate, all of the factors investigated regularly show both short and long-term relationships with stock prices. These results show that the Greek stock market has been inefficient in terms	Greece

	Trading Volume.		of information during this period.	
Ahmed (2008)	Dependent Variable: Independent Variable: Money Supply, Interest Rates, Exchange Rates, Exports, Foreign Direct Investments, Industrial Production.	Johansen Cointegration Test, Causality Test of Toda and Yamamoto(1995), Impulse Response Function (IRF) Analysis, and Forecast Error Variance Decomposition (FEVD) Analysis using quarterly data from march 1995 to march 2007.	- The study's results showed that there was a long-term association between stock prices and the money supply. - The relationship between the interest rate and stock markets does not exist. - In the short term, the interest rate seems to have contributed to asset prices.	India
Naik and Phadi (2012)	Dependent Variable: Independent Variable: Wholesale price index, industrial production index, exchange rates, money supply, and treasury bill rates	Johansen Vector Correction Model (VECM) using monthly 1994:04-2011:06	The study shows that the stock market index is cointegrated with macroeconomic factors, and that there is a long-term relationship between them. Furthermore, it is considered that stock prices were positive in relation to economic output and the money supply, but were negatively related to inflation. In spite of the effect on stock markets, short-term interest and exchange rates were deemed marginal. In the spirit of Granger 's causality, the long-term but not short-term share price is caused by the macroeconomic indicators. Bidirectional causality has	India

			been observed between stock prices and industrial production, while unidirectional causality has been observed between stock prices and inflation, money supply and stock prices, and stock market interest rates.	
Naik (2013)	Dependent Variable: Independent Variable: Industrial production index, inflation, money supply, short term interest rate exchange rates and stock market index	Johansen's cointegration and vector error correction model have been applied using monthly data over the period 1994:04–2011:04	The analysis reveals that macroeconomic variables and the stock market index are cointegrated and, hence, a long run equilibrium relationship exists between them. It is evident that the stock prices positively relate to the money supply and industrial production but negatively relate to inflation. The exchange rate and the short-term interest rate are found to be insignificant in determining stock prices. In the Granger causality sense, macroeconomic variable causes the stock prices in the long run as well as in the short run.	India
Ray and Sarkar (2014)	Dependent Variable: Independent Variable: Money supply, 91-day Treasury bills, long-term government bonds, exchange rate, industrial output and wholesale price index,	Johansen Cointegration Test, the Vector Error Correction Model and the Creativity Analysis using quarterly data from 1991:01 to 2008:04.	There is a positive relationship between the long-term stock market and the exchange rate and industrial output, and a negative correlation between the short-term and long-term interest rates, inflation and the supply of capital. The results of the study of innovation and causality explain that manufacturing activities are influenced by the Indian stock market and the market is expected to be	India

			more susceptible over the predicted period of the research to shocks of its own.	
Yang et al. (2018)	Dependent Variable: Independent Variable: stock returns, inflation, output growth, foreign exchange rate and interest rate	Johansen cointegration test. Structural vector autoregression (SVAR) Using monthly data from January 2003 to September 2015.	the findings confirm the negative (positive) relation of demand (supply) shocks to stock returns, this research also find that demand shocks have a greater effect on stock market variance than supply shocks. The sub-period study reveals that global market fluctuations had very little effect on Korean stock market results since the global financial crisis. They also discuss the generalized five-variable model, which involves the foreign exchange rate and the interest rate, verifying the findings of the three-variable scenario.	Korea
Hussin et al. (2012)	Dependent Variable: Independent Variable: Consumer Production Index (CPI), the Industrial Production Index (IPI), aggregate monetary supply (M3), the Kuala Lumpur Syariah Index (KLSI) and the Islamic Interbank rate	Vector Autoregressive (VAR) model using the monthly data from April 1999 to October 2007	Their findings showed that Islamic share prices were linked to the macroeconomic variables defined, where the share price was positively and significantly correlated with the index of industrial output, but also strongly and negatively correlated with the supply of currency, the interbank Islamic rate and the exchange rate of the US Dollar. From the Granger causal relationship perspective, it is observed that the variables CPI, M3 and MYR Granger cause KLSI and KLSI	Malaysia

			Granger cause IPI, CPI and MYR.	
Naseri and Masih (2013)	Dependent Variable: Independent Variable: Exchange rate, consumer price and money supply	Vector Error Correction, Long-Term structural Modelling and Variance Decomposition technique using monthly data from November 2006 to September 2013	They found there exists cointegration between the macroeconomic variables and the Islamic stock market has had an impact on the Islamic stock market in Malaysia as a result of the chosen macroeconomic variables.	Malaysia
Abdullah, et al.(2014)	Dependent Variable: Independent Variable: CPI, the Exchange rate, the Short-Term Interest Rate, Export, Government Bond Rate	Wavelet analysis using monthly data for the period January 1996 to September 2013	Their analysis has shown that the government bond, the short-term interest rate, and the KLC are exogenous variables; the leading variable is, in effect, the short-term interest rate.	Malaysia
Zakaria and Shamsuddin (2012)	Dependent Variable: Independent Variable: Inflation, Gross Domestic Product, money supply and exchange rate, interest rates	Generalised autoregressive conditional heteroskedasticity (GARCH) and vector autoregressive (VAR) model using monthly data from January 2000 to June 2012.	The regression analysis shows that only money supply volatility is substantially associated with stock market volatility, but volatility as a category of macroeconomic variables is insignificantly correlated with stock market volatility. It was shown that only inflation volatility caused by Granger caused stock market volatility, while only interest-rate volatility caused by stock market volatility was shown to be Granger out of five macroeconomic variables.	Malaysia

			In addition, the volatility of macroeconomic variables as a group does not cause volatility in stock market returns for Granger.	
Ibrahim (1999)	Dependent Variable: Independent Variable: Kuala Lumpur Composite Index, M1 Money Supply, M2 Money Supply, CPI, Exchange Rate, Domestic Credit, Foreign Reserve, Industrial Production	Cointegration Test, and Causality Test using monthly data series for the period January 1977 to June 1996.	The results show that the Malaysian stock market is inefficient in terms of information on consumer prices, official reserves and domestic credit aggregates. This study also provided evidence that stock prices were Granger caused by official reserves and short-term exchange rates. There was a marginal cointegration between Malaysian stock prices with M2 and there was no long-term relationship between stock prices and M1.	Malaysia
Ibrahim (2006)	Dependent Variable: Independent Variable: Share price, Bank Loans, Interest Rates, Exchange Rate, Price Level, Output.	VAR model, Impulse Response Function (IRF) Analysis using quarterly data, covering the period from 1978Q1 to 1998Q2	- The findings have shown that bank loans have responded positively to stock price changes, but the reverse is not true. - Bank loans seemed to accommodate real demand expansion but had little effect on real economic activity. - The IRFs also indicated that bank loans do not play an important role in the transition of stock market shocks to the real economy.	Malaysia
Hasan and Javed (2009)	Dependent Variable: Independent Variable: Money Supply, Treasury bill	Johansen Cointegration Test, Causality Test, Impulse Response Function Analysis, and	The analysis offered proof of the long-term correlation between the stock market and monetary variables. Between monetary variables and the stock market,	Pakistan

	rates, CPI, Foreign Exchange Rates.	Forecast Error Variance Decomposition (FEVD) Analysis using monthly data for the period June 1998 to June 2008	Unidirectional Granger causality has been found. IRFs showed that both the interest rate shock and the exchange rates had a negative effect on the return on equity, while the supply of capital had a positive impact on the equity market.	
Shoil and Hossain (2012)	Dependent Variable: Independent Variable: CPI, Money supply, Industrial production index, actual 3-month treasury bill rate and the exchange rate for three share indices. ISE10 indices, LSE25 indexes, KSE100 index, and KSE100 indexes for three stock exchange respectively	Johransen's cointegration using monthly data from December 2004 to June 2008.	This study found that in the three capital markets, industrial production has a long-term effect on share prices. The exchange rate has a positive influence on all indexes, except the ISE10 index. The CPI is also positively related to Karachi's stock returns, although it is negatively related to the other two stock exchanges. Finally, although the treasury bill rate has a mixed effect, the money supply adversely impacts stock returns.	Pakistan
Hussain, et al. (2012)	Dependent Variable: Independent Variable: exchange rate, foreign exchange reserve, industrial production index, interest rate, import, money supply, wholesale price	augmented dickey-full (ADF) and Kwiatkowski-Phillips-shin (KPSS) unit root tests, Johansen cointegration test, vector correction model (VECM) and Granger causation tests	Foreign exchange reserves, interest rates, money supply and the wholesale price index showed a positive and significant relationship with stock prices, while exchange rates and exports suggested a negative and significant relationship with stock prices. The Granger causality findings indicate that there are two paths for the wholesale price index and	Pakistan

	index and export		money supply, while the unidirectional relationship between foreign exchange reserve, exchange rate and import is with the stock price, but there is no causal relationship between interest rate, index of industrial output and export.	
Attari and Safdar (2013)	Dependent Variable: Independent Variable: Karachi Stock Exchange (KSE-100 Index), interest rate, inflation, and gross domestic product	Augmented Dickey Fuller (ADF) Test, Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH)	The results show that macroeconomic factors have a major influence on stock prices. Stock markets have a significant influence on the economy of the country and are also considered to be the strongest indicators for future economic and financial predictions. The implication of causality implies that there is no association between GDP and stock returns as they pass in the independent direction. But the inflation rate does have a casual impact on stock returns. And between stock returns and the interest rate, there is another unidirectional correlation.	Pakistan
Haroon, et al. (2013)	Dependent Variable: Independent Variable: Interest Rate, CPI, Wholesale Price Index and Inflation, Karachi Stock Exchange	Correlation and regression methodology using monthly data from July 2001 to June 2010.	Their research found that macroeconomic variables have an important relationship with the price index of the Karachi Stock Exchange (KSE100).	Pakistan

Hunjra, et al (2014)	Dependent Variable: Independent Variable: Exchange rate, inflation rate, GDP, and interest rate on Pakistan's stock price	Cointegration and Granger Causality using monthly data from 1 January 2001 to 31 December 2011.	Their findings showed that, in the short term, there is no correlation between the stock price and macroeconomic factors. However, a significant relationship between capital markets and macroeconomic variables has been demonstrated by the long-term results.	Pakistan
Kibria, et al (2014)	Dependent Variable: Independent Variable: GDP per capita, inflation, GDP savings, exchange rate and money supply	Correlation Analysis, Descriptive Analysis, Regression Analysis and Granger causality measures using annual data over the period from 1991 to 2013.	The results of the Granger Causality test imply that the GDP savings and exchange rate are supplied with unidirectional Granger causes Income. The KSE is also induced by unidirectional Granger savings on the other side of GDP. The results of the Regression Analysis show that inflation, the exchange rate, the supply of capital, per capita GDP and GDP savings have had a positive effect on the KSE 100 index.	Pakistan
Khan, S M et al. (2014)	Dependent Variable: Independent Variable: KSE-100, gross domestic product, the exchange rate, the interest rate and inflation rate	Multiple Regression and Pearson's correlation using monthly data over the 1992 to 2011	Gross domestic product, exchange rate and inflation have been positively associated with stock prices. Even though the interest rate index of the financial markets has had a negative impact. They also showed that stock prices in Pakistan were explained by 80 % of the differences in independent variables.	Pakistan

Ibrahim, MH (2011)	Dependent Variable: Independent Variable: Gross domestic product, market capitalization ratio, the investment ratio, and the aggregate price level	VAR, impulse-response functions and variance decompositions using quarterly data from 1993 to 2007	The results of the Cointegration test show that there is a long-term relationship between the variables, namely the actual gross domestic product (GDP), the market capitalization ratio, the investment ratio and the aggregate price level. Moreover, the impulse-response and variance decomposition functions simulated from the projected VAR models clearly indicate positive and significant contributions to both the actual GDP and the stock market growth investment ratio. Finally, the superexogeneity test suggests that the development of the system's stock market is superexogenous. Therefore, the relationship between economic growth and stock market development is structurally invariant to changes in policy.	Thailand
Muradoglu and Argac (2000)	Dependent Variable: Independent Variable: Money Supply, Overnight Interest Rate, Foreign Exchange Rate., inflation, industrial production	Johansen Cointegration Test	The three monetary variables were found not to be cointegrated with stock prices during the sample period and also during the sub-sample period from 1988 to 1989 in their analysis. The three other monetary variables were cointegrated in the 1990-1995 sub-period with stock prices. These findings indicated that the results of the study were adaptive to the time under review.	Turkey

Chinzara (2010)	Dependent Variable: Independent Variable: Industrial production, the CPI, broad money supply (M3), the exchange rate, the oil price and the gold price.	univariate GARCH models [i.e. GARCH, EGARCH and TARCH using monthly data	The results are that the Treasury bill rate, the exchange rate and the gold price, and negative volatility spill overs from inflation are positive volatility spill overs. It finds that stock market volatility is significantly influenced by macroeconomic uncertainty, that financial crises accelerate stock market volatility, and that exchange rate fluctuations are mainly influential factors affecting stock market instability, while gold price volatility, inflation and oil prices play insignificant roles in Africa	South Africa
Barakat et al. (2015)	Dependent Variable: Independent Variable: Stock market Index, Interest Rate, Inflation, Exchange Rate, M2 Money Supply	ADF, VAR, Johansen Cointegration test and Granger causality test. using Monthly data , 2012) through the period January 1998 until January 2014	The findings showed that the causal relationship between the stock index and the CPI, the exchange rate, the money supply and the interest rate occurs in Egypt. Except for CPI, which had no causal association with the market index, the same goes for Tunisia. Results have also shown that the four macroeconomic markets in both countries are cointegrated with the stock market.	Egypt and Tunisia

Hsing and Hsieh (2012)	Dependent Variable: Independent Variable: Industrial production, real GDP, M2/GDP ratio, Government borrowing/GDP ratio, Treasury bill rate, exchange rate, inflation, government bond yield	GARCH or ARCH	In the analysis conducted by Hsing and Hsieh(2012), the Polish stock market index is positively associated with industrial production or real GDP and negatively affected by the government borrowing/GDP ratio, the real interest rate, the nominal effective exchange rate, the projected inflation rate, and the government bond yield in the policy setting for the German economy. The paper shows that the value of the stock index and the size of the economy are positively (negatively) related for economies with an M2-GDP ratio of less (greater) than 43.68 %.	Poland Germany
Wongbampo and Sharma (2002)	Dependent Variable: Independent Variable: GNP, inflation, money supply, interest rates, and exchange rates	ADF, Johansen cointegration test, VECM and Granger causality test using monthly data from 1985 to 1996.	Their research showed that, when it comes to the long-term consequences, all five stock price indices are associated with the increase in production, and they are negatively correlated with the price level. There was a negative association between interest rates and stock market share price for Malaysia, Singapore, Thailand, Philippines, but strong correlation for Indonesia.	Malaysia, Philippines, Thailand, Singapore and Indonesia
Hammoudeh and Choi (2006)	Dependent Variable: Independent Variable: Oil Price, the US T-	Vector Error Correction Model (VECM), Impulse Response Function Analysis, and	- The US Treasury rate was a direct influence on some of the GCC markets. - Crude oil and other commodity securities had only a slight influence on the	Saudi Arabia, Kuwait, Bahrain, Qatar, the United Arab

	bill Rate, S&P 500	Forecast Error Variance Decomposition (FEVD) Analysis using weekly data from 15 February 1994 to 28 December 2004	U.S. stock indexes as they stood at a low point for several weeks afterwards. - S&P 500 shocks had modest positive impacts on all GCC markets over a 20-week; but, upon further review, no clear consensus on the effect of the T–bill rate was found. - The VDC studied the price history of oil in the Arab States and found that it clarified 30% of the changes of the UAE and 29% of the changes of Saudi Stock Exchange, respectively.	Emirates, and Oman Developing Countries
Mahmood and Mohd (2007)	Dependent Variable: Independent Variable: stock price indices, foreign exchange rates, CPI and industrial production index	ADF, Johansen cointegration test, VECM	The findings show that in just four nations, i.e., Japan, Korea, Hong Kong and Australia, there is a long-term balance between and between variables. As for short-term relations, there are several contacts between all countries except Hong Kong and Thailand. Hong Kong only shows a relationship between the exchange rate and the stock price, while Thailand only shows a major interaction between production and stock prices. A detailed estimate of the relationship between economic factors and the behavior of the stock market helps local and international investors to make successful investment decisions.	Malaysia, Korea, Thailand, Hong Kong, Japan, and Australia.

Yartey (2008)	Dependent Variable: Independent Variable: income level, savings and investment, stock market liquidity, macroeconomic stability, private capital flows and political risk as Institutional Quality variables	Generalized Method of Moments (GMM) using yearly data from 1990 to 2004	This paper found significant determinants of stock market growth in emerging market countries for macro-economic variables like income level, gross domestic investment, banking development, private capital flow and bond market liquidity. The findings suggest that laws and order, political risk, and bureaucratic efficiency are correlated with the growth of financial markets. The paper reveals factors that contribute to stock market growth in developing markets and those that contribute to stock market development in South Africa.	42 emerging economies
Alam (2013)	Dependent Variable: Independent Variable: Industrial Production, Inflation, Exchange Rate, Short term interest rate, Long term interest rate, Money Supply, Oil Price	Augmented Dickey-Fuller (ADF), Ordinary least squares (OLS) method using monthly time series data from July 2003 to June 2011	The empirical findings suggest that the substantial relationship between portfolio returns and macroeconomic factors for both sub-periods was not accurate.	Indonesia, Malaysia, Singapore and Thailand
Śükrüoğlu, et, al (2013)	Dependent Variable: Independent Variable: liquid liabilities, GDP, stocks traded by percentage of	ADF and VAR model using annual data over the 1995–2011	They found that macroeconomic variables have an impact on the development of the stock market. Monetization ratio and inflation have negative	19 European countries (Austria, Belgium, Bulgaria, Croatia, Czech

	GDP as a liquidity ratio, shares traded by% of market capitalization as a turnover ratio and cash surplus as a budget balance, GDS as a savings ratio and consumer inflation		effects, while profits, liquidity ratio and saving rate have positive effects on the growth of the stock market. The Liquidity Ratio asserts that the liquidity of the capital market tends to boost the growth of the stock market. In addition, the income and saving rate are connected to stock market development.	Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Netherlands, Portugal, Slovenia, Spain, Sweden and United Kingdom)
Benjamin (2008)	Dependent Variable: Independent Variable: nominal exchange rate, the money supply (M1), industrial production index and nominal interest rate, The US 3-month T-bill yield and the MSCI world index	ADF, VAR model impulse response functions using Monthly data from January 1986 to August 2001	The study finds that in explaining returns in all markets, global factors are continuously significant. The country factors are listed with varying significance and magnitudes influencing the markets. These results may have significant consequences for investors and national policymakers' decision-making. The findings indicate that for all the four markets analyzed, the MSCI global index and the U.S. 3-month T-bill yield are consistently relevant. In three out of the four markets analyzed, interest rates and exchange rates are relevant. For the most part, the relevant coefficients for the MSCI world index, the U.S. 3-month T-bill yield, interest rates and exchange rates	Latin America (Argentina, Brazil, Chile, Mexico)

			illustrate the predicted indications. Typically, the performance of money supply and industrial production is poor.	

Appendix 4A

Table 4.8.3A: Different Combination of Model

Models that were statistically analysed and reported in this study			
1	LnSPI LnRGDP LnCPI	2	LnSPI LnIPI LnCPI
3	LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER	4	LnSPI LnIPI LnCPI LnFDI LnREMI LnREER
5	LnSPI LnRGDP LnCPI LnFDI LnREMI LnOPEN	6	LnSPI LnIPI LnCPI LnFDI LnREMI LnOPEN
7	LnSPI LnRGDP LnCPI LnFDI LnREER LnOPEN	8	LnSPI LnIPI LnCPI LnFDI LnREER LnOPEN
9	LnSPI LnRGDP LnCPI LnREMI LnREER LnOPEN	10	LnSPI LnIPI LnCPI LnREMI LnREER LnOPEN
11	LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER LnOPEN	12	LnSPI LnIPI LnCPI LnFDI LnREMI LnREER LnOPEN
Models that were statistically analysed but not reported in this study			
13	LnSPI LnRGDP LnCPI LnFDI	14	LnSPI LnIPI LnCPI LnFDI
15	LnSPI LnRGDP LnCPI LnREMI	16	LnSPI LnIPI LnCPI LnREMI
17	LnSPI LnRGDP LnCPI LnREER	18	LnSPI LnIPI LnCPI LnREER
19	LnSPI LnRGDP LnCPI LnOPEN	20	LnSPI LnIPI LnCPI LnOPEN
21	LnSPI LnRGDP LnCPI LnFDI LnREMI	22	LnSPI LnIPI LnCPI LnFDI LnREMI
23	LnSPI LnRGDP LnCPI LnFDI LnREER	24	LnSPI LnIPI LnCPI LnFDI LnREER
25	LnSPI LnRGDP LnCPI LnFDI LnOPEN	26	LnSPI LnIPI LnCPI LnFDI LnOPEN
27	LnSPI LnRGDP LnCPI LnREMI LnREER	28	LnSPI LnIPI LnCPI LnREMI LnREER
29	LnSPI LnRGDP LnCPI LnREMI LnOPEN	30	LnSPI LnIPI LnCPI LnREMI LnOPEN
31	LnSPI LnRGDP LnCPI LnREER LnOPEN	32	LnSPI LnIPI LnCPI LnREER LnOPEN

Table 4.8.4A: The First Generation of Panel Unit Root Tests

Test	**LLC**	**Fisher**
Hypothesis test	• non-stationarity for all individual • homogeneous alternative	• Non-stationarity for all individual • heterogeneous alternative
Model specification	• individual effects • time trends • heterogeneous serial correlation structure of the errors	• individual fixed effects and time trend • heterogeneous serial correlation structure of the errors
Advantages	• unbalanced panels are allowed, but further simulations are required	• unbalanced panels are allowed. • it can be carried out for any unit root test derived. • it is possible to use different lag lengths in the individual *ADF* regressions
Disadvantages	• it requires an infinite number of groups. • all the groups are assumed to have the same type of non-stochastic components. • the critical values are sensitive to the choice of lag lengths in the individual *ADF* regressions. • it does not allow that some groups have a unit root and others do not	• the *p*-value have to be derived by Monte Carlo simulations • problems of size distortion with serial correlated errors
Properties	• it is a pooled test. • more relevant for panel of moderate size ($10 < N < 250$ and $25 < T < 250$) • super consistency of the estimators • there is a loss of power when time trends are included	• it is a combination test. • there is a loss of power when time trends are included. • with cross-sectional correlated errors it is more powerful than *LLC*

Table 4.8.5A: Advantages and Limitations of Different Cointegration Approaches

Method	Advantages	Limitations
Single Equation Method: Residual-Based Tests (Engle and Granger, 1987)	• Easy to understand and to implement. • Useful for bivariate analysis.	• Sensitive to the order of the variables • Inability to detect more than one cointegrating relationship. • Some errors generated from the first step can be carried over into the second step based on this two-step estimator. • All the variables are required to be integrated of the same order.
Multiple Equation Method based on Canonical Correlations: Johansen Tests (Johansen, 1991, 1995)	• Avoid the problem of normalization that plagues other estimators by using one-step estimation. • Able to detect more than one cointegrating relationship by using the multiple-equation approach. • Applicable for multiple variables. • Allow testing of restrictions on the cointegrating vector.	• Extremely sensitive to the assumption regarding to the underlying distributions of the error terms. • Tendency to find spurious cointegration. • High variance and high probability of producing outliers. • Require that all the variables be I(1).
Bounds Test within ARDL Modelling Method	• Simple to implement and interpret. • Irrespective to the order of the integration of the variables. • Allow for differential lag lengths for the variables, and able to accommodate more variables than in other models (i.e. VAR). • Allow for inference on long run estimates.	• Not applicable if there is a presence of I(2) in the system. • Highly sensitive to the order of lags.

Sources: Compiled by the Researcher from Asteriou and Hall (2011, pp. 366-367); Maddala and Kim (1998, pp. 173, 220-221); Pesaran and Shin (1999); Pesaran et al. (2001).

Appendix 5A

Selection of Optimal Lag Length (Developed and Emerging Markets)

The appropriate lag orders for VAR models are widely chosen by selected information criteria (i.e., Akaike information criterion (AIC) and Schwarz information criterion (SIC)) (Darrat & Dickens 1999; Mallik & Chowdhury 2001). Table 5.1A below summarizes the results of the lag lengths selected by AIC, SIC and Hannan-Quinn information criterion (HQ). It presents the optimal lag orders for different unrestricted VAR models by increasing the suggested lags until free of autocorrelation in the residuals.

Table 5.8.6A: VAR Lag Order Selection Criteria for Developed and Emerging Markets Combinedly

Model: 1 Endogenous variables: LnSPI LnRGDP LnCPI Exogenous variables: *C* Included observations: 574				**Model: 2** Endogenous variables: LnSPI LnIPI LnCPI Exogenous variables: *C* Included observations: 736		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	5.2757	5.3266	5.2963	5.4856	5.5383	5.5070
1	-7.3562	-7.1526	-7.2738	-6.3315	-6.1210	-6.2462
2	-8.2348	-7.87854*	-8.09053*	-6.8470	-6.47869*	-6.69770*
3	-8.2366	-7.7276	-8.0304	-6.8392	-6.3131	-6.6260
4	-8.2907*	-7.6291	-8.0228	-6.9428*	-6.2588	-6.6655
5	-8.2411	-7.4268	-7.9113	-6.9296	-6.0878	-6.5884
6	-8.1846	-7.2175	-7.7929	-6.8479	-5.8482	-6.4426
7	-8.1443	-7.0245	-7.6908	-6.7918	-5.6343	-6.3226
8	-8.1717	-6.8993	-7.6564	-6.7889	-5.4735	-6.2557
Model: 3 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER Exogenous variables: *C* Included observations: 741				**Model: 4** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREMI LnREER Exogenous variables: *C* Included observations: 711		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	8.0578	8.1596	8.0990	8.1862	8.2915	8.2289
1	-10.7016	-9.9890	-10.4130	-9.6538	-8.9172	-9.3552
2	-11.9938	-10.6705*	-11.4579*	-10.5441	-9.1761*	-9.9896*
3	-12.0319	-10.0977	-11.2485	-10.5927	-8.5933	-9.7822
4	-12.0693*	-9.5244	-11.0386	-10.7130	-8.0822	-9.6466
5	-11.9734	-8.8177	-10.6953	-10.7515*	-7.4894	-9.4292
6	-11.8285	-8.0620	-10.3031	-10.6403	-6.7468	-9.0620
7	-11.7217	-7.3445	-9.9489	-10.5985	-6.0737	-8.7644

8	-11.7621	-6.7740	-9.7419	-10.5717	-5.4155	-8.4816
Model: 5 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREMI LnOPEN Exogenous variables: *C* Included observations: 739				**Model: 6** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREMI LnOPEN Exogenous variables: *C* Included observations: 711		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	10.7407	10.8425	10.7819	10.9876	11.0928	11.0303
1	-9.9380	-9.2254	-9.6494	-8.7925	-8.0559	-8.4940
2	-11.3457	-10.0223*	-10.8097*	-9.8231	-8.4551*	-9.26855*
3	-11.3509	-9.4168	-10.5676	-9.8199	-7.8206	-9.0095
4	-11.4494*	-8.9045	-10.4187	-9.994946*	-7.3642	-8.9286
5	-11.2826	-8.1269	-10.0045	-9.8986	-6.6365	-8.5764
6	-11.1633	-7.3968	-9.6378	-9.7808	-5.8873	-8.2026
7	-11.1221	-6.7449	-9.3493	-9.7494	-5.2245	-7.9152
8	-11.1354	-6.1474	-9.1152	-9.7174	-4.5612	-7.6274
Model: 7 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREER LnOPEN Exogenous variables: *C* Included observations: 764				**Model: 8** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREER LnOPEN Exogenous variables: *C* Included observations: 736		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	6.4959	6.5977	6.5371	7.1524	7.2576	7.1950
1	-12.4830	-11.7704	-12.1944	-11.3793	-10.6427	-11.0807
2	-14.0305	-12.7072*	-13.4946*	-12.5023	-11.1343*	-11.9478*
3	-14.0942*	-12.1601	-13.3109	-12.5840	-10.5846	-11.7736
4	-14.0175	-11.4726	-12.9868	-12.6022*	-9.9715	-11.5358
5	-13.8588	-10.7031	-12.5807	-12.5132	-9.2511	-11.1909
6	-13.7109	-9.9444	-12.1854	-12.3644	-8.4709	-10.7862
7	-13.6558	-9.2785	-11.8829	-12.3087	-7.7839	-10.4746
8	-13.6835	-8.6955	-11.6633	-12.2933	-7.1371	-10.2033
Model: 9 Endogenous variables: LnSPI LnRGDP LnCPI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations: 739				**Model: 10** Endogenous variables: LnSPI LnIPI LnCPI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations: 711		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	7.9510	8.0528	7.9923	7.9471	8.0523	7.9897
1	-12.6994	-11.9869	-12.4108	-11.5965	-10.8599	-11.2979
2	-14.0642*	-12.7408*	-13.5282*	-12.5848	-11.2168*	-12.0303*
3	-14.0149	-12.0808	-13.2316	-12.5904	-10.5911	-11.7800
4	-13.9655	-11.4206	-12.9348	-12.6283*	-9.9976	-11.5619
5	-13.7773	-10.6216	-12.4993	-12.4754	-9.2133	-11.1531
6	-13.6191	-9.8527	-12.0937	-12.3220	-8.4285	-10.7438
7	-13.5246	-9.1473	-11.7518	-12.2691	-7.7443	-10.4350
8	-13.6398	-8.6518	-11.6196	-12.3745	-7.2183	-10.2845
Model: 11 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations: 739				**Model: 12** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations:		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	9.0170	9.1358	9.0651	9.2964	9.4192	9.3462
1	-13.1055	-12.1554	-12.7207	-11.9129	-10.9307	-11.5148

2	-14.6009	-12.8195*	-13.8794*	-13.0553	-11.2138*	-12.3089*
3	-14.6209*	-12.0082	-13.5627	-13.0928	-10.3919	-11.9980
4	-14.6061	-11.1620	-13.2112	-13.2094*	-9.6492	-11.7663
5	-14.4019	-10.1264	-12.6703	-13.1247	-8.7051	-11.3332
6	-14.2378	-9.1310	-12.1695	-13.0152	-7.7363	-10.8754
7	-14.1406	-8.2024	-11.7356	-12.9446	-6.8062	-10.4564
8	-14.2135	-7.4440	-11.4718	-12.9529	-5.9552	-10.1164

** indicates lag order selected by the criterion: Here, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion.*
Source: Selection of Lag Orders by Eviews 11.

The optimal lag lengths selected from Table 5.1A are used in the following cointegration and causality analyses.

This study used Schwartz information criteria (SIC) to determine optimum lag length. It is found that optimum lag length is 2.

Appendix 6A

Selection of Optimal Lag Length (Emerging Markets)

The appropriate lag orders for Vector autoregressive (VAR) models are widely chosen by selected information criteria (i.e. Akaike information criterion (AIC) and Schwarz information criterion (SIC)) (Darrat & Dickens, 1999; Mallik & Chowdhury, 2001). Table 6.1A below summarizes the results of the lag lengths selected by AIC, SIC and Hannan-Quinn information criterion (HQ) presents the optimal lag orders for different unrestricted VAR models by increasing the suggested lags until free of autocorrelation in the residuals.

Table 6.8.7A: VAR Lag Order Selection Criteria for Emerging Market

Model: 1 Endogenous variables: LnSPI LnRGDP LnCPI Exogenous variables: *C* Included observations: 574				**Model: 2** Endogenous variables: LnSPI LnIPI LnCPI Exogenous variables: *C* Included observations: 736		
Lag	AIC	SC	HQ	AIC	SC	HQ
0	3.5598	3.5826	3.5687	3.5597	3.5831	3.5689
1	-11.8209	-11.7299	-11.7854	-9.8596	-9.7660	-9.8230
2	-12.4743	-12.3150	-12.4121	-10.3242	-10.1603	-10.2602
3	-12.5738	-12.3463*	-12.4850	-10.3996	-10.1655*	-10.3082
4	-12.5650	-12.2693	-12.4497	-10.3944	-10.0900	-10.2755
5	-12.6562	-12.2922	-12.5142	-10.4831	-10.1085	-10.3367
6	-12.7182	-12.2860	-12.5496	-10.5491	-10.1043	-10.3753
7	-12.7545	-12.2540	-12.5593*	-10.5802	-10.0652	-10.3790*
8	-12.7660*	-12.1973	-12.5442	-10.5927*	-10.0075	-10.3641
Model: 3 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER Exogenous variables: *C* Included observations: 741				**Model: 4** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREMI LnREER Exogenous variables: *C* Included observations: 711		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	6.601059	6.648142	6.619460	6.5985	6.6470	6.6175
1	-16.39719	-16.06761	-16.26838	-14.2893	-13.9497	-14.1563
2	-17.23974	-16.62766*	-17.00053*	-14.9957	-14.3650*	-14.7488*
3	-17.33849	-16.44391	-16.98887	-15.0688	-14.1470	-14.7079
4	-17.30932	-16.13225	-16.84931	-15.0500	-13.8372	-14.5752
5	-17.36819	-15.90861	-16.79777	-15.0906	-13.5867	-14.5018
6	-17.42388	-15.68181	-16.74306	-15.1451	-13.3501	-14.4424
7	-17.45002	-15.42545	-16.65878	-15.1553	-13.0693	-14.3387

8	-17.47273*	-15.16566	-16.57110	-15.1852*	-12.8081	-14.2546
Model: 5 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREMI LnOPEN Exogenous variables: *C* Included observations: 739				**Model: 6** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREMI LnOPEN Exogenous variables: *C* Included observations: 711		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	8.7251	8.7723	8.7435	9.1503	9.1989	9.1693
1	-15.9123	-15.5818	-15.7831	-14.0301	-13.6905	-13.8972
2	-16.8783	-16.2645*	-16.6384*	-14.6616	-14.0309*	-14.4147*
3	-16.9513	-16.0542	-16.6006	-14.7306	-13.8089	-14.3698
4	-16.9452	-15.7648	-16.4838	-14.7359	-13.5231	-14.2611
5	-17.0206	-15.5569	-16.4485	-14.7890	-13.2851	-14.2003
6	-17.0766	-15.3296	-16.3937	-14.8528	-13.0579	-14.1501
7	-17.1115	-15.0813	-16.3179	-14.8722	-12.7862	-14.0556
8	-17.1473*	-14.8338	-16.2430	-14.9126*	-12.5355	-13.9820
Model: 7 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREER LnOPEN Exogenous variables: *C* Included observations: 764				**Model: 8** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREER LnOPEN Exogenous variables: *C* Included observations: 736		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	4.5655	4.6111	4.5833	4.8959	4.9427	4.9142
1	-19.6052	-19.2859	-19.4807	-17.8181	-17.4904	-17.6901
2	-20.7179	-20.1248*	-20.4865*	-18.6094	-18.0007*	-18.3716*
3	-20.8234	-19.9566	-20.4852	-18.7035	-17.8139	-18.3559
4	-20.8229	-19.6824	-20.3780	-18.7135	-17.5430	-18.2562
5	-20.9205	-19.5063	-20.3688	-18.8045	-17.3531	-18.2375
6	-20.9798	-19.2918	-20.3213	-18.8812	-17.1488	-18.2044
7	-21.0286	-19.0669	-20.2633	-18.9223	-16.9090	-18.1357
8	-21.1048*	-18.8694	-20.2328	-18.9955*	-16.7012	-18.0991
Model: 9 Endogenous variables: LnSPI LnRGDP LnCPI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations: 739				**Model: 10** Endogenous variables: LnSPI LnIPI LnCPI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations: 711		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	4.8131	4.8603	4.8316	4.9877	5.0362	5.0067
1	-18.8858	-18.5553	-18.7566	-17.0096	-16.6700	-16.8766
2	-19.8264	-19.2126*	-19.5865*	-17.6594	-17.0288*	-17.4126*
3	-19.9189	-19.0218	-19.5683	-17.7221	-16.8003	-17.3612
4	-19.9538	-18.7734	-19.4924	-17.7680	-16.5552	-17.2932
5	-20.0378	-18.5742	-19.4657	-17.8464	-16.3425	-17.2576
6	-20.1093	-18.3623	-19.4264	-17.9224	-16.1274	-17.2197
7	-20.1385	-18.1082	-19.3449	-17.9379	-15.8518	-17.1212
8	-20.2333*	-17.9198	-19.3290	-18.0454*	-15.6683	-17.1148
Model: 11 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations: 739				**Model: 12** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations:		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	6.8600	6.9151	6.8816	7.2146	7.2712	7.2367
1	-19.7946	-19.3540	-19.6224	-17.8928	-17.4400	-17.7156

2	-20.9105	-20.0843*	-20.5876*	-18.7091	-17.8601*	-18.3767*
3	-20.9860	-19.7741	-20.5123	-18.7693	-17.5242	-18.2819
4	-20.9770	-19.3796	-20.3526	-18.7801	-17.1388	-18.1375
5	-21.0305	-19.0475	-20.2554	-18.8234	-16.7859	-18.0258
6	-21.0924	-18.7238	-20.1666	-18.8886	-16.4549	-17.9359
7	-21.1148	-18.3606	-20.0382	-18.8929	-16.0630	-17.7851
8	-21.1742*	-18.0344	-19.9469	-18.9692*	-15.7431	-17.7063

** indicates lag order selected by the criterion: Here, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion.*
Source: Selection of Lag Orders by Eviews 11.

The optimal lag lengths that are selected from Table 6.1A are used in cointegration and causality analyses. This study used SIC to determine optimum lag length. It is found that optimum lag length is 2.

Appendix 7A

Selection of Optimal Lag Length (Developed Markets)

The share price index model specified in this study should have the appropriate number of lags included. Too many included lags will mean that the study will lose many degrees of freedom. The appropriate lag orders for VAR models are widely chosen by selected information criteria (i.e. Akaike information criterion (AIC) and Schwarz information criterion (SIC)) (Darrat & Dickens, 1999; Mallik & Chowdhury, 2001). Table 7.1A below summarizes the results of the lag lengths selected by AIC, SIC and Hannan-Quinn information criterion (HQ) that presents the optimal lag orders for different unrestricted VAR models by increasing the suggested lags until free of autocorrelation in the residuals.

Table 7.8.8A: VAR Lag Order Selection Criteria for developed market

Model: 1 Endogenous variables: LnSPI LnRGDP LnCPI Exogenous variables: *C* Included observations: 766				**Model: 2** Endogenous variables: LnSPI LnIPI LnCPI Exogenous variables: *C* Included observations: 736		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	4.5947	4.6128	4.6017	4.5628	4.5815	4.5700
1	-9.2012	-9.1285	-9.1732	-7.6583	-7.5833	-7.6293
2	-10.2575	-10.1303	-10.2085	-8.3314	-8.20012*	-8.2808
3	-10.3146	-10.1328	-10.2446	-8.3606	-8.1730	-8.2882
4	-10.3951	-10.1587*	-10.3041	-8.4425	-8.1987	-8.3485
5	-10.4345	-10.1436	-10.3225*	-8.4923	-8.1922	-8.3766*
6	-10.4484	-10.1030	-10.3154	-8.5096	-8.1532	-8.3721
7	-10.4443	-10.0444	-10.2904	-8.5163	-8.1037	-8.3572
8	-10.4700*	-10.0156	-10.2951	-8.5334*	-8.0645	-8.3526
Model: 3 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER Exogenous variables: *C* Included observations: 741				**Model: 4** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREMI LnREER Exogenous variables: *C* Included observations: 711		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	8.4191	8.4564	8.4335	8.4183	8.4568	8.4332
1	-13.0944	-12.8332	-12.9937	-11.4704	-11.2006	-11.3662
2	-14.4753	-13.9902*	-14.2883	-12.4609	-11.9599*	-12.2674
3	-14.6194	-13.9105	-14.3461*	-12.5786	-11.8464	-12.2957*
4	-14.6720	-13.7392	-14.3124	-12.6203	-11.6569	-12.2482

5	-14.6993	-13.5427	-14.2534	-12.6830	-11.4884	-12.2215
6	-14.6901	-13.3095	-14.1578	-12.6815	-11.2556	-12.1307
7	-14.7122	-13.1078	-14.0937	-12.7201	-11.0630	-12.0800
8	-14.7249*	-12.8967	-14.0201	-12.7230*	-10.8347	-11.9936
Model: 5 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREMI LnOPEN Exogenous variables: *C* Included observations: 739				**Model: 6** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREMI LnOPEN Exogenous variables: *C* Included observations: 711		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	10.6669	10.7042	10.6813	11.0678	11.1064	11.0827
1	-12.5464	-12.2847	-12.4455	-11.0275	-10.7578	-10.9233
2	-13.9890	-13.5030*	-13.8016	-12.0148	-11.5138*	-11.8213
3	-14.1078	-13.3974	-13.8339*	-12.1298	-11.3976	-11.8470
4	-14.1859	-13.2511	-13.8255	-12.2264	-11.2629	-11.8542*
5	-14.2035	-13.0444	-13.7565	-12.2649	-11.0703	-11.8035
6	-14.2127	-12.8293	-13.6793	-12.2783	-10.8524	-11.7275
7	-14.2521	-12.6443	-13.6321	-12.3064	-10.6493	-11.6663
8	-14.2717*	-12.4395	-13.5652	-12.3173*	-10.4290	-11.5879
Model: 7 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREER LnOPEN Exogenous variables: *C* Included observations: 764				**Model: 8** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREER LnOPEN Exogenous variables: *C* Included observations: 736		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	6.106699	6.143128	6.120724	6.5214	6.5589	6.5358
1	-15.90194	-15.64694	-15.80377	-14.4146	-14.1520	-14.3133
2	-17.52300	-17.0494*	-17.34068	-15.5899	-15.1023*	-15.4018
3	-17.71475	-17.02261	-17.4483*	-15.7819	-15.0692	-15.5070*
4	-17.75012	-16.83941	-17.39951	-15.8419	-14.9041	-15.4802
5	-17.78476	-16.65548	-17.35000	-15.9005	-14.7377	-15.4520
6	-17.80222	-16.45436	-17.28331	-15.9273	-14.5394	-15.3920
7	-17.88922	-16.32279	-17.28616	-16.0075	-14.3945	-15.3854
8	-17.9409*	-16.15591	-17.25371	-16.0374*	-14.1994	-15.3285
Model: 9 Endogenous variables: LnSPI LnRGDP LnCPI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations: 739				**Model: 10** Endogenous variables: LnSPI LnIPI LnCPI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations: 711		
Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	6.9385	6.9759	6.9529	6.9327	6.9712	6.9476
1	-15.4423	-15.1806	-15.3414	-13.8905	-13.6207	-13.7863
2	-16.8735	-16.3874*	-16.6861	-14.9017	-14.4007*	-14.7082
3	-17.0147	-16.3043	-16.7407*	-15.0450	-14.3128	-14.7622*
4	-17.0694	-16.1346	-16.7089	-15.1306	-14.1671	-14.7584
5	-17.0818	-15.9227	-16.6349	-15.1674	-13.9727	-14.7059
6	-17.0795	-15.6960	-16.5461	-15.1771	-13.7513	-14.6264
7	-17.1227	-15.5148	-16.5027	-15.2250	-13.5679	-14.5848
8	-17.2046*	-15.3725	-16.4982	-15.2908*	-13.4024	-14.5613
Model: 11 Endogenous variables: LnSPI LnRGDP LnCPI LnFDI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations: 739				**Model: 12** Endogenous variables: LnSPI LnIPI LnCPI LnFDI LnREMI LnREER LnOPEN Exogenous variables: *C* Included observations:		

Lag	AIC	SIC	HQ	AIC	SIC	HQ
0	9.0423	9.0859	9.0591	9.3987	9.4437	9.4161
1	-16.0940	-15.7450	-15.9594	-14.5441	-14.1845	-14.4052
2	-17.7277	-17.0734*	-17.4754	-15.7240	-15.0496*	-15.4635
3	-17.8783	-16.9186	-17.5083*	-15.8770	-14.8879	-15.4949*
4	-17.9244	-16.6593	-17.4366	-15.9468	-14.6430	-15.4432
5	-17.9358	-16.3654	-17.3302	-15.9924	-14.3738	-15.3672
6	-17.9304	-16.0547	-17.2071	-15.9944	-14.0611	-15.2476
7	-18.0031	-15.8220	-17.1621	-16.0609	-13.8129	-15.1925
8	-18.0531*	-15.5666	-17.0944	-16.0938*	-13.5311	-15.1039

** indicates lag order selected by the criterion: Here, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion.*
Source: Selection of Lag Orders by Eviews 11.

The optimal lag lengths that are selected from Table 7.1A in Appendix 7A are used in the following cointegration and causality analyses. This study used Schwartz information criteria (SIC) for 12 models to determine optimum lag length. It is found that optimum lag length is 2.