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Asymmetric Effect of Macroeconomic Variables on the N-11 Equity Returns: Moderating Role of Economic Policy Uncertainty

by

Aleena Nadeem

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This thesis is dedicated to my beloved parents. Their unconditional love and support have been an unwavering source of inspiration throughout this academic journey. This thesis is also dedicated to my respected supervisor Dr. Arshad Hassan, whose contribution and encouragement have been the driving force behind my perseverance. His continued support and guidance throughout the research work have fueled my determination to reach this milestone and left an indelible mark on my academic growth.

CERTIFICATE OF APPROVAL

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(Aleena Nadeem)

Abstract

The purpose of this study is to explore the short and long run impact of macroeconomic factors on the Next Eleven (N-11) stock markets for the period January 2005 to December 2022. Both ARDL and NARDL models are employed to investigate the linear and asymmetric relationship amid macroeconomic variables and N-11 equity markets. The results reveal that M2 has a significant long-term impact on the equity markets of Bangladesh, Vietnam and South Korea. CPI has a statistically long-term negative impact on the equity markets of Bangladesh, Turkey and Vietnam. EPU possess significant and negative influence on the equity markets of Indonesia, Turkey, Vietnam and Egypt. Only in Vietnam's equity market, oil prices hold significant positive impact in the long-run. IR has a significant impact on the stock markets of Mexico and Egypt. Exchange rate possess significant and negative relationship with the South Korean equity market while significant and positive relationship with the Egyptian stock market. IPI holds significant impact on the equity markets of Indonesia, Vietnam and South Korea. The sample countries exhibit a more pronounced short-term relationship due to the considerable impact of macroeconomic factors on equity returns. The results of NARDL approach indicate the asymmetric impact of M2, oil prices, IR, CPI and exchange rate on the equity markets of Pakistan, Bangladesh, Indonesia, Vietnam and Nigeria. EPU moderates the relationship between interest rate and equity markets of Bangladesh, Turkey, South Korea and Egypt in the long-run. Further, EPU plays a moderating role on the link between prices of oil and equity markets of Pakistan, South Korea, Mexico, Nigeria and Egypt in the short run only. Hence, the risk professionals should keep an eye on the changing global scenario as it will influence the asset under management. Investors should adopt a dynamic asset allocation strategy that adjusts to changing macroeconomic environment.

Keywords: ARDL as Auto-Regressive Distributive Lags, NARDL Non-Linear Auto-Regressive Distributive Lags, N-11 Equity Markets

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Abbreviations

(*)	Significant
ARDL	Auto-Regressive Distributive Lags
BD	Bangladesh
BIST	Borsa Istanbul Stock Exchange
CPI	Consumer Price Index
DSE	Dhaka Stock Exchange
EPU	Economic Policy Uncertainty
EGX-30	Egyptian Exchange
EG	Egypt
EM	Equity Markets
ER	Equity Returns
IPI	Industrial Production Index
IR	Interest Rate
ID	Indonesia
JSE	Jakarta Stock Exchange
KSE	Karachi Stock Exchange
KR	South Korea
L	Log
LN	Log Natural
KOSPI	Korea Composite Stock Price Index
M2	Broad Money Supply
MX	Mexico
NARDL	Non-Linear Auto-Regressive Distributive Lags
N-11	Next Eleven
NG	Nigeria

NSE	Nigerian Stock Exchange
OP	Oil prices
PSEI	Philippine Stock Exchange
PK	Pakistan
Prob	Probability
PHL	Philippines
RXR	Real Exchange Rate
S. Err	Standard Error
TR	Turkey
T-Stat	T-Statistics
VNI	Vietnam Index
VNM	Vietnam

Chapter 1

Introduction

1.1 Introduction

Stock markets tend to appear as performance gauges for any economy as they respond quickly to shocks and economic policy shifts Chang et al. (2019). Various theoretical frameworks have been employed to examine the impact of fluctuations in macroeconomic factors on stock returns, including the efficient market hypothesis presented by Fama (1970) alongside the arbitrage pricing theory put forth by Ross (1976). Many recent studies have also examined the effects of macroeconomic indicators on stock returns but their findings are inconsistent (Peiro, 2016; Rahman and Uddin, 2009). The debate on the fluctuations in the macroeconomic variables and the EM returns in the context of arbitrage pricing theory has continued since the 1980s. This argument was further extended in the context of symmetric and non-linear backgrounds (Hashmi and Chang, 2023). Hence, it is crucial to explore the impact of uncertainty in this relationship to identify its impact on the stock returns. This phenomenon needs to be considered through this lens. The existing studies focus on examining linear and non-asymmetric relationship amid macroeconomic variables and equity markets of developed economies. Few studies have undertaken research on frontier and developing countries. Thus, the current research investigates the impact of the asymmetry link between macroeconomic indicators and the stock markets of Next 11 countries that have sustainable economic development potential in the future. Within the dynamics of the current

study, the moderating effect of EPU has been examined on the link between OP, interest rate, and N-11 equity markets. It is recognized that scholars, portfolio managers, institutional investors, and individual investors have all become increasingly inclined to focus on uncertainty in decision-making (Bahmani-Oskooee and Maki-Nayeri, 2018).

This study is insightful for investors as by considering the uncertainty impact, they can restructure their portfolios and reallocate the risk accordingly. Further, this research will help regulators in the fair price discovery through disclosure.

1.2 Theoretical Background

1.2.1 Arbitrage Pricing Theory

The conventional asset pricing models proposed by Sharpe (1964); Lintner (1965) and Mossin (1966) provide that returns can be explained with the help of market premium only. However, the same was challenged by Ross (1976) who proposed the arbitrage pricing theory depicting that asset returns are influenced by 'n' many factors, and such variations are reflected in the stock prices.

This discussion was further extended by Chen, Roll, and Ross (1983) who identified certain macroeconomic variables that drive stock returns. The model of arbitrage pricing theory (APT) has also been tested in the prior literature that supports a congruent conclusion revealing stock prices respond to the fluctuations in several macroeconomic forces such as interest rate, industrial production, yield curve, inflation, and risk premium (Chen, Roll, and Ross 1983,1986).

Similarly, discounted cash flow model or the present value model (PVM) also concludes that the stock returns are significantly influenced by the behavior of macroeconomic variables. Macroeconomic variables that substantially impact the future cash flows of a firm also impact the stock prices as the stock prices are cumulative discounted values of the firm's future cash flows.

APT is an extension of (CAPM) that only incorporates the market premium as a single factor. Contrarily, the APT focuses on multiple factors to demonstrate the

stock prices. Based on this theory's theoretical foundation, investors' expected returns depend on several security-specific and macroeconomic factors.

1.2.2 Efficient Market Hypothesis

Fama (1965, 1970) proposed the market efficiency theory according to which prices of stock and variations in prices of stock reveal all readily available market info. Based on the Efficient Market Hypothesis (EMH), stocks' trading in the market should be kept at their market value; thus, taking advantage of abnormal profit will be impossible for investors in the long run. A higher return can only be earned by investing in riskier securities or by any chance rather than attaining benefit from passive portfolio investment.

The classification of EMH can be made into three types; weak form, semi-strong form, and strong form. If the market is efficient in its weak form, then asset prices ought to portray all the prior security-related info, while if the market is efficient in its semi-strong form, then prices of asset reveal reflect all the publicly available info. Finally, strong form of market efficiency implies that prices of assets reflect all available private information. Within the strong form of market efficiency, there should be no opportunity to earn future significant profits because all information appears in the stock price. These efficiencies in the market are an indication of how rapidly new information is factored into the current price of an investment. Considering the existence of market inefficiencies, investors are driven to use their novel strategies, strong investment expertise as well as sophisticated models to make predictions based on historical data to gain an advantage from market inefficiencies.

1.2.3 Gap Analysis

The existing literature primarily tends to focus on exploring the asymmetric impact of macroeconomic variables on the EM of developed economies and partial research is conducted on the frontier and emerging countries (Chang et al., 2019). The previous studies also demonstrate that the risk and returns appetite of developed countries vary from those of emerging countries. Hence, it is necessary to

research emerging economies, particularly N-11 countries that have the potential to become larger economies of the world in the future. The Next 11 countries include Pakistan, Bangladesh, Indonesia, Vietnam, South Korea, Iran, Mexico, Turkey, Philippines, Nigeria, and Egypt.

The current study aims to bridge the gap by examining the influence of the asymmetric link amid macroeconomic indicators and EM of N-11 countries in the presence of moderating role of economic policy uncertainty (EPU) on the link between prices of oil, interest rate and stock returns. Since technology and globalization have transformed lifestyles, the magnitude of uncertainty has become higher than ever.

The current spike in uncertainty is due to political conflict, polarization, and the immense role of government spending in the overall economy. As the globe is interconnected, the economic outcomes of one region can crucially influence another. The world is exceedingly complex now, and that raises the level of uncertainty. In light of recent developments, this study is useful for identifying how economic policy uncertainty impacts the stock market and, more specifically, the financial strategies of firms.

Global economic policy uncertainty substantially influences interest rates and oil prices. In the current research, the moderating role of EPU on equity markets of N-11 countries is examined with these 2 specific economic variables due to their global interconnectedness. Variation in any of such 2 economic indicators leads to affecting stock markets.

The global economy navigates through dynamic challenges such as higher interest rates, high inflation, depreciation in exchange rates, and rising oil prices. Consequently, the prevailing uncertainty slows down economic growth, causing cash flows to reduce and stock prices to fall.

1.2.4 Problem Statement

The problem stems from the point that earlier research has concentrated more on developed economies, and departing from emerging and frontier economies, particularly N-11 countries. The asymmetric impact of macroeconomic variables

in the context of developed countries both in the short term and long term has been explored (Hashmi and Chang, 2023).

However, this relationship needs to be examined specifically in the context of the N-11 stock markets. Further, uncertainties in economic policy also play a pivotal role in shaping certain economic outcomes as revealed by the recent economic downfalls that arise due to policy uncertainties (Xu et al., 2021).

Thus, it seems crucial to incorporate and investigate the moderating role of economic policy uncertainty in this research.

1.3 Research Questions

1. Does interest rate have an asymmetric impact on the stock market in the short run and long run?
2. Does economic policy uncertainty (EPU) moderate the relationship between interest rates and the stock market?
3. Does the real exchange rate (RXR) have an asymmetric impact on the stock market in the short run and long run?
4. Does M2 have an asymmetric effect on the equity market in the short run and long run?
5. Does inflation have an asymmetric impact on the stock market in the short run and long run?
6. Does EPU has an impact on the stock market in the short run and long run?
7. Does any non-linear relationship exist between oil prices and the equity market in the short run and long run?
8. Does economic policy uncertainty (EPU) moderate the relationship between oil prices and the stock market?
9. Does any asymmetric relationship exist amid the industrial production index (IPI) and the stock market in the short run and long run?

1.4 Research Objectives

The following research objectives are derived based on the above questions;

1. To explore the role of macroeconomic variables in influencing stock markets in the short run and long run.
2. To provide insight into the possibility of asymmetric effect of macroeconomic factors on stock markets in the short run and long run.
3. To investigate the moderating role of economic policy uncertainty on the link between interest rate, prices of oil and stock markets.

1.5 Significance of the Study

This study is vastly insightful for fund managers, investors, government, policymakers, stock market players as well as academia as it guides to comprehend the market dynamics based on variations in macroeconomic fundamentals at the country level. The specific significance of this research is that it primarily emphasizes the effect of the stock markets of N-11 economies that are also influenced by uncertainties in economic policies and asymmetric effects of macroeconomic indicators.

This study is one of the few that can aid legislators and investors in developing plans for coping with considerable levels of uncertainty, and it provides valuable information to all market participants. It focuses on how global uncertainty correlates with the financial strategies of investors trading on public exchanges around the world. When uncertainty escalates, the theoretical relationship does not remain the same. This study specifically provides insight into the movement and behavior of macroeconomic variables during uncertain environments.

Policymakers, financial market players, executive management along with asset managers can benefit from the implications of this study. The initial point that politicians and government agencies must comprehend is that uncertainty about economic policy (fiscal policy, fiscal spending, legislative, national debts, and

changes in taxes) can have a devastating impact on investor confidence and asset prices. For overcoming ambiguity regarding the government's stance on economic matters, government agencies should provide open communication to elected representatives. This could reduce market volatility and improve the value of financial assets by making it easier to predict the trajectory of certain government policies. Second, as economic policy uncertainty can have both short-term and long-term consequences on stock returns, market players and portfolio managers ought to be aware of the shifts and the direction of the shift in EPU and structure their portfolios accordingly. The asymmetric effects of EPU volatility should be of equal concern to asset managers as well as investors with diversified investment mandates and perspectives. Finally, the EPU metric can be used by corporate leaders to better time their capital-raising efforts. Therefore, business leaders can use the EPU to optimize the timing of their firm's capital-raising efforts and reduce their cost of capital.

1.6 Plan of the Study

This thesis is comprised of five primary chapters. The first chapter introduces the research topic by demonstrating the fundamentals of a study. It provides comprehensive details on the research background, theoretical framework, literature gap, problem statement, research questions and objectives as well as significance of the study.

Further, the second chapter portrays the existing literature to highlight the empirical and theoretical findings from past researches on the asymmetric effect of macroeconomic variables on the equity markets respectively.

As far as the third chapter is considered, it substantially focuses on the research methodologies, variables, sample data as well as the econometric model that is undertaken to conduct this research and explore the relationship between IVs and DV. In chapter 4, analysis from empirical results is elaborated to demonstrate the findings in the linear and non-linear context both in the long and short-term. Lastly, the chapter 5 summarizes conclusion and recommendations to be incorporated in future research direction.

Chapter 2

Literature Review

2.1 Interest Rate and Stock Returns

The relationship between interest rates and stock prices is supported theoretically. It is argued that when the interest rate increases, the discount rate increases which decreases the present value of expected cash flows. As price is the present value of expected cash flows so it also decreases. Moreover, a high-interest rate also decreases the earning of a firm which results in a decrease in cash flows leading to a reduction in price. The negative link between long-term interest rates and stock prices was identified by (Humpe and Macmillan, 2009) in the context of the United States. Peiro (2016) similarly explored the impact of interest rates on stock returns in the context of the UK, Germany, and France. Finally, Huang et al. (2016) examined this relationship in the United States and reached the same conclusion. From the perspective of behavioral finance, bad news has a strong impact on stock prices compared to good news. Asymmetric information has unequal magnitude as investors have more pessimistic reactions toward bad news than to good news during uncertainty. An increase in interest rate is a negative shock for investors so it has a larger impact on the stocks' prices than a decrease in interest rate which is perceived as a positive indicator for investors. Based on existing literature, it can be hypothesized that:

H1: Interest rate has a negative impact on equity returns.

H2: A rise in interest rate has more impact on the equity returns than a fall in interest rate.

H3: Interest rate has a short-run negative relationship with stock markets.

H4: Interest rate has a long-run negative relationship with stock markets.

2.2 Exchange Rate and Stock Returns

Soenen and Hennigar (1988) and Mukherjee and Naka (1995) found that the exchange rate significantly impacted stock prices. Mukherjee and Naka (1995) further added that depreciation of the native currency improves stock market performance. Depreciation of the native currency improves the international competitiveness of domestic products, which in turn boosts exports as well as cash flows, which drives up stock values. The local economy and stock prices also benefit from a rise in the exchange rate because of the positive effect it has on portfolio investment. Similar research by Nieh and Lee (2001) in G7 countries derived the same conclusion: the exchange rate has only a minor long-term effect on stock prices. Rahman and Uddin (2009) employed Johansen cointegration and Granger causality tests to learn more about the connection between the exchange rate and the price of stocks in the context of Pakistan, India, and Bangladesh. Their results show no meaningful connection, either in the long or short term. The link was further studied by Yang et al. (2014) in the context of the countries of India, Japan, Indonesia, Thailand, Korea, the Philippines, Taiwan, Singapore, and Malaysia. The authors employed Granger causality on quantiles to determine that, except for Thailand, there is a positive feedback link between a currency's exchange rate and the share prices of all the nations in the sample from 1977 to 2010.

Recent research explored the link between the exchange rate and stock prices Delgado et al. (2018); Roubaud and Arouri (2018); Ajaz et al. (2017). According to Ajaz et al. (2017), the impact of the exchange on stock prices can be both beneficial and negative. Roubaud and Arouri (2018) used VAR and Markov switching VAR models to examine the effect of exchange rate on stock prices, and they reached the same non-linear conclusion. The authors also declared that the regimes influenced

the nature of the association between the two variables. Delgado et al. (2018) similarly examined the impact of the exchange rate on Mexican stock prices and reach the same conclusion. The impact of asymmetric RXR on the stock markets of N-11 countries has a different magnitude. The effect of the depreciation of the currency is higher as its bad news for investors. However, the effect of currency appreciation is significantly lower on the stock markets as it leads to an increase in stock prices. Hence, the hypothesis can be formulated as follow:

H5: RXR has a negative impact on equity returns.

H6: Currency depreciation has more impact on equity returns than currency appreciation.

H7: RXR has a short-run negative relationship with stock markets.

H8: RXR has a long-run negative relationship with stock markets.

2.3 Inflation and Stock Returns

The existing literature examined the inflation impact on the prices of stock. Mukherjee and Naka (1995), as well as Fama (1981), demonstrated that inflation is negatively correlated with stock prices. According to Malkiel (1979), falling stock prices arise from investors demanding a higher risk premium because of rising inflation. Another rationale for the inverse correlation between inflation and the price of stocks is that higher inflation raises manufacturing costs, which in turn reduces firm cash flows. In addition, falling cash flows have a negative impact on prices of stock.

For instance, according to the Fisher effect, inflation induces an upward trend in the nominal interest rate (Zhong, 2022). Due to this inflationary effect, hikes in the interest rate have a detrimental influence on stock values. Chang et al. (2019) revealed that high inflation leads to higher financing costs, which in turn reduces business profitability and ultimately stock prices. Several research studies by Abdullah and Hayworth (1993); Bulmash and Trivoli (1991); Maysami and Koh (2000) reach the same conclusion and depict a negative correlation between inflation and prices of stock. Further research in the context of India was undertaken

by Andrieș et al. (2014), who also discovered a substantial association between inflation and the price of stocks.

The association between inflation and the price of stocks has been the subject of numerous empirical investigations. The inverse relationship between the rate of inflation and the price of stocks was found by Marshall (1992). However, significant co-integration between inflation and the price of stocks was found by Ibrahim (2003); Nasseh and Strauss (2000). Dritsaki (2005) examined the causal relationship between inflation and stock price and revealed that prices of stock are significantly influenced by inflation. The considerable link between inflation and stock prices was also tested by Bj0rnland and Jacobsen (2013). Finally, Delgado et al. (2018) used a VAR model and reach the same conclusion about the negative association between inflation and stock prices. Based on the above literature review, it is hypothesized that:

H9: Inflation has a negative impact on equity returns.

H10: Inflation has a negative relationship with the stock market in the short run.

H11: Inflation has a negative relationship with the stock market in the long run.

2.4 Oil Prices and Stock Returns

To explore the effects of fluctuating prices of oil on the equity market, Basher and Sadorsky (2006) examined that oil volatility has impacted equity returns, particularly in the context of emerging markets. Arouri and Rault (2012) employed a Granger causality test to show that fluctuations in the price of oil were significantly correlated with movements in European stock markets. Pan et al. (2016) examined weekly future price data from February 2000 to August 2015 and concluded statistically significant asymmetric oil-stock connections. Chang et al. (2020) investigated the link between prices of oil and stock indices using a co-integration strategy. Moreover, monthly data were collected from March 2005 to June 2018 to investigate the effect of fluctuations in oil prices on the stock exchanges of Kazakhstan, Russia, and Iran (Köse and Ünal, 2020). The correlation between commodities prices and stock market performance was studied using the DCC

GARCH model ((Chebbi and Derbali, 2015). The results demonstrated an impartially significant and volatile relationship. Using co-integration, PRICE (2012) found a correlation between the price of crude oil and the Indian stock market index. Additionally, the leveraging effect of COVID-19 on oil prices volatility was reported by Meher et al. (2020). Many other studies (Ergun and Ibrahim, 2013; Ding et al., 2016; Jain and Biswal, 2016; Benkraiem et al., 2018; Dutta et al., 2019; Kumar et al., 2023), also observed strong correlations between oil and stock prices. The association between oil and stock has been reported by Cong et al. (2008); Kumar et al. (2019). Based on the existing literature, it can be hypothesized that:

H12: Oil prices have a negative impact on equity returns.

H13: Oil prices have a significant negative impact on the stock markets in the short run.

H14: Oil prices have a significant negative impact on the stock markets in the long run.

2.5 Money Supply and Stock Returns

The existing literature reveals an ongoing empirical disparity between the returns on the stock market and the money supply (Fromentin et al., 2022). Researchers demonstrated a correlation between rising stock prices and expanding money supply because an increasing money supply implies rising money demand. Studies contradict this viewpoint indicating that an increase in the supply of money leads to higher inflation, which in turn raises the discount rate and lowers stock prices (Öztürk and Altınkaynak, 2022).

Conversely, a decrease in the supply of money leads to higher stock prices. Few studies explore how long- and short-term shifts in macroeconomic variables affect stock prices. The tests used are the correlation, the Granger Causality Test, and the Johannsen Co-integrating. The research outcomes depict a positive link between the supply of money and the equity market. Similar results are found in other studies (Ratanapakorn and Sharma, 2007; Patel, 2012; Naik, 2013; Kibria et al., 2014; Khan and Khan, 2018).

Moreover, Sikalao-Lekobane (2014) investigate whether or not macroeconomic variables affect pricing behavior in Botswana's stock market. The Johansen Co-Integration Approach is used to test the hypotheses. The results imply a negative relationship between money supply and long-term stock market returns. Furthermore, some studies indicate no relationship between the money supply and the stock market. The preceding analysis signifies that there is a positive, negative, as well as insignificant relationship between money supply and returns on the stock market. Based on the available literature review, it is hypothesized that:

H15: Money Supply has an impact on equity returns.

H16: Money Supply has a positive impact on the stock market in the short run.

H17: Money Supply has a negative impact on the stock market in the long run.

2.6 Industrial Production Index and Stock Returns

The IPI has been shown to have a favorable effect on stock prices by Abdullah and Hayworth (1993); Mukherjee and Naka (1995). The researchers demonstrated that a rise in output must mean an increase in profitability and, hence, stock prices. The correlation between IPI and the price of stocks has also been the subject of numerous empirical investigations. For instance, research outcomes of a study undertaken by Humpe and Macmillan (2009) show that IPI has a beneficial effect on stock prices. Singh (2010) examined the link in the setting of India and demonstrated the same conclusion that IPI and stock prices move in both directions.

Singh (2010) further investigated the link between IPI and stock prices and discovered a statistically significant correlation. In a study comparing Sweden, Norway, Finland, and Denmark, Kuosmanen et al. (2015) showed that the effect was more pronounced in Sweden and Finland than in either Norway or Denmark. Peiro (2016) also examined the association and exposed the same favorable impact of IPI on stock prices but in the context of Germany, France, and the UK. Based on the existing literature, it can be hypothesized that:

H18: IPI has a positive impact on equity returns.

H19: IPI has a positive impact on EM in the short run.

H20: IPI has a positive impact on EM in the long run.

2.7 Moderating Role of EPU between Macroeconomic Variables and Stock Markets

Several economic determinants and business finance management policies are negatively influenced by economic policy uncertainty, according to the current literature Al-Thaqeb and Algharabali (2019) and Xu et al. (2021). However, recent research in the literature has shown that the impacts of the EPU index on many elements and policies are not uniform. The problem with EPU's asymmetrical impact is that they add complexity by making its effects less predictable and may be depending on other variables or the positioning of marketplaces.

Foerster et al. (2014) concluded that the impacts of uncertainty on employment and economic activity are not uniform. He revealed that the relationship may be influenced and governed by shifts in uncertainty and that rising levels of uncertainty have a disproportionately large impact on economies. According to the author's research, a sizable increase in uncertainty has a detrimental effect on economic activity, and the economy may take considerable time to recover, whereas a substantial decrease in uncertainty has no direct effect on economic activity. Moreover, moderate shifts in either direction have negligible if any impact on economic activity. Significant asymmetries in the effects of uncertainty on domestic investment and money supply and demand have been demonstrated among the G7 countries (Bahmani-Oskooee and Maki-Nayeri, 2019). This insignificant relationship remains when uncertainty prevails but diminishes or disappears when uncertainty is low. There is no time horizon for which this relationship does not hold. This finding that uncertainty has an asymmetrical impact on other economic activities and monetary policy has been corroborated by other researchers (Bahmani-Oskooee and Maki-Nayeri, 2018). The uneven consequences of uncertainty are observed in more areas than just the economy and the labor market.

Inflation expectations were found to be significantly impacted by the unpredictability of economic policies and oil prices Istiak and Alam (2019). However, there are asymmetric impacts in the relationship, such as the impact of uncertainty or higher oil prices on projected inflation may vary depending on whether the time frame is just before or just after a financial crisis. The impact of an upsurge in the EPU index on trade is substantially larger than the impact of a fall of the same magnitude, as explored by Hassan et al. (2018). Insurance markets also show the asymmetric impact of uncertainty, with rises in non-life insurance premiums and declines in life insurance rates in response to uncertainty spikes (Gulen and Ion, 2016). Insurance premiums are thus affected unevenly by the EPU index. Therefore, considering the EU's role as a moderator in this study, the following hypotheses can be formulated:

H21: EPU has a negative relationship with the stock market.

H22: EPU strengthens a negative relationship between interest rates and the stock market.

H23: EPU strengthens a negative relationship between oil prices and the stock market.

2.8 The Hypothess of Study

Based on the existing literature, the following hypothesis can be framed:

H1: Interest rate has a negative impact on ER.

H2: A rise in interest rate has more impact on the equity returns than a fall in interest rate.

H3: Interest rate has a short-run negative relationship with stock markets.

H4: Interest rate has a long-run negative relationship with stock markets.

H5: EPU strengthens a negative relationship between interest rates and the stock market.

H6: RXR has a negative impact on equity returns.

H7: Currency depreciation has more impact on equity returns than currency appreciation.

H8: RXR has a short-run negative relationship with stock markets.

H9: RXR has a long-run negative relationship with stock markets.

H10: Inflation has a negative impact on equity returns.

H11: Inflation has a negative relationship with the stock market in the short run.

H12: Inflation has a negative relationship with the stock market in the long run.

H13: Oil prices have a negative impact on equity returns.

H14: Oil prices have a significant negative impact on the stock markets in the short run.

H15: Oil prices have a significant negative impact on the stock markets in the long run.

H16: EPU strengthens a negative relationship between oil prices and the stock market.

H17: Money Supply has an impact on equity returns. H18: Money Supply has a positive impact on the stock market in the short run.

H19: Money Supply has a negative impact on the stock market in the long run.

H20: IPI has a positive impact on ER.

H21: IPI has a positive impact on EM in the short run.

H22: IPI has a positive impact on EM in the long run.

H23: EPU has a negative relationship with the stock market.

Chapter 3

Methodology

3.1 Data Description

This research substantially explores the influence of macroeconomic variables including (M2, IR, RXR, oil prices, EPU, inflation and IPI) over equity markets of N-11 economies of Pakistan (KSE-100 index), Bangladesh (DSEX Composite), Indonesia (JKSE Composite), South Korea (KOSPI Composite), Egypt (EGX-30 index), Turkey (BIST-100), Vietnam (VN-30 index), Philippines (PSEI Composite), Nigeria (NSE-30 index), and Mexico (S&P). However, Iran has been excluded from the sample due to economic and fiscal sanctions that it is exposed to. This study uses monthly data on macroeconomic variables, economic policy uncertainty, and equity markets from the period 2005 to 2022. The primary sources of data are World Bank database, Yahoo Finance and Global EPU Index.

3.2 Econometric Model

The ARDL model is employed in this research. The linear ARDL approach has been empirically tested in the first phase of this study to analyze impact of selected macroeconomic factors at the equity returns of N-11 countries. In second phase of this study, Nonlinear ARDL model is used to analyze the asymmetric impact of macroeconomic variables on the equity returns. The long-run relationship between

macroeconomic variables and equity market returns is presented below:

$$\mathrm{LI}_t = \beta_0 + \beta_1 LIIP_t + \beta_2 LINF_t + \beta_3 LM2_t + \beta_4 LIR_t + \beta_5 LOP_t + \beta_6 LRXR_{t\mu t} + \beta_7 LEPU_t + \mu t \tag{3.1}$$

Where:

I = Stock Index

IIP = Index of Industrial Production

INF = Inflation Rate

M2 = Broad Money Supply

IR = Interest Rate $

OP = Oil Prices in $

RXR = Real Exchange Rate in $

per Domestic Currency

EPU = Economic Policy Uncertainty

L = Log Form

The representation of above equation (3.1) as the ARDL is as follow:

$$LI_t = \beta_0 + \Sigma\Psi LI_{t-i} + \Sigma\beta_i LIIP_{t-1} + \Sigma\delta_i LINF_{t-i} + \Sigma\lambda_i LM2_{t-i} + \Sigma\kappa_i LIR_{t-i} + \Sigma\zeta LOP_{(t-i)} + \Sigma_i LRXR_{t-i} + \Sigma\xi_i LEPU_{t-i} + \mu t \tag{3.2}$$

The short-run relationship between macroeconomic variables and equity market returns is explored by using ECM as detailed below:

$$\Delta LI_t = \beta_0 + \Sigma\Delta\beta_i LIIP_{t-i} + \Sigma\Delta\delta_i LINF_{t-i} + \Sigma\Delta\lambda_i LM2_{t-i} + \Sigma\Delta\kappa_i LIR_{t-i} + \Sigma\ \Delta\zeta_i LOP_{t-i} + \Sigma\Delta_i LRXR_{t-i} + \Sigma\Delta\xi LEPU_{t-i} + ECT \tag{3.3}$$

Where:

ΔI = Change in Stock Index

ΔIIP = Change in Index of Industrial Production

ΔINF = Change i Rate of Inflation

Δ**M2** = Change in Broad Money Supply

Δ**IR** = Change in Interest Rate in $

Δ**OP** = Change in Oil Prices in $

Δ **RXR** = Change in Real Exchange Rate in $ per Domestic Currency

Δ**EPU** = Change in Economic Policy Uncertainty

L = Log Form

$$\begin{gathered} LI_t = \beta_0 + \Sigma\psi_i LI_{t-i} + \Sigma\beta_i LIIP_{t-i}(P) + \Sigma\beta_i LIIP_{t-i}(N) + \Sigma\delta_i LINF_{t-i}(P) \\ +\Sigma\delta_i LINF_{t-i}(N) + \Sigma\lambda_i LM2_{t-i}(P) + \Sigma\lambda_i LM2_{t-i}(N) + \Sigma\varkappa LIR_{t-i}(P) \\ +\Sigma\varkappa LIR_{t-i}(N) + \Sigma\zeta LPO_{t-i}(P) + \Sigma\zeta LPO_{t-i}(N) + \Sigma\tau_i LRXR_{t-i}(P) \\ +\Sigma\tau_i LRXR_{t-i}(N) + \Sigma\xi LEPU_{t-i}(P) + \Sigma\xi LEPU_{t-i}(N) + \mu t \end{gathered} \tag{3.4}$$

$$\begin{gathered} \Delta LI_t = \beta_0 + \Sigma\Delta\beta_i LIIP_{t-i}(P) + \Sigma\Delta\beta_i LIIP_{t-i}(N) + \Sigma\Delta\delta_i LINF_{t-i}(P) \\ +\Sigma\Delta\delta_i LINF_{t-i}(N) + \Sigma\Delta\lambda_i LM2_{t-i}(P) + \Sigma\Delta\lambda_i LM2_{t-i}(N) + \Sigma\varkappa LIR_{t-i}(P) \\ +\Sigma\Delta\varkappa LIR_{t-i}(N) + \Sigma\zeta LPO_{t-i}(P) + \Sigma\Delta\zeta LPO_{t-i}(N) + \Sigma\Delta\tau_i LRXR_{t-i}(P) \\ +\Sigma\Delta\tau_i LRXR_{t-i}(N) + \Sigma\Delta\xi LEPU_{t-i}(P) + \Sigma\Delta\xi LEPU_{t-i}(N) + ECT_t \end{gathered} \tag{3.5}$$

The role of moderator between specific macroeconomic variables and equity market returns both in the long-term and short-run is presented by the equation below:

$$\begin{gathered} LI_t = \beta_0 + \Sigma\beta_i LIIP_{t-i} + \Sigma\delta_i LINF_{t-i} + \Sigma\lambda_i LM2_{t-i} + \Sigma\varkappa_i LIR_{t-i} + \\ \Sigma\zeta LOP_{(t-i)} + \Sigma\tau_i LRXR_{t-i} + \Sigma\Delta\xi_i LEPU_{t-i} \\ +\Sigma\varsigma_i LEPU_{t-i} \star LIRt - i + \Sigma\Gamma_i LEPU_{t-i} \star LOP_{t-i} + \mu t \end{gathered} \tag{3.6}$$

$$\begin{gathered} \Delta LI_t = \beta_0 + \Sigma\Delta\beta_i LIIP_{t-i} + \Sigma\Delta\delta_i LINF_{t-i} + \Sigma\Delta\lambda_i LM2_{t-i} + \Sigma\Delta\varkappa_i LIR_{t-i} \\ +\Sigma\Delta\zeta LOP_{(t} + \Sigma\Delta\tau_i LRXR_{t\mu_t} + \Sigma\Delta\xi_i LEPU_t + \Sigma\Delta\varsigma_i LEPU_t \star LIR_t \\ +\Sigma\Delta\Gamma_i LEPU_t \star LOP_t + ECT_t \end{gathered} \tag{3.7}$$

3.3 Description of Variables

3.3.1 Stock Market Index

An equity market index is a performance measure that tracks the upward or downward trend of the stock market. Primarily, the index is computed by taking a weighted average of the stock prices of the selected securities included in the index. Market return refers to the change in an index of the stock market. It is computed as follows.

$$\Delta LI = ln\frac{I_t}{I_{t-i}}$$

3.3.2 Interest Rate

The interest rate is referred to as the additional amount being charged over the principal from the borrower to incorporate the impact of the time value of money. The change in interest rate is measured as mentioned below:

$$\Delta LIR_t = ln\frac{IR_t}{IR_{t-i}}$$

3.3.3 Exchange Rate

The exchange rate is defined as the domestic currency price relative to the international currency. National currencies are quoted in US dollars at the indicated exchange rate. They can be expressed in either the local currency or a foreign currency. A unit price is computed as an international currency in terms of local currency. Contrarily, a unit of a foreign currency can be stated in terms of a unit of the local currency to make an indirect reference to that currency.

$$\Delta LRX_t = ln\frac{RXR_t}{RXR_{t-i}}$$

3.3.4 Money Supply

The aggregate volume of money in circulation in an economy is a measure of the money supply. All of the banknotes, cash deposit account balances, and liquid

asset resources are included in circulated money. Policymakers and financial analysts ought to revise their current strategy either by shrinking or expanding the supply of money through examination and valuation for regulating the supply of money in an economy. Broad money, as measured by M2, is used as a proxy for money. The money growth is computed as under.

$$\Delta LMS_t = ln\frac{MS_t}{MS_{t-i}}$$

3.3.5 Inflation Rate

Inflation is expressed as a percentage change in services and goods prices in a particular timeframe. In this research, CPI is used as a measure of variation in prices of services and goods. Hence, inflation rate is computed as a change in CPI as stated under.

$$\Delta LCPI_t = ln\frac{CPI_t}{CPI_{t-i}}$$

3.3.6 Crude Oil Prices

Crude oil prices reveal the one-barrel spot rate of standard crude oil. The mechanism of demand and supply drives the oil prices that have a substantial impact on an economy. When the oil supply diminishes, its demand escalates causing the oil prices to rise. Similarly, when the oil supply rises, its demand reduces leading to a fall in prices of oil. The oil price change is measured through Brent.

$$\Delta LOP_t = ln\frac{OP_t}{OP_{t-i}}$$

3.3.7 Industrial Production Index

The industrial production index is comprised of business productivity i.e., output that is integrated into the economy's industrial sector such as mining, utilities, and manufacturing. The growth rate of industrial production is measured using the formula mentioned below:

$$\Delta LIPI_t = ln\frac{IPI_t}{IPI_{t-i}}$$

Chapter 4

Results and Discussion

This section covers the descriptive statistics and results of ARDL and NARDL model in the short run and long run. It also reports the moderating effect of EPU with the oil prices and interest rate on the Next-Eleven equity markets. Lastly, the results are discussed.

4.1 Descriptive Statistics of N-11 Equity Markets

Table 4.1 shows the results of Pakistan's descriptive statistics. An average value of the KSE index is 25514 with an average variation of 14463.19. The max value of index is 50592 while, the min value is 5377.42. An average value of money supply is $94639.09 bn along an average variation of $30279 bn. An average per barrel value of oil prices is $74 with average variation of $24 in its per barrel prices. An average exchange rate of PKR in dollar terms is Rs104.029 per dollar with an average variation of Rs7.662. Further, an average interest rate is 10.025% with an average variation of 2.8%. An average value of industrial production index is 102 with an average variation of 8. An economic policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 135.426 with an average variation of 56.018. The results exhibit that data is positively skewed. However, only IPI is negatively skewed indicating that data is skewed on the left side. The KSE, M2, OP, IR, IPI and

CPI have a platykurtic distribution with thin tails and flat data. Contrarily, XR and EPU have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of majority of the variables are significant demonstrating that data is non-random except of IPI that reveals random nature of data.

Table 4.1: Descriptive Statistics Pakistan

	KSE	**M2**	**OP**	**XR**	**IR**	**IPI**	**EPU**	**CPI**
Mean	25513.97	94639.09	73.881	104.029	10.025	101.784	156.537	135.426
Median	25522.21	88180.16	69.235	101.803	9.905	102.373	137.912	137.431
Maximum	50591.57	153986.4	132.83	123.501	17.00	118.760	427.873	289.759
Minimum	5377.42	46175.39	22.74	93.753	5.820	87.228	48.951	53.799
Std. Dev.	14463.19	30278.70	23.908	7.662	2.776	7.940	77.232	56.018
Skewness	0.135	0.112	0.284	1.192	0.275	-0.052	0.888	0.491
Kurtosis	1.394	1.604	2.102	3.295	2.173	2.264	3.240	2.732
Jarque-Bera	23.859	17.984	10.157	51.899	8.873	4.969	28.921	9.322
Probability	0.000	0.000	0.006	0.000	0.011	0.083	0.000	0.009

Table 4.2 reports the results of descriptive statistics of Bangladesh. An average value of the DSE index is 4407 with an average variation of 1617.561. The max value of index is 8364.240 while, the min value is 1302.430. An average value of money supply is $91466 bn along an average variation of $52640 bn. An average per barrel value of oil prices is $74 with an average variation of $24 in its per barrel prices. An average exchange rate of Bangladeshi Taka in dollar terms is BDT77.091 per dollar with an average variation of BDT7.491. Further, an average interest rate is 6.807% with an average variation of 4.3%. An average value of industrial production index is 124 with an average variation of 17. An economic policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 133.955 with an average variation of 44.493. The results exhibit that data is positively skewed as majority of the variables are skewed on the right side. However, only DSE is negatively skewed indicating that data is skewed on the left side. The DSE, M2, OP, XR, IPI and CPI have a platykurtic distribution with thin tails and flat data. Contrarily,

IR and EPU have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of majority of the variables are significant demonstrating that data is non-random except of XR that reveals random nature of data.

TABLE 4.2: Descriptive Statistics Bangladesh

	DSE	**M2**	**OP**	**XR**	**IR**	**IPI**	**EPU**	**CPI**
Mean	4406.660	91465.76	73.881	77.091	6.807	123.527	156.537	133.955
Median	4585.025	84098.53	69.235	77.807	6.775	113.823	137.912	131.718
Maximum	8364.240	192447.0	132.830	98.846	33.540	151.513	427.873	224.369
Minimum	1302.430	22248.49	22.740	61.653	0.430	100.000	48.951	67.607
Std. Dev.	1617.561	52639.50	23.908	7.491	4.265	16.739	77.232	44.493
Skewness	-0.308	0.365	0.284	0.147	1.735	0.406	0.888	0.211
Kurtosis	2.362	1.851	2.102	2.524	9.932	1.422	3.240	1.877
Jarque-Bera	7.068	16.661	10.157	2.811	540.948	28.339	28.921	12.942
Probability	0.029	0.000	0.006	0.245	0.000	0.000	0.000	0.001

Table 4.3 reports the results of descriptive statistics of Indonesia. An average value of the JSE index is 4215.319 with an average variation of 1813.181. The max value of index is 7229 while, the min value is 1030. An average value of money supply is $313863.6 bn along an average variation of $120958.2 bn. An average per barrel value of oil prices is $74 with an average variation of $24 in its per barrel prices. An average exchange rate of Indonesian Rupiah in dollar terms is IDR11659.52 per dollar with an average variation of IDR2295.904. Further, an average interest rate is 7.134% with an average variation of 2.392%. An average value of industrial production index is 82.249 with an average variation of 12. An economic policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 119.710 with an average variation of 29. The results exhibit that data is positively skewed. However, JSE, M2 and CPI are negatively skewed indicating that data is skewed on the left side. The JSE, M2, OP, XR, IPI and CPI have a platykurtic distribution with thin tails and flat data. Contrarily, IR and EPU have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all variables are significant demonstrating that data is non-random.

TABLE 4.3: Descriptive Statistics Indonesia

	JSE	**M2**	**OP**	**XR**	**IR**	**IPI**	**EPU**	**CPI**
Mean	4215.319	313863.6	73.881	11659.52	7.134	82.249	156.537	119.710
Median	4565.970	326660.4	69.235	11697.55	7.055	77.583	137.912	120.576
Maximum	7228.910	551576.9	132.830	15867.43	14.675	102.818	427.873	167.315
Minimum	1029.610	109140.4	22.740	8526.800	3.749	65.658	48.951	63.379
Std. Dev.	1813.181	120958.2	23.908	2295.904	2.392	11.719	77.232	28.971
Skewness	-0.299	-0.002	0.284	0.091	0.976	0.765	0.888	-0.156
Kurtosis	1.869	2.125	2.102	1.351	4.162	1.982	3.240	1.754
Jarque-Bera	14.730	6.888	10.157	24.762	46.508	30.418	28.921	14.845
Probability	0.000	0.031	0.006	0.000	0.000	0.000	0.000	0.000

Table 4.4 reports the results of descriptive statistics of Turkey. An average value of the BIST index is 869.280 with an average variation of 675.132. The max value of index is 5509.160 while, the min value is 235.920. An average value of money supply is $1480000 bn along an average variation of $1640000 bn. An average per barrel value of oil prices is $74 with an average variation of $24 in its per barrel prices. An average exchange rate of Turkish lira in dollar terms is 3.793 per dollar with an average variation of 3.822. Further, an average interest rate is 16.149% with an average variation of 6.397%. An average value of industrial production index is 104 with an average variation of 11.93. An economic policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 167.469 with an average variation of 116.106. The results exhibit that data is positively skewed as all variables are skewed on the right side. The OP and IR follow a platykurtic distribution with thin tails and flat data. Contrarily, BIST, M2, XR, IPI, EPU and CPI have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all variables are significant demonstrating that data is non-random.

Table 4.5 reports the results of descriptive statistics of Vietnam. An average value of the VNI is 696.28 with an average variation of 311.722. The max value of index is 1498.28 while, the min value is 233.32. An average value of money supply is $5454722 bn along an average variation of $3916406 bn. An average per barrel

Table 4.4: Descriptive Statistics Turkey

	BIST	**M2**	**OP**	**XR**	**IR**	**IPI**	**EPU**	**CPI**
Mean	869.280	1480000	73.881	3.793	16.149	104.447	156.537	167.496
Median	750.740	918000	69.235	2.076	15.000	100.503	137.912	130.001
Maximum	5509.160	8210000	132.830	18.653	32.000	135.671	427.873	698.322
Minimum	235.920	827710	22.740	1.171	8.750	88.876	48.951	62.956
Std. Dev.	675.132	1640000	23.908	3.822	6.397	11.926	77.232	116.106
Skewness	3.674	2.147	0.284	2.334	0.621	1.308	0.888	2.252
Kurtosis	21.147	7.638	2.102	8.327	2.354	3.969	3.240	8.728
Jarque-Bera	3450.098	359.669	10.157	451.518	17.653	70.065	28.920	478.056
Probability	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000

value of oil prices is $74 with an average variation of $24 in its per barrel prices. An average exchange rate of Vietnamese dong in dollar terms is ₫20258.45 per dollar with an average variation of ₫2739.051. Further, an average interest rate is 6.319% with an average variation of 3.419%. An average value of industrial production index is 114 with an average variation of 13. An economic policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 127.123 with an average variation of 38.158. The results exhibit that data is positively skewed. However, XR and CPI are negatively skewed indicating that data is skewed on the left side. The VNI, M2, OP, XR, IPI and CPI have a platykurtic distribution with thin tails and flat data. Contrarily, IR and EPU have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is non-random.

Table 4.6 reports the results of descriptive statistics of South Korea. An average value of the KOSPI is 1971.782 with an average variation of 467.799. The max value of index is 3296.68 while, the min value is 911.3. An average value of money supply is $2103456 bn along an average variation of $777726.4 bn. An average per barrel value of oil prices is $74 with an average variation of $24 in its per barrel prices. An average exchange rate of South Korean won in dollar terms is ₩ 1118.314 per dollar with an average variation of ₩ 103.821. Further, an

Table 4.5: Descriptive Statistics Vietnam

	VNI	**M2**	**OP**	**XR**	**IR**	**IPI**	**EPU**	**CPI**
Mean	696.280	5454722	73.881	20258.45	6.319	113.854	156.537	127.123
Median	586.800	4459215	69.235	21036.00	5.240	112.111	137.912	141.456
Maximum	1498.280	14367305	132.830	23679.35	16.140	134.723	427.873	180.474
Minimum	233.320	629833.2	22.740	15794.00	1.110	92.432	48.951	58.119
Std. Dev.	311.722	3916406	23.908	2739.051	3.419	12.657	77.232	38.158
Skewness	0.721	0.596	0.284	-0.555	1.047	0.236	0.888	-0.475
Kurtosis	2.660	2.199	2.102	1.722	3.352	1.804	3.240	1.840
Jarque-Bera	19.767	18.557	10.157	25.797	40.638	14.882	28.920	20.243
Probability	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000

average interest rate is 3% with an average variation of 1.656%. An average value of industrial production index is 100.82 with an average variation of 3.899. An economic policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 106 with an average variation of 10.799. The results exhibit that data is positively skewed. However, IR and CPI are negatively skewed indicating that data is skewed on the left side. The M2, OP, IR, IPI and CPI have a platykurtic distribution with thin tails and flat data. Contrarily, KOSPI, XR and EPU have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of majority of the variables are significant demonstrating that nature of data is non-random except for KOSPI that reveals random nature of data.

Table 4.7 reports the results of descriptive statistics of Mexico. An average value of the S&P index is 37689.88 with an average variation of 10465.62. The max value of index is 56536.68 while, the min value is 12322.99. An average value of money supply is $6290000 bn along an average variation of $2730000 bn. An average per barrel value of oil prices is $74 with an average variation of $24 in its per barrel prices. An average exchange rate of Mexican Peso in dollar terms is MX$93.694 per dollar with an average variation of MX$11.661. Further, an average interest rate is 5.72% with an average variation of 1.951%. An average value of industrial production index is 112.194 with an average variation of 6.872. An economic

Table 4.6: Descriptive Statistics South Korea

	KOSPI	M2	OP	XR	IR	IPI	EPU	CPI
Mean	1971.782	2103456	73.881	1118.314	3.006	100.820	156.537	105.895
Median	1986.405	1936260	69.235	1123.315	3.428	100.438	137.912	108.421
Maximum	3296.680	3792930	132.830	1461.980	6.392	108.379	427.873	128.396
Minimum	911.300	958504	22.740	915.860	0.052	94.692	48.951	85.355
Std. Dev.	467.799	777726.4	23.908	103.821	1.656	3.899	77.232	10.799
Skewness	0.266	0.489	0.284	0.384	-0.058	0.381	0.888	-0.332
Kurtosis	3.511	2.319	2.102	3.838	2.171	1.942	3.240	2.183
Jarque-Bera	4.918	12.801	10.157	11.648	6.304	15.309	28.920	9.968
Probability	0.085	0.001	0.006	0.002	0.042	0.000	0.000	0.006

policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 116.408 with an average variation of 25. The results exhibit that data is positively skewed. However, S&P and XR are negatively skewed indicating that data is skewed on the left side. The S&P, M2, OP, IR, XR, IPI and CPI have a platykurtic distribution with thin tails and flat data. However, only EPU has a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that nature of data is non-random.

Table 4.7: Descriptive Statistics Mexico

	S&P_BMV	M2	OP	XR	IR	IPI	EPU	CPI
Mean	37689.88	6290000	73.881	93.694	5.720	112.194	156.537	116.408
Median	40865.02	5860000	69.235	93.903	5.220	111.216	137.912	114.079
Maximum	56536.68	12500000	132.830	115.175	9.960	129.074	427.873	173.626
Minimum	12322.99	2450000	22.740	68.269	2.670	100.000	48.951	79.277
Std. Dev.	10465.62	2730000	23.908	11.661	1.951	6.872	77.232	24.876
Skewness	-0.717	0.481	0.284	-0.017	0.212	0.334	0.888	0.370
Kurtosis	2.617	2.089	2.102	1.785	1.768	2.268	3.240	2.160
Jarque-Bera	19.841	15.831	10.157	13.277	15.270	8.850	28.920	11.293
Probability	0.000	0.000	0.006	0.001	0.000	0.011	0.000	0.003

Table 4.8 reports the results of descriptive statistics of Nigeria. An average value of the NSE index is 33102.37 with an average variation of 10147.17. The max value of index is 65652.38 while, the min value is 19851.89. An average value of money supply is $18680479 bn along an average variation of $12314869 bn. An average per barrel value of oil prices is $74 with an average variation of $24 in its per barrel prices. An average exchange rate of Nigerian Naira in dollar terms is ₦108.319 per dollar with an average variation of ₦13.505. Further, an average interest rate is 8.057% with an average variation of 4.066%. An average value of industrial production index is 88.297 with an average variation of 20. An economic policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 173.489 with an average variation of 104. The results exhibit that data is positively skewed. However, only IR is negatively skewed indicating that data is skewed on the left side. The OP, XR, IR and CPI have a platykurtic distribution with thin tails and flat data. Contrarily, NSE, M2, IPI and EPU have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that nature of data is non-random.

Table 4.8: Descriptive Statistics Nigeria

	NSE	**M2**	**OP**	**XR**	**IR**	**IPI**	**EPU**	**CPI**
Mean	33102.37	18680479	73.881	108.319	8.057	88.297	156.537	173.489
Median	30543.95	15651800	69.235	108.867	8.540	82.496	137.912	140.157
Maximum	65652.38	51761800	132.830	146.007	15.480	136.280	427.873	456.191
Minimum	19851.89	2227470	22.740	82.1147	0.030	59.483	48.951	58.642
Std. Dev.	10147.17	12314869	23.908	13.505	4.066	19.975	77.232	103.636
Skewness	0.888	0.847	0.284	0.122	-0.195	0.995	0.888	0.952
Kurtosis	3.088	3.087	2.102	2.208	1.925	3.152	3.240	2.942
Jarque-Bera	28.510	25.932	10.157	6.175	11.767	35.897	28.920	32.717
Probability	0.000	0.000	0.006	0.045	0.002	0.000	0.000	0.000

Table 4.9 reports the results of descriptive statistics of Egypt. An average value of the EGX-30 index is 8779.959 with an average variation of 3473.075. The max value of index is 18295.57 while, the min value is 3507.99. An average value of

money supply is $2217705 bn along an average variation of $1809210 bn. An average per barrel value of oil prices is $74 with an average variation of $24 in its per barrel prices. An average exchange rate of Egyptian Pound in dollar terms is EGP10.015 per dollar with an average variation of EGP5.309. Further, an average interest rate is 12.51% with an average variation of 3.492%. An average value of industrial production index is 94.675 with an average variation of 2.786. An economic policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 170.102 with an average variation of 97. The results exhibit that data is positively skewed as majority of the variables are skewed on the right side. However, only IPI is negatively skewed indicating that data is skewed on the left side. The EGX-30, OP, XR, IR, IPI and CPI have a platykurtic distribution with thin tails and flat data. Contrarily, M2 and EPU have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that nature of data is non-random.

Table 4.9: Descriptive Statistics Egypt

	EGX_30	**M2**	**OP**	**XR**	**IR**	**IPI**	**EPU**	**CPI**
Mean	8779.959	2217705	73.881	10.015	12.510	94.675	156.537	170.102
Median	7956.670	1392975	69.235	6.970	11.828	94.706	137.912	135.259
Maximum	18295.57	7402740	132.830	24.623	21.564	100.000	427.873	391.916
Minimum	3507.990	469567	22.740	5.310	5.258	89.597	48.951	56.137
Std. Dev.	3473.075	1809210	23.908	5.309	3.492	2.786	77.232	96.775
Skewness	0.558	1.113	0.284	0.733	0.560	-0.140	0.888	0.621
Kurtosis	2.314	3.161	2.102	1.879	2.682	1.801	3.240	2.002
Jarque-Bera	15.457	44.875	10.157	30.692	12.219	13.644	28.920	22.845
Probability	0.000	0.000	0.006	0.000	0.002	0.001	0.000	0.000

Table 4.10 reports the results of descriptive statistics of Philippines. An average value of the PSEI is 5415.439 with an average variation of 2112.491. The max value of index is 8764.010 while, the min value is 1825.09. An average value of money supply is $7125695 bn along an average variation of $4048780 bn. An average per barrel value of oil prices is $74 with an average variation of $24 in

its per barrel prices. An average exchange rate of Philippine peso in dollar terms is ₱102.068 per dollar with an average variation of ₱8.440. Further, an average interest rate is 2.762% with an average variation of 1.717%. An average value of industrial production index is 84.552 with an average variation of 8.693.

An economic policy uncertainty has an average value of 157 with an average variation of 77.232. Lastly, CPI measuring inflation has an average rate of 111.063 with an average variation of 18.912. The results exhibit that data is positively skewed as majority of the variables are skewed on the right side. However, PSEI, XR and CPI are negatively skewed indicating that data is skewed on the left side. The PSEI, M2, OP, IR, IPI and CPI have a platykurtic distribution with thin tails and flat data. Contrarily, XR and EPU have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that nature of data is non-random.

Table 4.10: Descriptive Statistics Philippines

	PSEI	**M2**	**OP**	**XR**	**IR**	**IPI**	**EPU**	**CPI**
Mean	5415.439	7125695	73.881	102.068	2.762	84.552	156.5371	111.063
Median	6199.760	6705030	69.235	103.857	2.279	84.086	137.9121	112.832
Maximum	8764.010	15893400	132.830	113.465	7.655	100.000	427.8736	150.471
Minimum	1825.090	2162550	22.740	76.523	0.001	69.435	48.95117	76.135
Std. Dev.	2112.491	4048780	23.908	8.440	1.717	8.693	77.23297	18.912
Skewness	-0.351	0.510	0.284	-1.031	0.506	0.069	0.888231	-0.0029
Kurtosis	1.619	1.919	2.102	3.697	2.325	1.945	3.240018	2.132
Jarque-Bera	21.596	19.888	10.157	42.685	13.320	10.174	28.92085	6.771
Probability	0.000	0.000	0.006	0.000	0.001	0.006	0.000	0.003

4.2 $\triangle$ in Descriptive Statistics of N-11 Equity Markets

Table 4.11 reports the results of change in descriptive statistics of Pakistan. An average change in return of KSE index is 0.008% with an average variation of 0.07%. An average change in money supply growth rate is 0.004% along an average variation of 0.026%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of PKR in dollar terms is Rs-0.0001 per dollar with an average variation of Rs0.005. Further, an average change in interest rate is 0.004% with an average variation of 0.05%. An average change in industrial production growth rate is 0.0004% with an average variation of 0.01%. An economic policy uncertainty has an average change of 0.008 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.007% with an average variation of 0.005%. The results exhibit that data is negatively skewed as majority of the variables are skewed on the left side. However, only ΔEPU and ΔCPI is positively skewed indicating that data is skewed on the right side. All the variables have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is non-random.

Table 4.12 reports the results of change in descriptive statistics of Bangladesh. An average change in return of DSE index is 0.005% with an average variation of 0.06%. An average change in money supply growth rate is 0.009% along an average variation of 0.014%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of Bangladeshi Taka in dollar terms is BDT0.002 per dollar with an average variation of BDT0.008. Further, an average change in interest rate is -0.002% with an average variation of 0.31%. An average change in industrial production growth rate is 0.001% with an average variation of 0.007%. An economic policy uncertainty has an average change of 0.007 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.005% with an average variation of 0.002%. The results exhibit that data is positively skewed as majority of the variables are skewed on the right side except ΔDSE, ΔM2 and ΔOP. All the

variables have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is non-random.

Table 4.13 reports the results of change in descriptive statistics of Indonesia. An average change in return of JSE index is 0.008% with an average variation of 0.05%. An average change in money supply growth rate is 0.007% along an average variation of 0.02%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of Indonesian Rupiah in dollar terms is IDR0.002 per dollar with an average variation of IDR0.02. Further, an average change in interest rate is -0.0006% with an average variation of 0.07%. An average change in industrial production growth rate is –0.001% with an average variation of 0.005%. An economic policy uncertainty has an average change of 0.007 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.004% with an average variation of 0.003%. The results exhibit that ΔJSE, ΔM2, ΔOP and ΔIPI are negatively skewed while ΔXR, ΔIR, ΔEPU and ΔCPI are positively skewed. All the variables have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is non-random.

Table 4.14 reports the results of change in descriptive statistics of Turkey. An average change in return of BIST index is 0.01% with an average variation of 0.07%. An average change in money supply growth rate is 0.05% along an average variation of 0.49%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of Turkish lira in dollar terms is 0.01 per dollar with an average variation of 0.04. Further, an average change in interest rate is -0.005% with an average variation of 0.08%. An average change in industrial production growth rate is 0.001% with an average variation of 0.007%. An economic policy uncertainty has an average change of 0.007 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.011% with an average variation of 0.013%. The results exhibit that data is positively skewed as majority of the variables are skewed on the right side except ΔBIST and ΔOP. All the variables have a leptokurtic

distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant except ΔBIST demonstrating that data is non-random.

Table 4.15 reports the results of change in descriptive statistics of Vietnam. An average change in return of VNI index is 0.006% with an average variation of 0.08%. An average change in money supply growth rate is 0.0005% along an average variation of 0.09%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of Vietnamese dong in dollar terms is ₫0.001 per dollar with an average variation of ₫0.006. Further, an average change in interest rate is 0.002% with an average variation of 0.16%. An average change in industrial production growth rate is 0.001% with an average variation of 0.004%. An economic policy uncertainty has an average change of 0.007 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.005% with an average variation of 0.006%. The results exhibit that ΔVNI, ΔM2, ΔOP and ΔIPI are negatively skewed while ΔXR, ΔIR, ΔEPU and ΔCPI positively skewed. All the variables have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is non-random.

Table 4.16 reports the results of change in descriptive statistics of South Korea. An average change in return of KOSPI index is 0.004% with an average variation of 0.05%. An average change in money supply growth rate is 0.006% along an average variation of 0.004%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of South Korean won in dollar terms is ₩0.001 per dollar with an average variation of ₩0.02. Further, an average change in interest rate is 0.003% with an average variation of 0.21%. An average change in industrial production growth rate is -0.0001% with an average variation of 0.003%. An economic policy uncertainty has an average change of 0.007 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.0018% with an average variation of 0.0014%. The results exhibit that data is positively skewed as majority of the variables are skewed on the right side except ΔKOSPI and ΔOP. All the variables

have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is non-random.

Table 4.17 reports the results of change in descriptive statistics of Mexico. An average change in return of S&P index is 0.006% with an average variation of 0.04%. An average change in money supply growth rate is 0.007% along an average variation of 0.01%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of Mexican Peso in dollar terms is MX$-0.0007 per dollar with an average variation of MX$0.02. Further, an average change in interest rate is 0.0006% with an average variation of 0.03%. An average change in industrial production growth rate is 0.001% with an average variation of 0.005%. An economic policy uncertainty has an average change of 0.007 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.003% with an average variation of 0.001%. The results exhibit that ΔS&P, ΔOP, ΔXR and ΔIR are negatively skewed while ΔM2, ΔIPI, ΔEPU and ΔCPI are positively skewed. All the variables have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is non-random.

Table 4.18 reports the results of change in descriptive statistics of Nigeria. An average change in return of NSE index is 0.004% with an average variation of 0.07%. An average change in money supply growth rate is 0.014% along an average variation of 0.04%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of Nigerian Naira in dollar terms is ₦-0.002 per dollar with an average variation of ₦0.01. Further, an average change in interest rate is -0.005% with an average variation of 0.36%. An average change in industrial production growth rate is 0.0005% with an average variation of 0.01%. An economic policy uncertainty has an average change of 0.007 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.009% with an average variation of 0.003%. The results exhibit that data is negatively skewed except ΔM2 and ΔEPU. All the variables have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is

non-random.

Table 4.19 reports the results of change in descriptive statistics of Egypt. An average change in return of EGX-30 index is 0.007% with an average variation of 0.09%. An average change in money supply growth rate is 0.012% along an average variation of 0.01%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of Egyptian Pound in dollar terms is EGP0.006 per dollar with an average variation of EGP0.04. Further, an average change in interest rate is 0.002% with an average variation of 0.06%. An average change in industrial production growth rate is -0.0001% with an average variation of 0.004%. An economic policy uncertainty has an average change of 0.007 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.009% with an average variation of 0.005%. The results exhibit that data is positively skewed except ΔEGX-30, ΔOP and ΔIPI. All the variables have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is non-random.

Table 4.20 reports the results of change in descriptive statistics of Philippines. An average change in return of PSEI index is 0.005% with an average variation of 0.05%. An average change in money supply growth rate is 0.009% along an average variation of 0.02%. An average per barrel change in oil prices is 0.003% with average variation of 0.107% in its per barrel prices. An average change in exchange rate of Philippine peso in dollar terms is ₱0.001 per dollar with an average variation of ₱0.01. Further, an average change in interest rate is -0.002% with an average variation of 0.70%. An average change in industrial production growth rate is -0.001% with an average variation of 0.003%. An economic policy uncertainty has an average change of 0.007 with an average variation of 0.18. Lastly, an average change in inflation rate is 0.003% with an average variation of 0.002%. The results exhibit that data is negatively skewed except ΔEPU and ΔCPI. All the variables have a leptokurtic distribution with flat tails and peaked data. Lastly, Jarque-Bera probabilities of all the variables are significant demonstrating that data is non-random.

Table 4.11: Δ in Descriptive Statistics Pakistan

	ΔKSE	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.008583	0.004589	0.003211	-0.000192	0.004915	0.000465	0.008144	0.007779
Median	0.012865	0.005725	0.017559	0.000693	0.002061	0.001612	-0.002194	0.007510
Maximum	0.202276	0.081470	0.335115	0.021249	0.222754	0.064728	0.625249	0.041331
Minimum	-0.448796	-0.140768	-0.798244	-0.040126	-0.317229	-0.084205	-0.495398	-0.016364
Std. Dev.	0.070011	0.026993	0.107126	0.005982	0.053939	0.011182	0.183416	0.005079
Skewness	-1.645545	-0.945903	-2.270711	-1.504862	-0.303902	-1.836383	0.510522	0.830534
Kurtosis	11.85715	6.976440	17.26812	14.01565	12.38005	27.88297	4.164951	13.81348
Jarque-Bera	796.0837	172.9031	1999.150	1162.760	787.8297	5641.142	21.39681	1067.241
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000023	0.000000

Table 4.12: Δ in Descriptive Statistics Bangladesh

	ΔDSE	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.005776	0.009378	0.003222	0.002196	-0.002960	0.001933	0.007019	0.005579
Median	0.005208	0.009727	0.016852	0.000271	-0.004101	0.001669	-0.002583	0.005302
Maximum	0.264055	0.050282	0.335115	0.054160	1.798494	0.080172	0.625249	0.022048
Minimum	-0.363548	-0.057136	-0.798244	-0.026349	-1.404510	-0.040235	-0.495398	-0.005100
Std. Dev.	0.068214	0.014655	0.106875	0.008538	0.318407	0.007541	0.183730	0.002002
Skewness	-0.604244	-0.513928	-2.276316	3.211315	0.419085	3.965118	0.513253	1.695806
Kurtosis	8.085327	6.077358	17.34968	19.10352	10.99193	61.88863	4.143671	29.50344
Jarque-Bera	244.7506	94.30099	2030.315	2692.637	578.4709	31629.72	21.15688	6395.672
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000025	0.000000

Table 4.13: Δ in Descriptive Statistics Indonesia

	ΔJSE	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.008744	0.007396	0.003222	0.002463	-0.000617	-0.001957	0.007019	0.004515
Median	0.013722	0.007706	0.016852	0.001254	-0.000204	-0.001184	-0.002583	0.004116
Maximum	0.183417	0.069982	0.335115	0.158610	0.557481	0.030170	0.625249	0.023199
Minimum	-0.377197	-0.132096	-0.798244	-0.076196	-0.336834	-0.062315	-0.495398	-0.010310
Std. Dev.	0.056044	0.023965	0.106875	0.023533	0.071767	0.005932	0.183730	0.003355
Skewness	-1.758556	-1.086800	-2.276316	1.470486	1.864430	-4.075065	0.513253	1.260382
Kurtosis	13.43992	8.755434	17.34968	13.33364	22.63485	56.51252	4.143671	10.57531
Jarque-Bera	1087.201	339.0689	2030.315	1034.091	3578.244	26248.05	21.15688	571.0004
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000025	0.000000

Table 4.14: Δ in Descriptive Statistics Turkey

	ΔBIST	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.013970	0.053445	0.003222	0.012212	-0.005528	0.001074	0.007019	0.011192
Median	0.017252	0.015805	0.016852	0.006451	0.000000	0.000760	-0.002583	0.007355
Maximum	0.224142	7.201502	0.335115	0.254232	0.748717	0.055825	0.625249	0.049228
Minimum	-0.262915	-0.048204	-0.798244	-0.082779	-0.413976	-0.036856	-0.495398	-0.077330
Std. Dev.	0.079243	0.491323	0.106875	0.040766	0.088657	0.007715	0.183730	0.013006
Skewness	-0.181740	14.42587	-2.276316	1.841881	2.721712	1.586429	0.513253	0.276039
Kurtosis	3.659569	210.3303	17.34968	10.82615	38.04154	23.04908	4.143671	15.09313
Jarque-Bera	5.080702	392538.8	2030.315	670.2507	11265.46	3691.125	21.15688	1312.831
Probability	0.078839	0.000000	0.000000	0.000000	0.000000	0.000000	0.000025	0.000000

Table 4.15: Δ in Descriptive Statistics Turkey

	ΔVNI	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.006802	0.000558	0.003222	0.001870	0.002171	0.001363	0.007019	0.005270
Median	0.009077	0.013297	0.016852	0.000315	0.003284	0.001482	-0.002583	0.003497
Maximum	0.325824	0.137456	0.335115	0.070654	0.674965	0.032805	0.625249	0.062207
Minimum	-0.286342	-1.114013	-0.798244	-0.008007	-0.741508	-0.039727	-0.495398	-0.018738
Std. Dev.	0.087300	0.092396	0.106875	0.006626	0.164847	0.004947	0.183730	0.006470
Skewness	-0.136582	-9.233142	-2.276316	6.828861	0.097003	-1.545351	0.513253	3.711100
Kurtosis	5.073146	104.2187	17.34968	63.07331	7.548565	32.00479	4.143671	35.08573
Jarque-Bera	39.17080	94834.97	2030.315	33999.89	185.6801	7622.023	21.15688	9716.059
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000025	0.000000

Table 4.16: Δ in Descriptive Statistics South Korea

	ΔKOSPI	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.004068	0.006346	0.003222	0.001032	0.003348	-0.000101	0.007019	0.001899
Median	0.008348	0.005781	0.016852	0.000442	-0.000286	-0.000252	-0.002583	0.001667
Maximum	0.133652	0.023701	0.335115	0.160289	2.039464	0.020038	0.625249	0.010263
Minimum	-0.263112	-0.012540	-0.798244	-0.085705	-0.918221	-0.017841	-0.495398	-0.002559
Std. Dev.	0.054332	0.004954	0.106875	0.023344	0.212130	0.003143	0.183730	0.001476
Skewness	-0.778172	0.113024	-2.276316	1.437699	3.290964	0.793034	0.513253	1.404547
Kurtosis	5.739666	4.476092	17.34968	13.35556	43.87355	17.00061	4.143671	8.626909
Jarque-Bera	88.93813	19.97658	2030.315	1034.737	15354.31	1778.523	21.15688	354.3300
Probability	0.000000	0.000046	0.000000	0.000000	0.000000	0.000000	0.000025	0.000000

Table 4.17: Δ in Descriptive Statistics Mexico

	ΔS&P	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.006086	0.007552	0.003222	-0.000722	0.000683	0.001187	0.007019	0.003646
Median	0.007189	0.006679	0.016852	0.001550	0.000000	0.000900	-0.002583	0.003258
Maximum	0.123787	0.058134	0.335115	0.087147	0.123060	0.033549	0.625249	0.011567
Minimum	-0.196668	-0.024650	-0.798244	-0.149509	-0.150128	-0.027344	-0.495398	-0.002941
Std. Dev.	0.048934	0.013085	0.106875	0.026574	0.039963	0.005847	0.183730	0.001440
Skewness	-0.622160	0.820687	-2.276316	-1.352624	-0.307218	0.137567	0.513253	0.837051
Kurtosis	4.714203	4.531564	17.34968	10.23404	4.580540	15.94002	4.143671	9.619211
Jarque-Bera	40.19445	45.14819	2030.315	534.3619	25.76093	1500.699	21.15688	417.6068
Probability	0.000000	0.000000	0.000000	0.000000	0.000003	0.000000	0.000025	0.000000

Table 4.18: Δ in Descriptive Statistics Nigeria

	ΔNSE	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.004120	0.014383	0.003222	0.002677	-0.005904	0.000574	0.007019	0.009542
Median	0.002425	0.010798	0.016852	0.003266	-0.004008	-0.000171	-0.002583	0.009419
Maximum	0.323516	0.395378	0.335115	0.052745	2.852631	0.056763	0.625249	0.020887
Minimum	-0.365883	-0.286732	-0.798244	-0.057994	-3.355735	-0.081584	-0.495398	-0.010218
Std. Dev.	0.071858	0.047122	0.106875	0.010413	0.369466	0.012385	0.183730	0.003359
Skewness	-0.466381	1.486302	-2.276316	-0.403861	-1.095786	-0.469087	0.513253	-0.761920
Kurtosis	7.670305	29.48167	17.34968	13.32727	49.87408	14.60604	4.143671	8.794031
Jarque-Bera	203.1911	6361.448	2030.315	961.2733	19726.09	1214.574	21.15688	321.5404
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000025	0.000000

Table 4.19: Δ in Descriptive Statistics Egypt

	ΔEGX_30	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.007186	0.012827	0.003222	0.006667	0.002898	-0.000134	0.007019	0.009038
Median	0.005422	0.011868	0.016852	0.000124	0.001694	6.58E-05	-0.002583	0.008189
Maximum	0.311706	0.168323	0.335115	0.579465	0.438076	0.022841	0.625249	0.062451
Minimum	-0.403312	-0.027940	-0.798244	-0.095559	-0.137768	-0.032413	-0.495398	-0.013247
Std. Dev.	0.090160	0.013689	0.106875	0.045134	0.060964	0.004052	0.183730	0.005974
Skewness	-0.474801	6.960311	-2.276316	10.05974	2.054477	-1.638882	0.513253	3.458730
Kurtosis	5.460211	79.48480	17.34968	123.7987	15.21309	26.23708	4.143671	34.15320
Jarque-Bera	62.29968	54141.56	2030.315	134349.1	1487.469	4933.406	21.15688	9122.924
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000025	0.000000

Table 4.20: Δ in Descriptive Statistics Philippines

	ΔPSEI	**ΔM2**	**ΔOP**	**ΔXR**	**ΔIR**	**ΔIPI**	**ΔEPU**	**ΔCPI**
Mean	0.005505	0.009277	0.003222	0.001712	-0.002917	-0.001697	0.007019	0.003169
Median	0.013236	0.007261	0.016852	0.001522	-0.007277	-0.001599	-0.002583	0.003119
Maximum	0.139495	0.098487	0.335115	0.041682	6.214608	0.017796	0.625249	0.021160
Minimum	-0.275382	-0.084621	-0.798244	-0.037472	-6.763885	-0.030376	-0.495398	-0.010535
Std. Dev.	0.054613	0.021399	0.106875	0.012220	0.700585	0.003632	0.183730	0.002395
Skewness	-1.175565	-0.032664	-2.276316	-0.043751	-0.886766	-0.877756	0.513253	1.280070
Kurtosis	7.252734	6.303426	17.34968	3.934485	70.33860	30.52275	4.143671	22.77244
Jarque-Bera	211.5381	97.79717	2030.315	7.891567	40649.63	6813.560	21.15688	3560.970
Probability	0.000000	0.000000	0.000000	0.019336	0.000000	0.000000	0.000025	0.000000

4.3 Unit Root Analysis

Table 4.21 depicts the unit root test results of N-11 countries to identify the order of integration for variables under study. The reporting of data is portrayed in log form for coefficients' smoothing. The Phillip-Perron testing is employed at level as well as at 1st difference with constant assumption for unit root testing. The reults reveal that all of time series are non-stationary at level that turn out to be stationary at 1st difference.

4.4 Diagnostic Testing

The results shown in table 4.22 report diagnostic testing information of N-11 equity markets and reports no autocorrelation issue. Further, Ramsey test reveals that no problem of model specification is present. Mostly, normal distribution is not observed in the time series data. As times-series data encompass combinations of multiple integration order; thus, heteroscedasticity presence has no effect on estimates and it can be detected naturally (Shrestha and Chowdhury, 2005).

Table 4.21: Unit Root Analysis N-11 Equity Markets

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL	Integrated
EM	-13.7361	-14.2578	-11.6929	-13.6623	-11.0958	-15.0466	-14.1492	-12.4447	-12.938	-14.3815	I (1)
LM2	-15.9601	-15.3933	-13.6429	-13.7358	-9.4069	-14.8584	-16.326	-17.8711	-14.4038	-17.1223	I (1)
LOP	-10.6708	-10.7356	-10.7356	-10.7356	-10.7356	-10.7356	-10.7356	-10.7356	-10.7356	-10.7356	I (1)
LIR	-10.9746	-16.2005	-13.5617	-13.8551	-16.6653	-8.7689	-8.8087	-11.584	-12.6046	-25.5232	I (1)
LXR	-8.0393	-10.6434	-11.4058	-9.5686	-11.6082	-9.3505	-11.1298	-10.162	-11.305	-11.1362	I (1)
LIPI	-10.8912	-11.3807	-10.224	-10.0448	-9.9106	-9.0827	-10.6066	-7.8238	-9.8015	-11.665	I (1)
LEPU	-23.108	-23.2714	-23.2714	-23.2714	-23.2714	-23.2714	-23.2714	-23.2714	-23.2714	-23.2714	I (1)
LCPI	-7.3518	-9.7527	-6.7797	-5.8352	-9.6944	-5.446	-6.1096	-6.5586	-9.1141	-9.8719	I (1)

Table 4.22: Diagnostic Test N-11 Equity Markets

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
Serial Correlation										
LM Test	0.8794	0.8773	0.3367	1.3790	0.2458	2.3287	0.2718	0.3352	1.0307	0.4127
Prob	0.4167	0.4176	0.7145	0.2544	0.7823	0.1001	0.7623	0.7156	0.3587	0.6624
Heteroscedasticity										
White Test (F-Stat)	3.0752	2.0203	3.7587	1.5463	3.5555	2.1483	3.0917	2.0737	1.1408	0.9946
Prob	0.0000	0.0091	0.0000	0.0548	0.0000	0.0093	0.0001	0.0062	0.3222	0.4554
Functional Form										
(Ramsey Test, F-Stat)	0.2349	4.9531	3.7576	0.0012	7.3613	0.0307	6.1217	2.3332	1.3128	6.2275
Prob	0.6285	0.0272	0.0540	0.9720	0.0073	0.8610	0.0142	0.1283	0.2533	0.0134

4.5 ARDL Bounds Test

Table 4.23 depicts the info about the outcomes of ARDL bounds test of N-11. The reported results of bounds test indicate that variables are either I(0) or I(1) because presence of any I(2) variables will violate the ARDL model making computed F-stat invalid Phillips and Hansen (1990). The table 4.23 reveals both lower and upper limits for 95% level of confidence interval as our model is based on such confidence interval. In case of Pakistan, Indonesia, Nigeria and Philippines, the long-term relationship is inconclusive or cannot be identified because the F-stat value of these 4 countries is higher than the lower bound of 2.32 but lower than the upper bound of 3.5. On the other hand, the F-stat value of Bangladesh, Turkey, Vietnam, South Korea, Mexico and Egypt is more than the 3.5 upper bound concluding an existence of long-term co-integration in the variables.

Table 4.23: ARDL Bounds Test N-11 Equity Markets

	PK	**BD**	**ID**	**TR**	**VNM**	**KR**	**MX**	**NG**	**EG**	**PHL**
Sig. 5%										
F-stat	1.021	3.834	3.470	4.510	4.317	5.276	5.964	2.101	4.967	2.386
LL	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32
UL	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

4.6 ARDL Representation N-11 Equity Markets

Table 4.24 depicts info about the AIC-based selected ARDL. The results demonstrate that oil prices, inflation rate and interest rate have a statistically significant influence on KSE equity market of Pakistan. Contrarily, broad money, exchange rate, industrial production index and economic policy uncertainty have statistically insignificant effect on KSE equity returns. Table 4.24 reveals macroeconomic variables significantly explain the equity return of the KSE 100 index. Further in case of Bangladesh, the results reveal that money supply, exchange rate, interest rate and CPI have a statistically significant effect on DSE equity returns. However, oil price, industrial manufacturing index and economic policy uncertainty have statistically insignificant effect on DSE equity returns. Table 4.24 shows macroeconomic variables significantly explain the equity return of the

DSE index. The results depict that oil prices, interest rate, economic policy uncertainty and CPI have a statistically significant effect on JSE equity market of Indonesia. Conversely, supply of money, exchange rate and industrial production index have statistically insignificant effect on JSE equity returns.

Hence, macroe- conomic variables significantly explain the equity return of the JSE index. As far as Turkey is considered, inflation, IPI, interest rate, M2, oil prices and rate of exchange have a statistically significant influence on BIST EM. Only EPU has statistically insignificant impact on equity index. Moreover, the results portray that exchange rate, money supply, economic policy uncertainty and CPI have a statistically significant impact on EM of Vietnam.

How- ever, oil prices, interest rate and industrial manufacturing index have statistically insignificant impact on equity index. Additionally, the prices of oil, exchange rate and IPI have a statistically significant influence on EM of South Korea but interest rate, broad money, EPU and inflation have statistically insignificant impact on equity index. In case of Mexico, M2, oil prices and interest rate are statistically significant. In contrast, exchange rate, IPI, CPI and EPU have a statistically insignificant effect on equity market of Mexico.

In Nigeria, only CPI has a statistically significant effect on equity market. Conversely, oil prices, M2, exchange rate, interest rate, IPI as well as EPU have statistically insignificant impact on equity index of Nigeria. CPI, interest rate and exchange rate have a statistically significant effect on equity market of Egypt. Contrarily, oil prices, industrial manufacturing index, EPU and M2 have statistically insignificant impact on equity index of Egypt.

Lastly, the results show that interest rate and CPI have a statistically significant effect on EM of Philippines. However, exchange rate, oil prices, M2, IPI and EPU have statistically insignificant impact on equity index of Philippines.

Table 4.24: ARDL Representation N-11 Equity Markets

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
Var										
LN_EM(-1)	0.9456***	0.924***	0.891***	0.819***	1.082***	0.795***	0.716***	0.955***	0.898***	0.982***
	(0.037)	(0.027)	0.047)	(0.040)	(0.083)	(0.062)	(0.060)	(0.105)	(0.048)	(0.028)
LN_EM(-2)					-0.245***	0.059	0.203***	0.004	-0.122	
					(0.074)	(0.091)	(0.063)	(0.118)	(0.065)	
LN_EM(-3)						0.133		0.181		
						(0.115)		(0.101)		
LN_EM(-4)						-0.197***		-0.209**		
						(0.072)		(0.089)		
LN_M2	0.287	1.609***	0.007	0.004	-0.187***	-0.868	0.492**	0.019	-0.012	-0.139
	(0.193)	(0.388)	(0.133)	(0.004)	(0.056)	(0.749)	(0.213)	(0.055)	(0.138)	(0.072)
LN_M2(-1)	-0.319	-1.151***		0.011***	-0.188**	1.132	-0.551			
	(0.192)	(0.399)		(0.002)	(0.085)	(0.726)	(0.351)			
LN_M2(-2)				-0.002	0.626***		-0.817***			
				(0.003)	(0.216)		(0.292)			
LN_M2(-3)				-0.017***			0.773***			
				(0.003)			(0.242)			

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
LN_OP	0.178***	0.081**	0.115***	0.144***	0.176**	-0.049**	0.143***	0.132	0.022	-0.001
	(0.060)	(0.041)	(0.036)	(0.044)	(0.078)	(0.022)	(0.023)	(0.086)	(0.020)	(0.034)
LN_OP(-1)	-0.196***	-0.058	-0.105***	-0.135***	-0.226		-0.142***	-0.135		-0.059
	(0.071)	(0.041)	(0.036)	(0.045)	(0.121)		(0.029)	(0.074)		(0.035)
LN_OP(-2)	0.162***				0.092					
	(0.070)				(0.061)					
LN_OP(-3)	-0.132***									
	(0.054)									
LN_XR	-0.032	1.096	-0.871***	-0.864***	-1.313**	-0.215**	0.465***	1.054	0.134	-0.125
	(0.088)	(0.673)	(0.165)	(0.190)	(0.643)	(0.090)	(0.143)	(0.761)	(0.103)	(0.104)
LN_XR(-1)		-1.366	1.281***	1.059***	1.401***		-0.363**	0.500	-0.027	
		(0.944)	(0.203)	(0.267)	(0.555)		(0.178)	(1.314)	(0.082)	
LN_XR(-2)		2.094***	-0.726***	-0.614***			-0.551**	-2.533**	-0.325***	
		(0.870)	(0.188)	(0.211)			(0.253)	(1.148)	(0.098)	
LN_XR(-3)		-1.543***	0.535***	0.416***			0.572	-0.349	0.449***	
		(0.553)	(0.214)	(0.143)			(0.295)	(0.911)	(0.098)	
LN_XR(-4)			-0.201				-0.236	1.263		
			(0.134)				(0.149)	(0.832)		

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
LN_IR	-0.094	0.008	-0.105	-0.039	0.053	0.000	-0.044***	-0.014	-0.168***	0.003
	(0.097)	(0.014)	(0.087)	(0.048)	(0.030)	(0.006)	(0.010)	(0.008)	(0.059)	(0.004)
LN_IR(-1)	-0.179	-0.007	0.012	0.076	-0.064					0.002
	(0.149)	(0.018)	(0.077)	(0.045)	(0.033)					(0.004)
LN_IR(-2)	0.251***	-0.030**	0.083**	0.110***						-0.012***
	(0.105)	(0.014)	(0.038)	(0.038)						(0.003)
LN_IR(-3)				-0.170***						
				(0.037)						
LN_IPI	0.909	-0.036	-0.314	-0.527	0.233	0.613***	0.152	-0.529	0.106	0.100
	(0.573)	(0.106)	(0.167)	(0.544)	(0.137)	(0.213)	(0.097)	(0.540)	(0.297)	(0.428)
LN_IPI(-1)	-1.021			2.157***				-0.267		
	(0.541)			(0.883)				(0.766)		
LN_IPI(-2)				-1.945***				0.775		
				(0.596)				(0.471)		
LN_EPU	-0.012	0.015	-0.042**	-0.046	-0.062**	-0.014	-0.017	-0.009	-0.067	-0.022
	(0.029)	(0.019)	(0.021)	(0.028)	(0.027)	(0.034)	(0.016)	(0.025)	(0.037)	(0.021)
LN_EPU(-1)	0.070**			0.049		0.034				
	(0.033)			(0.037)		(0.025)				
LN_EPU(-2)	-0.076**			-0.056						
	(0.040)			(0.033)						

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
LN_CPI	-2.739**	4.597	1.572	0.547	-0.572***	6.393	0.214	-5.419**	3.433***	0.633***
	(1.224)	(2.634)	(0.862)	(0.528)	(0.199)	(3.828)	(0.252)	(2.382)	(1.303)	(0.224)
LN_CPI(-1)	2.838**	-13.117***	1.797	2.597***		-6.938		5.438**	-0.830	
	(1.220)	(4.192)	(1.100)	(0.694)		(3.671)		(2.390)	(1.870)	
LN_CPI(-2)		16.936***	-4.914***	-2.874***					-2.530**	
		(4.129)	(1.205)	(0.492)					(1.247)	
LN_CPI(-3)		-9.309***	-2.567							
		(2.588)	(1.610)							
LN_CPI(-4)			4.179***							
			(1.148)							
D1	-0.008	0.007	0.001	-0.078***	-0.030	-0.009		-0.066**	-0.091***	0.016
	(0.021)	(0.023)	(0.007)	(0.029)	(0.025)	(0.013)		(0.033)	(0.034)	(0.022)
C	0.976	-1.411	1.904	1.683	-1.836	-0.923	2.129	0.856	1.467	-0.132
	(0.909)	(1.112)	(2.132)	(0.987)	(1.984)	(0.914)	(1.733)	(0.536)	(2.204)	(3.080)
F-stat	1281.817	625.600	1564.518	604.636	430.908	290.265	788.573	193.393	298.855	1342.160

***1% significance level, **5% significance Level

Table 4.25 shows the short-term dynamic relationship among the macroeconomic factors and the equity returns of N-11 stock markets. ECM (-1) demonstrates speed of adjustment of one period from a long-term disequilibrium. The error correction model shows the magnitude to which elimination of exogenous shock and correction of short-term imbalance is occurred in the long run. Rationally, the value of ECM must be negative and significant. Hence, in case of N-11 countries, the same can be observed in the results of ECM except Pakistan and Philippines that have negative and statistically insignificant value indicating no adjustment in rectification of disequilibrium in the long run. However, the coefficients of ECM term of rest of the countries are significant and negative indicating a prompt adjustment from disequilibrium route. As far as Bangladesh is considered, the ECT coefficient indicates that 7 percent of price disequilibrium is rectified from its last month's disequilibrium route. Likewise, from the previous period, 10 percent adjustment in the stock prices of Indonesian stock market has occurred to recover from price disequilibrium. Similarly, results of ECT coefficient of Turkey, Vietnam, South Korea, Mexico, Nigeria and Egypt show quick adjustment of stock prices towards equilibrium path in the current month.

The ECM depicts that oil prices, interest rate and CPI have negative relationship with the stock market returns and statistically significant impact on the equity returns of KSE-100 index in the short run. In case of Bangladesh, M2, oil prices, exchange rate, interest rate and CPI have a statistically significant and positive association with the DSE equity returns in the short-term. Further, IR, EPU and CPI have negative and significant relationship with stock returns of JSE index. However, oil prices have positive and significant association with the Indonesian stock market returns in the short run. Additionally, CPI, IPI, IR, broad money, oil prices and exchange rate have significant influence on the equity returns of BIST index. Also, XR, M2, EPU and CPI have negative and statistically significant influence on the equity returns of VNI. In case of South Korea, oil prices and exchange rate have negative association but industrial manufacturing index have positive association with the stock returns and all these 3 macroeconomic indicators are statistically significant in the shorter-run. M2 and IR have negative whereas oil prices have positive and significant association with S&P index

of Mexican stock market returns. However, only CPI has a negative and significant influence on the equity returns of stock market of Nigeria in the short-term. Moreover, CPI, IR and XR depicts negative and statistically significant relationship with the stock returns of EGX-30 index. Lastly, only IR and CPI have positive and significant impact on the stock returns of Philippines's EM.

Table 4.25: ARDL Error Correction Model for Short Run Relationship N-11 Equity Markets

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
Var										
D(LN_EM(-1))					0.245***	0.004	-0.203***	0.024	0.122	
					(0.074)	(0.075)	(0.063)	(0.096)	(0.065)	
D(LN_EM(-2))						0.063		0.028		
						(0.068)		(0.069)		
D(LN_EM(-3))						0.197***		0.209**		
						(0.072)		(0.089)		
D(LN_M2)	0.287	1.609***	0.007	0.004	-0.187***	-0.868	0.492**	0.019	-0.012	-0.139**
	(0.193)	(0.388)	(0.133)	(0.004)	(0.056)	(0.749)	(0.213)	(0.055)	(0.138)	(0.072)
D(LN_M2(-1))				0.002	-0.626***		0.817***			
				(0.003)	(0.216)		(0.292)			
D(LN_M2(-2))				0.017***			-0.773***			
				(0.003)			(0.242)			
D(LN_OP)	0.178***	0.081**	0.115***	0.144***	0.176**	-0.049**	0.143***	0.132	0.022	-0.001
	(0.060)	(0.041)	(0.036)	(0.044)	(0.078)	(0.022)	(0.023)	(0.086)	(0.020)	(0.034)
D(LN_OP(-1))	-0.162**				-0.092					
	(0.070)				(0.061)					
D(LN_OP(-2))	0.132**									
	(0.054)									

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_IR)	-0.094	0.008	-0.105	-0.039	0.053	0.000	-0.044***	-0.014	-0.168***	0.003
	(0.097)	(0.014)	(0.087)	(0.048)	(0.030)	(0.006)	(0.010)	(0.008)	(0.059)	(0.004)
D(LN_IR(-1))	-0.251**	0.030**	-0.083**	-0.110***						0.012***
	(0.105)	(0.014)	(0.038)	(0.038)						(0.003)
D(LN_IR(-2))				0.170***						
				(0.037)						
D(LN_XR)	-0.032	1.096	-0.871***	-0.864***	-1.313**	-0.215***	0.465***	1.054	0.134	-0.125
	(0.088)	(0.673)	(0.165)	(0.190)	(0.643)	(0.090)	(0.143)	(0.761)	(0.103)	(0.104)
D(LN_XR(-1))		-2.094**	0.726***	0.614***			0.551**	2.533**	0.325***	
		(0.870)	(0.188)	(0.211)			(0.253)	(1.148)	(0.098)	
D(LN_XR(-2))		1.543***	-0.535***	-0.416***			-0.572**	0.349	-0.449***	
		(0.553)	(0.214)	(0.143)			(0.295)	(0.911)	(0.098)	
D(LN_XR(-3))			0.201				0.236	-1.263		
			(0.134)				(0.149)	(0.832)		
D(LN_IPI)	0.909	-0.036	-0.314	-0.527	0.233	0.613***	0.152	-0.529	0.106	0.100
	(0.573)	(0.106)	(0.167)	(0.544)	(0.137)	(0.213)	(0.097)	(0.540)	(0.297)	(0.428)
D(LN_IPI(-1))				1.945***				-0.775		
				(0.596)				(0.471)		

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_EPU)	-0.012	0.015	-0.042**	-0.046	-0.062**	-0.014	-0.017	-0.009	-0.067	-0.022
	(0.029)	(0.019)	(0.021)	(0.028)	(0.027)	(0.034)	(0.016)	(0.025)	(0.037)	(0.021)
D(LN_EPU(-1))	0.076			0.056						
	(0.040)			(0.033)						
D(LN_CPI)	-2.739**	4.597	1.572	0.547	-0.572***	6.393	0.214	-5.419**	3.433***	0.633***
	(1.224)	(2.634)	(0.862)	(0.528)	(0.199)	(3.828)	(0.252)	(2.382)	(1.303)	(0.224)
D(LN_CPI(-1))		-16.936***	4.914***	2.874***					2.530**	
		(4.129)	(1.205)	(0.492)					(1.247)	
D(LN_CPI(-2))		9.309***	2.567							
		(2.588)	(1.610)							
D(LN_CPI(-3))			-4.179***							
			(1.148)							
Dummy	-0.008	0.007	0.001	-0.078***	-0.030	-0.009		-0.066**	-0.091***	0.016
	(0.021)	(0.023)	(0.007)	(0.029)	(0.025)	(0.013)		(0.033)	(0.034)	(0.022)
CointEq(-1)	-0.054	-0.076**	-0.109**	-0.181***	-0.163***	-0.209***	-0.081***	-0.069***	-0.223***	-0.018
	(0.037)	(0.027)	(0.047)	(0.040)	(0.043)	(0.054)	(0.022)	(0.028)	(0.041)	(0.028)

***1% significance level, **5% significance Level

Table 4.26 shows that all of the variables have statistically insignificant relationship with the equity market of Pakistan, Nigeria and Philippines in the long-run. It demonstrates that the following equity markets follow random walk in the long-term and their stock prices cannot be predicted by analyzing the behavior of macroeconomic factors. It is noted that only broad money has positive and CPI has negative but statistically significant impact on equity market of Dhaka in the long run. However, rest of the variables have statistically insignificant association with the Dhaka equity market. Similarly, IPI and EPU have negative and statistically significant influence on the equity market of Indonesia. Further, CPI and EPU have statistically significant impact on the Turkish stock market in the long run but remaining variables depict no statistically significant effect on the equity market. In case of Vietnam, oil prices, M2, IPI, EPU and CPI have statistically significant influence on the equity market. However, oil prices, M2, and IPI have positive impact whereas EPU and CPI have negative relationship with the stock market of Vietnam in the long run. Additionally, M2, XR and IPI have long-term statistically significant relationship with the stock market of South Korea. It is observed that only IR has statistically significant association with the Mexican equity market in the long run while other variables hold no long-term relationship with the specific stock market. Lastly, EPU and IR have long-term statistically significant and negative effect on the equity of Egypt while XR has positive and statistically significant influence on the Egyptian stock market.

Table 4.26: ARDL Model for Long Run Relationship N-11 Equity Markets

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
Var										
LN_M2	-0.581	6.029***	0.060	-0.023	1.538***	1.268***	-1.281	0.270	-0.055	-7.534
	(2.039)	(2.164)	(1.231)	(0.023)	(0.245)	(0.468)	(1.817)	(0.768)	(0.612)	(14.673)
LN_OP	0.220	0.312	0.098	0.050	0.259***	-0.233	0.007	-0.043	0.096	-3.266
	(0.528)	(0.236)	(0.105)	(0.120)	(0.096)	(0.124)	(0.197)	(0.367)	(0.086)	(5.136)
LN_XR	-0.598	3.698	0.166	-0.016	0.539	-1.032***	-1.391	-0.944	1.030***	-6.761
	(1.727)	(3.449)	(1.064)	(0.475)	(1.572)	(0.333)	(0.871)	(1.325)	(0.246)	(14.087)
LN_IR	-0.405	-0.391	-0.090	-0.126	-0.069	-0.002	-0.545***	-0.205	-0.751***	-0.361
	(0.744)	(0.204)	(0.277)	(0.127)	(0.148)	(0.031)	(0.180)	(0.120)	(0.225)	(0.552)
LN_IPI	-2.064	-0.476	-2.874**	-1.737	1.425**	2.939***	1.877	-0.309	0.473	5.414
	(3.015)	(1.386)	(1.394)	(1.041)	(0.675)	(0.872)	(1.387)	(0.913)	(1.377)	(17.858)
LN_EPU	-0.325	0.192	-0.382***	-0.297**	-0.382***	0.093	-0.204	-0.123	-0.302**	-1.180
	(0.339)	(0.232)	(0.151)	(0.129)	(0.143)	(0.097)	(0.188)	(0.334)	(0.135)	(2.390)
LN_CPI	1.819	-11.746**	0.615	1.489***	-3.502***	-2.612	2.636	0.275	0.327	34.220
	(1.397)	(5.110)	(2.557)	(0.595)	(0.738)	(1.526)	(3.506)	(1.135)	(0.845)	(52.523)
D1	-0.150	0.094	0.012	-0.430***	-0.185	-0.042		-0.955**	-0.407***	0.876
	(0.359)	(0.318)	(0.066)	(0.147)	(0.158)	(0.062)		(0.480)	(0.127)	(1.863)
C	17.972	-18.576	17.413	9.284	-11.249	-4.427	26.242	12.369	6.565	-7.109
	(24.870)	(15.990)	(16.330)	(5.947)	(11.810)	(4.138)	(24.881)	(8.018)	(9.142)	(158.205)

***1% significance level, **5% significance Level

4.7 Moderating Role of EPU on the Link between IR and N-11 EM

Table 4.27 shows the short-term dynamic relationship among the macroeconomic factors and the equity returns of N-11 in the presence of moderating role of economic policy uncertainty with IR. There exists a negative and significant relationship at first lag between IR and the ER of KSE-100 index. However, the co-efficient of interaction term (EPU*IR) is positive and insignificant and this effect is persistent indicating no impact of EPU on stock returns when interest rate changes. Further, a negative and insignificant impact of IR is depicted on the stock returns of Dhaka equity market at first lag that reverses into lag 2 with significant impact on stock returns. However, the co-efficient of interaction term is negative and significant showing the EPU weaken the relationship between IR and equity returns. Same results are observed in case of Turkey, South Korea, Egypt and Philippines. Moreover, IR has statistically negative and significant impact on the equity returns of Indonesian stock market and this effect is further strengthened as the interaction term is negative and significant. This result is in line with the findings of Xu et al. (2021). Contrarily, in case of Vietnam, Mexico and Nigeria, the results of interaction term are insignificant which means EPU does not play a moderating role between IR and equity returns in the short-run and hence, no relationship exist.

Table 4.27: Moderating Role of EPU on the Short Run Link between IR and N-11 Equity Markets

	PK	**BD**	**ID**	**TR**	**VNM**	**KR**	**MX**	**NG**	**EG**	**PHL**
Var										
D(LN_EM(-1))			-0.110	-0.081	0.230***	-0.048	-0.193***	0.015		
			(0.079)	(0.097)	(0.076)	(0.083)	(0.062)	(0.095)		
D(LN_EM(-2))						0.027		0.026		
						(0.074)		(0.069)		
D(LN_EM(-3))						0.170***		0.211**		
						(0.071)		(0.091)		
D(LN_M2)	0.339	1.616***	0.346	0.007**	-0.135***	0.115	0.511**	0.032	-0.077	-0.140**
	(0.205)	(0.387)	(0.211)	(0.004)	(0.053)	(0.122)	(0.197)	(0.057)	(0.129)	(0.073)
D(LN_M2(-1))				0.002	-0.603***		0.758***			
				(0.003)	(0.198)		(0.290)			
D(LN_M2(-2))				0.019***			-0.696***			
				(0.003)			(0.242)			
D(LN_OP)	0.188***	0.082**	0.100***	0.149***	0.168***	0.009	0.147***	0.139	0.109**	-0.010
	(0.060)	(0.041)	(0.033)	(0.050)	(0.062)	(0.041)	(0.025)	(0.085)	(0.056)	(0.034)
D(LN_OP(-1))	-0.163***									
	(0.065)									
D(LN_OP(-2))	0.132***									
	(0.052)									

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_XR)	-0.072	1.157	-0.680***	-0.839***	-0.045	-0.104	0.505***	1.112	0.052	-0.074
	(0.097)	(0.666)	(0.229)	(0.201)	(0.236)	(0.087)	(0.142)	(0.748)	(0.108)	(0.112)
D(LN_XR(-1))		-2.110***	0.496**	0.529***			0.418**	2.823**	0.397***	
		(0.852)	(0.234)	(0.217)			(0.218)	(1.321)	(0.109)	
D(LN_XR(-2))		1.538***	-0.289**	-0.349***			-0.510	0.074	-0.500***	
		(0.542)	(0.144)	(0.148)			(0.281)	(0.908)	(0.100)	
D(LN_XR(-3))							0.222	-1.219		
							(0.144)	(0.865)		
D(LN_IR)	-0.269	0.037	-0.139	0.482***	-0.232	0.172***	-0.188	0.055	-1.191***	0.121**
	(0.499)	(0.128)	(0.130)	(0.205)	(0.223)	(0.060)	(0.143)	(0.074)	(0.396)	(0.057)
D(LN_IR(-1))	-0.434***	-0.146		-0.110***	-0.002					
	(0.168)	(0.171)		(0.042)	(0.035)					
D(LN_IR(-2))		0.382***		0.181***	0.060**					
		(0.129)		(0.042)	(0.028)					
D(LN_IPI)	0.967	-0.336	-0.328***	-0.927	0.228	0.542***	0.221	-0.353	0.242	0.261
	(0.552)	(0.608)	(0.115)	(0.638)	(0.142)	(0.221)	(0.119)	(0.545)	(0.317)	(0.429)
D(LN_IPI(-1))		-0.981		0.607				0.190		
		(0.591)		(0.769)				(0.914)		
D(LN_IPI(-2))				0.979**				-0.773		
				(0.505)				(0.477)		

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_EPU)	-0.076	0.026	-0.076	0.207**	-0.138***	0.026	-0.064	0.018	-0.560***	-0.004
	(0.195)	(0.050)	(0.052)	(0.098)	(0.056)	(0.020)	(0.047)	(0.036)	(0.201)	(0.021)
D(LN_EPU(-1))		-0.070		0.055						
		(0.066)		(0.032)						
D(LN_EPU(-2))		0.136***								
		(0.051)								
D(LN_CPI)	-3.224***	5.007**	1.223	0.317	-0.524***	7.578	0.237	-5.770***	3.591***	0.732***
	(1.269)	(2.594)	(1.657)	(0.548)	(0.189)	(4.109)	(0.247)	(2.358)	(1.271)	(0.257)
D(LN_CPI(-1))		-17.228***	4.276	2.577***					2.674**	
		(4.121)	(2.335)	(0.482)					(1.239)	
D(LN_CPI(-2))		9.316***	2.719							
		(2.598)	(2.351)							
D(LN_CPI(-3))			-4.400***							
			(1.499)							
D(LN_EPU * LN_IR)	0.029	-0.007	0.009	-0.099***	0.059	-0.035***	0.036	-0.012	0.213***	-0.023**
	(0.089)	(0.026)	(0.026)	(0.037)	(0.042)	(0.012)	(0.029)	(0.013)	(0.080)	(0.012)
D(LN_EPU(-1) * LN_IR(-1))	0.033	0.038	-0.017***				-0.016			
	(0.018)	(0.035)	(0.006)				(0.010)			
D(LN_EPU(-2) * LN_IR(-2))		-0.077***								
		(0.026)								
Dummy	0.004	-0.017	-0.001	-0.059	-0.012	0.006		-0.062	-0.065**	0.017
	(0.021)	(0.025)	(0.012)	(0.031)	(0.024)	(0.014)		(0.038)	(0.034)	(0.023)
CointEq(-1)	-0.063	-0.094***	-0.081**	-0.188***	-0.188***	-0.213***	-0.079***	-0.074***	-0.223***	-0.013
	(0.038)	(0.028)	(0.038)	(0.048)	(0.040)	(0.058)	(0.025)	(0.028)	(0.043)	(0.027)

***1% significance level, **5% significance Level

Table 4.28 shows that EPU does not have any statistically significant influence on the link between IR and equity returns of the stock markets of Pakistan, Indonesia, Vietnam, Mexico, Nigeria and Philippines in the long-run. It reveals that the following equity markets have independent behavior in the long-term and their stock prices are not influenced by increase or decrease in economic uncertainty along with subsequent fluctuations in the nominal interest rate. On the other hand, IR has a statistical significant effect on stock markets of Bangladesh, Turkey, South Korea and Egypt but this effect is weakened due to moderating effect of EPU indicating that fluctuations in IR and uncertainty in economic policy independently influences the stock prices in the long run.

Table 4.28: Moderating Role of EPU on the Long Run Link between IR and N-11 Equity Markets

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
Var										
LN_M2	0.230	3.154	0.466	-0.022	1.324***	0.539	-1.684	0.431	-0.346	-10.436
	(1.465)	(1.601)	(1.736)	(0.025)	(0.229)	(0.512)	(2.032)	(0.727)	(0.549)	(25.373)
LN_OP	0.376	0.213	0.188	0.132	0.224**	-0.234	0.004	0.025	0.029	-4.304
	(0.524)	(0.200)	(0.209)	(0.123)	(0.098)	(0.129)	(0.200)	(0.316)	(0.092)	(9.121)
LN_XR	-1.131	1.345	1.614	-0.137	-0.240	-0.489	-1.607	-1.358	0.626**	-5.467
	(1.655)	(2.566)	(2.051)	(0.504)	(1.265)	(0.360)	(0.942)	(1.278)	(0.287)	(17.233)
LN_IR	-7.940	-3.450***	-1.715	2.534**	-1.747	0.807***	-2.373	0.740	-5.348***	8.216
	(6.117)	(1.206)	(1.587)	(1.139)	(1.271)	(0.308)	(1.713)	(1.082)	(1.773)	(17.840)
LN_IPI	-1.873	-0.636	-4.039	-2.652	1.216	2.549***	2.784	0.012	1.089	19.443
	(2.439)	(1.113)	(2.217)	(1.501)	(0.682)	(0.821)	(1.794)	(0.865)	(1.561)	(31.156)
LN_EPU	-3.446	-1.024**	-0.929	1.063	-0.733**	0.122	-0.806	0.238	-2.744***	-0.294
	(2.555)	(0.515)	(0.622)	(0.592)	(0.320)	(0.104)	(0.544)	(0.535)	(0.901)	(1.775)
LN_CPI	1.059	-5.416	-2.044	1.979***	-2.791***	0.275	2.988	0.064	1.037	54.428
	(0.974)	(3.714)	(4.395)	(0.584)	(0.634)	(1.663)	(3.723)	(1.077)	(0.771)	(112.404)
LN_EPU* LN_IR	1.454	0.606***	0.317	-0.526**	0.313	-0.163***	0.364	-0.165	0.958***	-1.722
	(1.146)	(0.218)	(0.316)	(0.227)	(0.236)	(0.062)	(0.334)	(0.190)	(0.365)	(3.727)
D1	0.058	-0.181	-0.018	-0.312**	-0.063	0.027		-0.843	-0.293**	1.285
	(0.345)	(0.248)	(0.145)	(0.139)	(0.128)	(0.064)		(0.498)	(0.128)	(3.267)
C	29.896	0.839	19.129	3.976	-0.595	-9.550**	33.359	8.926	17.176	-124.986
	(28.468)	(12.374)	(20.757)	(6.938)	(10.776)	(4.694)	(28.080)	(7.540)	(9.452)	(194.705)

***1% significance level, **5% significance Level

4.8 Moderating Role of EPU on the Link between OP and N-11 EM

Table 4.29 shows the short-term dynamic relationship among the macroeconomic factors and the equity returns of N-11 in the presence of moderating role of economic policy uncertainty with prices of oil. There exists a negative and significant relationship at first lag between oil prices and the stock returns of KSE-100 index that reverses into lag 2 with significant effect on returns of stock. The co-efficient of interaction term is also positive and significant showing the EPU has magnified the relationship between OP and equity returns. Conversely, in case of South Korea, Mexico, Nigeria and Egypt, oil prices have positive and significant effect but the co-efficient of interaction term is negative and significant showing the EPU weaken the relationship between OP and equity returns translating the opposite effect. Contrarily, in case of Bangladesh, Indonesia, Turkey, Vietnam, and Philippines the results of interaction term are insignificant which means EPU does not play a moderating role between oil prices and returns of equity in the short-run.

Table 4.30 shows that EPU does not have any statistically significant influence on the relationship amid oil prices and stock returns of the N-11 equity markets in the long run. It reveals that the N-11 equity markets depict independent behavior in the long-term and their stock prices are not influenced by increase or decrease in economic uncertainty along with subsequent fluctuations in the oil prices.

Table 4.29: Moderating Role of EPU on the Short Run Link between OP and N-11 Equity Markets

	PK	**BD**	**ID**	**TR**	**VNM**	**KR**	**MX**	**NG**	**EG**	**PHL**
Var										
D(LN_EM(-1))				-0.078	0.235***	-0.040	-0.183***	0.000	0.118	
				(0.072)	(0.067)	(0.082)	(0.065)	(0.097)	(0.066)	
D(LN_EM(-2))						0.028		0.036		
						(0.078)		(0.077)		
D(LN_EM(-3))						0.170***		0.220***		
						(0.066)		(0.088)		
D(LN_M2)	0.318	1.568***	0.011	0.005	-0.174**	-1.140	0.523***	0.022	0.068	-0.139**
	(0.201)	(0.348)	(0.121)	(0.010)	(0.080)	(0.772)	(0.188)	(0.052)	(0.144)	(0.068)
D(LN_M2(-1))				0.001	-0.588***		0.765***			
				(0.014)	(0.205)		(0.292)			
D(LN_M2(-2))				0.018			-0.758***			
				(0.010)			(0.242)			
D(LN_OP)	-0.099	0.116	0.167	-0.032	-0.399	0.558**	-0.257**	0.971***	1.123***	0.370
	(0.158)	(0.138)	(0.117)	(0.178)	(0.351)	(0.245)	(0.131)	(0.345)	(0.356)	(0.356)
D(LN_OP(-1))	-0.260***				-0.085		0.570***			
	(0.080)				(0.057)		(0.190)			
D(LN_OP(-2))	0.130***									
	(0.054)									

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_XR)	-0.093	1.160***	-0.864***	-0.885***	-1.162	-0.205**	0.478***	1.105	-0.027	-0.108
	(0.096)	(0.493)	(0.174)	(0.147)	(0.855)	(0.091)	(0.146)	(0.814)	(0.105)	(0.108)
D(LN_XR(-1))		-2.130***	0.723***	0.561***			0.625***	2.205**	0.416***	
		(0.825)	(0.234)	(0.222)			(0.232)	(1.100)	(0.096)	
D(LN_XR(-2))		1.520***	-0.537***	-0.396***			-0.598**	0.693	-0.487***	
		(0.598)	(0.227)	(0.137)			(0.263)	(0.874)	(0.095)	
D(LN_XR(-3))			0.198				0.230	-1.461		
			(0.141)				(0.143)	(0.826)		
D(LN_IR)	-0.154	0.006	-0.107**	-0.034	0.078**	-0.001	-0.042	-0.014	-0.119**	0.002
	(0.096)	(0.011)	(0.048)	(0.055)	(0.037)	(0.006)	(0.089)	(0.008)	(0.061)	(0.004)
D(LN_IR(-1))	-0.294***	0.031***	-0.084	-0.122	0.001		0.036			0.011***
	(0.114)	(0.013)	(0.047)	(0.084)	(0.042)		(0.107)			(0.004)
D(LN_IR(-2))				0.171***	0.060		-0.140			
				(0.061)	(0.036)		(0.074)			
D(LN_IPI)	0.884	-0.377	-0.326***	-0.449	0.205	0.591***	0.140	-0.706	0.082	0.175
	(0.547)	(0.467)	(0.115)	(0.813)	(0.158)	(0.207)	(0.127)	(0.586)	(0.325)	(0.442)
D(LN_IPI(-1))		-0.918***		1.862**				-1.012**		
		(0.390)		(0.842)				(0.490)		

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_EPU)	-0.237**	0.081	0.000	-0.197	-0.501	0.430***	-0.318***	0.646***	0.804***	0.285
	(0.120)	(0.111)	(0.093)	(0.146)	(0.281)	(0.179)	(0.102)	(0.244)	(0.268)	(0.258)
D(LN_EPU(-1))				0.052			0.464***			
				(0.028)			(0.150)			
D(LN_CPI)	-2.917***	4.447	1.516	0.530	-0.565***	5.762	0.001	-6.719***	3.239***	0.706***
	(1.118)	(3.320)	(1.649)	(0.735)	(0.178)	(3.803)	(0.229)	(2.681)	(1.271)	(0.231)
D(LN_CPI(-1))		-16.866**	4.867**	2.942***					2.725**	
		(8.211)	(2.373)	(0.750)					(1.283)	
D(LN_CPI(-2))		9.012***	2.608							
		(3.651)	(2.361)							
D(LN_CPI(-3))			-4.216***							
			(1.481)							
D(LN_EPU * LN_OP)	0.055	-0.013	-0.010	0.035	0.103	-0.105**	0.076***	-0.157***	-0.195***	-0.068
	(0.031)	(0.029)	(0.022)	(0.035)	(0.065)	(0.045)	(0.023)	(0.057)	(0.061)	(0.065)
D(LN_EPU(-1) * LN_OP(-1))	0.018**						-0.113***			
	(0.009)						(0.036)			
Dummy	-0.004	-0.003	0.002	-0.079**	-0.020	-0.013		-0.071**	-0.093***	0.017
	(0.020)	(0.022)	(0.012)	(0.041)	(0.031)	(0.014)		(0.034)	(0.035)	(0.029)
CointEq(-1)	-0.043	-0.070***	-0.109***	-0.168***	-0.174***	-0.217***	-0.065***	-0.067***	-0.219***	-0.025
	(0.037)	(0.028)	(0.034)	(0.043)	(0.032)	(0.057)	(0.025)	(0.027)	(0.046)	(0.027)

***1% significance level, **5% significance Level

Table 4.30: Moderating Role of EPU on the Long Run Link between OP and N-11 Equity Markets

	PK	**BD**	**ID**	**TR**	**VNM**	**KR**	**MX**	**NG**	**EG**	**PHL**
Var										
LN_M2	-0.600	5.986***	0.103	-0.027	1.330***	1.234***	-0.147	0.331	0.313	-5.537
	(2.524)	(2.397)	(1.113)	(0.025)	(0.302)	(0.429)	(1.989)	(0.736)	(0.686)	(8.109)
LN_OP	-5.842	1.648	0.582	-0.194	1.299	0.408	-5.104	1.385	0.372	-2.714
	(6.341)	(2.046)	(1.078)	(1.057)	(1.190)	(0.610)	(2.887)	(2.389)	(0.814)	(7.067)
LN_XR	-2.139	4.504	0.316	-0.006	1.055	-0.947***	-1.681	-1.262	0.856***	-4.316
	(3.082)	(2.920)	(1.104)	(0.487)	(1.352)	(0.321)	(1.389)	(1.282)	(0.256)	(7.756)
LN_IR	-0.679	-0.432	-0.087	-0.102	-0.166	-0.005	-0.600**	-0.208	-0.544**	-0.270
	(0.980)	(0.246)	(0.223)	(0.138)	(0.161)	(0.027)	(0.271)	(0.129)	(0.247)	(0.311)
LN_IPI	-2.681	-0.165	-2.982**	-2.069	1.181	2.727***	2.140	-0.231	0.376	6.969
	(4.121)	(1.071)	(1.288)	(1.272)	(0.867)	(0.759)	(2.409)	(0.916)	(1.538)	(13.667)
LN_EPU	-5.474	1.155	0.003	-0.513	0.546	0.598	-4.442**	1.219	-0.098	-1.346
	(5.659)	(1.623)	(0.848)	(0.841)	(0.997)	(0.481)	(2.288)	(1.922)	(0.619)	(5.640)
LN_CPI	1.709	-11.749**	0.382	1.577***	-3.257***	-2.443	0.020	0.177	-0.070	28.168
	(1.704)	(5.321)	(2.402)	(0.615)	(0.854)	(1.424)	(3.511)	(1.106)	(0.950)	(29.953)
LN_EPU* LN_OP	1.251	-0.284	-0.092	0.045	-0.213	-0.125	1.024	-0.263	-0.058	0.036
	(1.362)	(0.406)	(0.203)	(0.204)	(0.234)	(0.116)	(0.554)	(0.449)	(0.156)	(1.301)
D1	-0.084	-0.049	0.018	-0.471**	-0.113	-0.062		-1.054**	-0.426***	0.663
	(0.427)	(0.310)	(0.107)	(0.234)	(0.181)	(0.067)		(0.501)	(0.128)	(1.327)
C	53.185	-27.457	15.021	11.564	-17.595	-6.918	34.540	6.052	2.605	-30.494
	(61.503)	(17.163)	(15.167)	(7.197)	(12.597)	(3.875)	(31.907)	(10.691)	(10.637)	(96.525)

***1% significance level, **5% significance Level

4.9 NARDL Representation N-11 Equity Markets

4.9.1 Asymmetric Impact of M2, OP and EPU on N-11 EM

Table 4.31 shows the short run asymmetric impacts of M2, oil prices and EPU on the stock returns of N-11 countries. The results of Pakistan demonstrate that the coefficient reflecting the positive shocks in M2 is positive and significant. It means that 1 percent increase in M2 will pose an increase in stock returns by 0.61%. Contrarily, the coefficient reflecting the negative shocks in M2 is also negative and significant after 2 lags. It indicates that a 1 percent decrease in M2 will lead to 0.59% decrease in the stock returns after 2 months. Further, the coefficient reflecting the positive shock in the OP is statistically insignificant and positive showing no impact of 1 percent upturn in oil prices on the stock returns of KSE index in the short-term. However, the coefficient revealing a negative shift in the oil prices is also negative and significant and a similar effect remain persistent on the stock returns even after 2 periods. Moreover, the coefficient reflecting the positive shocks in the EPU is positive and significant after a month. While, the coefficient representing the negative shocks in EPU is insignificant, so decrease in uncertainty does not have any effect on the ER in the short run. Similar results can be seen in Bangladesh, Turkey, Vietnam, South Korea, Mexico, Nigeria, Egypt and Philippines as the coefficient capturing a negative change in the EPU is insignificant in the short-term creating no impact on the stock returns.

While in Bangladesh, the coefficient reflecting the positive shocks in M2 is positive and significant after 3 lags. It means that 1 percent increase in M2 will lead to 0.98% rise in stock returns after 3 months. On the other hand, the coefficient reflecting the negative shocks in M2 is also negative and significant and the effect remain persistent even after a month indicating a 2.92% fall in stock returns of Dhaka stock market with a 1 percent decrease in the broad money. The coefficient associated with the positive shock in the OP is negative and statistically significant after 2 lags indicating a 0.23% decline in the stock returns due to 1 percent

increase in the oil prices. However, a negative shock in the OP is associated with the negative trend in the stock returns as the coefficient is also negative and significant after 3 months. Furthermore, the coefficient reflecting the positive shocks in the EPU is positive and significant after 3 months. The coefficient representing a positive shock in M2 is positive and insignificant causing a no influence on the equity returns of Indonesian stock market. Whereas, coefficient capturing a negative shock in M2 is positive and significant after a period creating a 0.75% increase in equity returns due to 1% drop in M2. Also, the coefficient associated with the positive shock in the OP is statistically insignificant and positive showing no impact of increase in oil prices on the stock returns of equity market of Indonesia in the short-term. Similar results can be seen in the case of Turkey, South Korea, Mexico and Egypt in which increase in OP create no influence on the stock returns in the short-run. The decrease in oil prices has a significant and negative impact and will reduce the equity returns of Indonesian stock market by 0.13% and by 0.18% in Turkish equity market. The coefficient showing the positive change in EPU is negative and significant at lag 1 that reversed into lag 2. Also, the coefficient showing the negative change in EPU is positive and significant at lag 1 that reversed into lag 2. In Turkey, the coefficient linked to positive change in EPU is negative and significant that shows 0.06% decrease in the equity returns because of 1 percent increase in uncertainty. The coefficient associated with the positive shock in the M2 is statistically significant and positive after 1 lag that effect remain persistent in the subsequent month. The coefficient associated with the negative shock in the M2 is also negative and significant indicating 0.74% decrease in the equity returns of Turkish stock market when broad money supply is reduced by 1%. In Vietnam, coefficient reflecting the positive shock in the OP is positive and statistically significant indicating a 0.09% increase in the stock returns due to 1 percent increase in the oil prices. The decrease in oil prices has a significant and negative impact on the stock returns causing 0.27% decline in the current month which is then reversed in the subsequent month. The coefficient reflecting the positive shocks in the EPU is negative and significant showing 0.09% decrease in the equity returns when uncertainty rises by 1%. In South Korean context, the coefficient of positive change is negative and insignificant while the coefficient of negative change is also

negative and insignificant. The decrease in oil prices has a significant and positive impact on the stock returns causing 0.07% increase in the stock returns of KOSPI index. In case of Mexico, the coefficient reflecting the positive shocks in M2 is positive and significant which is then reversed after 2 lags. Whereas, coefficient revealing the negative shock in the M2 is positive and insignificant creating no change in the equity returns. Additionally, results of asymmetric shocks of M2 on equity returns are insignificant in the Nigeria, Egypt and Philippines. Hence based on the discussion, it is demonstrated that stock returns of N-11 equity markets have an asymmetric relationship with the M2, oil prices and EPU in the short-run and these results are aligned with the findings of Chang and Rajput (2018).

Table 4.31: Asymmetric Impact of M2, OP and EPU on N-11 Equity Returns in Short Run

	PK	**BD**	**ID**	**TR**	**VNM**	**KR**	**MX**	**NG**	**EG**	**PHL**
Var										
D(LN_EM(-1))	-0.011	-0.057		-0.134	0.276***	-0.031	-0.192***	0.026	0.122	
	(0.077)	(0.060)		(0.088)	(0.063)	(0.080)	(0.064)	(0.092)	(0.080)	
D(LN_EM(-2))	-0.137	-0.118				0.035		0.029		
	(0.075)	(0.070)				(0.064)		(0.057)		
D(LN_EM(-3))						0.177***		0.196**		
						(0.075)		(0.087)		
D(LN_M2_POS)	0.614**	1.321***	0.031	0.006	1.021***	-0.075	0.870***	0.057	0.060	-0.182
	(0.307)	(0.328)	(0.131)	(0.004)	(0.203)	(0.343)	(0.277)	(0.082)	(0.271)	(0.106)
D(LN_M2_POS(-1))		-0.820		0.007**			1.053***			
		(0.595)		(0.003)			(0.363)			
D(LN_M2_POS(-2))		0.601		0.013***			-0.943***			
		(0.639)		(0.003)			(0.260)			
D(LN_M2_POS(-3))		0.989**								
		(0.468)								

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_M2_NEG)	-0.105	2.078**	0.469	0.744**	-0.186***	0.089	-0.471	-0.161	5.348	-0.057
	(0.298)	(0.936)	(0.361)	(0.350)	(0.029)	(1.996)	(0.382)	(0.156)	(2.960)	(0.132)
D(LN_M2_NEG(-1))	-0.033	2.930***	-0.757**							
	(0.375)	(1.170)	(0.338)							
D(LN_M2_NEG(-2))	0.592**									
	(0.298)									
D(LN_OP_POS)	0.150	0.148	0.008	0.041	0.091***	-0.027	-0.015	-0.089**	0.185	-0.085***
	(0.110)	(0.108)	(0.024)	(0.029)	(0.028)	(0.020)	(0.020)	(0.044)	(0.115)	(0.031)
D(LN_OP_POS(-1))		0.226								
		(0.124)								
D(LN_OP_POS(-2))		-0.232***								
		(0.099)								
D(LN_OP_NEG)	0.251***	0.053	0.138***	0.181***	0.277***	-0.075**	0.223***	0.178	0.040	0.053
	(0.066)	(0.046)	(0.047)	(0.063)	(0.077)	(0.033)	(0.033)	(0.117)	(0.030)	(0.074)
D(LN_OP_NEG(-1))	-0.283***	-0.052			-0.185***					
	(0.102)	(0.059)			(0.060)					
D(LN_OP_NEG(-2))	0.220***	0.005								
	(0.074)	(0.068)								
D(LN_OP_NEG(-3))		0.171***								
		(0.062)								

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_XR)	0.138	1.499***	-0.747***	-0.855***	-1.296***	-0.220	0.406***	0.777	0.070	-0.108
	(0.168)	(0.555)	(0.210)	(0.217)	(0.483)	(0.124)	(0.147)	(0.662)	(0.112)	(0.112)
D(LN_XR(-1))		-1.182	0.345	0.470***			0.588***	2.877***	0.347***	
		(0.867)	(0.258)	(0.188)			(0.218)	(1.119)	(0.087)	
D(LN_XR(-2))		1.228**	-0.431***	-0.363***			-0.587**	0.297	-0.565***	
		(0.594)	(0.150)	(0.136)			(0.272)	(0.983)	(0.139)	
D(LN_XR(-3))		1.040					0.259	-1.345		
		(0.635)					(0.151)	(0.940)		
D(LN_IR)	-0.092	0.019	-0.068**	-0.002	0.047	-0.002	-0.048***	-0.012	-0.160***	0.001
	(0.100)	(0.012)	(0.030)	(0.028)	(0.031)	(0.006)	(0.013)	(0.009)	(0.058)	(0.004)
D(LN_IR(-1))	-0.263**	0.045								0.010***
	(0.136)	(0.016)								(0.004)
D(LN_IR(-2))	0.192									
	(0.134)									
D(LN_IR(-3))	-0.196**									
	(0.091)									
D(LN_IPI)	1.121**	-0.487	-0.388***	-0.080	1.073***	0.518**	0.272	0.107	-0.448	0.420
	(0.533)	(0.491)	(0.154)	(0.176)	(0.250)	(0.230)	(0.144)	(0.074)	(0.385)	(0.556)
D(LN_IPI(-1))		-0.981								
		(0.537)								

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_EPU_POS)	0.006	0.029	-0.031	-0.065**	-0.090***	-0.046	-0.026	-0.047	-0.086**	-0.030
	(0.039)	(0.038)	(0.030)	(0.030)	(0.032)	(0.054)	(0.016)	(0.026)	(0.044)	(0.022)
D(LN_EPU_POS(-1))	0.084**	0.034	-0.105***							
	(0.041)	(0.040)	(0.040)							
D(LN_EPU_POS(-2))		-0.019	0.090***							
		(0.049)	(0.032)							
D(LN_EPU_POS(-3))		0.079**								
		(0.040)								
D(LN_EPU_NEG)	-0.040	-0.001	-0.027	0.015	-0.025	0.025	-0.004	0.052	0.023	0.057
	(0.039)	(0.031)	(0.038)	(0.045)	(0.036)	(0.020)	(0.020)	(0.032)	(0.060)	(0.038)
D(LN_EPU_NEG(-1))			0.100**	0.069						
			(0.047)	(0.062)						
D(LN_EPU_NEG(-2))			-0.086***	0.003						
			(0.035)	(0.058)						
D(LN_EPU_NEG(-3))				0.078						
				(0.051)						

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_CPI)	-2.546	0.606	1.948	0.385***	-1.607***	5.363	0.366	0.792**	3.671***	1.003***
	(1.357)	(2.696)	(1.671)	(0.131)	(0.310)	(4.099)	(0.409)	(0.357)	(1.215)	(0.410)
D(LN_CPI(-1))	2.325	-18.781***	3.970						3.757***	
	(1.250)	(6.947)	(2.332)						(1.494)	
D(LN_CPI(-2))		7.589***	2.679							
		(3.008)	(2.331)							
D(LN_CPI(-3))			-4.630***							
			(1.471)							
Dummy	-0.011	-0.071***	-0.008	-0.085	-0.008	-0.001		-0.051	-0.100***	0.026
	(0.023)	(0.025)	(0.012)	(0.034)	(0.037)	(0.011)		(0.031)	(0.034)	(0.027)
CointEq(-1)	-0.101**	-0.099***	-0.136***	-0.201***	-0.327***	-0.189***	-0.124***	-0.069***	-0.267***	-0.009
	(0.048)	(0.033)	(0.050)	(0.046)	(0.048)	(0.063)	(0.028)	(0.027)	(0.056)	(0.036)

***1% significance level, **5% significance Level

Table 4.32 shows the long run asymmetric impacts of broad money, oil prices and EPU on the N-11 equity markets. In Pakistan, Indonesia, South Korea, Mexico and Philippines, both coefficients representing positive and negative shocks in the broad money, oil prices and EPU are insignificant. It means no asymmetric relationship is present amid variables in the long run and impact on equity markets of such countries is inconclusive in the long-term. In Bangladesh and Turkey, the coefficient showing positive change in EPU is negative and significant while coefficient representing negative shock is positive and insignificant. In Bangladesh, the coefficient showing positive shock in M2 is positive and insignificant whereas, the coefficient showing negative change in M2 is also positive but significant. Further, the coefficient linked to positive shocks in oil prices is insignificant and negative, while the coefficient depicting negative change in OP is positive and significant. Hence, it can be demonstrated that in Bangladesh, a non-linear association exists among variables in the long-run. In Turkey and Egypt, both coefficients representing positive and negative shocks in the broad money, and oil prices are insignificant indicating absence of asymmetric link between variables. In Vietnam, both coefficients representing positive and negative shocks in the broad money, and oil prices are significant and positive. While, the coefficient showing positive change in EPU is negative and significant but the coefficient representing negative shock is positive and insignificant. Thus, this unequal magnitude reveals presence of long-term asymmetric relationship amid variables of interest in the Vietnam. In Nigeria, only coefficient representing positive shocks in EPU is significant and negative however, the asymmetric connection of Nigerian stock market with M2 and OP is inconclusive in the long-term. In Egypt, the coefficient showing positive change in EPU is negative and significant while coefficient representing negative shock is positive and significant. Hence, it can be concluded from the above discussion that increase in uncertainty creates negative influence on the equity markets in the long-run and these results are in accordance with Batabyal and Killins (2021).

Table 4.32: Asymmetric Impact of M2, OP and EPU on N-11 Equity Markets in Long Run

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
Var										
LN_M2_POS	0.573	1.958	0.229	-0.032	3.122***	-0.397	0.356	0.833	0.223	-19.221
	(1.792)	(2.085)	(0.990)	(0.021)	(0.315)	(1.881)	(1.307)	(1.101)	(0.990)	(76.113)
LN_M2_NEG	-5.189	-13.512**	0.440	3.704**	0.131***	0.471	-3.787	-2.340	19.995	-6.014
	(3.398)	(6.154)	(1.389)	(1.957)	(0.050)	(10.580)	(3.106)	(2.568)	(12.705)	(24.792)
LN_OP_POS	-0.242	-0.343	0.061	0.206	0.279***	-0.145	-0.124	-1.301	-0.100	-8.998
	(0.400)	(0.377)	(0.172)	(0.146)	(0.060)	(0.121)	(0.174)	(0.728)	(0.131)	(33.882)
LN_OP_NEG	0.876	-1.121**	0.223	-0.058	0.416***	-0.395	0.073	-0.172	0.150	-9.340
	(0.613)	(0.522)	(0.149)	(0.126)	(0.083)	(0.259)	(0.148)	(0.604)	(0.096)	(36.851)
LN_XR	1.373	-5.333	1.271	-0.074	0.069	-1.161	-1.139**	-0.378	0.989	-11.355
	(1.650)	(2.995)	(1.335)	(0.497)	(0.676)	(0.660)	(0.549)	(1.391)	(0.632)	(50.389)
LN_IR	-0.975	-0.202	-0.501***	-0.009	-0.002	-0.010	-0.385***	-0.173	-0.598***	-1.157
	(0.581)	(0.158)	(0.210)	(0.141)	(0.069)	(0.030)	(0.107)	(0.114)	(0.216)	(4.581)
LN_IPI	-0.891	-0.580	-2.853***	-0.400	3.282***	2.736***	2.185	1.565	-1.674	44.222
	(2.113)	(1.548)	(1.132)	(0.921)	(0.554)	(0.949)	(1.190)	(1.053)	(1.427)	(186.474)
LN_EPU_POS	-0.220	-0.757**	-0.222	-0.322**	-0.277***	0.081	-0.207	-0.688**	-0.321**	-3.194
	(0.241)	(0.382)	(0.131)	(0.146)	(0.093)	(0.112)	(0.119)	(0.323)	(0.137)	(12.804)
LN_EPU_NEG	-0.395	-0.008	-0.212	-0.251**	-0.076	0.132	-0.031	0.753	-0.307***	-3.576
	(0.327)	(0.310)	(0.152)	(0.133)	(0.113)	(0.123)	(0.163)	(0.604)	(0.128)	(13.763)
LN_CPI	-0.952	0.627	0.735	1.914***	-4.914***	0.342	2.942	11.538**	1.654	105.695
	(1.518)	(6.724)	(2.300)	(0.561)	(0.481)	(4.461)	(3.476)	(5.807)	(0.908)	(411.031)
D1	-0.111	-0.717***	-0.060	-0.424***	-0.025	-0.006		-0.744	-0.373***	2.785
	(0.227)	(0.277)	(0.092)	(0.141)	(0.111)	(0.060)		(0.479)	(0.112)	(12.102)
C	11.378	28.885	7.176	0.082	9.787	1.307	-6.832	-41.568	9.154	-599.543
	(8.363)	(27.578)	(8.425)	(5.550)	(5.367)	(15.149)	(15.597)	(26.963)	(5.973)	(2378.858)

***1% significance level, **5% significance Level

4.9.2 Asymmetric Impact of IR and XR on N-11 EM

Table 4.33 shows the short run asymmetric impacts of interest rate and exchange rate on the stock returns of N-11 countries. The results of Pakistan demonstrate that the coefficient reflecting the positive shocks in XR is positive and significant that reversed in lag 1 indicating that 1 percent appreciation in PKR will lead to 3.08% drop in the returns of KSE index after a month. Similar situation is seen in case of South Korea. Contrarily, the coefficient reflecting the negative shocks in XR is positive and insignificant depicting no impact of currency depreciation on the equity returns Pakistan, Bangladesh Vietnam South Korea and Philippines. Further, the coefficient associated with the positive shock in the IR is statistically insignificant and negative showing no impact of 1 percent increase in interest rate on the stock returns of KSE index and Dhaka stock index in the short-term. Similar results are reported in case of Indonesia Turkey Vietnam and South Korea. However, the coefficient associated with the negative shock in the IR is statistically significant and positive after one period and the same scenario is seen in case of Bangladesh but it's after 3 months and in Turkey, Vietnam and South Korea it's after 2 lags. In terms of Indonesia, the coefficient associated with the positive shock in XR is negative and significant that shows 1 percent currency appreciation will lead to 0.81% decrease in the stock returns. In contrary, the coefficient associated with the negative shock in XR is positive and significant after 2 lags. It means that 1% depreciation in the Indonesian Rupiah will increase the equity returns by 0.66% after 2 months. Results of Turkey show that coefficient representing positive change in XR is negative and significant after 2 periods while coefficient reporting a negative change in XR is positive and significant indicating an immediate impact of depreciation on the equity returns of BIST index in the short-term. In Mexican context, the coefficient reflecting the positive shocks in the XR is negative and significant causing 0.21% decrease in the stock returns due to 1% appreciation in the Mexican Peso. On the other hand, the coefficient reflecting the negative shocks in the XR is negative and significant for one month which then reversed into insignificant impact after 3 months. In Mexico, the coefficient representing positive changes in IR is negative and significant after 2 lags. While, the coefficient representing negative changes in IR is positive and significant indicating that 1%

decrease in IR will lead to 0.11% increase in the stock returns of S&P index in the short-term. In Nigeria, the coefficient representing positive changes in XR is positive and significant whereas the coefficient representing negative changes in XR is also positive and significant after 3 months. The coefficient representing positive changes in IR is negative and significant after 3 lags while the coefficient representing negative changes in IR is positive and significant. In Egypt, the coefficient representing positive changes in XR is positive and insignificant creating no impact of currency appreciation on the stock returns whereas, 1 % depreciation in Egyptian Pound significantly effects stock returns of EGX-30 index and cause a decline of 0.52% in the returns. Moreover, the coefficient representing positive changes in IR is negative and significant while the coefficient capturing negative changes in IR is positive and insignificant. Lastly in Philippines, the coefficient representing positive changes in IR is negative and significant while the coefficient representing negative changes in IR is also negative and significant that remain persistent even after 2 months. Hence based on the discussion, it is demonstrated that stock returns of N-11 equity markets have an asymmetric relationship with the XR and IR in the short-run and the results are in line with the findings of Chang and Rajput (2018); Hashmi and Chang (2023).

Table 4.33: Asymmetric Impact of XR and IR on N-11 Equity Returns in Short Run

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
Var										
D(LN_EM(-1))				-0.158	0.246***	-0.103	-0.199***	-0.012	0.129**	
				(0.083)	(0.071)	(0.089)	(0.068)	(0.082)	(0.063)	
D(LN_EM(-2))						0.118		0.008		
						(0.103)		(0.059)		
D(LN_EM(-3))						0.194***		0.199**		
						(0.065)		(0.095)		
D(LN_M2)	0.342	1.516***	0.237	0.002	-0.225***	0.138	0.369**	-0.093	-0.008	0.003
	(0.196)	(0.295)	(0.255)	(0.003)	(0.057)	(0.148)	(0.159)	(0.062)	(0.131)	(0.115)
D(LN_M2(-1))			-0.272	-0.005	-0.803***		0.693***			
			(0.243)	(0.003)	(0.257)		(0.271)			
D(LN_M2(-2))				0.021***			-0.732***			
				(0.003)			(0.252)			
D(LN_OP)	0.170***	0.091***	0.111***	0.192***	0.182**	0.010	0.137***	0.088	0.016	0.017
	(0.057)	(0.028)	(0.037)	(0.048)	(0.081)	(0.038)	(0.026)	(0.067)	(0.022)	(0.035)
D(LN_OP(-1))	-0.177**				-0.098		-0.050			
	(0.079)				(0.062)		(0.040)			
D(LN_OP(-2))	0.132**									
	(0.058)									

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_XR_POS)	3.165**	1.040	-0.809***	-0.491	-1.106	-0.765**	-0.210***	1.813**	0.141	-0.383
	(1.465)	(0.585)	(0.292)	(0.288)	(0.660)	(0.339)	(0.085)	(0.790)	(0.108)	(0.197)
D(LN_XR_POS(-1))	-3.083***	-2.893***		0.511**		0.546**				
	(1.095)	(0.820)		(0.258)		(0.243)				
D(LN_XR_POS(-2))		2.330***		-0.430**						
		(0.636)		(0.185)						
D(LN_XR_NEG)	-0.023	2.582	-0.496	-1.348***	-1.802	0.527	0.830***	0.068	0.522**	0.031
	(0.129)	(1.627)	(0.381)	(0.422)	(2.578)	(0.385)	(0.224)	(1.112)	(0.232)	(0.253)
D(LN_XR_NEG(-1))			0.629				0.967***	4.492***		
			(0.427)				(0.298)	(1.330)		
D(LN_XR_NEG(-2))			-0.664***				-0.829	1.666		
			(0.243)				(0.442)	(1.115)		
D(LN_XR_NEG(-3))							0.250	-3.296***		
							(0.200)	(1.008)		
D(LN_IR_POS)	-0.056	-0.020	-0.168	-0.002	0.066	0.002	0.041	-0.043***	-0.231***	-0.019***
	(0.063)	(0.012)	(0.130)	(0.036)	(0.055)	(0.008)	(0.140)	(0.018)	(0.057)	(0.008)
D(LN_IR_POS(-1))							-0.049	0.013		
							(0.186)	(0.018)		
D(LN_IR_POS(-2))							-0.219	0.023		
							(0.116)	(0.015)		
D(LN_IR_POS(-3))								-0.045***		
								(0.013)		

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_IR_NEG)	-0.006	0.045**	-0.033	-0.079	0.044	0.051	-0.115***	-0.022***	-0.121	0.009***
	(0.155)	(0.020)	(0.027)	(0.102)	(0.044)	(0.031)	(0.030)	(0.008)	(0.081)	(0.003)
D(LN_IR_NEG(-1))	-0.357**	0.108***		-0.176***	-0.009	0.076				0.030***
	(0.155)	(0.035)		(0.067)	(0.048)	(0.049)				(0.008)
D(LN_IR_NEG(-2))		-0.001		0.234***	0.101***	-0.091***				
		(0.031)		(0.054)	(0.041)	(0.030)				
D(LN_IR_NEG(-3))		-0.047**								
		(0.021)								
D(LN_IPI)	0.793	-0.416	-0.409***	-1.254**	0.406**	0.183	-0.896	-0.035	2.227	0.467
	(0.531)	(0.447)	(0.146)	(0.651)	(0.182)	(0.216)	(0.525)	(0.063)	(1.984)	(0.500)
D(LN_IPI(-1))		-1.063***		0.502						
		(0.375)		(0.871)						
D(LN_IPI(-2))				1.079						
				(0.646)						

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_EPU)	-0.027	0.005	-0.032	-0.039	-0.051	-0.002	0.000	-0.002	-0.064	-0.012
	(0.029)	(0.017)	(0.020)	(0.026)	(0.032)	(0.020)	(0.016)	(0.026)	(0.037)	(0.021)
D(LN_EPU(-1))	0.073									
	(0.040)									
D(LN_CPI)	-2.532	6.162**	2.065**	0.195	-0.798***	5.232	0.034	-3.952***	0.796	0.953
	(1.694)	(2.774)	(0.974)	(0.506)	(0.276)	(4.895)	(0.394)	(1.457)	(1.380)	(1.169)
D(LN_CPI(-1))		-14.429**	4.324***	1.786***		-1.292			2.574	-0.007
		(7.022)	(1.070)	(0.523)		(7.491)			(1.445)	(1.872)
D(LN_CPI(-2))		11.637***	2.568			8.625				-2.964***
		(3.205)	(1.523)			(5.344)				(1.101)
D(LN_CPI(-3))		-4.365**	-4.422***							
		(1.936)	(1.076)							
Dummy	0.001	-0.015	0.002	0.021	-0.017	0.022		-0.021	-0.088***	0.027
	(0.025)	(0.015)	(0.010)	(0.024)	(0.018)	(0.017)		(0.033)	(0.035)	(0.022)
CointEq(-1)	-0.075**	-0.052**	-0.127**	-0.140***	-0.198***	-0.231***	-0.093***	-0.044	-0.214***	-0.034
	(0.037)	(0.026)	(0.061)	(0.040)	(0.046)	(0.056)	(0.029)	(0.025)	(0.041)	(0.039)

***1% significance level, **5% significance Level

Table 4.34 shows the long run asymmetric impacts of IR and XR on the N-11 equity markets. In Pakistan, Bangladesh, Indonesia, Turkey, Vietnam, Nigeria and Philippines, both coefficients representing positive and negative shocks in the XR and IR are insignificant. It means no asymmetric relationship exists amid variables in the long-run and impact on equity markets of such countries is inconclusive in the long-term. Similar findings are reported by Yacouba et al. (2019). In South Korea, both coefficients showing positive and negative shocks in IR is insignificant whereas, only the coefficient revealing a negative shock in the exchange rate is significant and positive indicating a substantial impact of depreciation of South Korean won on the equity market in the long-run. In Mexico, the coefficient showing a positive shock on the exchange rate is negative and significant whereas the coefficient showing a negative shock on the exchange rate is positive and insignificant. It means currency appreciation substantially influences the Mexican stock market but depreciation in Mexican Peso poses no effect on the equity market in the long-run. Additionally, only the coefficient depicting a negative shock in the interest rate is positive and significant indicating a presence of long-term asymmetric connection between variables. In Nigeria, the coefficient showing positive change in IR is negative and significant while the coefficient showing negative change in XR is also negative and significant. It shows an asymmetric relation exists amid variables in the long-run.

Table 4.34: Asymmetric Impact of XR and IR on N-11 Equity Markets in Long Run

	PK	**BD**	**ID**	**TR**	**VNM**	**KR**	**MX**	**NG**	**EG**	**PHL**
Var										
LN_M2	-0.687	5.162	0.020	-0.062**	1.577***	0.598	-1.645	-2.136	-0.038	0.091
	(2.006)	(3.149)	(0.854)	(0.033)	(0.311)	(0.606)	(1.691)	(2.142)	(0.608)	(3.355)
LN_OP	0.274	0.081	0.125	0.165	0.289***	-0.315***	0.213	-0.824	0.077	-1.527
	(0.540)	(0.331)	(0.120)	(0.152)	(0.106)	(0.109)	(0.171)	(0.934)	(0.104)	(2.165)
LN_XR_POS	2.795	2.924	0.277	0.233	0.995	-0.554	-2.258***	5.545	0.659	-11.230
	(4.486)	(4.299)	(1.109)	(0.679)	(1.516)	(0.594)	(0.929)	(9.237)	(0.513)	(17.051)
LN_XR_NEG	-0.305	-11.272	1.154	1.206	-9.125	-1.512***	-1.163	-6.559	2.436**	0.907
	(1.713)	(12.046)	(1.242)	(0.751)	(12.831)	(0.459)	(1.187)	(12.172)	(1.076)	(7.922)
LN_IR_POS	-0.751	-0.383	-0.320	-0.017	-0.230	0.008	0.196	0.104	-1.076***	-0.556
	(0.861)	(0.321)	(0.256)	(0.255)	(0.204)	(0.036)	(0.315)	(0.303)	(0.216)	(0.615)
LN_IR_NEG	-0.546	-0.472	-0.264	-0.253	-0.169	0.065	-1.241***	-0.495	-0.565	-0.499
	(0.752)	(0.378)	(0.215)	(0.256)	(0.165)	(0.045)	(0.436)	(0.311)	(0.377)	(0.507)
LN_IPI	-0.461	0.116	-3.230**	-4.479**	2.053***	0.790	1.548	-0.802	-0.728	13.677
	(1.894)	(2.388)	(1.592)	(1.963)	(0.742)	(0.926)	(1.548)	(1.594)	(1.417)	(16.185)
LN_EPU	-0.301	0.093	-0.254	-0.282	-0.257	-0.011	0.000	-0.055	-0.297**	-0.338
	(0.269)	(0.312)	(0.178)	(0.197)	(0.147)	(0.084)	(0.174)	(0.581)	(0.151)	(0.824)
LN_CPI	1.486	-13.580	1.588	2.399***	-4.042***	-2.617	0.368	-4.689	2.050**	32.435
	(1.760)	(8.016)	(1.980)	(0.919)	(0.882)	(2.183)	(4.252)	(7.356)	(0.987)	(48.027)
D1	0.014	-0.287	0.013	0.151	-0.088	0.095		-0.485	-0.413***	0.783
	(0.337)	(0.321)	(0.078)	(0.184)	(0.085)	(0.067)		(0.760)	(0.141)	(1.248)
C	12.413	10.731	16.187	17.926	-8.036	8.072	36.372	68.452	5.215	-188.414
	(18.637)	(17.407)	(15.981)	(10.359)	(5.534)	(12.952)	(28.866)	(61.218)	(11.439)	(277.031)

***1% significance level, **5% significance Level

4.9.3 Asymmetric Impact of IPI and CPI on N-11 EM

Table 4.35 shows the short run asymmetric impacts of CPI and IPI on the stock returns of N-11 countries. The results of Pakistan demonstrate that the coefficient reflecting the positive shocks in IPI is positive and significant after 2 lags. The coefficient associated with the negative shock in IPI is also positive and insignificant creating no influence of industrial growth on the equity returns of KSE index. Additionally, the coefficient associated with the positive shock in CPI is positive and significant depicting that 1 percent escalation in inflation will lead to 0.68% increase in the stock returns of Pakistan stock market. In contrary, the coefficient associated with the negative shock in CPI is negative and significant after a period showing 4.92% decline in the stock returns due to 1% fall in the inflation. In Bangladesh, the coefficient associated with the positive shock in IPI is negative and significant after 2 lags whereas, the coefficient associated with the negative shock in IPI is also positive and insignificant as reported in the case of Pakistan. The coefficient reflecting the positive shocks in CPI is positive and significant after 2 lags while, drop in inflation is significant and will decrease the stock returns by 27.39% in the short-term. In Indonesia, the coefficient reflecting the positive shocks in IPI is positive and significant whereas the coefficient capturing the negative shocks in IPI is negative and significant after one month. It means 1 percent reduction in the industrial growth will cause a decline of 1.44% in the stock returns of Indonesian stock market. Further, the coefficient showing the positive shocks in CPI is positive and significant that then reversed after 3 lags. It means initially at the current month, 1 percent rise in inflation will increase the stock returns by 6.61% but after 3 months 1% increase in inflation will cause a substantial decline in the stock returns by 4.57%. The coefficient reflecting the negative shocks in CPI is positive and significant. In context of Turkey, the coefficient reflecting the positive shocks in IPI is negative and insignificant whereas the coefficient capturing the negative shocks in IPI is also negative and significant after one month. The coefficient depicting positive changes in CPI is significant and positive after 1 lag but this relationship is insignificant when inflation is decreased causing no influence on the ER of BIST index. In Vietnam, the coefficient capturing the positive shocks in IPI is negative and insignificant whereas the coefficient capturing

the negative shocks in IPI is also negative and significant. The coefficient depicting positive changes in CPI is significant and negative after 1 lag however, drop in inflation has insignificant impact on the stock returns. In South Korea, the coefficient depicting positive changes in IPI is insignificant and positive whereas, the coefficient presenting negative changes in IPI is significant and negative after 3 lags. The coefficient showing positive changes in CPI is insignificant and negative, so rise in inflation poses no influence on the stock returns. Contrarily, fall in inflation will cause a 65% decline in the returns. In Mexico and Philippines, the results demonstrate insignificant impact of both positive and negative shocks in IPI and CPI on the stock returns in the short-term. Similarly, in Nigeria, increase or decrease in the industrial growth does not have any significant influence on the stock returns. The coefficient depicting negative changes in CPI is significant and positive after 1 lag but positive changes in CPI has no impact on the returns in the short-run. In Egypt, the coefficient reflecting the positive shocks in IPI is negative and significant after a month while the coefficient showing the negative shocks in IPI is also negative and significant after 2 periods. The coefficient showing positive changes in CPI is insignificant and positive; however, the coefficient showing negative changes in CPI is significant and positive indicating 8.73% increase in the equity returns due to 1% fall in inflation. Hence, based on the discussion, it is demonstrated that stock returns of N-11 equity markets have an asymmetric relationship with the IPI and CPI in the short-run and these findings are in accordance with Chang and Rajput (2018); Hashmi and Chang (2023).

Table 4.35: Asymmetric Impact of IPI and CPI on N-11 Equity Returns in Short Run

	PK	**BD**	**ID**	**TR**	**VNM**	**KR**	**MX**	**NG**	**EG**	**PHL**
Var										
D(LN_EM(-1))	-0.068				0.222***	-0.127	-0.205***	-0.010	0.094	
	(0.069)				(0.066)	(0.082)	(0.062)	(0.096)	(0.064)	
D(LN_EM(-2))	-0.156					-0.049		-0.008		
	(0.082)					(0.074)		(0.064)		
D(LN_EM(-3))	-0.144					0.117		0.198**		
	(0.076)					(0.070)		(0.091)		
D(LN_M2)	0.233	1.459***	-0.075	0.003	-0.182***	-1.268	0.521***	0.011	-0.156	-0.126
	(0.167)	(0.303)	(0.147)	(0.004)	(0.054)	(0.725)	(0.210)	(0.064)	(0.152)	(0.070)
D(LN_M2(-1))				0.002	-0.629***		0.852***			
				(0.002)	(0.234)		(0.267)			
D(LN_M2(-2))				0.015***			-0.614**			
				(0.003)			(0.269)			
D(LN_OP)	0.204***	0.088***	0.100***	0.139***	0.198***	-0.005	0.137***	0.120	0.050	0.004
	(0.049)	(0.026)	(0.034)	(0.046)	(0.074)	(0.037)	(0.025)	(0.082)	(0.027)	(0.035)
D(LN_OP(-1))	-0.152		-0.012		-0.112					
	(0.079)		(0.064)		(0.063)					
D(LN_OP(-2))	0.034		-0.066							
	(0.073)		(0.061)							
D(LN_OP(-3))	0.112***		0.079***							
	(0.044)		(0.028)							

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_XR)	-0.131	1.067**	-1.107***	-0.863***	-0.676	-0.237**	0.524***	1.097	0.299***	-0.019
	(0.112)	(0.496)	(0.158)	(0.186)	(0.644)	(0.110)	(0.150)	(0.637)	(0.078)	(0.114)
D(LN_XR(-1))		-2.199***	0.692***	0.611***			0.529**	3.185***		
		(0.621)	(0.158)	(0.213)			(0.247)	(1.162)		
D(LN_XR(-2))		1.736***	-0.527**	-0.391***			-0.500	0.325		
		(0.501)	(0.241)	(0.149)			(0.306)	(0.954)		
D(LN_XR(-3))			0.290				0.216	-1.337		
			(0.191)				(0.153)	(0.929)		
D(LN_IR)	-0.016	0.005	-0.106	-0.036	0.058	0.004	-0.049***	-0.028***	-0.224***	0.004
	(0.097)	(0.010)	(0.087)	(0.050)	(0.033)	(0.006)	(0.011)	(0.008)	(0.062)	(0.004)
D(LN_IR(-1))	-0.223	0.035***	-0.100***	-0.098***	-0.001					0.010***
	(0.153)	(0.014)	(0.039)	(0.033)	(0.033)					(0.003)
D(LN_IR(-2))	0.173			0.139***	0.059**					
	(0.114)			(0.034)	(0.030)					
D(LN_IR(-3))	-0.199**									
	(0.089)									
D(LN_IPI_POS)	0.627	0.239	-4.551***	-0.202	-0.319	0.586	-1.292	0.118	0.571	-0.006
	(0.782)	(0.402)	(0.641)	(0.222)	(0.483)	(0.372)	(0.825)	(0.210)	(2.847)	(0.800)
D(LN_IPI_POS(-1))	-0.869	-0.209	-2.186***						-9.089**	
	(0.579)	(0.643)	(0.682)						(4.372)	
D(LN_IPI_POS(-2))	1.813***	-1.053**								
	(0.457)	(0.507)								

	PK	BD	ID	TR	VNM	KR	MX	NG	EG	PHL
D(LN_IPI_NEG)	-0.131	-1.237	0.463	-1.478	1.531**	-0.302	0.225	-0.196	5.178**	0.089
	(0.212)	(0.882)	(0.382)	(0.808)	(0.738)	(2.789)	(0.256)	(0.228)	(2.534)	(0.524)
D(LN_IPI_NEG(-1))			1.448***	2.856***		-3.456			0.414	
			(0.388)	(0.836)		(2.041)			(1.888)	
D(LN_IPI_NEG(-2))						-6.321***			4.351***	
						(1.712)			(1.221)	
D(LN_IPI_NEG(-3))						4.459***				
						(1.550)				
D(LN_EPU)	-0.031	0.000	-0.054***	-0.048	-0.061**	-0.038	0.001	-0.011		-0.015
	(0.028)	(0.016)	(0.022)	(0.026)	(0.028)	(0.034)	(0.020)	(0.027)		(0.020)
D(LN_EPU(-1))	0.057			0.053						
	(0.037)			(0.034)						
D(LN_CPI_POS)	0.681***	0.612	6.612***	-1.697	0.730	-0.105	0.322	-0.102	0.110	0.648
	(0.167)	(2.733)	(1.479)	(1.873)	(0.543)	(0.380)	(0.270)	(0.167)	(0.178)	(0.341)
D(LN_CPI_POS(-1))		-22.648	8.002***	6.132***	-3.021***					
		(9.177)	(1.965)	(1.461)	(0.542)					
D(LN_CPI_POS(-2))		11.968***	3.912							
		(3.261)	(3.098)							
D(LN_CPI_POS(-3))			-4.578***							
			(1.866)							
D(LN_CPI_NEG)	-8.272***	27.358***	-4.800**	0.340	-9.025	17.596**	4.296	-15.001***	-8.731***	3.883
	(2.451)	(10.928)	(2.288)	(0.453)	(6.418)	(7.957)	(6.988)	(3.629)	(3.242)	(2.141)
D(LN_CPI_NEG(-1))	4.922***				4.982	65.005***		-12.784***		
	(1.236)				(5.041)	(13.026)		(4.214)		
Dummy	-0.048	-0.004	0.010	-0.081**	0.032	-0.005		-0.041	-0.143***	0.009
	(0.027)	(0.016)	(0.008)	(0.040)	(0.026)	(0.013)		(0.036)	(0.048)	(0.022)
CointEq(-1)	-0.067	-0.050	-0.202***	-0.172***	-0.183***	-0.203***	-0.093***	-0.051	-0.228***	-0.018
	(0.048)	(0.028)	(0.051)	(0.038)	(0.046)	(0.059)	(0.029)	(0.033)	(0.049)	(0.027)

***1% significance level, **5% significance Level

Table 4.36 shows the long run asymmetric impacts of IPI and CPI on the N-11 equity markets. In Pakistan, Bangladesh, Turkey, Mexico, Nigeria and Philippines, both coefficients representing positive and negative shocks in the CPI and IPI are insignificant. It means no asymmetric relationship exists amid variables in the long-run and impact on equity markets of such countries is inconclusive in the long-term. In Indonesia, the coefficient showing a positive shock in the IPI is negative and significant whereas the coefficient showing a negative shock on the IPI is positive and significant. Further, both coefficients showing positive and negative shocks in the CPI is positive and significant. In Vietnam, the coefficient depicting negative change in IPI is negative and significant while the coefficient demonstrating a positive change in CPI is negative and significant. It indicates presence of long-term asymmetric relationship between variables in the long-run. In South Korea, the coefficient depicting negative change in IPI is negative and significant while the coefficient demonstrating a negative change in CPI is positive and significant. In Egypt, only the coefficient showing the negative shocks in CPI is positive and significant however, asymmetric changes in IPI pose no influence on the Egyptian stock market in the long-term.

Table 4.36: Asymmetric Impact of IPI and CPI on N-11 Equity Markets in Long Run

PK		BD	ID	TR	VNM	KR	MX	NG	EG	PHL
Var										
LN_M2	-1.185	6.260	-0.372	-0.022	1.362***	0.348	-1.408	0.210	-0.683	-6.902
	(2.855)	(5.729)	(0.686)	(0.026)	(0.332)	(0.794)	(1.583)	(1.242)	(0.704)	(13.237)
LN_OP	0.082	-0.376	-0.047	-0.016	0.407***	-0.365**	0.017	-0.258	0.220	-3.435
	(0.560)	(0.525)	(0.070)	(0.149)	(0.121)	(0.183)	(0.217)	(0.554)	(0.096)	(5.064)
LN_XR	-1.958	6.685	-1.479***	-0.115	3.540	-1.172***	-1.705	-1.781	1.313***	-1.048
	(1.969)	(8.186)	(0.405)	(0.504)	(2.463)	(0.420)	(1.054)	(3.712)	(0.385)	(6.951)
LN_IR	0.609	-0.635	0.012	-0.134	-0.204	0.020	-0.527***	-0.171	-0.982***	-0.218
	(0.764)	(0.440)	(0.156)	(0.164)	(0.157)	(0.030)	(0.211)	(0.174)	(0.256)	(0.349)
LN_IPI_POS	-24.288	-1.125	-8.637***	-1.177	-1.740	2.893	1.778	2.310	1.466	-0.311
	(15.981)	(2.057)	(2.599)	(1.389)	(2.763)	(1.937)	(1.608)	(4.814)	(2.806)	(43.783)
LN_IPI_NEG	-1.944	16.051	-1.649**	-2.472	8.348**	5.407***	2.426	-3.834	1.243	4.868
	(3.900)	(13.872)	(0.743)	(1.705)	(4.111)	(2.034)	(3.264)	(5.872)	(2.737)	(23.967)
LN_EPU	-0.206	0.003	-0.265***	-0.291	-0.332***	-0.032	-0.262	-0.224	-0.379***	-0.829
	(0.404)	(0.319)	(0.074)	(0.155)	(0.140)	(0.103)	(0.190)	(0.449)	(0.129)	(1.780)
LN_CPI_POS	10.152	-9.518	3.574***	1.261	-2.512***	-0.520	3.476	-1.989	0.483	35.383
	(6.394)	(10.842)	(1.048)	(0.721)	(0.895)	(1.826)	(3.569)	(3.881)	(0.760)	(49.857)
LN_CPI_NEG	14.518	66.706	-23.714**	1.975	-12.711	-155.014***	46.369	52.912	- 38.319***	212.105
	(27.760)	(121.910)	(11.445)	(2.606)	(10.223)	(62.869)	(80.142)	(81.514)	(13.426)	(344.317)
D1	-0.712	-0.076	0.048	-0.474**	0.175	-0.024		-0.801	-0.629***	0.508
	(0.446)	(0.334)	(0.038)	(0.212)	(0.145)	(0.065)		(0.620)	(0.149)	(1.491)
C	30.142	-80.797	25.632***	7.722***	-46.096	12.359	50.742	17.342	18.559**	130.867
	(33.641)	(87.393)	(10.657)	(0.850)	(25.870)	(11.348)	(37.377)	(20.938)	(9.123)	(239.672)

***1% significance level, **5% significance Level

Chapter 5

Conclusion and Recommendations

5.1 Conclusion

The current research serves the purpose of exploring the asymmetric impact of macroeconomic factors on the ER of N-11 stock markets both in the short run and long run. Additionally, the moderating role of EPU is tested on the link between oil prices, interest rate and N-11 equity markets both in the short run and long run. The time span of this study is 17 years i.e. from January 2005 to December 2022. The macroeconomic variables explored in the research include broad money, oil prices, economic policy uncertainty, CPI, RXR, IPI, interest rate as well as equity index. Both ARDL and NARDL models are employed to explore the linear and asymmetric effect of macroeconomic variables on the stock returns of N-11 equity markets.

The results of ARDL model depict that no long-term relationship occurs between all variables of interest and the equity markets of Pakistan and Philippines. M2 has a significant long-term impact on the equity markets of Bangladesh, Vietnam and South Korea. Whereas, in the short run M2 has statistically significant relationship with the equity returns of Bangladesh, Turkey, Vietnam and Mexico's stock indices. CPI has a statistically long-term negative impact on the equity markets of Bangladesh, Turkey and Vietnam while having a significant impact on

the stock returns of Pakistan, Indonesia, Turkey, Vietnam, Nigeria, Egypt and Philippines's equity indices in the short run. Similarly, EPU possess significant and negative influence on the equity markets of Indonesia, Turkey, Vietnam and Egypt. Only in Vietnam's equity market, oil prices hold significant positive impact in the long-run. However, oil prices have a statistically significant impact on equity returns of Pakistan, Bangladesh, Indonesia, Turkey, South Korea and Mexico in the short-run. Further, nominal interest rate has a significant impact on the stock markets of Mexico and Egypt. Exchange rate possess significant and negative relationship with the South Korean equity market while significant and positive relationship with the Egyptian stock market. Lastly, IPI holds significant impact on the equity markets of Indonesia, Vietnam and South Korea.

Moreover, the moderating role of EPU is investigated on the link between interest rate and equity returns of N-11 stock markets. IR has a statistically significant impact on the equity returns of Bangladesh, Turkey, South Korea, Egypt and Philippines. However, presence of EPU as moderator has weakened this relationship in the short-run. IR has statistically significant and negative impact on the equity returns of Indonesia and this effect is further strengthened as the interaction term is also negative and significant. In case of Pakistan, Vietnam, Mexico and Nigeria, the results are insignificant which means EPU does not play a moderating role between IR and equity returns in the short-run and hence, no relationship exist. IR has a statistical significant effect on stock markets of Bangladesh, Turkey, South Korea and Egypt but this effect is weakened due to moderating effect of EPU indicating that fluctuations in IR and uncertainty in economic policy independently influences the stock prices in the long-run. Furthermore, the moderating role of EPU on the relationship between oil prices and equity returns of N-11 stock markets is insignificant in the long-run revealing that stock prices are not influenced by increase or decrease in economic uncertainty along with subsequent fluctuations in the oil prices. However, in the short-run this effect is magnified in case of Pakistan but weakened in the equity markets of South Korea, Mexico, Nigeria and Egypt.

In an asymmetric context, the M2 has only a short-term asymmetric influence on the stock returns of KSE and DSE. No long-term asymmetric relationship is discovered amid M2 and N-11 equity markets except Vietnam as both coefficients

representing positive and negative shocks in the broad money prices of Vietnam's stock market are significant and positive.

Oil prices has only a short-term non-linear effect on the equity returns of DSE and VNI. However, no asymmetric impact of oil prices is reported on the stock returns of KSE, JSE, BIST, KOSPI, S&P, EGX-30 and PSEI in the short-term. The asymmetric connection among $N - 11$ stock markets and prices of oil is inconclusive in the long-term excluding Vietnam.

No asymmetric impact of EPU in the short term is discovered in Pakistan ,Bangladesh, Turkey, Vietnam, South Korea, Mexico, Nigeria, Egypt and Philippines as the coefficient capturing a negative change in the EPU is insignificant creating no impact on the stock returns. In the long-term, an asymmetric impact of EPU is revealed on the Egyptian equity market only.

A short-term asymmetric relationship exists between exchange rate and the equity returns of JSE, BIST and NSE. IR has a short-term asymmetric impact on the equity returns of S&P, NSE and PSEI. In Pakistan, Bangladesh, Indonesia, Turkey, Vietnam, South Korea, Mexico, Nigeria and Philippines, no long-term asymmetric impact of XR and IR is revealed on the equity markets of such countries. An asymmetric relation only exists amid IR, XR and Nigerian equity market in the long-run.

CPI possess a short-term non-linear effect on the equity returns of KSE, DSE and JSE. An asymmetric link among IPI and equity returns of JSE and EGX-30 exists in the short-term. In Pakistan, Bangladesh, Turkey, Mexico, Nigeria and Philippines, both coefficients representing positive and negative shocks in the CPI and IPI are insignificant depicting no asymmetric impact on equity markets of such countries in the long-term. In the long run, both IPI and CPI possess asymmetric significant influence only on the equity market of Indonesia.

5.2 Implications and Policy Recommendations

M2 has an asymmetric impact on equity market of Pakistan, Bangladesh and Vietnam. Hence, this coincides with the contraction and expansion of the money

supply. So, policymakers should be prudent while formulating monetary policy. In the short run, returns are higher due to the money supply growth rate. However, this effect is proven to be considerable if the money supply growth rate is negative. Thus, investors should be vigilant as the asymmetric impact of M2 is of different magnitude. As M2 has a short-term asymmetric impact on the equity returns of KSE and DSE, so the financial regulators in Pakistan and Bangladesh may adopt countercyclical monetary policies to stabilize the economy during short-term fluctuations in M2. In the face of a recession or economic downturn, policymakers might implement expansionary monetary measures to boost money supply, lower interest rates, and stimulate spending.

Oil prices has a long-term non-linear impact on equity market of Vietnam. Thus, investors should revisit their portfolio diversification strategies in response to oil price fluctuations. Financiers should incorporate risk management strategies into their investment decisions, considering the potential impact of oil price movements on different asset classes. This may involve hedging strategies or adjusting portfolio allocations. Regulatory authorities may need to monitor and regulate financial markets of Vietnam to ensure their stability during periods of heightened volatility as sharp increases in oil prices could contribute to inflationary pressures.

EPU moderates the relationship between interest rate and equity markets of Bangladesh, Turkey, South Korea and Egypt in the long-run. Also, EPU plays a moderating role on the link between prices of oil and equity markets of Pakistan, South Korea, Mexico, Nigeria and Egypt in the short run only. Thus, the risk professionals should keep an eye on the changing global scenario as it will influence the asset under management. Investors should adopt a dynamic asset allocation strategy that adjusts to changing macroeconomic environment.

CPI has a long-term non-linear relationship with the Indonesian equity market. Short-term stock returns are adversely affected by an increase in inflation. This pattern of behaviour holds for both rising and falling inflation growth rates. Hence, when making decisions, investors should be cognizant of the upward and downward trend of the inflation rate and simultaneously take into consideration the nonlinear context. Inflation can introduce additional uncertainties into financial

markets. Investors should incorporate risk management strategies, including diversification and hedging, to navigate market fluctuations associated with inflationary pressures.

IR and XR have a long-term non-linear relationship with the Nigerian equity market. While making decisions, investors should exercise vigilance when IR and XR increases or decreases and also take the asymmetric environment into account. Investors should be aware of the interest rate sensitivity as rising interest rates may negatively impact stock index.

5.3 Direction for Future Research

The asymmetric association indicates that extensive research in this particular domain needs to be conducted as the selected N-11 countries reports an asymmetric impact of macroeconomic factors on stock markets. Further, more indicators should be incorporated to generalize the results. Lastly, a comparative analysis needs to be conducted for frontier and developed economies to analyze the behaviour of macroeconomic indicators on the stock markets of such countries.

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