Investor Confidence, Macroeconomic Forces and the Performance of Stock Market- An Empirical Investigation of the Pakistan Stock Market

BY

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ABSTRACT

This study investigates investor confidence and the macroeconomic factors contributing to the Stock market performance in Pakistan during the period 1997- 2012. We find that: (1) Macro economic variables play an important role in explaining stock market performance in Pakistan. (2) The effects of macroeconomic variables on the stock market performance across different sectors, different firm sizes, and different risk portfolios are somewhat different. (3) Historical stock return volatility significantly influences the current stock market volatility; and historical volatility shocks drive volatility changes in all sectors of the stock market. (4) Investor sentiment exhibits explanatory power in capturing financial market anomalies such as the size, sector momentum effect and betas of the firm. Particularly, there is a positive association between investor confidence and stock returns, and the majority of variations in stock returns are explained by the investor sentiment index. (5) The sensitivities of the stock market performance are different across different industries. (6) The findings also indicate that risky portfolio returns are more sensitive to the investor confidence, and vice versa. (7) Similarly, the large firms are less sensitive, where small firms are highly sensitive to the investors' confidence. The findings let us to conclude that high risk firms and small firms are hard-to-arbitrage. Our findings facilitate policy-makers and practitioners to understand the importance of investor sentiment and take remedial measures to build confidence among investors.

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The beautiful struggle of life is more important than the destination.

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DEDICATION

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In the memory of my loving father

&

To my loving mother

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey–Fuller test
ARCH	Autoregressive Conditional Heteroskedasticity
DF	Dickey–Fuller
ESM	Emerging stock market
ESP	Economic Survey of Pakistan
EX	Exchange Rate
FDI	Foreign direct investment
FE	Fixed effect
GP	Gold price
IPI	Industrial Production Index
INF	Inflation
INT	Interest rates (discount rate)
IRF	Impulse Response Function
ISI	Investor Sentiment Index
KSE	Karachi stock exchange
M2	Money supply
OLS	Ordinary least squares
OP	International oil prices
Rt	Stock returns
RE	Random effect
SBP	State Bank of Pakistan
TB	T-Bill rate
VAR	Vector autoregressive
VECM	Vector error correction model

CHAPTER 1: INTRODUCTION

1.1: BACKGROUND

The stock market plays an important role in the mobilization of capital resources. It reallocates equity capital, channels them into investments and signals the investors where investments are fruitful and needed. In general, stock market serves as a medium for the allocation of equity capital resources. Since equity capital investment is an important determinant of the financial development, an efficient stock market is important for the economic growth and success.

Efficient Market Hypothesis (EMH) suggest that, in an efficient market, stock prices will reflect all available information about the firms so that investors can assure that the securities they buy for their portfolio are priced close to the true equilibrium. It is a fact that if the stock market is more organized and efficient, stock market attracts more investors; capital is more likely to be allocated and used effectively.

Generally, the stock market is extremely volatile for many financial and non-financial reasons. At the macro level, macroeconomic indicators such as money supply, exchange rate, GDP, interest rate, inflation, financial liberalization, industrial production index, monetary and fiscal policy, foreign direct investment, foreign reserves and international oil prices are major factors, which affect the stock market performance. EMH proposes that wealth-maximizing competition between investors in an efficient market can be ensured through stock markets working efficiency. In an efficient market, significant change in macroeconomic factors and firm-specific determinants is entirely reflected by the current stock prices, because investors are unable to earn the desired profit through future

stock market prophecy actions. The investors are unable to earn more than average returns regularly, except in instances involving inside information. In general, a well performing stock market assists economic development through escalating the liquidity of financial investment instruments. Furthermore, it diversifies investor global risk through key investment decisions and foreign portfolio attractions. The stock market is commonly recommended to save through hedge funds and provides financial tools for better risk preferences and liquidity needs (Leigh, 1997), as well as a risk sharing investment (Caporale, 2003).

Previous studies in the developed stock market (Geske and Roll 1983; Fama 1981, 1990; and Chen et al., 1986; among others) have demonstrated that the behaviour of stock returns has a dynamic relationship to economic activities. The performance of advanced stock markets is better than emerging stock markets because the latter suffers a great deal from bubble and speculation effects. In the last few decades, extensive studies have focused on examining the behaviour of stock returns in advanced markets and have neglected the emerging stock market. The understanding of operational efficiency and the excessive volatility of emerging stock markets (ESM) has become very important because many ESM are now integrated with the world's developed stock markets. If the efficiency of the stock market increases, both local and foreign investors make investment decisions by considering the true value of asset prices at all times. High volatility in the stock markets means that there is too much fluctuation in stock returns over a specific period of time. This measurement of risk links to the investors' investment decisions in the stock market (Alexander, 2007 and Taylor, 2007). Volatility may create a difficult environment for steady stock market functions and have a negative impact on the performance of the economy. Examples of such stock market volatilities are Black Monday in 1987, the Asian crisis in

1997 and the 2008 global crisis, which affected the domestic and the international economies. Investigating fluctuating stock market performance, hence, is very important for financial analysts, practitioners, and policymakers. Potential investors, financial analysts and policy makers are interested in the nature and pattern of volatility in financial assets for their investment and financial planning purposes. The emerging stock markets demonstrate higher volatility with respect to developed stock markets (Abugri, 2008) and volatility information provides indicators for investors whom the diversification of investment portfolios might be prudent.

Researchers have investigated the return-predictive power in the real economic context by employing various statistical techniques, mainly focused on stock market integration with the economy (Errunza, 1983 and Henry, 2000; among others). Quite a few existing studies in this area document that stock prices have a short and long-term association with macroeconomic and financial variables (Al-Majali & Al-Assaf, 2014, Mutuku & Ng'eny, 2014). Most of these studies focused on developed economies, among them USA, UK, etc. The empirical research on the emerging stock market, particularly Pakistan is very challenging and fruitful due to the following motives (1) academic scholars can obtain information regarding APT application with different conditions when fundamental principles do not exist (2) it provides information regarding the volatility of stock return to the practitioners and portfolio investors for capital investment decision making.

The Pakistani stock market is one of the world's leading emerging stock market because of its high growth rate and liquidity throughout in the last two decades. The KSE maintains record highs up to 10.34% a year to date (KSE, 2013). This consistency is largely due to government incentives provided to local and international investors with an improved regulatory framework and policies, and the worldwide strategic position of Pakistan of

assisting the country in securing an outbreak of financial support. These factors brought a remarkable revolution in the Pakistani stock market. According to the available information, no one has brought up the issue of the impact of the volatility of macroeconomic factors on the volatility of stock returns, short and long-term associations between the stock market, investor behaviour and real economic activity in Pakistan. This is a motivation for us to explore the long run and short-run relationship of macroeconomic forces with the movements of the Pakistan stock market during the period 1997-2012. We will discuss further the reasons why Pakistan market deserves a study in the following section 1.1.1, 1.1.2 and 1.3.

1.1.1: PROBLEM IN EMERGING STOCK MARKET

At the beginning of 1991, the stock returns of KSE unexpectedly increased as a result of the regulatory framework. However, by 1998 it was very low due to challenges created by sanctions and restrictions imposed following nuclear testing that year. These challenges included a freeze on foreign exchange accounts, political instability, a poorly structured Corporate Law Authority (CLA), poor reporting of accosting standards, fixed monetary policy and the high cost of borrowing. Following this time period, investors enjoyed a good return for their investment. This was followed by an equally unpredictable increase in 2007 and then an unexpected decline in 2009, due to persistent political instability, the war in Afghanistan, energy crises, etc. However, in 2010, the KSE Index was increased dramatically (see fig 1.1). These unexpected turns of events raise the following interesting questions:

1) What variables and conditions affected the stock market working efficiency and behaviour of investors at the beginning of 2008s when stock return of KSE was at its worst level in the history of KSE?

2) How was it possible that the temperamental bubble grew up to such extreme magnitude?

3) Are the sensitivities of the stock market performance to the macroeconomic conditions different across industries?

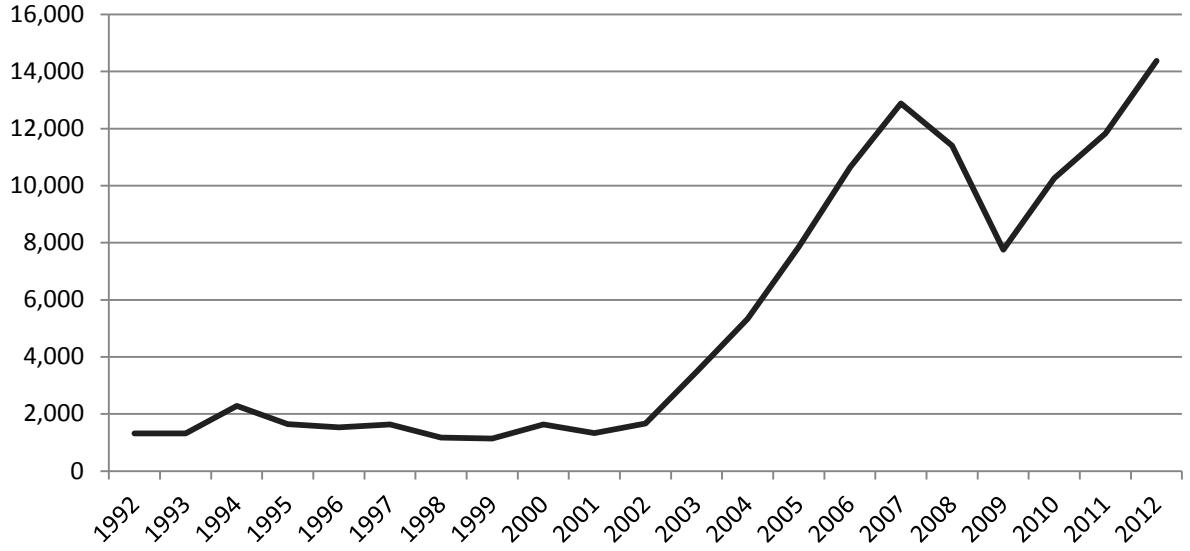
4) Are the impacts of macroeconomic factors on the stock market performance different according to the scales of the business?

5) Are the impacts of macroeconomic factors on the stock market performance across different risk portfolios?

6). How is a fluctuation in oil price important and what is the impact of oil price volatility on the performance of stock returns?

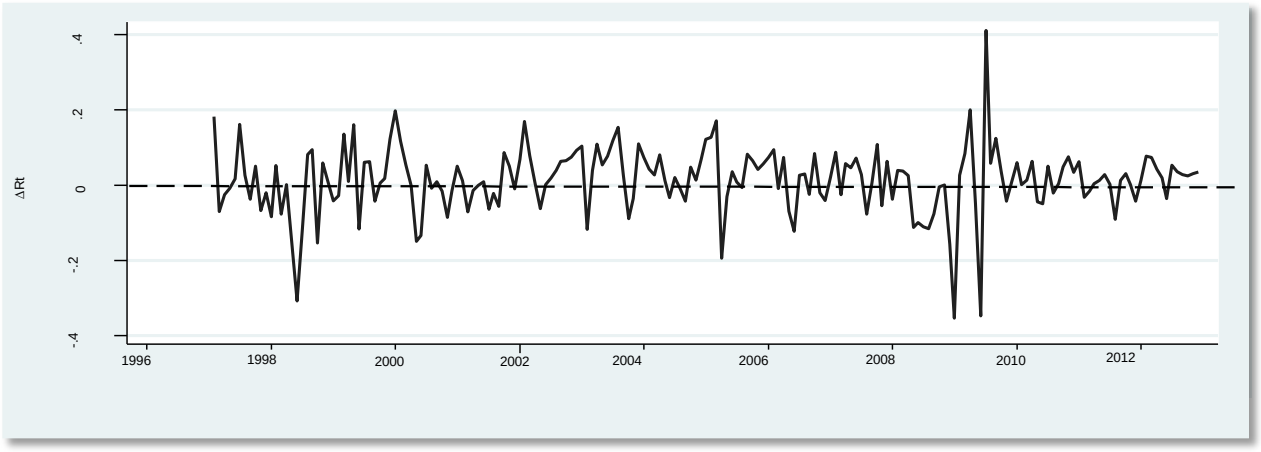
7) Does investor confidence play any role in explaining the pattern of the stock market behaviour?

Figure 1.1: The Performance of KSE 100 indexes over the time period (1992-2012)



(Source: KSE and Author)

Figure 1.2: The Performance of KSE 100 index over the time period (1992-2012)



(Source: KSE and Author)

1.1.2: RESEARCH GAP AND RATIONALE OF THE STUDY

It has been well-documented that stock prices are significantly influenced by economic factors in developed countries. For example, Ratanapakorn and Sharma (2007) document that the oscillation in stock prices frequently imitated true economic activities; Fama (1981) documented a strong association between industrial production index and stock returns; Chen et al., (1986) observed a powerful association of economic activities with stock market returns. Nishat et al., (2004) documented that the industrial production index has a strong positive effect on the returns of Pakistan's stock market; Ratanapakorn and Sharma (2007) hypothesised that industrial production has a long-standing relationship with stock prices, as did Humpe and Macmillan (2009) who, by using the co-integration technique, observed that industrial production had positively influenced stock returns. Similarly, Aggarwal (1981) documented a positive (significant) relationship between exchange rates and stock prices, while Soenen and Hennigan (1988) documented a negative association between exchange rates and stock prices.

The market volatility is associated with macroeconomic factors that are the consequence of the investor reaction to the change in the market. Behavioural finance has uncovered the reasons behind investors under-reaction and overreaction to the stock prices and questions how investors form their beliefs and how these beliefs change. Empirical evidence revealed that a large wave of investor sentiment would have a higher effect on securities whose valuations are highly subjective and difficult to arbitrage (Baker and Wurgler, 2006 and Dalika, 2012). While most of the literature of the relationship between stock market performance and macroeconomic variables focused on the developed market, emerging stock markets such as Pakistan, India, China, etc. received less attention. As to my knowledge, there are very few studies examine the relationship between macroeconomics

variable and market performance in Asian emerging markets. These include Ahmed, (2008), Zukarnain & Shamsuddin (2012), Büyükşalvarcı, (2010) (Ahmed (2002), Islam (2002), Hossain (2009) and Mahmood & Dinniah (2007)). These studies reveal that macroeconomic variables have a relationship with market performance. However, none of them focuses on the impact of investor sentiment on the stock performance at firm/industry/different portfolio levels.

Among emerging stock markets, Pakistan's stock market is Asia's third largest, with KSE declares to be the world's best stock market for three consecutive years from 2002-2004 (US newspaper, 2002 and 2004), but as many other emerging markets, this stock market is unpredictable due to their sensitivity to political disturbance, uncertain market condition, terrorist attacks, stock behaviour and insider's information (See figure 1). In addition, investors often herd, adds greater consequences to the problems.

The stock market efficiency and the behaviour of stock prices have long been an interesting area of exploration for the academics, investors and the government of Pakistan. The Government of Pakistan has progressively come to understand the importance of improving the operational efficiency of the stock market.

Recently, in Pakistan, a dramatic change in economic growth has been observed, created by increased stability and policy reforms. The Karachi Stock Exchange emerges as one of the world's leading stock markets and as an attraction for both international and local investors, regardless of political uncertainty and macroeconomic discrepancies. These developments accompany higher economic growth in the country.

However, there is not enough attention paid to the dynamic relationships between the stock market performance, investor confidence, and economic activity in Pakistan. This

could be an interesting reason for this study to provide a comprehensive examination of the relationship between investor confidence, key macroeconomic and industry variables and stock performance in Pakistan, and identify factors by which the industry can forecast the stock returns discrepancy among Pakistani companies.

This study will fill in the research gap and previous shortcomings in the literature through examining the causes of domestic and global factors on stock return volatility in Pakistan emerging stock market, and aim to answer to the following questions: (1) Are macroeconomic variables' volatility shocks transmitted in the Karachi stock market performance? if so, are these shocks persistent and their clusters present the arbitrage possibility? (2) Do these shocks of macroeconomics and international factors have any considerable asymmetric consequences on stock return volatility? (3) Does investor sentiment influence the performance market Pakistan stock market? Does this impact differ across the different (size/industry/ risk level) portfolios?

1.1.3: RESEARCH OBJECTIVES

As discussed above the main objective of this research is to provide a comprehensive investigation on the relationship between investor confidence, macroeconomic variables and stock performance across different sectors, firm scales and risk clusters in Karachi Stock Exchange. A thoroughly investigation on the stock market volatility is also very important for the reason that economic decisions depend on the perception that financial volatility has a tendency to affect the investor confidence and an investment flow away from the stock market (Schwert, 1989).

Our specific objectives includes;

- To examine the response of stock returns to fluctuations in economic indications, at company and industry level.
- To study the impact of macroeconomic variables on the stock returns through different (size, industry, risk) portfolio analysis to ascertain which major factors influence the degree of sensitivity.
- To examine whether a significant lead-lag (causal) association is present between macroeconomic variables and stock returns, and what is the direction of causality.
- To investigate whether the investors' sentiments provide explanatory power in capturing financial market anomalies such as the size, sector momentum effect and beta of the firm.

The following key research questions will be investigated in order to achieve the research objectives.

1) Do macroeconomic variable (Exchange rate, Industrial production, Money supply, FDI, Oil prices, Gold prices, Discount rate, T-Bill rate and inflation rate) affect the efficiency of stock market performance?

2) Does any lead-lag (causality) relationship exist between these variables? If so, how much and what is the causal direction?

3) Do past stock returns play an important role in stock movements?

4) Does macroeconomic volatility influence the stock-return volatility?

5) Does the investor sentiments influence the stock market performance in Pakistan? If yes, how the sensitivity levels differ across different industries, different firm and different firm risk?

1.1.4: FINDINGS, CONTRIBUTIONS AND BENEFICIARIES

There is a common point of view that not all investors are fully rational when making investment decisions. In addition, the market is not efficient and mispricing takes place when investors go through systematic unfairness and there are perimeters to arbitrage as a result of the risk-averse nature of arbitrageurs. Accordingly, there would be a significant effect of the noise traders on the stock market. It is a natural assumption that adding a behavioural factor to the asset pricing model might assist in describing the behaviour of stock prices. This study's findings and contribution lie in the fact that factors from the traditional financial theory, particularly in emerging stock markets, could face the risk of failing to fully explain the behaviour of the stock prices.

Empirical strategy and findings from our work;

(1) First, we divide our sample into a different portfolio according to size, industries, and risk level. We investigate the dynamic relationship between macroeconomic factors and the performance of different portfolio returns using various models, (cross sectional time series, fixed and random effects, and generalized method of movement). Overall portfolio results reveal that there is a positive (significant) association between the stock returns and macroeconomic factors; however, the effects of macroeconomic variables on the cross sectional returns are somewhat different.

(2) Second, we examine the causes of domestic and international factors on the stock return volatility in emerging stock market of Pakistan using ARCH (1)-GARCH(1,1) models. We find that the volatility of macroeconomic shocks are transmitted to the Karachi stock market and that these shocks have significant asymmetric effects on the stock return volatility, since it is linked with rate of information flow.

(3) We examined whether the investor sentiment (confidence) impacts on the stock returns in the Pakistani stock market. We find that investor sentiment exhibits explanatory power in capturing financial market anomalies such as the size, sector momentum effect and beta of the firm. The investor sentiments predict the returns of stock and have a tendency to revert to their mean during the sample period. In particular, we find that

(i) There is a positive association between investor confidence and stock returns, and the majority of variations in stock returns are explained by the investor sentiment index.

(ii) Similarly, there is a positive relationship between returns of size portfolios and investor confidence. The large firms are less sensitive, where small firms are highly sensitive to the investors' confidence, leading us to conclude that 'small firms are hard-to-arbitrage.

(iii) The findings also indicate that risky portfolio returns are more likely to be (positive) influenced by investor confidence.

Contributions

This study contributes to the existing literature in the following ways. It is the first study to examine the effect of investor sentiment on the market performance using a range of firm-level variables in Pakistan stock exchange. It provides a comprehensive investigation of the relationship between stock market returns and macroeconomic variables in an emerging market, particularly Pakistan. It provides up-to-date insights into the economic factors of one of the most dynamic markets, a market that plays a leading role in the region and which has experienced a rapid change in recent years. It also contributes to the knowledge of firms' managers, and investors, on optimal asset allocation and hedging strategies in an emerging market.

Beneficiaries

The above findings facilitate different beneficiaries to understand the importance of investor sentiment and take remedial measures to build confidence among investors.

Firstly, this study will benefit academia by adding an empirical contribution to the existing literature of the relationship between investor confidence, macroeconomic variables and the stock market performance in an emerging country, particularly Pakistan.

Secondly, this study will benefit Pakistani firm managers as it builds towards a better understanding on how external factors such as exchange rate exposure and other macroeconomic variables have impacts on market performance so that they can make their financial management decision accordingly.

Thirdly, this study will also benefit policy makers at the economy level. It provides a better understanding on how the stock market behaviour is linked to real economic growth and other economic indicators. Indeed, the policy makers can improve the rules and regulations to create better market conditions and forecast the direction of economic growth by using such type of information. In addition, the study is also important for other market regulators because they can formulate policies in a way to ensure that the investment and trading atmosphere is smooth for investors in the Pakistan.

Finally, this study will endow investors with better information on how the levels of sensitivity of stock returns are different across different industry, firm scale and risk type, so that they can make their investment accordingly.

1.2: EMERGING STOCK MARKET AND ECONOMIC GROWTH

The stock market is a major indicator of an economy and a vital part of a financial sector. It plays an important role in the mobilization of savings and channels them into fruitful investment. An efficient and well-functioning stock market provides better opportunities for investors as well as allocated investment efficiently. The exceptional growth of the stock market in the past decade has shifted the centre of attention in the recent literature towards the linkage between the economic growth and the stock market efficiency.

Levine and Zervos (1998) document a positive (significant) relationship between economic growth and the performance of the stock market in developed countries, but in emerging stock markets this relationship is more or less insignificant. Shahbaz et al., (2008) examine a dynamic long-running relationship between the development of the Pakistan stock market and economic growth using yearly data from 1971-2006. They confirm that the development of the stock market and economic growth has a long-term relationship, which signifies that the development of the stock market is imperative for economic growth.

According to Greenwood & Smith (1997), the cost of savings mobilization can be reduced through the stock market and investment facilitation. The stock market improves resource allocation and speeds up economic growth through global integration and risk diversification (Obstfeld, 1994). Demirgüç-Kunt & Maksimovic (2002) suggest that when the stock markets are immature, there is a capital accumulation and an increase in the cost of financing and in the economy of debt. As a consequence, stock market development escorts a relative enhancement of equity financing. In the same vein, Atje & Jovanovich (1993) conclude that stock market development tends to enhance the level of capital accumulation.

The major problems in emerging stock markets are the lack of capital resources and the weak mobilization of investment to purchase capital assets, which are essential for industrial

development. There are different points of view, however: economists are optimistic on the subject of the function of financial market in the economic development. An efficient stock market provides notable opportunities for domestic and foreign investors; the security market gathers household savings and invests them in financial assets by financial intermediaries. In summary, the stock market plays the following roles: (1) The stock market provides the stock liquidity and marketability to investors, and also facilitates the issuing of new securities to the public (2) The stock market mobilizes savings for investment purpose and provides a connection between borrowers and savers through a favourable environment. (3) The stock market facilitates the ownership of financial assets through decreasing the concentration of economic power. This occurs when shares are allocated countrywide, which ensures equal public participation of that desiring incorporation ownership. (4) The stock market can be utilized as a vehicle to mobilize foreign capital into the local market without any disturbance of economic activity. (5) The stock market can be used as a magnet to attract foreign investment to reduce shortages in capital and liquidity, which is very important for the developing countries (Abbott, 1985).

There are many internal and external factors that affect the stock market performance. The expectation is the most important manipulating factor in the financial markets. For example, if the interest rates are high, the demand for security and the supply of money will be increased with the expectation that in the future the interest rates will decline, and security prices will go up. Expectations of increased inflation could raise interest rates, with the result that the price of goods increases. Interest rates have effects on inflation and prevailing interest rates can be determined significantly through the level of spending. Another important factor affecting the financial market is fiscal policy, which decides how and where government deficits are financed, which in turn influences the supply and demand for cash balances.

According to Calamanti's (1983) argument, an efficient financial system, particularly in developing countries will accelerate smooth economic growth by reducing the cost of capital and by changing investor beliefs. The diversification in portfolio holding occurs when the financial asset range is accessible and changes the beliefs of investors in developing countries. Currently, it is common that the total wealth holdings and investment in a developing country should be allocated in the animals and/or the land which has no spill-over effects and is not very productive. Efficient capital markets facilitate the acquisition of new investments and risk reduction through diversification, which may increase the level of investments and improve the allocation of savings. The release of real resources to financial assets increases the production capacity within the economy through such resources being transformed into capital goods. An important argument is that when the capital market acts as a channel for direct investment funds, then do this efficiently the most productive investments. Increase volume of investment reduces the cost of funds significantly.

According to Reilly and Brown (2006), the well-functioning stock market has the following attributes: (1) it provides timely and true information regarding pricing and the volume of past transactions, (2) investors make transactions quickly if the price of an asset is close to the previous transaction price and a liquid market requires continuity in prices, (3) there is a low cost for the transaction, (4) the rapid adjustment of stock prices according to new available information. This efficiency of stock guarantees that the prevailing stock prices reflect and provide momentum for those savings to be channelled through the capital market. It is noted that although the level of domestic savings in developing countries has been increased gradually; they are still only able to sustain savings at very low levels, and may not be capable to re-allocate savings from the money market to the security market, i.e. holdings in shares and bonds (Calamanti, 1983).

Table 1.2.1: World eminent emerging stock market (FTSE, 2010)

	Market Capitalization (% of GDP)		Turn Over ratio		No of Listed firms	
	2000	**2009**	**2000**	**2009**	**2000**	**2009**
Brazil	35.1	37.4	43.5	67.4	459	425
Greece	88.3	25.4	63.7	59.2	329	280
Mexico	21.5	21.4	32.3	43.4	179	125
Malaysia	124.7	84.4	44.6	54.7	795	957
Poland	18.3	17.1	49.9	56.0	225	354
S. Africa	154.2	177.7	33.9	83.8	618	411
Thailand	24.0	37.7	53.2	110.2	381	497
Bangladesh	2.5	8.4	74.4	212.6	221	295
Chile	80.3	78.1	9.4	20.7	258	232
China	48.5	64.6	158.3	229.5	1086	1700
Egypt	28.8	52.9	34.7	59.7	1076	306
India	32.2	55.7	90.6	116.3	5937	4946
Indonesia	16.3	19.3	32.9	78.1	290	401
Morocco	29.4	74.0	9.2	12.0	53	78
Pakistan	8.9	14.3	475.5	99.9	762	650
Philippines	34.2	31.2	15.8	24.9	228	245
Russia	15.0	78.7	36.9	154.9	249	333
Turkey	26.1	16.0	206.2	138.4	315	315

(Source: FTSE and Author)

The market capitalization value of emerging stock markets grows by 13.5% of GDP from 2000-2009 (FTSE, 2010), for Indonesia, Turkey, Pakistan and Thailand. This growth rate has increased the confidence of investors in emerging stock markets (see table 1.2.1). The correlation between MSCI emerging stock markets and World index (table 1.2.2) increased from 0.48 to 0.81 between 1992 and 2007, with the progressive assimilation of financial markets worldwide. In all large emerging stock markets except Russia- correlation is higher than that in developed stock markets such as, Japan and Hong Kong, in the recent time period. This reveals that emerging stock markets in developing countries are moving in the right direction, and their positions are greatly improved from last decade. According to MSCI (2008), economic developments play a significant role in global investment

opportunities. It is very important and interesting to understand how the market reacts to liberal policies and the changes in economic conditions in emerging countries.

According to Calamanti (1983), the size of activities in emerging markets is a limitation, because owners are reluctant to issue financial instruments due to the loss of control and the disclosure of private information to competitors, which may result in a rise in the tax burden.

Table 1.2.2: Correlation between MSCI emerging stock markets and World MSCI index

	1992	1997	2002	2007
Korea	0.37	0.28	0.6	0.66
China	n/a	0.15	0.48	0.62
Taiwan	0.14	0.32	0.54	0.57
India	n/a	0.12	0.33	0.53
Thailand	0.42	0.45	0.5	0.53
Indonesia	-0.05	0.44	0.37	0.51
Malaysia	0.55	0.45	0.38	0.46
Pakistan	n/a	0.22	0.12	0.29
EM Asia	0.55	0.49	0.67	0.74
EM LATAM	0.27	0.48	0.75	0.76
Emerging Market	0.48	0.58	0.79	0.81
Developing market	0.86	0.82	0.91	0.94

(Source: MSCI Standard Indices and assembled by the author)

Due to a shortage of foreign reserves in developing countries, this rule can't attract foreign investors, and such measures are not acceptable for economic liberty (World Bank, 2005). This is a way of motivating and encouraging private companies to issue shares and investors to buy such shares. The level of confidence of investors is reflected by the demand for shares in the market and good expectations of the performance of the portfolio, which raise a belief that a piece of paper represents real wealth. In order to establish public confidence, government and regulatory bodies must regulate the security market to improve operational efficiency so that it plays a greater role in economic development through the allocation of economic resources.

1.3: PAKISTAN STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH

Following country's independence in 1997, lots of social, political, economic and financial issues emerged, including sectarian violence, growing population, outmoded bureaucratic procedure, political instability, counterproductive tax rated and customs duties. These problems reduced foreign direct investment and the government of Pakistan deliberately kept the economy and stock market blocked to foreigners. Even though in the early days Pakistan struggled with these social and political problems, the country made a positive step toward economic development through reforms, which were initiated in early 1990. The most significant reform was in the area of foreign investment; first time foreign investors were allowed to invest in the Pakistan equity market, and there was a positive impact of these reforms on the equity market. Following partition in 1947, the first few years were difficult due to the influx of refugees, socioeconomic challenges and civil unrest, and more generally an overall uneven development experience. In the beginning, the government had focused on the construction of infrastructure and took some necessary action regarding economic policies and development in the financial sector; these were controlled up to 1970s but were subsequently liberalized. The business-oriented liberal policies have been pursued in the last two decades to build a favourable environment in the capital markets in Pakistan. In the early 1990s, market friendly measures. These include the privatization of state-owned enterprise units, permitting the arrangement of commerce and investment in private banks and the authorization for foreign investment into the stock market, which helped build confidence in the Pakistan stock market (ESP, 2012). After two decades the outcome of above measures was that the aggregate market capitalization increased up to $ 38.40 billion in March 2012, and the market was increased by 15.2% more than the previous year (ESP, 2011-12). As a result of these improvements, the Pakistan stock market is now one of the leading stock

markets in the world. Over the past two decades, Pakistan had made significant efforts to restructure its financial system. Macroeconomic policy is an integral part of positive significant economic reimbursement and can be expected through these financial reforms, mainly through a more efficient allocation of resources to enterprise and the effective mobilization of the domestic savings by domestic and the foreign investors. Generally, financial liberalization has greater influence on economic growth. Some researchers have a different point of view, maintaining that many countries are ineffective economically due to financial liberalization and foreign exchange crises. Another school of thought is that the economic growth rate and the investment can be enhanced through openness, financial liberalization and the efficient allocation of economic resources.

The Historical Performance and Development of the Pakistani Stock Market

At the beginning of the 1970s, the Government of Pakistan reformed the financial system when the financial institutions of public sector development were expanded the public sector supremacy was noticeable with 94% share in total assets up to 1990. Government owned banks provide loss-making loans in order to subsidize “social projects” such as agriculture, education, etc. Those lending were based on “political” rather than “social” objectives hence did not provide incentives for private sector growth. Following the nationalization process, it was realized that financial sector performance was very poor. To make the market strong and competitive, and in accordance with world standards, reforms were initiated at a broad level. The prime purpose of these initiates was to build financial institutions and markets in order to enhance governance regulation (SBP, 2002). A monetary system, exchange and credit management was established in order to create mechanisms for resource allocation. From 1997 onwards, a number of structural and fundamental reforms were introduced in addition to the money and the banking reforms for transparency. The State Bank of Pakistan pursued

a trouble-free monetary policy with the purpose of reducing the cost of government borrowing and encouraging credit expansion in the private sector until 2000. The lending interest rates gradually decreased from 15.6% to 8.81%, but real interest rate increased from 3.6% to 10.9%. The performance of financial development indicators such as, the trend of broad money has increased. The market capitalization was 4.68% and increased to 20.61% in 2010 shown in the table 1.3.1.

Table 1.3.1: Performance of the financial development indicators of Pakistan (% of GDP)

Years/ Decades	Broad Money	Total Bank Deposit	Total Reserve	Private Sector Credit	Stock market Capitalization
1980s	34.02	32.36	6.61	21.45	3.75
1990	32.27	27.91	2.61	19.92	4.68
2000	38.59	37.51	2.82	22.33	8.90
2001	39.64	33.23	5.83	22.02	6.84
2002	43.80	36.03	12.16	21.92	14.11
2003	46.99	40.32	14.19	24.87	19.92
2004	49.36	44.16	10.94	29.30	29.60
2005	48.61	45.02	10.14	28.44	41.92
2006	44.98	45.48	10.10	28.94	35.71
2007	46.37	48.45	11.03	29.66	49.06
2008	44.01	53.21	5.50	29.84	14.33
2009	39.05	48.40	8.39	23.54	20.52
2010	44.98	46.81	7.29	22.67	20.61
2011	39.50	43.30	6.50	29.60	15.59

(Sources: IMF, SBP and KSE dataset)

A study on the relationship between macroeconomic factors and market performance in developing countries such as, Ma and Jalil (2008) find a significant and strong positive association of financial development with the economic growth of Pakistan and China. They put forward that financial sector reforms have increased the financial depth in Pakistan. Husain and Qayyum (2006) examine the South Asian stock market's characteristics which were liberalized in the early 1990s, including Bangladesh, India, Pakistan, and Sri Lanka from 1980-2003. The following variables, market capitalization, volume of trade, GDP and

investment were employed to measure the impact of liberalization on the stock market. They find that liberalization had a significant impact on stock market development in the region. Stock market capitalization and the volume of trade indicators increased several times, but significant development in the stock market did not seem to influence the real sector. Reforms in the financial sector, which were undertaken in the last two decades made a great deal of progress. These reforms strengthened the financial system and decreased the weaknesses of the current financial structure.

In fact, a few companies boost the stock market and revealed robust growth during the time period and stock market clocking in at 21% in the last decade (ESP, 2010-11). For the sector wise growth performance, the following sectors outperformed the historical average during 2010-11, i.e. Energy and Petroleum, banks and fertilizer sectors, and clock in at 24% (ESP, 2010-11), when Pakistan became a member of Morgan Stanley Capital International Frontier Markets. At the same time, Pakistan has witnessed of the inflow growth in foreign investment, and foreign holding weighted market capitalization stands at an all-time high of 33%. At the beginning of 2009, the market was at the lower level of 4,815, but in May, 2011 KSE100 had doubled and was trading at 12,000 levels (ESP, 2010-11).

The Karachi Stock Exchange (KSE) was instituted in September 1947, and became a limited company in 1956, a benchmark of the Pakistani equity market. The Karachi stock exchange is the first, oldest, largest, most liquid and active stock exchange. It started with 5 listed companies with paid up capital of the Rs.37 billion. In early 1994, KSE was enjoying extraordinary success, but a year later, the political disturbances of the financial crises and the poor economic performance have driven foreign investors away. The focus of foreign investment broadened quickly from an initial interest in multinational corporations and blue chip companies, to a whole range of second-tier scripts. The financial and energy sectors

benefited particularly, but most stocks shared in the market's appreciation. The Karachi Stock Exchange introduced a capital weighted average KSE100 index; of 100 well efficient and large capitalize firms' stocks in 1991. Nowadays, the Karachi Stock Exchange is the largest stock exchange with 644 listed companies, 200 members and brokers, 1850 trading terminal, market capitalization is US$35875 million, and the listed capital is US$12918 million (table 1.3.1). KSE declares the “best performing emerging stock market among other major emerging stock markets of the world, for the successive three years” by the World Printed Media on October, 2004 (Business Week, US newspaper, USA Today, KSE, (2004). According to the turnover ratio, the Pakistani stock market was ranked 1st in 2003 and 3rd in 2006 in Global Stock Markets (Fact book, 2004; 2007).

A milestone was achieved when KSE-100 Index reached the level of 15,737 for the first time in KSE history on 20th April, 2008. This sentence is strange. KSE-100 index witnessed an optimistic trend in the first half of 2012, and had reached almost at 13,000 index value. However, the KSE100 index continued increase during 2011-12 and reached the index value at 13,450. The progressive performance of the stock market and gearing up the momentum is a considerable foreign investment. The foreign inflow of $301.5 million and a good growth in corporate earnings led to a strong market performance (ESP, 2011-12) and two debt instruments were listed.

The Pakistan stock market is relatively small in size; KSE attained the third position in 1991 in terms of growth percentage in the local stock market index (IFC, 1992) - and has been receiving attention in recent years as a result of this. According to Country Report on IMF (2004), Pakistan’s macroeconomic conditions improved due to a reduction in interest rates, an enhancement in liquidity, better government and a supervision of the stock market.

Table 1.3.2: Overall stock market (KSE) performance in Pakistan

Year	Listed Companies	Value Traded (US$ Million)	Market Capitalization ($US Million)	Turnover Ratio (%)	KSE100 Index
1994	683	3198.0	12300	26.9	2661.0
1995	746	3210.0	9286	29.2	1497.8
1996	783	6054.0	10639	58.7	1339.9
1997	782	11476.0	10966	111.3	1753.8
1998	779	9038.0	5418	114.3	945.2
1999	769	21056.8	6964.7	345.2	1408.9
2000	762	32973.7	6581.4	475.5	1520.0
2001	747	12454.8	4944.0	226.8	1340.4
2002	711	26029.9	10199.7	343.9	2701.4
2003	701	66598.1	16578.6	497.4	4471.6
2004	661	73871.9	29002.2	324.5	6218.4
2005	661	140995.8	45936.8	376.3	9556.6
2006	651	126559.6	45517.6	276.7	10040.5
2007	654	1004516.3	710304.5	173.8	14075.8
2008	653	54358.8	263220.0	115.9	5865.0
2009	651	23526.9	33172.5	82.9	9386.9
2010	644	12918.0	38175.1	36.18	12022.4
2011	639	10141.1	32763.0	28.60	11826.9
2012	591	10541.1	33763.0	24.60	13450.0

(Source: World Bank, Karachi stock Exchange, Pakistan and economic survey of Pakistan)

Recently, due to current global financial crisis, political instability, terrorist attacks, high inflation and reforms in a capital market, the stock market in Pakistan is very volatile. There was an indecisive rising trend in Pakistan stock market from 2010-11, 638 in total companies were listed with a capital value of US$ 11.5 billion. The stock market capitalization and index increase 16 % and 19% overall during 2010-11 respectively as compared to 2009-10.

In addition, Smith and Walter (1998) find that the Pakistan stock market correlation with the US stock market is -0.01. Similarly, Harvey (1995) reported that the correlation between the Pakistan stock market index and MSCI index was 0.02, and with the world market index was 0.04. Table 1.3.3 shows the Pearson correlation coefficient of Pakistan and

S&P/IFCG aggregate price indices of selected stock markets. The correlation between Pakistan and developed stock markets was very low and similarly a high correlation was observed between regional emerging stock markets such as India. Similarly, Hyde et al., (2007) documents, the Pakistan stock returns have a low correlation with other stock markets, 0.03 and 0.07 respectively, while with USA is too small as compared to other stock markets.

Table 1.3.2: Correlation between Pakistan and the world stock markets

Market	US	UK	Japan	India	Latin America	Asia	Europe
Correlation	0.091	0.052	0.025	0.260	0.324	0.236	0.164

(Source: Global Stock Markets Fact book 2007 and author)

Hussain and Saidi (2000) found that prices in the stock market of Pakistan moved smoothly; and has diversified potential. While, Lamba (2005) finds the stock market of Pakistan proves to be fairly isolated. In brief, the evidence about emerging stock market co-integration, such as Pakistan, are still incorporated strongly with advance stock markets. The Pakistani stock market's liquidity and turnover ratio was very high among the selected countries in 2000 and average in 2009 (see table 1.3.2) and in 2003 the stock market turnover was the highest worldwide (FTS, 2004). The high growth rates of GDP, low interest rates and stable political conditions could be the major reasons for high trading activity. However, another opinion is that this liquidity is due to short-term speculative trading by traders in the over-the-counter market, which is prevailing in various forms in the stock market. To explain whether good returns in Pakistan are linked to a high level of risk and index volatility, the standard deviation of Pakistani stock market return volatility is high and diverse when compares with other emerging stock markets. Market concentration is an adverse characteristic of markets and causes further risk, while the poor performance of a few firms can hurt the whole stock value.

1.4: STRUCTURE OF THE THESIS

This dissertation is organized into seven chapters. Chapter Two reviews the literature. Chapter Three describes our portfolio construction and empirical strategy, and investigates the dynamics Lead-Lag relationship between macroeconomic variables and Pakistani stock market performance. Chapter Four examines the static and dynamic relationship between macroeconomic factors and the performance of different portfolio returns. Chapter Five investigates the impact of macroeconomic variables' volatility on stock return volatility of the Pakistan stock market. Chapter Six examines whether investor confidence had explanatory power to the pattern of stock returns in the Pakistani stock market. The final chapter concludes the thesis and provides a recommendation for further study.

CHAPTER 2: REVIEW OF PREVIOUS LITERATURE

This chapter discusses the theoretical framework of the study, and reviews the empirical studies on the relationship between stock market performance and macroeconomic variables in both developed and developing markets.

2.1: THEORETICAL BACKGROUND

The performance of a stock market is affected by different market conditions.

There are two main theories that explain the relationship of macroeconomic variables and stock market performance, Efficient Market Hypothesis and Arbitrage Pricing Theory.

2.1.1: EFFICIENT MARKET HYPOTHESIS

Efficient Market Hypothesis states that security prices fully reflect all available information. There are three forms of market efficiency: (1) Strong-form efficiency; a market is efficient if all information related to the value of a share, whether or not generally available to existing or potential investors, is quickly and accurately reflected in the market price (2) Semi-strong form; a market is efficient if all relevant publicly available information is quickly reflected in the market price. (3) Weak-form efficiency, where the succession of past price contains no information about future return price. The concept of operational stock market efficiency has gained importance in the academic and business world. Stiglitz (1985) identifies that ‘‘prices of securities reflect with available information on efficient stock markets and facilitate the distribution of inadequate capital resources within alternative investment opportunities."

Mishkin (2001) suggests that well performing stock market inspired investment prospects leads to domestic economic activities, the domestic savings, proficiency in the

distribution of capital, and improved risk diversification. There is a reflection that emerging stock markets are inefficient as a consequence of operational efficiency characteristics and investor nature (Kitchen, 1986). Most investors argue that inefficient stock market prices are unpredictable and basic values are not reflected. In emerging stock markets, it is believed that the security pricing system is not consistent with efficiency (Parkinson, 1987). The current evidence from emerging stock markets is not enough to draw convincing conclusions on their weak-form efficiency.

2.1.2: ARBITRAGE PRICING THEORY

The Arbitrage Pricing Theory (APT) is very popular and its applications have been examined rigorously on the developed stock market. Generally, APT applications are used for forecasting the expected rate of return of common stock, behaviour of stock prices, systematic risk and cost of capital. Current literature has taken a new direction, viewing APT (Ross, 1976), as an alternative of the Capital Asset Pricing Model. The difficulty of measuring the true market portfolio is a critical estimation point of CAPM model. Despite a number of problems in the testing the CAPM, few other models have been proposed by well-known researchers. The APT model shortly attracted a number of leading researchers, For example, Roll & Ross (1980) and Burmeister & McElroy (1988) document interesting insight into both the theoretical and practical grounds of the model from many points of view. It is identified through the APT assumptions that there are multiple undetermined economic factors, which influence individual stock return, e.g. inflation, risk aversion and interest rate.

Ross (1976) document that in any economy, there are many sources of risk, which can be removed through diversification. These causes of risk can be determined through economy-related factors, such as inflation and changes in aggregate output. Instead of a single beta calculation like in the CAPM, multiple firm betas can be calculated, as in arbitrage pricing

theory, by estimating the sensitivity of an asset's return to variation in each factor. According to Opfer and Bessler (2004), the above two models have been developed as a foundation for stock returns being affected by particular economic variables. According to the assumptions of the arbitrage pricing theory, a security's returns have a linear function of K regular economic factors. Therefore, APT indicate that the risk premium can enhance the asset's sensitivity as well. The APT predicts that all risky asset prices are traditional to the economic condition when there is no arbitrage. In the absence of arbitrage, it is signified that an individual investor invests in a well-diversified portfolio that cannot earn any additional return. The APT assumes that a different level of internal and external variables contributes towards a stock returns, and a multi factor model has been developed by following above assumptions. The factors frequently employed to include exchange rate, interest rate, money supply, consumer price index, industrial production, risk free rate, balance of trade, announcements of dividend and unanticipated results in both domestic and global stock markets. The existing empirical literature indicates that only three or four economic factors are important and relevant to stock market performance. In general, there are two major approaches to test the APT (1) exploratory factor analysis approach, where asset sensitivities and unidentified factors that estimate stock returns, (2) general factor analysis approach that assists to explain the pricing behaviour within the stock market. General factors are financial and macroeconomic variables, which influence the future companies' cash flows and risk-adjusted discount rates. This method has been used by Chen et al., (1986), among others to estimate the impact of macroeconomic factors on stock return performance under APT framework. However, a lot of critical issues were raised, when APT theory was tested in a different economy by various researchers.

2.2: EMPIRICAL STUDIES

In the past three decades, many researchers have documented a dynamic correlation between macroeconomic factors and stock return. Studies mainly focus on developed and well industrialized economies such as the USA, UK, etc. However, few researchers have focused on newly industrialized economies, such as China, India and other Asian emerging stock markets.

2.2.1: STUDIES ON DEVELOPED MARKETS

In the developed market, the pioneering researchers in this field are Fama (1990), Geske & Roll (1983), Chen et al., (1986), Longin & Solnik (1995), Estrella & Mishkin (1996), among others. However, the studies differ in terms of context and methods employed in this field of studies.

Chen et al., (1986) document that macroeconomic factors affect the discount rate, the ability of firms to generate cash flow, and future dividend payout, provided the basis for the belief that a long-term equilibrium existed between stock prices and macroeconomic factors. Poon and Taylor (1991) investigate the relationship between macroeconomic variables and stock returns by using macroeconomic variables such as industrial production growth, inflation, risk premium and stock return, and conclude that macroeconomic variables do not affect the share of UK stock, in a manner similar to that described by Chen et al., (1986). Cheng (1995) finds the same result by analysing the UK stock return and concludes that the pricing explanatory power of APT is not high in the UK stock market.

Clare & Thomas (1994) examined the relationship between the stock returns of the UK market and macroeconomic factors, i.e. retail price index, oil prices, bank lending and

corporate default risk, etc., where they found that 18 macroeconomic factors are important risk factors for stock return of UK stock market.

Further, Hamao (1988) conducted a study within the framework of APT for the Japanese market and documented that change in expected/unexpected inflation and risk significantly influenced the stock returns. Moreover, this study discovers the effects of money supply, IPI, exchange rate, and a residual market error in the Japanese stock market; these macro factors are significantly associated with the risk premium in return of Japanese equities. Maysami & Koh (2000) report the connection between macroeconomic variables with stock index on the Singapore stock market from 1988 to 1995. They document a positive association of stock returns with changes in the money supply, and a negative relationship with exchange rate, changes in price levels, short- term and long-term interest rate. From the above discussion, it is concluded that APT has failed to predict the price of stock either in Spanish or UK; this means that the effect of macroeconomic factors on stock return in above both stock markets is varied from Chen et al., (1986). These investigations concluded that there are other factors, which affect the stock return. The stock markets are very influential for the following reasons; (1) the stock market return is influenced by any incident that builds up in another stock market. This prominent condition can change financial asset prices, and security prices reflect this, due to relatively available information about a stock market and without any bias (Hendriksen & Vanbreda, 1992). (2) According to Markowitz' Portfolio Theory, investors would like to reduce associated risk and enhance stock return. As investor attempt to make a consistent portfolio of suitable investments and possible investors invest in substitute financial instruments such as, gold, real estate, bond and bank deposits, etc.

Sharp (1964) and Linter (1965), using CAMP model maintained that economy and firm-related factors can change the stock return. The main purpose of APT was to link the various

risk factors for rationalizing the violation of stock return (Sekhara et al, 2000). The most important opinion about the inflation and stock market relationship is attributed to Irving Fisher (1934), who stated that the nominal rate of return could progress one-to-one with the anticipated rate of inflation. Fisher's hypothesis is valid for interest rates and all assets. For example; stock return application indicates that an increase in the inflation rate can enhance the nominal return, and investors are protected against inflation through investment in the stock market. However, some researchers are unable to find any significant relationship between inflation and return on a stock such as, Sonmez (2007), Dabbagh (2005), Adib (2003) and Razzaghi (2002), who applied different methodologies and obtained the same result. However, few researchers discover a negative relationship between inflation rate and stock market return (Bhaduri (2009) and Humpe & Macmillan (2009). Overall, a correlation between macroeconomic variables and stock market return has been observed. Some other variables examined by Chan et al., (1985), Chen et al., (1986), Chen (1991) and Ferson & Harvey (1991) include industrial production, default risk premium, term structure spread, unexpected and expected inflation. These academics found that default risk and term structure premium are priced risk factors, and IPI growth is a strong risk factor. Franck & Young (1972) investigate a relationship between stock prices and exchange rates, and they document that the stock price has no significant relationship with exchange rate variables.

Table 2.2.1: Macroeconomic variables and stock returns in developed stock markets

Author	Variable and Methods	Major Findings
Darrat (1990), Canada	M2, Inflation, Interest & Rates, Fiscal Deficits, Real Income by using Causality Test	The stock prices are fully incorporated with all monetary policy information and returns at a firm level and Granger-caused due to changes in fiscal deficits lagged.
Abdullah & Hayworth (1993), USA	M1, Short-Term Interest Rates, Inflation, Budget and Trade Deficits, IP, by using the VAR, Granger Causality &FEVD Test	All variables are Granger-cause the stock returns. Stock returns have a positive effect on inflation and money growth; however, there are negative effect on budget deficits, trade deficits, and interest rates.
Dhakal et al., (1993), USA	M2, Short-term Interest, Price Level, Real Output by using VAR Model	Stock prices have a direct significant relationship with money supply, but interest rate and inflation rate having indirect impacts. Price volatility causes real output.
Darrat& Dickens (1999)	M1, IP by employing Causality Tests	The IP, M1, and S&P 500 were strongly integrated and had causal relationships.
Gjerde & Saettem (1999), Norway	Interest Rates, Inflation, Exchange Rate, Oil Price, IP, CS, OECD. VAR Model	Stock returns significantly influenced by changes in real interest rate and oil price changes. This study may be different in size.
Chaudhuri & Smiles (2004), Australia	M3, Oil Price, Private/Personal CE, GDP, by Johansen Cointegration, IRF & FEVD test	The long-term relationship between all variables. IRF and VDC analysis revealed weak evidence for the relationship between real stock price and variables.
Gan et al., (2006), New Zealand	M1, Interest rates, Inflation, GDP, Exchange rates, Oil Price. By VAR& FEVD Analysis	A long-term association exists among stock index and all macroeconomic variables. The causality test indicated stock index was not a principal indicator of economy.
Hashemzadeh & Taylor(1988), US	M1, US-Treasury bill. Causality Tests	The significant relationship between MI and S&P 500, but the T bill and MI are not predictors for stock prices.
Hondroyiannis & Papapetrou (2001), Greece	IP, Interest Rates, the Exchange Rates, Real Oil Price, S&P 500. Multivariate VAR Model	Macroeconomic factors and foreign stock market transform partially explained stock return growth, and oil price significantly influences stock return.
Kapital (1998), USA	Money, CPI, Oil Prices, Exchange Rate, Real Income by GARCH-X	All variables, except exchange rates, consistently shared short and long run relationships with stock prices.
Kim & Moreno (1994), Japan	Bank Loans. VAR Model	The stock return have a positive response to bank lending, and bank lending changes contributed significantly in stock returns.
Léon (2008), Korea	Interest Rate, Volatility-GARCH Model	The conditional returns have a negative association with interest rates in the US market. The predictive power of interest rates is strong for returns volatility.
Liljeblom & Stenius (1997),	M2, CPI, Trade, IP. By using VAR Model	Stock market predictive power of macroeconomic volatility was documented.

Malliaris&Urruti a (1991), USA	M1, IP. By using Causality Tests	The bi-directional casualty was documented between MI and S&P 500 index.
Maysami et al., (2004), Singapore	M2, IP, Long-Term and Short-Term of Interest rates, CPI, Exchange Rates, by Johansen Cointegration Test	The finance sector and property index have a significant long-term relationship with other variables except IP and money supply
Mukherjee & Naka (1995), Japan	M2, Bond Rate, Inflation, IP, Exchange Rate. VEC Model & Johansen Cointegration	All variables were integrated with the stock prices during the whole sample period and for an additional two sub-periods examined.
Patra et al., (2006), Greece	Money Supply, Inflation, Exchange Rate, Trading Volume. Causality Test, and VEC Model	All variables, excluding exchange rate, constantly exhibit short and long run relationships with stock prices. The stock market was inefficient in terms of information during this time period.
Rahman & Mustafa (2008), USA	M2, Oil Price. Causality Test, and Vector Error Correction Model	All variables are cointegrated, a causal effect in the short-term. The stock volatility fuelled past volatility, negative oil price shocks initially depressed stock market.
Ratanapakorn and Sharma (2007), USA	Money Supply, Short-term and long-term interest Rate, Inflation, exchange Rate, IPI. By using Causality Test & FEVD Analysis	The stock prices are negatively associated with long-term interest rate, and positively with money supply, IP, inflation, exchange rate, and the short-term interest rate. All macroeconomic variables are Granger caused stock prices in the long run,.
Sadorsky (1999), USA	Interest Rate, Oil Price, IPI. VAR & FEVD Analysis	Returns are positively depressed by oil shocks, whereas interest rates and IP have a positive impact on returns.
Thornton (1993), UK	M0, M5, Real GDP by employing Causality Tests	The stock prices are likely to lead M5 and real GDP; GDP tends to lead stock price volatility.
Thornton (1998), Germany	M1, Interest Rates, Real Income by Johansen Causality Tests	The stock prices and long-run demand for M1 have a positive relationship, however unidirectional Granger-causality effect with interest rates.

(Source: Author)

2.2.2: STUDIES ON EMERGING MARKETS

In emerging stock markets, previous studies include those of, Nishat and Saghir (1991), Khilji (1993), Ahmed and Rosser (1995), Hussain and Uppal (1998), Ahmad and Zaman (2000), Attaullah (2001), Muhammad et al., (2002), Nishat et al., (2004), Iqbal & Haider (2005) and Ihsan et al., (2007). However, the results of the above studies are not coherent regarding the contributory relationship between macroeconomic variables and stock return.

In the context of Pakistan, the APT model was also employed generally by some researchers, but there is little exacting empirical evidence on equilibrium models. Further, Ahmad and Zaman (2000) find that some indicators, such as positive expected return, are in the favour of investors; however, speculative bubbles were also reported by using sector-wide monthly data from 1992 - 1997. Hussain (2000) has also documented that there is no weak anomaly effect and concluded the nonexistence of predictable pattern implied efficiency of the stock market from 1989-1993. Khilji and Nabi (1994) document that few stock returns have differentiated by non-linear enslavement. Another similar study, Ahmed and Rosser (1995) find that there is a risk return relationship with sector indices. Zaighum (2014) find that macroeconomic factors, e.g., consumer price index, money supply and risk free rate have a negative association with firm stock returns, whereas industrial production index and market return's indicators have a positive relationship.

Iqbal & Haider (2005) employed the APT model to examine the validity of stock returns by using monthly data from 1997-2003. Overall, they found variability, in the case of a sub-period, two significantly priced factors, which support APT. In this study, they used most recently available data for macro-economic variables, firm stock return, price over earning ration and the return of the stock market. They employed APT with multifactor approaches

to investigate the impact of macro-economic variables on return of individual firm and the stock market also to analyse the response of stock returns due to economic factor changes at the firm level as well as stock market level.

There are a few empirical studies on individual emerging stock market such as, Kwon et al., (1997) for Korea, Ibrahim (1999) for Malaysia, Mukhopadhyay & Sarkar(2003) for India, Iqbal & Nawaz (2009) for Pakistan and Chen et al., (2005) for Taiwan. It was found that there is a significant influence of macroeconomic variables on financial asset's return.

Mubarik and Javid (2009) find that the previous day-trading volume has a significant effect on current stock return of Pakistan, and the Granger Causality test suggests that there is a response relationship between stock return and volume of trading. In the case of individual stock return, the return causing volume is stronger than volume causes the return. The result was consistent with previous empirical results done by Doe et al., (2008) for Asia Pacific stock markets and for Pakistan's stock market, Mustafa and Nishat (2006), Iqbal and Brooks (2007) and Iqbal et al., (2010) who conclude that Fama’s variables have a few roles in explaining the beta-return relationship in the stock market of Pakistan.

According to Shahbaz et al., (2008), the development of the stock market is an essential factor for economic growth and has a long-term direct influence on corporate finance and economic development. It is very significant because the investment process is supported by financial intermediation, by mobilizing foreign and household saving for investment through firms (Gerald, 2006). It guarantees that firms can work with renewed efficiency by providing liquidity and allocating funds in the most productive ways. A growing literature has articulated the consequence of the financial system for economic growth.

Nurudeen (2009) finds that the stock market increases economic growth, and suggested that if obstacles, such as tax and regulatory hurdles are removed, then the development of national infrastructure will create a good environment for business and enhance the firm's productivity (efficiency) as well as encourage access funding from the stock market. Furthermore, it is suggested that in order to enhance the confidence of stock market participants check the sharp practices of the market operator as safeguard for shareholders.

In emerging stock markets, there are several potential benefits of stock markets opening to foreign investors. The main benefit is that openness to markets represents an important opportunity to attract foreign capital for economic growth. The changes in the economy occur due to liberalized foreign portfolio investment and move toward capital market liberalization (Elna, 2001). In ESM, the interest rate has been increased significantly in the last two decades, and due to political and economic structures that previously existed, the levels of global investment were very low. Therefore, it has been witnessed that in the last decade, there have been massive capital inflows into the emerging stock markets. The emerging stock market returns and risks have been documented as being higher than in developed stock markets (Harvey, 1995). The emerging stock market returns are more predictable when compared with developed stock markets, and exhibit stronger mean reversion properties (Bekaert and Harvey, 2002) and a higher degree of autocorrelation and segmentation from world capital markets. Hussain et al., (2009) examine the association between macroeconomics factors with stock prices in the case of KSE of Pakistan. They used variables such as, exchange rate, foreign reserve, industrial production index, money supply and stock prices. They find that after the 1991 reforms, the exchange rate and foreign reserve significantly influenced the stock price, while IPI insignificantly affected the stock prices. Further, they found internal factors of firms such as, production growth and capital

formation do not affect stock prices, while external factors, for example, the exchange rate and foreign reserve have a positive (significant) impact on stock prices.

According to Wickremasinghe's (2011) investigation, there is a casual link between stock prices and macroeconomic variables. It was also found that there are short and long-run causal associations between stock prices and macroeconomic variables. Furthermore, his findings invalidate the validity of semi-strong version of an efficient market hypothesis and have implications for all investors.

Nandha and Faff (2008) point out that several empirical studies indicate that the shock of oil prices has a negative impact on real output and corporate profits where oil is used as a key input. In addition, they examine whether and to what level oil price shocks have an impact on the return of the stock market. They documented that oil price has a negative impact on returns apart from the mining sector. These findings are consistent with economic theory and evidence presented in earlier empirical studies. Further Nandha & Faff proposed that global portfolio investors could consider hedging for oil price risk. Moreover, Cong et al., (2008) document the strong relationship between oil price shocks and stock market of China by employing multivariate vector auto-regression. The results showed that oil price shocks have an insignificant impact on stock return, apart from the manufacturing index of some oil firms. A rise in oil volatility may boost the assumptions in both the mining index and petrochemical's index, which raises their stock returns (Cong et al., 2008). Further, Sadorsky (2008) document a correlation between the movements of oil price and stock prices.

Bhattacharya and Mukherjee (2002) also document the relationship between stock price and exchange rate changes in India by employing Granger's causality technique and found causality between changes in the stock price and exchange rate in one direction.

Ajayi and Mougoue (1996) find that there is a negative impact of the aggregate rise in stock price on currency value in the short-term; however, they found a positive effect in the long-term. Yu (1997) examines the possible interaction with financial variables by employing the Granger causality test. The findings show that the variations in stock prices are due to variation in the exchange rate from Tokyo and Hong Kong economies, but find no causality in the case of the Singapore stock market. However, in the Tokyo stock market, there is a dual causality between stock return and variation in the exchange rate. Furthermore, a strong relationship is found between stock prices and exchange rate.

Granger et al., (2000) investigate the issue of causality by using Granger causality and the impulse response function in nine Asian countries (Hong Kong, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Thailand and Taiwan). They find a positive relationship between exchange rates and stock prices in Japan and Thailand. However, a negative relationship was found between stock returns and exchange rates in Taiwan. They also document that there is a strong bi-directional causality between stock returns and exchange rates in the Philippines, Indonesia, Malaysia and Korea.

Rashid (2007) investigate the cause-effect relationship between exchange rates and stock prices in Pakistan by employing co-integration tests. Rashid find mixed evidence that there is no co-movement between stock price and exchange rate. In some cases, the causations between stock prices and exchange rates were found. However, these findings support to examine the determination of asset market to exchange rate that is reported about no association between the said variables.

Muhammad et al., (2002) investigate the association of stock prices with the exchange rates among four South Asian economies from 1994-2000 periods. For Pakistan, Bangladesh, Sri

Lanka and India, they find no long and short-run relationship between stock prices and exchange rates. These findings proposed that in the South Asian economy, stock prices and exchange rate are unrelated in the short term; therefore, the investors do not consider any information in their prediction about the behaviour of the other financial market which is attained from any stock market. Moreover, the policy makers of these countries do not consider the exchange rate as a tool to attract foreign investment. They also considered some other factors, such as interest rates, political uncertainty, achieving a better law and order situation and creating a conducive investment climate. Muhammad et al., (2002) suggests that if daily (weekly) data are used the significance level of results may be improved.

In the 1980s, a question was asked by Schwert (1989), ‘‘why does stock market volatility change over time’’. The answer to that question was “the amplitude of the fluctuations in aggregate stock volatility is difficult to explain using simple models of stock valuation’’. This explicates the time-varying stock return volatility by the time-varying volatility of macroeconomic and financial variables.

Another similar study about the causal relationship between stock returns and macroeconomic variables and its activity was done by Husain & Mahmood (2001). They confirmed the causation between macroeconomic variables and the returns of the Pakistan stock market, and argue that macroeconomic variables fluctuation cause changes in stock prices. There is a considerable impact of macroeconomic variables on financial asset's return in developed and more efficient markets. In Pakistan, few economists have examined the relationship of stock returns with macroeconomic factors. Recently, economists and researchers are taking a greater interest in this area. For example, renowned Pakistani economist Nishat (2004) documents that macroeconomic variables and returns of stock prices have a causal relationship in the long-term by employing the Granger causality test.

Further, industrial production has a significant and positive relationship with stock price, and inflation rate has a negative relationship with stock prices, and a significant relationship between interest rate and stock prices was also found. Moreover, Hussain & Mahmood (2001) investigate the association of investment, GDP and consumption with stock returns and documented few variables had a significant relationship with stock prices. Mohammad and Ali (2009) document the relationship between stock prices and macroeconomics variables with regard to the Pakistan stock market. The following variables were used: exchange rate, industrial production, foreign reserve, money supply, interest rate, gross fixed capital formation and wholesale price index. They find that stock prices are highly affected by exchange rates and foreign reserves.

Büyükşalvarc (2010) investigate the relationship between macroeconomics variables and the return of Istanbul Stock Exchange (ISE). The result shows that the interest rate, exchange rate, IPI and oil price negatively affect stock returns, whereas the money supply positively influenced the returns. Hameed and Ashraf (2009) find that ‘‘returns exhibit persistence and volatility clustering’’ and further demonstrated that earlier time period information assists in predicting future prices, and it initiated that the incident of 9/11 has led to diminished volatility in Pakistan. Similarly, Sharma and Mahendru (2010) document a correlation between macroeconomic variables and stock returns.

Pan et al., (2007) document that there is a significant causal interaction between exchange rates and stock prices for the following economies, Hong Kong, Japan, Malaysia, and Thailand prior to the Asian financial crisis 1997. Further, they document a causal interaction between the stock market and foreign exchange market in Hong Kong, Korea, and Singapore. Furthermore, they do not find any significant causal relationship between stock prices and exchange rates during the Asian crisis 1997, apart from in the case of Malaysia. They test for

robustness of their findings by employing Granger causality tests, and variance decomposition analysis. They conclude that interaction varies from economy to economy relating to exchange rate regimes, the trade volume, the degree of capital control, and the size of the stock market.

Phylaktis and Ravazzolo (2005) document a positive interaction between stock prices and foreign exchange markets, and concluded that the stock market of USA acts as a conduit for these links. In addition, they found that the financial crisis had a transitory effect on the long-run co-movement of stock markets. The relationship of stock returns with the exchange rates was investigated by Dimitova (2005). Here it was found that the parity condition of interest rate affects stock prices. A similar relationship was also documented by Sulaiman et al., (2009), where it was found that the exchange rate and exchange reserve have a significant relationship with the returns of the Karachi stock market. Adjasi et al., (2008) examine a relationship of the exchange rate with the Ghana stock market, where they found a positive association between CPI and stock returns. Further, they demonstrated that high volatility in stock returns is found when the inflation rate is high. Studies about interest rate and stock market returns from developed and developing countries were done and found that interest rates negatively influence the stock returns (Alam & Salah, 2009). The same type of research was conducted by Fama (1981), where it was found that "return of the stock market negatively associated with expected inflation and interest rate". Numerous further empirical studies documents that macroeconomic variables significantly influence the stock market return. The variation in the short term as well as long-term in any economic variables have a significant impact on the stock market efficiency of Pakistan. For example, the rise in an interest rate causes a cost of business that ultimately decreases the profit and dividend yield

of firms. Conversely, a decline in the interest rate indicates a positive signal to investors, as a result, boosting the returns of the stock market.

In the current literature, several researchers are conducting an extensive debate on the influence of macroeconomic variables on the stock returns. Economic theory might also explain this relationship, the arguments being that expectations about future corporate performance are reflected by stock prices (Wan and Nazihah, 2009). Therefore, if the price of stock perfectly revealed the fundamentals, the price of stock must be used as a leading indicator for future economic growth (Wan and Nazihah, 2009). Hence, the causal dynamic relationships between macroeconomic forces, financial development and stock prices return are essential for national macroeconomic policy formulation. According to Oberuc (2004), macroeconomic forces/variables are generally associated with stock price movement. These variables are also employed by several researchers in their respective work, for example, dividend yield, IPI, interest rate, default spread, inflation rate, real effective exchange rate, M2, GDP and returns on stock prices. The following studies investigated the relationship between stock returns and other financial and economic factors such as, Alam and Salah (2009), Ibrahim (2006), Wongbangpo & Sharma (2002), Arango (2002), Fama & French (1989), Chen et al., (1986) and Geske & Roll (1983), among others.

Fama and French (1989) found that the expected returns of common stocks and long-term bonds hold a maturity premium that follows a business-cycle pattern. Further, they point out that expected returns hold a risk-premium transmitted from longer-term business situations. Ferson and Harvey (1991) concluded that predictability is primarily related to sensitivity to economic variables, and the stock market risk-premium is very important in detaining the predictable variation into stock portfolios, whereas premiums related to interest rate risks capture predictability on bond returns. Further, Mukherjee and Naka (1995) investigate

matters related to co-integration between the stock exchange index of Tokyo and macroeconomic variables of Japan, i.e. exchange rate, money supply, inflation rate, IPI, long-term bond rate, and call money rate. They document a co-integrating relationship where stock prices significantly contribute to this relationship. Likewise, Ibrahim (1999) investigated the dynamic relationship between stock prices and seven different macroeconomic variables for the emerging stock market of Malaysia. The results of bivariate analysis put forward a co-integration between stock prices and the following macroeconomic variables, consumer prices, credit aggregates and official reserves. Wongbangpo and Sharma (2002) investigate the function of macroeconomic variables such as CPI, money supply, interest rate, and exchange rate with the stock prices of five Asian economies. They observed short term associations between stock prices and these macroeconomic variables. Arestis el al., (2001) investigated the development of stock markets and economic growth, and the control of the banking system and stock market volatility. They found that the development of the stock market is possibly capable of supporting economic growth, and further suggested that the stock market contribution towards economic growth can be inflated by utilizing cross-country growth. Maria and Ross (2002) maintain that FDI has a positive influence on economic growth, tax incentives, infrastructure subsidies, import duty discharges, and other's methods that countries have approved to attract foreign investment.

Baharumshah and Thanoon (2006) found that domestic savings contribute positively to the long-term economic growth and manipulate FDI growth that is higher than domestic savings. From a policy point of view, these indications strongly suggested that emerging economies that are successful in attracting FDI can finance more investments and grow faster as compare to those that deter FDI.

Table 2.2.2: Macroeconomic factors and stock performance in emerging markets–Summary of literature

Study	Variable /Methods	Major Results
Ibrahim (1999), Malaysia	Money, CPI, Exchange Rate, IP. By Cointegration & Causality Test	The stock market is not efficient and Stock prices are Granger-caused in the short run due to changes in official reserves and exchange rates, and co-integrated with M2.
Maghayereh (2003) , Jordan	M1, inflation, interest rate, IP. By using VECM Model & Cointegration Test	The stock price index is co-integrated with all variables, and results suggest that capital market violated the theory of market efficiency from 1987- 2000.
Gunasekarage et al., (2004), Sri Lanka	M2, T-bill Rate, CPI, and Exchange Rate. By using VAR, IRF and FEVD Test	Lagged values of the money supply and T-bill rate had a significant influence on the stock market. Price Index has no influences on M2 but has influence on T-bill rate.
Ibrahim (2006), Malaysia	Bank Loans, Interest & Exchange Rate, Output. By using VAR & IRF Analysis	Bank loans reacted positively to stock prices, but the converse is not true. Bank loans contain the expansion in real output, but no influence on real economic activity.
Muradoglu & Argac (2001), Turkey	Money supply, interest rate, exchange rate, using Johansen Cointegration Test	Three monetary variables were found not to be co-integrated with stock prices during the sample period from 1988 to 1989.
Ahmed (2008), India	M2, Interest & Exchange Rate, Exports, FDI, IP. By Johansen & FEVD Test	The long-term relationship between stock prices and money supply existed. The interest rate appeared to lead the stock prices in the short run.
Hasan & Javed (2009), Pakistan	Money Supply, T-bill rates, CPI, Exchange Rates. Johansen Cointegration, Causality and FEVD Test,	A long-term relationship and Unidirectional Granger causality found between equity market and monetary variables. Interest rates and exchange rates have a negative, whereas the money supply has a positive impact on returns.
Zafar et al. (2008), Pakistan	90 Days T-bill Rate by using GARCH Model	Conditional market returns had a negative relationship with interest rates, indicating easy to predict the stock returns..
Büyükşalvarcı (2010), Turkey	Interest rate, gold Price, CPI, IPI, oil price, M2 and exchange rate	The stock return has a negative effect on interest rates, IPI, oil price, exchange rates and positive impact on money supply.
Zukarnain & Shamsuddin (2012), Malaysia	GDP, inflation, exchange rate, interest rates, money supply by GARCH Model	Volatility in inflation and interest rate found to be Granger-caused stock market volatility. Macro volatility's do not Granger-cause volatility in stock returns
Babikir et al., (2012),S.Africa	Stock prices through GARCH Model	A high level of persistence and variability is found in the estimate parameter across the sub-samples in GARCH-M.

(Source: Author)

Based on our literature review and study objective, the following hypotheses are intended to achieve the objective of this study to measure the effects of macroeconomic variables on the returns of the emerging stock market of Pakistan.

H2: Macroeconomic factors have an impact on stock returns and the levels of sensitivity are different across the different portfolio (Size, Industry and beta).

H3: Past stock returns effect current stock movements, and these movements do not follow a trend.

H4: The level of any relationship observed between stock returns and macroeconomic variable changes over time.

H1: There is a causal relationship between macroeconomic variables and stock returns.

H5: There is a significant relationship between stock return volatility and macroeconomic volatility.

H6: There is a significant association between investor confidence and stock performance.

Various statistical techniques have been employed to get the answers to research questions such as, pooled OLS analysis, Johansen cointegration test, the Granger causality test & IRF, FEVD and standard GARCH (p, q).

2.3: CONCLUSION

We now present the key conclusions of this broad literature review. Firstly, even though existing applied and behavioural finance theories hypothesize a relationship between macroeconomic variables and return of stock markets, they are unable to identify the number of macroeconomic variable (factors) to be included. Consequently, the current empirical studies reviewed in this chapter have shown the use of a vast range of macroeconomic variables to examine their influence on stock returns. A summary of these variables is provided in table 2.2.1 as above. While previous studies have significantly examined the relationships between financial markets and real economic activity, the findings from the literature are mixed given that they were sensitive to the choice of countries, variable selection, and sample time period. It is difficult to generalize the results because each market is unique in terms of its own rules, regulations, and type of investors. Thirdly, there are reviews of main theories such as, Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) and the concepts, assumptions, statistical procedures and extensions to the international front have been explained. Fourthly, the VAR framework, Co-integration tests, Granger causality tests, and GARCH models were commonly used to examine the relationships between stock prices and real economic activity. However, there is no definitive guideline for choosing an appropriate model. It is obvious that there is a shortage of literature concerning emerging stock markets, but it is particularly lacking for the Pakistan market. To fill the gap in literature, this empirical study will examine the associations between the stock returns, investor confidence and macroeconomic factors across different industries, firm sizes, and firm risks using different models.

CHAPTER 3: DYNAMICS LEAD-LAG RELATIONSHIP BETWEEN MACROECONOMIC VARIABLES AND STOCK MARKET RETURNS

This chapter investigates the dynamics lead-lag relationship between macroeconomic variables and return of the stock market. Part 3.1 discussed literature regarding the relationship between macroeconomic variables and stock returns; part 3.2 presents the data description and our methods. Part 3.3 perform the unit root test, the test of stationary problems in time-series data and integration order by using Dickey Fuller and Augmented Dickey Fuller test. Part 3.4 investigates whether lead-lag dynamic long-run (short-run) relationship exists between stock prices of Pakistan market and macroeconomic variables by employing VAR models, including Granger causality and Variance Decompositions and Impulse response procedures. The final part presents the findings and conclusion, along with the contributions to knowledge as a result of this research.

3.1: REVIEW OF EMPIRICAL LITERATURE

The relationship between macroeconomic variables and stock market returns is well documented in existing literature. However, a void in the literature relates to examining the cointegration between macroeconomic variables and stock market, particularly in developed markets. In this section, we divide literature into group and discussion following the structures. Engle and Granger (1987) discovered a co-integration analysis and build the foundation for long-term relationship between stock prices and macroeconomics variables. The popular study by Campbell and Shiller (1988) based on the theoretical foundation of the stock market model such as, dividend discount model, where it was assumed that actual dividends, discount rate and stock return having a long-term equilibrium co-integration relationship. Similar types of long run relationship were documented over the time period by many researchers such as, Lee (1995), Timmermann (1995), Sung and Urrutia (1995),

and Crowder and Wohar (1998), among others. By contrast, researchers such as, Campbell and Shiller (1988) and Mukherjee & Naka (1995) employed Johansen method of co-integration analysis for the Japanese stock market by using monthly data from 1971-1990. Where, they found two different co-integration relationships between the variables. The results show a negative effect of CPI and government bonds on stock prices, while the exchange rate, money supply and industrial production index having a positive effect on stock prices. For this reason, firstly, we analysed the relationship between the return of Pakistan stock market and macroeconomic in a co-integration framework.

Oseni and Nwosa (2011) examine the relationship between return of stock and macroeconomic variables by employing LA-VAR Causality test in Nigeria. Where, they found a bi-causal link between stock return and GDP. Erdal et al. (2011) also find a bidirectional causality relationship between economic growth, stock market and banking sector development in Turkey. Furthermore, they point out the banking sector's contribution to economic growth is more than the stock market.

Amare and Mohsin (2000) document a long-term association between exchange rates and stock prices of Asian emerging stock markets by employing the co-integration technique to monthly data from 1980-1998. They find that stock prices of Singapore and Philippines market having a long-run relationship with exchange rates. However, when an important variable rate of interest was added to the co-integration equation, co-integration between interest rate, exchange rates and stock prices was found in six out of nine countries. Chowdhury and Rahman (2004) contribute to the existing debate with the innovative demonstration that how forecasted macroeconomic variables volatility was transmitted with stock return of Bangladesh by employing VAR framework. They confirm that stock market volatility strongly causes due to macroeconomic volatility. According to Abdullah and

Hayworth (1993) investigation by using following variables such as, money supply, short and long-term interest rate, inflation, trade deficits and industrial production index that the stock return of the USA had a positive relationship with the inflation rate and money supply, but a negative relationship with trade deficits and short and long-term interest rates. Further, Hussain et al., (2009) point out the coefficients of ECM1 (–1) and ECM2 (–1) were negative. They also found that inflation variance decompositions confirm the high forecast error for KSE.

Sohail & Hussain (2009) examine the long-run and short-run relationships of stock return with economic factors related to Lahore stock exchange of Pakistan. They found the negative impact of CPI on return of stock, however, a positive long run impact of industrial production index, exchange rate, and money supply on the stock returns.

Mehta and Sharma (2011) investigate the time-varying volatility of Indian stock market by employing the S&P CNX Nifty index from 2001-2010. They found that the Indian stock market has witnessed the prevalence of time varying volatility, past volatility having a significant impact on the current volatility; it was also found that conditional volatility identification can help to investors to forecast their returns from the equity market under alternate market phenomenon. In many studies, macroeconomic variables are used to examine the stock market performance during good or bad economic conditions. However, there are other significant factors influencing the performance of the stock return index e.g., the term- structure, the spread of a bond's return, the default spread and the ratio of dividend yield. Many researchers found the association between these variables and stock return (Leon, 2008; among others).

Bulmash and Trivoli (1991) find that the majority of macroeconomic variables have varied effects on the return of stock market depending on condition of the economy of any country.

Further, they argued that money supply increases government debt, and in the short run has a positive consequence on liquidity; however, in the long run they have a negative impact on liquidity due to inflation. Hussain and Saidi (2000) contribute to the existing discussion with the innovative manifestation of dynamic linkages of the stock markets; they found that stock prices in Pakistan market smoothly move and has a diversification potential.

Pan et al., (2007) document the dynamic interaction of seven East Asian stock prices with exchange rates from 1988 to 1998. They found a noteworthy causal interaction between stock prices and exchange rates of the following economies prior to the Asian financial crisis. Further, they documented a contributory interaction between foreign exchange market and stock market in Korea, Hong Kong and Singapore only. They also documented robust findings by employing methods such as Granger's causality tests and variance decomposition analysis. They conclude that interaction varied from economy to economy relating to regimes of exchange rate, trade volume and size of the stock market.

Wongbangpo and Sharma (2002) empirically document the long run negative association between the inflation rate and stock prices; money growth in Malaysia, Singapore and Thailand has a positive influence on the return of these stock markets. Bahmani-Oskooee & Sohrabian (1992) document a long-run association of stock prices with exchange rates by employing Granger causality test. They find a twofold causality between stock prices and real effective exchange rate.

Abdalla and Murinde (1997) document a long-run association of stock price with the exchange rate by employing the co-integration approach in Pakistan, Korea, India and Philippine stock markets. The result shows that there is a long-run association between variables for Pakistan, Korea, India and Philippines only. Further the issue of causation was examined between prices of stock and exchange rate by employing Granger causality test.

Phylaktis and Ravazzolo (2005) investigate the short and long-run dynamic relationship between exchange rate and prices of stock, and exogenous shocks influence of these stock markets by employing co-integration and Granger causality methods into a Pacific Basin economy group from 1980-1998 period. They documented a positive interaction between stock price and foreign exchange markets, and concluded that the stock market of USA acts as a conduit for these links. Further, they found that there has been a transitory effect of the financial crisis in the long-run co-movement of following stock markets. A similar study has been done by Muhammad et al., (2002), where they find a co-integration between Pakistan's stock market, USA and UK. Further, Lamba, employing the co-integration method, (2005) investigate the relationship to the advance stock market of the Indian, Pakistani and Sri Lankan stock markets and found that Indian stock market co-integrated with the USA stock market, while the stock market of Pakistan comparatively emerges isolated. Concluding the evidence about stock market co-integration, many emerging stock markets, such as Pakistan are still incorporated with advance market.

The Pakistani stock market is still one of the smallest with respect to market capitalization ratio and financial illiteracy as compared to some other emerging stock markets. It has been estimated that half of the total population invests in the stock market, and other investing in real estate properties, gold and liquid assets (SBP, 2011). In general, the Pakistan stock market is not the witness of saving mobilization and risk diversification, and political family connections ownership firms enjoyed low-cost debt from the government own banks and these loans are never paid back. According to Khawaja and Mian’s (2005) documentation for Pakistan, the firms borrow 45% more debt and default rate of these firms are 50% higher than other's firms, and these favoured dealings occur exclusively in government-owned banks. The renowned Pakistani economist Nishat (2004) examines the long-run causal relationship between stock price and macroeconomic variables, by using the CPI, IP, M2

and exchange rate from 1974-2004. Where, Nishat find that macroeconomic variables and stock prices having a causal relationship for the long term by employing Granger causality test. Further, he documents that the industrial production index and interest rate have a positive (significant) impact and inflation has a negative impact on stock prices. Likewise, Subayyal & Shah (2011) document bidirectional causality between the exchange rate and stock return, and claimed that these results were different from earlier studies about this topic because those studies used data of pre-floating exchange rate regimes. Further, they examined the effect of macroeconomic variables on the stock market in the autoregressive framework. They also found a spurious CPI effect on stock return in the short run, but a negative CPI effect on stock return in the long run. In terms of the money supply, they find short-term positive and long-term negative effects on stock return. Similarly, in the long run, the interest rates and government debt had a negative effect on stock return.

Overall, we can conclude that the majority of scholars found associations between macroeconomic variables and stock returns. However, the Pakistan stock market is under-researched and according to our knowledge and available information in the literature, we are unable to find any co-integration analysis and relationship between either macro or global variables with the stock returns of the Pakistan market after the boom, Asian crises and the 1990's stock market reforms. As mentioned earlier, the performance of the Pakistan stock market almost oscillates 25% from 1997 and 2012. As a result, a good understanding of the historical events might help to find pre-emptive measures to avoid a recurrence of the Pakistan experience in the future. This study is different from earlier studies related to Pakistan on this topic because these studies utilizing the pre-post-floating exchange rate regimes. According to available information and my knowledge, there has not been done any empirical study in Pakistan.

3.2: DATA DESCRIPTION AND SOURCES OF VARIABLES

This section describes the variables, sample selection, sources and construction of primary variables. Following main stream literature, we employ the following variables, including; stock returns (Rt), Money supply (M2), inflation rate (INF), exchange rate (EX), 6-month T-bill rate (TB) as a proxy of short-term interest rate, discount rate (repurchase rate (REPO) as a proxy of long-term interest rate (INT), FDI, Industrial Production index (IPI) employed as a proxy to capture the economic activity throughout the country instead of GDP because monthly GDP is not available, Gold price (GP) and Brent's oil price (OP) are global factors.

The data of individual firm stock prices and other variables were obtained DataStream Advance. 140 listed firms at Karachi Stock Exchange have been selected as a final sample for this study. The monthly average stock returns of each firm have been calculated from 1997 to 2012, with total 26840 observations. These 140 firms are the most active stocks, and more than 16-year life with approximately 70% cumulative market capitalization of KSE listed companies. The selection of historical monthly data was intended to confine long-term volatility and to eliminate the consequences of settlement that were known to significantly influence firm returns due to shorter intervals of the sample. We use monthly data to eliminate the spurious correlation problem. The majority of firms' data was unavailable before 1994 for the reason that a large number of firms either established or privatized and afterwards joined the Karachi Stock Exchange later than that date. Initially, the list of 612 companies within the sample was selected that have information on KSE website. However, 472 companies were dropped from the initial list of samples due to unavailability of data. The data before 1997 were not feasible and too many observations were missing. As such, the entire sample size was decreased to 192 months from January 1997 to 2012 later. During this period KSE attained highest index value, and declared the world best performing stock

market. Consequently, we need a large sample to get reliable results, whereas this period is relatively smooth and covered the period of the post-liberalization and pre-post Musharaf government. These anticipated economic, financial and foreign policies consequent to the September 11th attacks had transported radical changes in the economic prospect and examined whether stock return behaviour has changed in these different periods.

Variables and its description

Our dependent variable is stock returns of the listed firms are calculated as weighted average and later than the take difference between the two consecutive series. As discussed above, our independent variables include Money supply (M2), inflation rate (INF), exchange rate (EX), 6-month T-bill rate(TB) as a proxy of short-term interest rate, discount rate (repurchase rate (REPO) as a proxy of long-term interest rate (INT), FDI, Industrial Production index (IPI), Gold price (GP) and Brent's oil price (OP).

Interest Rate: This is a significant variable for economic policy and directly related to economic growth. This variable play an important role in an economy, because the return and profitability of business and stock market efficiency can be the effect due to the sudden change in an interest rate. Interest-rate risk affects the value of payment far in the future relative to near term payment (Chen et al., 1986). Generally, the interest rate is assumed as a cost of capital, from borrowers' point of view, the interest rate is the cost of borrowing money, and from the point of view of lenders, interest rate is the cost for lending of money (Alam & Salah, 2009). The majority of investors preferred to invest their funds in the stock market, but a few of them are capable of generating some extraordinary return from an inefficient market because a lot of investors, they lose confidence in the profitability of the stock market. In this case a majority of investors may switch their investment from stock

market to bank, when a bank rate of interest on deposit increases or changes the portfolio structure to get the maximum return (Hashemzadeh and Taylor, 1988). The data regarding interest rate, a weighted average Government T-bill rates as short-term and discount rate as long term as independent variables are taken.

Exchange Rate (EX): The foreign exchange rate is a monthly average conversion rate of currency, which is converted into a benchmark currency. If the exchange rate fluctuates, the country's export and imports can be suffered, and economic growth of Pakistan will be the effect. In Pakistan, the import sector dominates the export sector; if the local currency devalues, as a result, the prices of production will be increased and thus cash flows of companies reduce. Because of currency fluctuation, the return is relatively striking to foreign portfolio investors (Malliaropulos, 1998), as depreciation in currency having short-term and long-term negative effects on the stock market return (Ajayi and Mougoue, 1996). In the case of exports, depreciation in currency having a positive impact on domestic return, fluctuation in levels of exchange rate affects the stock return of the market (Mukherjee & Naka, 1995).

Inflation Rate (INF): Inflation is described as an increase in the average price level of all goods and services, and a number individual goods and services prices always increasing while others are failing. Inflation occurs when a rise in the price level in the economy, and it measures the rate of inflation anticipated by economic agents in a particular financial instrument (Peter et al., 2006). Inflation influences the discount rate and value of future cash flow (Chen et al., 1986). The expected and unexpected inflation negatively affects the stock returns (Asprem, 1989). While expected inflation moves up, then interest rates will increase, and Kaul (1987) found a negative relationship between stock returns and inflation. The data regarding the inflation (INF) rate is calculated as the change in the consumer price index. It

is argued that ‘‘ 1% increase in inflation is caused to increase 1% of really required rate of return, which cause 20% decline in stock prices’’ (Sharp, 1999).

Industrial Production Index (IPI): It is an important economic indicator and measures real current production and growth of the whole domestic economy. The change in IPII affects the opportunities facing investors and real values of cash flow (Elton et al., 2003). The following researchers found that industrial production has a positive and significant impact on stock return throughout increasing the expected cash flow: Fama (1981), Chen et al., (1986), Elton et al., (2003) and Erdogan and Ümit (2005) among others.

Money Supply (M2): In this study, we used the Money supply (M2) to measure the impact on stock return; because it increases the market liquidity ultimately which lead to increase the prices of equity nominally (Reilly and Brown, 2006). Therefore, it is assumed that there is the positive impact of the rise in the money supply on the return of the equity market.

Foreign Direct Investment (FDI): This is a net inflow of investment to acquire for operating economic activities other than that of the investor (WB, 2012). FDI is an investment into the economy to obtain the long-lasting interest in enterprises operating an outer of the economy, and FDI has a significant influence over the foreign enterprise as well as whole economic growth. Considering these signals the monthly FDI is used as an independent variable.

Oil Prices (OP): Oil prices and stock return’s relationship have been found negative in nature, since the production and manufacturing economy depends on energy. If the prices of the oil increase due to that cost of input and production will increase, that causes the decline in cash flows and gross profits. As a result of this risk, the confidence levels of investor go down and investor made the investment decision in cost cutting activity as alternative

investments. This perceived risk was investigated by Toloui (2007), where he found that changes in oil prices effect the investor's investment decision. In this study monthly international Brent crude price of oil is used as an independent variable which is obtained by WB and U.S. Energy Information Administration Data Distribution System (www.eia.gov).

Gold Prices (GP); the gold is an important alternative saving and investment instrument in Pakistan; there is anticipation that gold may be looked upon as an asset for that holding idle money and for speculative purposes. In Pakistan, investors are likely to be investing less in stocks as compare to Gold that used as financial assets as the hedge against inflation.

Table 3.2.1: The set of macroeconomic variables used in previous studies

Variable	Previous Studies, where variables used
Stock Returns: $\Delta RM_t = \ln(M_t) - \ln(M_{t-1})$	Fama(1981), Gertler &Grinols (1982), Flannery & James (1984), Chen et al. (1986), Burmeister & McElroy (1988), Ferson and Harvey (1994), Ghazali & Yakob (1997), Hussain & Mahmood (2001), Ibrahim & Aziz (2003), Faff et al. (2005), Husain (2006), among others.
Industrial Production Index $\Delta IPI = \ln (IPI_t - \ln IPI_{t-1}$	Chan et al.,(1985), Chen et al., (1986), Burnmeister & Wall (1986), Beenstock & Chan (1988), Mukherjee & Naka (1995), Ibrahim and Aziz (2003), Iqbal and Nawaz (2009), among others.
Inflation $\Delta INF = \Delta \ln (CPI_t - \ln CPI_{t-1}$	Fama (1981), Chan et al., (1985, 86), Burmeister & MacElroy (1988), Poon &Taylor (1991), Ferson & Harvey(1994), Ibrahim & Aziz (2003), Ihsan et al. (2007), Büyüksalvarcı (2010), among others.
$\Delta FDI=\ln(FDI_t - \ln (FDI_{t-1})$	Claessens et al. (2001), Jeffus (2005); Adam &Tweneboah (2009); Onaran et al., (2010) Soumaré & Tchana(2011), and among others.
Money Supply(M2) $\Delta M2= \ln(M_t) - \ln (M_{t-1})$	Fama (1981), Beenstock and Chan (1988), Cutler et al. (1989), Mukherjee and Naka (1995), Maysami and Koh (2000), Ibrahim and Aziz (2003), Ihsan et al. (2007), Büyüksalvarcı (2010), among others.
Exchange Rate $\Delta EX= \ln(EX_t) - \ln(EX_{t-1})$	Geske & Roll (1983), Yasushi (1988), Bollerslev (1990), Kryzanowski & Zhang (1992), Bartov &Bodnar (1994), Sauer (1994), Abdalla & Murinde (1997), Özcam (1997), Altay (2003), Ibrahim & Aziz (2003), Akkum &Vuran (2005), among others.
Interest Rates $\Delta INT(DR)= (Dr_t - DR_{t-1})$	Burmeister & MacElroy (1988), Bessler & Booth (1994), Ferson & Harvey (1994), Faff et al., (2005), Ihsan et al., (2007), among others.
Gold Prices $\Delta GP= (GP_t - GP_{t-1})$	Neill (1988), Jaffe (1989), Tursoy et al., (2008), Kilian & Park(2009), Chan et al., (2002), Buyuksalvarci (2010), Christensen (2011), Le et al.,(2011), Drira, et al., (2012), among others.
6-month T bill rate $\Delta TB= (TB_t - TB_{t-1})$	Goodfriend (1991), Addo & Sunzuoye (2013). Kuwornu & Owusu-Nantwi (2011), among others.
International oil prices $\Delta OP=\Delta\ln(OP_t) - Ln (OP_{t-1})$	Hamilton (1983),Neill (1988), Jeffrey1989), Mork (1989); Blose a& Laurence (1995); Hamilton(1996), Jones & Kaul (1996), Sadorsky (1999), Wei (2003), Pollet (2004), Toloui (2007), Apergis et. al., (2009), Arouri et al., (2011), Christensen (2011), Jaime & Freddy (2011), among others.
Investor Confidence $\Delta ISI= \Delta (ISI_t - ISI_{t-1})$	Persaud (1996), Lashgari (2000), Baker & Stein (2002), Dennis & Mayhew (2002), Fisher & Statman (2000, 2003), Charoenrook (2003), Randall & Tully (2003), Arindam & Jones(2005), Baker & Wurgler (2006), Francisca & Zouaoui (2013), among others.

Note: This table shows the how monthly variables changed into orthogonal time series, because this eliminates the multi-Collinearity problem and reduces the original variable's dimensionality

Figure 3 shows the evolution of different variables during the study time period, and also presents the evidence that the Pakistan stock market did not communicate one-to-one relationship market in setting the interest rate during the sample period. At the start of 1991, the stock return of KSE unexpectedly increased and investors were enjoying a good return on investment; this was followed by an equally unexpected increase up to 2007 and then unexpected decline up to 2009; however, from 2010 to onwards KSE100 index increased.

The table 3.2.2 summarizes the basic statistical characteristics of data under discussion, such as mean, median, mode, standard deviation, kurtosis and skewness. The standard deviations point out that IPI, INF and EX are more volatile as compared to M2, FDI, GP, OP, INT and stock return (Rt). Furthermore, the standard deviations indicate that M2 and GP are less volatile as compared to other left over macroeconomic variables over the time period. The result shows that the skewness and kurtosis of a sample are statistically significantly different from zero respectively. Since catharsis' of macroeconomic variables is all less than two except FDI, it demonstrates that distributions of the time series are non-normally distributed (Stock & Watson, 2006). Moreover, the skewness tests have positive values for Rt, M2, INF, INT, EX, GP and TB advocate that following variables have long right tails, whereas skewness test values are negative for FDI, INT, SP and OP put forward that the above variables have long left tails (Stock & Watson, 2006). Similarly, descriptive results of the first difference of all variables, industry, size and risk level portfolios show that skews and kurtosis of a sample are statistically significantly unlike from zero (table 3.2.3). Since the kurtosis of macroeconomic variables are less than three except financial services and insurance industry, the distributions of this time-series sample appear to be non-normally distributed (Stock & Watson, 2006), the skewness of all variables have long left tails.

Figure 3.1: Graphic representation of variables

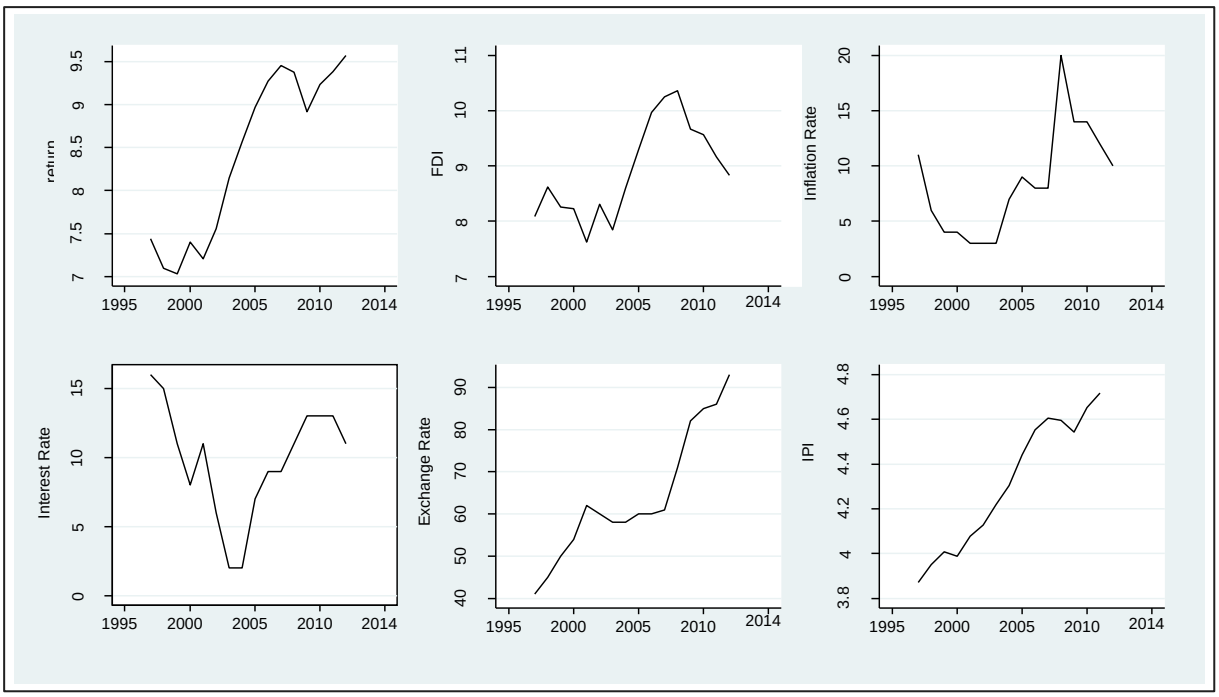


Table 3.2.2: Statistical features of the macroeconomic variables

	Mean	Median	Mode	Std. Dev.	Skewness	Kurtosis
Rt	61.54	49.92	42.87	40.47	0.51	-1.05
INF	8.58	8.06	2.29	5.07	1.16	1.55
IPI	79.59	82.18	43.20	23.85	0.01	-1.15
EX	64.07	60.05	46.12	14.96	0.55	-0.69
TB	9.74	10.27	8.81	3.96	-0.49	-0.31
M	3.23	2.72	10.14	19.51	1.70	-1.70
FDI	10599	5825.04	3182.43	12238.93	2.46	8.72
GP	652.84	427.50	1598.50	439.54	1.05	-0.23
OP	53.25	44.32	9.91	34.25	0.65	-0.81
INT	11.85	12	7.5	3.35	0.64	-0.27

Note: Dependent variable is stock returns; independent variables include exchange rate (EX); inflation rate(INF); long term interest rate (INT); foreign direct investment (FDI); industrial production index(IPI), money supply (M); gold price (GP) and oil prices(OP).

Table 3.2.3: First difference statistical features of macroeconomic variables

	Mean	Std. Deviation	Skewness	Kurtosis
ΔRt	1.24	5.62	-0.34	3.16
ΔINF	-0.03	1.03	0.39	1.25
ΔIPI	0.26	7.26	0.20	0.83
ΔEX	0.30	0.83	2.27	6.79
ΔM	35368	61338	0.79	1.32
ΔTB	-0.1	0.65	-0.02	3.75
ΔFDI	39.0	11837	-0.22	7.52
ΔGP	6.43	26.9	2.18	8.22
ΔOP	0.45	5.95	-1.20	5.83
ΔINT	-0.1	0.47	-0.79	7.21

Note: Dependent variable is stock returns; independent variables include exchange rate (EX); inflation rate (INF); long term interest rate (INT); foreign direct investment(FDI); industrial production index(IPI) , money supply(M); gold price(GP) and oil prices (OP).

Although we are notable for observing the causation, table 3.2.4's reported results reveal the information on macroeconomic variables' relationship strength. In particular, results demonstrate a strong positive association between stock return, money supply, oil prices, gold prices, INF, TB and FDI. Table 3.2.4 suggests a positive (significant) relationship between stock return and macroeconomic variables; however, interest rate having a less negative significant association and the results support the inclusion of these macroeconomic variables in our analysis. The stock return relationship with a short-term interest rate is negative and significant, but very low in terms of strength. The relationship with FDI is average and insignificant with a short-term interest rate, very small in strength.

Table 3.2.4: Pearson correlations matrix of the macroeconomic variables with stock return

	M	INF	IPI	EX	GP	INT	OP	FDI	TB
Rt	0.791	0.533	0.768	0.762	0.740	0.133	0.738	0.500	-0.203
	(0.02)	(0.01)	(0.00)	(0.04)	(0.00)	(0.060)	(0.04)	(0.00)	(0.01)

Note: Dependent variable is stock returns, independent variables include exchange rate (EX), inflation rate(INF), long term interest rate(INT), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

3.3: EMPIRICAL RESULTS OF THE VAR MODEL

As discussed earlier, the long-run analysis is performed by following the three steps that are involved in Johansen-Juselius (1990) Co-integration test. Firstly, we checked whether the entire variables within the system are Co-integrated with a similar order that can be confirmed through unit root tests. Next we find out the optimal length of lag for the VAR model to validate whether estimated residuals are not auto-correlated. Lastly, to approximate the VAR model to erect to conclude the vector's order that is obligatory for institute the tests of trace and the max-eigenvalue (Enders, 2004, 2010). After financial and economic crises that hit the Asian economy in the last two decades. The stationary in financial market time-series data has become ‘‘attractive’’ word among researchers, policy maker and investors. Generally in a time-series data, series are non-stationary, which can create spurious results. According to one definition ‘‘a process is said to be stationary if its mean and variance are independent of time’’ and it has a constant variance and mean over the time period. If time series’ mean and variances are changing over the period, then series called ‘‘non-stationary’’. This means that a stationary series is a series in which, variance, means and covariance are constant over the time period of sample, and they do not fluctuate (change), while in non-stationary time series has a different mean at different time periods, and its variance and covariance fluctuate over time (Mohammed, 2005). In summary, ‘‘a time series (X_t), mean E (X_t) and Variance E $(X_t\text{-E}\ (X_t))^2$ examine and check stationary for any period of sample’’.

Several steps are necessary to test the stationary issue in time series data; firstly, we examined the properties of time-series data by looking a trend. We plotted the line graph of all variables and found the upward sloping trend; we can say that all series are appeared to be non-stationary. To resolve this problem the time series variable data have to be examined for a unit root. If sets of all-time-series data series data are 1 (1) (non-stationary), after that the regression can produce 1 (0) error term, then the equation is said to be cointegrated.

Mostly, non-stationary time series follow a random walk process, fundamentally Dickey-Fuller test engages for testing the existence of a random walk. Conversely, if series have a constant mean, the variance is irregular and so the series is to be non-stationary. To make a stationary series, then random walk requires first-difference.

Different researchers have used different methods for estimation, which was suggested by Dickey and Fuller (1979, 1981) and Kwiatkowski et al., (1992) are very popular and powerful. In this study, Augmented Dickey-Fuller (ADF) and unit root test was used for checking further that the series is stationary or non-stationary. Dickey Fuller and Augmented Dickey Fuller tests for unit roots was done through graphical analysis, it was concluded that there is an idea about the presence of a unit root problem in this series data. Further test was done for confirmation about a problem of the stationarity, for this the DF tests to estimate and Construct the hypothesis for DF and ADF is;

$\text{Ho: Seriesisnotstationary}(\emptyset - 1 = 0)$

$\text{H1: Seriesisstationary}(\emptyset - 1 < 0)$

For further confirmation, we plot the autocorrelation (ACP) and partial autocorrelation (PACF) graph pattern of said variables, and result advocated that ACF function falling slowly and series is said to AR (1) process. The autocorrelation function (ACF) and partial autocorrelation function (PACF) graph start with high value at lag 1 and falling very slowly. The results signified the time series looks like non-stationary. In the case of the correlogram graph, we found a similar pattern, these findings leading us to conclude that all said time series are non-stationary; these series might be non-stationary in mean or variance or both.

Finally, the Granger causality test employed to measure the causal relationship between stock return and macroeconomic variables.

3.3.1. UNIT ROOT TEST AND OPTIMAL LAG LENGTH SELECTION CRITERIA

To find the integration order among all variables in the first study, we appreciated the long-run interaction between the variables. Thus, the unit root test was used to check all (if any) factors within the system are integrated in the similar order. In the existing literature, the Augmented Dickey-Fuller (1979) (ADF) unit root tests are broadly employed. The following ADF model that comprises both drift and linear time trend for ADF estimated;

$$\Delta LY_t = \alpha_0 + a1_t + Y_{t-1} + \sum_{t=0}^{P} B_i \Delta Y_{t-1} + \varepsilon_t \quad (3.1)$$

Whereas in question LY represent the variable's natural logarithm**,** whereas constant terms are α_I and γ**,** whereas both t, and Δ are respectively time trend and first difference operator. While ε_t, is residual of white noise and p is the lagged values of ΔLY_t to control for higher order correlation where it is supposed that time series follow AP (p).

These DF and ADF test results show that there is no normal distribution with large sample size, where the null hypothesis examined by using the Enders (2010) technique. Similarly, lag-length upper limit is found by using the Bartlett criteria which suggested that the upper limit of the lag-length is 12 for all estimated models. The best lag-length ultimately was picked to decrease Schwarz information criterion (SIC), SIC by using this equation SIG =T ln|Σ|+ nln(T), here T and S represent the number of observations and the sum of squared of estimated residuals of parameters respectively. Where optimal lag length changes across the time series (see tables 3.3.1.2 & 3.3.1.3).

Table 3.3.1.1 shows the results of the DF model with intercept and trend component data in level. These results significantly do not reject (series is non-Stationarity) the null hypothesis of non-stationary for any of the series data on levels apart from FDI and IPI, since ADF statistical results of all variables except two variables are not greater than any critical values of 1%, 5%, and 10% respectively. We can say that all variables are non-stationary.

Table 3.3.1.1: DF Unit Root test with intercept and time trend

Variables	t-statistics	coefficient	Std. Error	P-value	[95% Conf. Interval]	
Rt	0.016	0.0003	0.0177	0.994	-0.0346,	0.0352
INT	-2.014	-0.0213	0.0105	0.594	-0.042,	-0.0004
M	0.086	0.0007	0.0081	0.995	-0.0153,	0.0166
INF	-2.159	-.0373461	0.0173	0.513	-0.0714,	-0.0032
IPI	-5.408	-0.2662	0.0492	0.000	-0.3634,	-0.1691
EX	-0.322	-0.0036	0.0109	0.989	-0.0247,	0.0178
GP	-1.555	-0.0153	0.0098	0.810	-0.0346,	0.0041
TB	-1.854	-0.0219	0.0118	0.678	-0.045,	0.0013
OP	-3.005	-0.0849	0.0283	0.131	-0.1407,	-0.0292
FDI	-8.483	-0.5551	0.0654	0.000	-0.684,	-0.4261

Note: Dependent variable is stock returns; independent variables include exchange rate (EX); inflation rate(INF); long term interest rate (INT), foreign direct investment (FDI), industrial production index(IPI), money supply(M); gold price(GP) and oil prices (OP).
***critical value intercepts only at 1% (-3.480), 5%(-2.884), 10 %(-2.574)
***critical value with intercept and trend at 1% (-4.010), 5% (-3.438), 10 % (-3.138)
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

Table 3.3.1.1a: DF Unit Root test with intercept only

Variables	t-statistics	Coefficient	Std. Error	P-value	[95% Conf. Interval]	
Rt	2.439	0.017	0.006	0.999	0.0032	0.0306
INT	-2.448	-0.024	0.010	0.129	-0.0443	-0.0048
M	4.878	0.010	0.002	0.000	0.0064	0.0149
INF	-1.556	-0.022	0.014	0.506	-0.0516	0.0060
IPI	-2.071	-0.0454	0.0219	0.256	-0.0885	-0.0021
EX	1.187	0.0048	0.0041	0.996	-0.0031	0 .0128
GP	2.127	0.0095	0.0044	0.999	0.0007	0.0182
TB	-1.830	-0.0216	0.0118	0.366	-0.0449	0.0017
OP	-0.795	-0.0101	0.0127	0.820	-0.0351	0.0149
FDI	-7.590	-0.4662	0.0615	0.000	-0.5874	-0.3451

Note: Dependent variable is stock returns, independent variables include exchange rate (EX), inflation rate(INF), long term interest rate (INT), foreign direct investment(FDI), industrial production index(IPI), money supply(M); gold price (GP) and oil prices (OP).
***critical value intercepts only at 1% (-3.480), 5%(-2.884), 10 %(-2.574)
***critical value with intercept and trend at 1% (-4.010), 5% (-3.438), 10 % (-3.138)
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

Table 3.3.1.2: ADF Unit Root test for log variables value at first difference

	RT	M	FDI	IPI	EX	GP	OP	INF	INT
					Model with intercept (t-Statistic)				
lag(1)	0.305	0.55	-3.795	-2.322	-0.620	1.488	-0.98	-1.858	-2.46
lag(2)	0.185	0.69	-2.711	-2.221	-0.660	1.561	-1.04	-2.059	-2.49
lag(3)	0.028	0.933	-2.107	-2.896	-0.735	1.085	-1.15	-2.757	-2.55
lag(4)	-0.028	1.127	-2.001	-2.139	-0.713	1.169	-1.03	-2.834	-2.60
lag(5)	-0.088	1.399	-1.663	-1.786	-0.798	1.254	-1.04	-2.541	-2.65
lag(6)	0.085	0.448	-1.772	-1.470	-0.794	0.886	-1.08	-2.367	-2.31
lag(7)	-0.095	0.420	-1.720	-1.353	-0.814	0.970	-0.86	-2.429	-2.17
lag(8)	-0.030	0.390	-1.558	-1.336	-0.900	1.067	-0.71	-2.354	-2.28
lag(9)	-0.027	1.040	-1.510	-1.353	-0.378	0.523	-0.76	-2.107	-2.35
lag(10)	0.056	1.265	-1.385	-1.307	-0.205	0.570	-0.83	-2.072	-2.22
lag(11)	0.075	1.473	-1.258	-1.068	-0.430	0.676	-1.23	-2.074	-2.26
lag(12)	0.006	1.150	-1.236	-0.887	-0.426	0.760	-1.10	-1.107	-2.31

Note: Dependent variable is stock returns; independent variables include exchange rate(EX), inflation rate(INF), long term interest rate (INT), foreign direct investment (FDI), industrial production index (IPI), money supply (M), gold price (GP) and oil prices(OP).

Table 3.3.1.3: ADF Unit Root test for lag variables value at first difference

	RT	M	FDI	IPI	EX	GP	OP	INF	INT
					Model with intercept and trend (t-Statistic)				
lag(1)	-2.295	-2.22	-5.210	-5.858	-1.711	-3.422	-3.352	-2.546	-2.083
lag(2)	-2.301	-1.99	-3.637	-6.590	-1.746	-3.247	-3.387	-2.605	-2.173
lag(3)	-2.309	-2.09	-2.863	-8.677	-1.917	-3.101	-3.717	-3.639	-2.281
lag(4)	-2.326	-1.83	-2.707	-6.620	-1.896	-3.227	-3.690	-3.736	-2.339
lag(5)	-2.554	-1.69	-2.114	-5.629	-2.048	-3.216	-3.662	-3.466	-2.376
lag(6)	-2.760	-2.04	-2.244	-4.865	-2.036	-3.096	-3.852	-3.221	-2.126
lag(7)	-2.889	-1.98	-2.121	-3.907	-1.924	-3.207	-3.338	-3.261	-2.007
lag(8)	-2.663	-1.91	-1.801	-2.301	-2.117	-3.219	-3.304	-3.229	-2.114
lag(9)	-2.865	-2.71	-1.603	-1.922	-1.928	-3.007	-3.304	-2.958	-2.230
lag(10)	-2.731	-2.69	-1.330	-0.953	-1.890	-3.067	-3.456	-2.945	-2.182
lag(11)	-2.825	-2.76	-1.052	-0.520	-2.131	-2.630	-3.953	-2.912	-2.140
lag(12)	-2.620	-3.66	-0.689	-0.996	-1.893	-2.669	-3.790	-1.493	-2.173

Note: Dependent variable is stock returns; independent variables include exchange rate (EX), inflation rate(INF), long term interest rate(INT), foreign direct investment(FDI), industrial production index (IPI), money supply(M), gold price(GP) and oil prices(OP).

According to these findings, all variables are integrated of order 1(1). Table 3.3.1.2 shows the ADF test results with intercept and trend components' data at first difference level and

there is no clear evidence to reject the null hypothesis of non-stationarity (series is non-stationarity) for any of the series data in levels apart from FDI and IPI, since ADF statistics of all factors except two variables are not greater than at any significance level, i.e., 1%, 5%, and 10% respectively. Consequently, we conclude that all variables within the system are non-stationary at levels. Similarly, we employed the same type of test at first difference level data; results show that a unit root null hypothesis is significantly rejected for all, and it is concluded that all variables have an integration of order one. The above DF and ADF test validated the unit root test results, and also to confirm that all individual series are non-stationary at levels as well as at the first difference except two-time series of variables, and all individual series are considered as integrated of order one. Further, the autocorrelation (AC) and partial autocorrelation (PAC) confirmed the result which derived from the previous test. Of the above, PAC and AC result look likely to be non-stationary and but two series such as IPI and FDI look like to be stationary. The graphic results of the autocorrelation coefficients (AC) confirmed a slow decay in trend, and suggesting a non-stationary and partial correlation coefficient (PAC) does not illustrate spikes after a lag (2) which advises that this time series demonstrate a significant autocorrelation (Prob. > Q value), as a result we can reject the null hypothesis that all logs are not auto correlated.

Optimal Lag Length Selection Criteria

Next, we find out the optimal number of lags in the VAR system. In the existing literature, five different criteria adopted to find out the optimal number of lags such as, (1) sequential modified likelihood ratio (LR) (2) Akaike information criterion (AIC) (3) final prediction error criteria (FPEC) (4) Schwarz information criterion (SIC), and (5) Hannan-Quinn information criterion (HQIC) are employed to decide the lag lengths in VAR model. The selection of the length of lags was made when three criteria agree, if there is conflicting results, in case the following recommendation followed. For example, Ivanow and Kilian (2001) put forwards in the framework of VAR models, the AIC criterion is more liable in monthly time-series data; HQIC criteria provide more accurate results in quarterly time-series data over 120 sample size, and SBIC criteria provide more accurate information about length of lags with quarterly time-series data for any sample size (on VEC models). In this study, there is monthly time-series data with more than 120, HQIC and AIC criteria suggest a lag of 4 and further analysis was carried out by employing three lags criteria, which were recommended by LR criteria. By employing these criteria, it is found that there is no autocorrelation up to 12 months in VAR model. Moreover, Lagrange multiplier (LM) tests p-values point out that there is no serial association in estimated residuals, which are produced through VAR (3) models equal to lag 12; rest of criteria recommended one lag to estimate the VAR than lag 12. It is discovered through LM test results that there is no evidence to reject the null hypothesis of ‘‘no serial correlation’’ in the estimated residuals produced by VAR (1) model. The results of each criterion for a maximum of 12 lags are reported in table 3.1.4.

Table 3.3.1.4: Optimal lag length of VAR Model

Lag	Log likelihood	FPE	AIC	SIC	HIQ
0	1575.44*	1.91E-18	-15.26	-12.26	-14.05
1	1541.62	1.46E-18	-15.52*	-13.97*	-14.89*
2	1090.57	1.72E-16	-10.76	-9.19	-10.13
3	884.34	1.51E-15	-8.58	-7.02	-7.96
4	762.00	5.44e-15	-7.31	-5.73	-6.67
5	691.48	1.13e-14	-6.57	-4.99	-5.93
6	671.41	1.36e-14	-6.39	-4.80	-5.75
7	594.01	3.09e-14	-5.57	-3.98	-4.93
8	554.35	4.65e-14	-5.16	-3.56	-4.51
9	522.13	6.48e-14	-4.82	-3.23	-4.18
10	514.34	6.88e-14	-4.77	-3.16	-4.12
11	552.904	4.46e-14	-5.20	-3.59	-4.55
12	638.48	1.65e-14	-6.19	-4.58	-5.54

Note: *** Significant at 1%, *** significant at 5% level and * significant at 10% level.

In the above outcomes, AIC criteria recommend a lag of 1; that is also suggested by SIC and HIQ, AIC. Further, the analysis is proceeding with two lags proposed by sequential modified LR test. Employing two lags to find out there is no autocorrelation in VAR system and Lagrange multiplier tests strongly indicate that there is a serial correlation and the null hypothesis is rejected in the estimated residuals generated from VAR models with lag12. Further, with all criteria and discover there is evidence to reject the null hypothesis ‘‘no serial correlation’’ on LM test’s results.

Table 3.3.1.5: VAR Lagrange-multiplier test

lags	chi2	df	Prob. > chi2
1	632.25	100	0.00000
2	289.96	100	0.00000

H0: no serial correlation at lag order

*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

3.3.2. THE JOHANSEN-JUSELIUS CO-INTEGRATION TEST

Finally, we employed the Johansen-Juselius co-integration test to find out the number of co-integrating vectors, because this test is very responsive to the presence of deterministic trends (Johansen, 1991, 1995), and further Johansen recommended that there are five potential deterministic trends may be analysed such as, in VAR (1) there is no deterministic trends, no intercepts and trend and Co-integration relationship (2) there is no deterministic trends, there is an intercept but no trend, and Co-integration relationship (3) there is a linear trend and Co-integration relationship with intercept; (4) there is a linear trend and the Co-integration relationship with the deterministic trend (5) the quadratic trend and Co-integrating relationship with a linear deterministic trend. Further, it is supposed that overall time series data have a stochastic trend, that's why we examined; whether there was any long run and short run association between stock return and macroeconomic variables to proceed the further analysis. We assume that there is a Co-integration relationship and linear trend in the VAR with intercept. The detailed results of table 3.3.2.1 provide the evidence regarding co-integration tests together with trace and the max-eigenvalue test ($P<0.05$). The max-eigenvalue tests hold one co-integration vector, but trace tests put forward five co-integrating vectors at the 5% significance level. On the other hand, this analysis permits one co-integrating vector at in relation to maximum eigenvalue statistic test, which was suggested by Enders (2004) and Banerjee et al., (1993) both who always have a preference on the max-eigenvalue test. Throughout these tests, the following major implications have been developed: there is a long run relationship of all macroeconomic variables and each variable proportionally inclines to eliminate short run deviations from long run equilibrium, and there is a two-way causality between most variables.

Table 3.3.2.1: Johansen-Co integration test (Trend constant) co-integration rank

Hypothesized of CE(s)		LL	Eigenvalue	Trace Statistic	Critical value(0.05)
Null	alternative				
r=0	r ≥ 1	2137.460	0.009	258.37	192.89
r≤ 1	r ≥ 2	2097.479	0.453	193.28	124.24
r≤ 2	r ≥ 3	2132.426	0.322	139.47	94.15
r≤ 3	r ≥ 4	2158.697	0.253	95.23	68.52
r≤ 4	r ≥ 5	2179.090	0.203	56.44	47.21
r≤ 5	r ≥ 6	2195.628	0.168	23.36*	29.68
r≤ 6	r ≥ 7	2201.238	0.061	12.14	15.41
r≤ 7	r ≥ 8	2205.684	0.048	3.25	3.76

Note: 'r' indicates the number of co-integrating vectors and critical values are from the MacKinnon-Haug-Michelis table (1999) at 5% level of significance. The Trace statistic test confirms three co-integration relations among the variables.

The result of 'trace statistics' present 5 co-integration equations at a 5% level of significance. These results lead us to conclude that there exist five co-integrated relations. The null hypothesis r=0, r≤1, r≤2, r≤3, and r≤4 can clearly be rejected. The trace statistic test value of 258.37 lies outside the critical interval (0, 192.89), whereas the second trace statistic test value of 193.48 is higher than124.24 and similarly third, fourth and fifth trace statistic test values are higher than the critical interval values. However, the null hypothesis of r≤5 change is zero to reject and trace statistic test value is lower than the critical value at 5% level of significance. By employing Johansen co-integration test and conclude that at least 5 co-integrating vectors between stock return and other macroeconomic variables are co-integrated to each other in this study. This discovery of a long-run relationship between stock returns of Pakistan and macroeconomic variables is consistent with a large body of empirical studies such as, Maysami et al., (2004); Gunasekarage et al., (2004); Patra et al., (2006); Hassan and Javed (2009); Humpe and Macmillan (2009), among others. In general, the above results point out that all macroeconomic variables are significantly contributing into long run relationships with stock return, but exchange rates. These results are not surprising, since the existing empirical studies demonstrate same relationship between

macroeconomic variable and returns of the stock market (Bartram & Bodnar, 2012). It can be concluded that stock return, and macroeconomic variables exhibit a long-run relationship, and we can say that these time series do not move “too far away” from each other. Since co-integration is confirmed, the next stage is to build of the error correction mechanism (ECM) model for dynamic relationship.

The above findings are consistent and reliable with Bernanke (2003); however, on the contrary, argue that assets correlated with the fixed interest rates that are not a main substitute for major investors, the co-integration test disclosed a significant negative association between discount rates and stock return in Pakistan. One likely rationalization of negative association is that economic agents would not think about Pakistan's stock market for investment when interest rates are high; therefore, in long run capital and money markets are alternatives in Pakistan. These results are consistent with the results of such empirical studies as those of Zafar et al. (2008); Ratanapakorn and Sharma (2007); Hammoudeh and Choi (2006); Gunasekarage et al., (2004); Hondroyiannis and Papapetrou (2001) etc.

3.4. SHORT-RUN ANALYSIS AND GRANGER CAUSALITY TESTS

The dynamic relationship between stock return and macroeconomic variables is very important. We examined the dynamic relationship between stock return and macroeconomic variables by employing the following statistical methods such as causality tests, impulse response (IRs) and forecast error variance decompositions (FEVD) analysis. These methods are discussed, and results are presented in the following sections. Firstly, the vector error correction (VEC) model as intended by Engle and Granger (1987) is performed for short-run analysis of these variable M2, INT, INF, IPI, OP, GP, TB, FDI and stock return are co-integrated, because the Granger (1988) point out by employing a VECM model and find out the same outcome within any loss in the long run information, as in Granger (1969) causality test. On the other hand, the test of Granger causality is utilized to investigate the short-run dynamic association between macroeconomic variables and stock return. The following sections provide the outcomes of the VECM model and Granger causality tests.

VECM Causality Tests

In this part, we examined short-run and long-run dynamic relationship by using a VECM model, and the following equation used for estimation:

$$\Delta X_t = \delta + \Pi X_{t-1} + \sum_{t=0}^{p-1} \Phi_j^* \Delta X_{t-1} + \upsilon_t \qquad (3.2)$$

Where, ΔXt an *nx1* vector of all variables within the system and δ is an (nx1) constant vector. *Π,* presented the error-correction mechanism that has two elements: $\Pi = \alpha\beta'$ where, (nx1) column vectors indicating the short run adjustment speed of long-run equilibrium and $\Phi_j^{*}{}'$ is a (1xn) co-integrating vector along with the coefficients of the long run matrix. At last, υ_t represent (nx1) white-noise error terms vector, and *p* represent the auto regression order.

Equation 3.2 has two causation's channels; 1st channel through coefficients of lagged exogenous variables and 2nd is causation's channel through the error correction term. The Error Correction technique detains system adjustment towards long run equilibrium and VECM method commonly employed in the standard VAR model. The investigation continues to find out the lag length, ''p'', for dynamic terms, specifically, the first difference lagged variable's type, number of co-integrating vectors, and structural co-integrating vector of the VECM. The length of the best lag is p=4 and is dependent on the sequential modified statistics LR test.

Table 3.4.1: Lagrange-Multiplier test

lags	chi2	Df	Prob.> chi2
1	187.6654	100	0.00000
2	188.9341	100	0.00000
3	125.3996	100	0.04369
4	171.4863	100	0.00001

H0: no autocorrelation at lag order

*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

The LM test results provided in table 3.4.1 show that estimated VECM with p=4 constantly produce residuals that are significantly free from serial correlation 5% level of significance, the null hypothesis rejected, and we accept the alternative that there is an autocorrelation in the residual for any order. Moreover, the same co-integrating vector structure used for Johansen-Juselius co-integration tests previously, and assumed the linear trends in VECM system. This co-integrating association has only one intercept that confirmed our data have the stochastic trend. Lastly, following the earlier Max-eigenvalue test results concludes that there is one co-integrating vector in the VECM model among the variables. In table 3.4.2, the causality tests for both long and short-run results are provided. In the first row, the result provided for short run and long run association between stock return as dependent variables and with variables. Similarly, first column results illustrate the short-run contribution of

stock return with other variables within the system. This short and long run causality test results are diverse in nature. The p-values provide to signify unidirectional significant short-run causal effects of INT, EX and GP with stock returns. Based on above findings, we can conclude that the Pakistan stock market is an ineffective stock market with regard to INT, EX and GP, since returns of the Pakistan stock market can be predicted by employing available information regarding factors in the short run over the time period. These results are constant and reliable with the empirical indication disclosed by Abdullah and Hayworth (1993), Thornton (1998), Ibrahim (1999), Ahmed (2008), and Hasan and Javed (2009) in their studies. On the other hand, the remaining variables, i.e., INT, M, FDI, INF and OP having insignificant association with the returns in the short-run.

Table 3.4.2: Multivariate VECM causality tests

Dep. variable	**Independent variable**										
	ΔRt	**ΔINF**	**ΔM2**	**ΔIPI**	**ΔINT**	**ΔEX**	**ΔGP**	**ΔTBl**	**ΔOP**	**ΔFDI**	**ECT**
ΔRt		-.014	-42.7	.1212	-.03*	-.032*	.78*	.006	.049	56.1	.795*
ΔINF	-.259		-4175	.0532	.0451	.042	3.80*	.046	-.22	-170	-.020
ΔM	-3e-7	-1e-6		6e-6	3e-7	5e-7	.001*	-2e-7	3e-7	.043*	328*
ΔIPI	.0587	.001	408.4		.0032	.008	.009	-.005	.042	67.53	-.085
ΔINT	-1.7*	.2334	5904	.8568		-.153	-2.5	.3649	-.36	2222	-.027
ΔEX	-1.4*	.0725	3151	.077	-.052		-2.6	.1105	-2*	-119	.33*
ΔGP	.031*	.006*	307.4*	.001	-.001	-.002		-.000	.021	61.6*	4.46*
ΔTB	.418	.1234	-1760	-.676	.188*	.172*	-.09		.002	2073	-.047
ΔOP	.038	-.007	27.63	.0659	-.002	-.032*	.42	.0001		39.65	.756
ΔFDI	.001	-1e-6	1.205*	.0001	3e-6	-6e-6	.01*	6e-6	.001		-141

Note: Dependent variable is stock returns; independent variables include exchange rate(EX), inflation rate(INF), long term interest rate(INT), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
This table contains both t-statistics associated with the error-correction term (ECT), and p-values associated with the .2-statistic, which represents the test joint significance of the lagged values of independent variables.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

The above results show the error correction term for co-integrating equation with stock return (Rt) as a dependent variable. There is an evidence for the existence of Granger causality between INT, EX and GP in the long-run and this is negative with INT and EX and positive with gold prices. Though, there is no confirmation of the existence of Granger

causality of reaming variables with stock return in the long-run. Similarly, there is an indication about the existence of Granger causality between EX and stock return and this casualty is negative; it is concluded that exchange rate plays a negative role in stock return performance. However, there is evidence for Granger causality between GP and stock return in the long run, and it is concluded that GP played an important positive role in stock return performance. On the other hand, the t-statistic related to the coefficient of the lagged error-correction term, or adjustment of speed, identify a long-run significant and positive causal effect (see table 3.4.2). Moreover, the ECT test exhibits that Pakistan stock market come together to its equilibrium within two years once being shocked adjusting about 79% in every month. These results are consistent with pervious researches (Ratanapakorn and Sharma, 2007 and Ibrahim, 1999). The values presented in the first column of table 3.4.2, point out that stock return of Pakistan is an important indicator for few macroeconomic variables, i.e., long-term interest rate, exchange rate and gold price. In the existing literature, there is no consent regarding how real economic activity act in responses of stock market shocks. However, according to the empirical findings of Patra et al., (2006), the stock market is a leading indicator of real economic activities.

Granger Causality Tests

This analysis is concerned with the Granger causality test findings for stock return and selected macroeconomic variables. If some variables are not co-integrated than the Granger causality test is suitable for short-run dynamic relationships' examination among all variables. In case of spurious regression, this problem can be overcome through the unit root test to check its stationary. If the time-series data is non-stationary, and regression produces an error term I (0), then this equation is known as it is co-integrated. To resolve the stationary position, Dickey-Fuller test has employed to overcome this problem through the autocorrelation test.

The maximum number of lags can find out by adopting commonly and reference criteria, i.e. AIC and SIC. According to DF and ADF test results of the drift (constant) and time trend, and these tests consist sensitivity to conduct the test and power to the test. This is due to high data span somewhat to sample size. To examine the co-integration among more than two non-stationary time series, for that firstly run the OLS regression and save the residuals, and then apply the ADF test on those residuals to find out its stationary, the time series are co-integrated if the residuals are stationary. However, in relation to the Granger representation theorem, if two series *y* and *x* are co-integrated. In this case, the co-integration presents evidence of a long-run association among included variables within the system, whilst the ECM provides confirmation of short-run association.

The results in table 3.4.3 show that the return of the Pakistan stock market is self-determining from changes in other variables such as, inflation and IPI. Although, these tests of Granger causality (1969) results are depended on a model that was selected arbitrarily given that monthly data is employed. Moreover, the test of Granger causality was done by up

to 12 lags maximum, and the outcomes are consistent. For that reason, stock return does not Granger-cause on T-bill rate, IPI and discount rate during this sample time period, but all reaming variable's stock returns do Granger-cause. Similarly, all variables have a Granger - cause of stock return, and it appeared that Granger Casualty runs in two-way except IPI but IPI and inflation rate did not cause on stock return and T-bill rate does Granger cause in one direction. The nonexistence of a relationship between the stock return and T-bill rate, IPI and inflation rate are consistent. However, these results possibly constitute a signal the stock market previously was affected by T-bill rate, IPI and inflation rate when efficient market hypothesis conditions are met.

Table 3.4.3: Granger causality tests between dependent and independent variables

Null Hypothesis	DF	chi2	P-values	Implication
ΔRt does not Granger Cause ΔINT	2	02.43	0.296	No causality
ΔINT does not Granger Cause ΔRt	2	11.99	0.002	Causality
ΔRt does not Granger Cause ΔINF	2	09.39	0.009	Causality
ΔINF does not Granger Cause ΔRt	2	00.40	0.819	No causality
ΔRt does not Granger Cause ΔTB	2	1.032	0.597	No causality
ΔTB does not Granger Cause ΔRt	2	7.611	0.022	Causality
ΔRt does not Granger Cause ΔM2	2	10.93	0.004	Causality
ΔM2 does not Granger Cause ΔRt	2	16.86	0.000	Causality
ΔRt does not Granger Cause ΔFDI	2	15.28	0.000	Causality
ΔFDI does not Granger Cause ΔRt	2	18.81	0.000	Causality
ΔRt does not Granger Cause ΔGP	2	13.944	0.001	Causality
ΔGP does not Granger Cause ΔRt	2	05.89	0.050	Causality
ΔRt does not Granger Cause ΔIPI	2	01.33	0.515	No causality
ΔIPI does not Granger Cause ΔRt	2	00.01	0.998	No causality
ΔRt does not Granger Cause ΔEX	2	07.05	0.029	Causality
ΔEXC does not Granger Cause ΔRt	2	08.17	0.017	Causality
ΔRt does not Granger Cause ΔOP	2	09.48	0.009	Causality
ΔOP does not Granger Cause ΔRt	2	10.13	0.006	Causality
ΔRt does not Granger Cause overall	2	86.69	0.000	Causality

Note: Dependent variable is stock returns; independent variables include exchange rate (EX), inflation rate (INF); long term interest rate (INT), foreign direct investment (FDI), industrial production index (IPI), money supply (M), gold price (GP) and oil prices (OP).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

3.5. FORECAST ERROR VARIANCE DECOMPOSITIONS AND IMPULSE RESPONSE FUNCTIONS

Although the significance value of investigating causality tests, where causality tests did not illustrate the association among all variables within the system over the time period. Thus, the reaction of Pakistan's stock market returns is investigated as far as shocks with the following macroeconomic variable's shocks such as, money supply growth, variation in the short-term interest rate, variation in exchange rate, changes as the price of oil, and inflation. The forecast error variance decompositions and Impulse response functions' test were employed to estimate the responses. The Granger causality discovery is limited within sample tests; however, incapable of figure out the degree of originality of variables beyond a time period of the sample. Forecast error variance decomposition is considered for examination of this issue due to a shock from a variable in the system. Salim and Bloch (2007) point out, in the system if one variable is exogenous relating to other variables, and this improvement will describe the forecast error variance in all variables. Firstly, we examine a vector auto regression (VAR) consisting of the stock return and explanatory variables with the limited information that are used in the structural model. A normalization estimation of the VAR model that the simultaneous value for each variable in the system is regressed with lagged values of all variables; the stock return equation is written as follows,

$$R_t = \alpha_{i1} R_{t-1} + \alpha_{i2} R_{t-2} + \alpha_{in} R_{t-n} + B_{i1} X_{t-l} + B_{i2} X_{t-2} + B_{in} X_{t-n} + u_t \qquad (3.3)$$

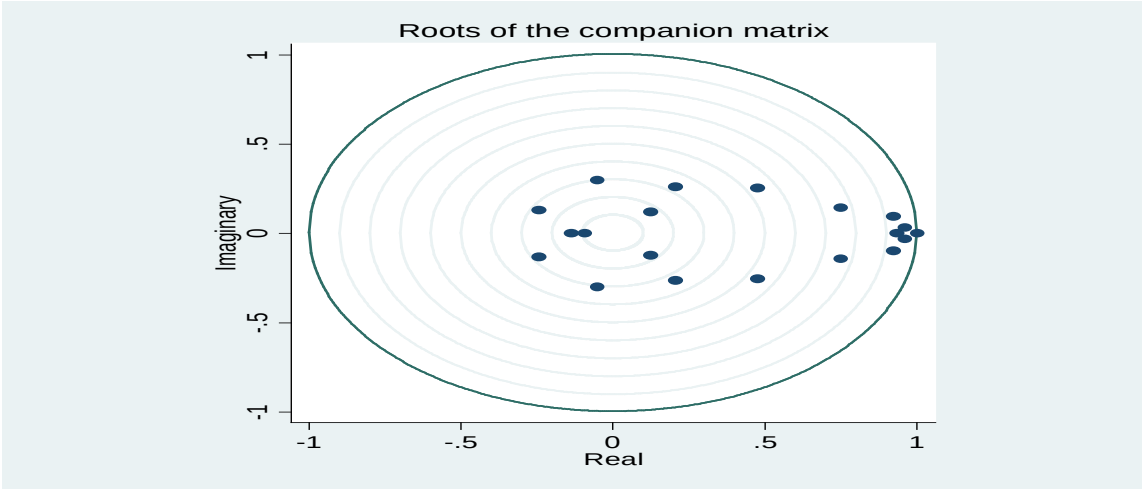
Where R_t is the stock return at time t, and X_{t-n} is a vector of lagged values of the other variables included in this system. Expressing the VAR, system in the form of an equation (3.1) facilitates estimation. However, this normalization does not preclude contemporaneous relations among variables within the system, and these effects are confined in the covariance matrix of the disturbance term's unit.

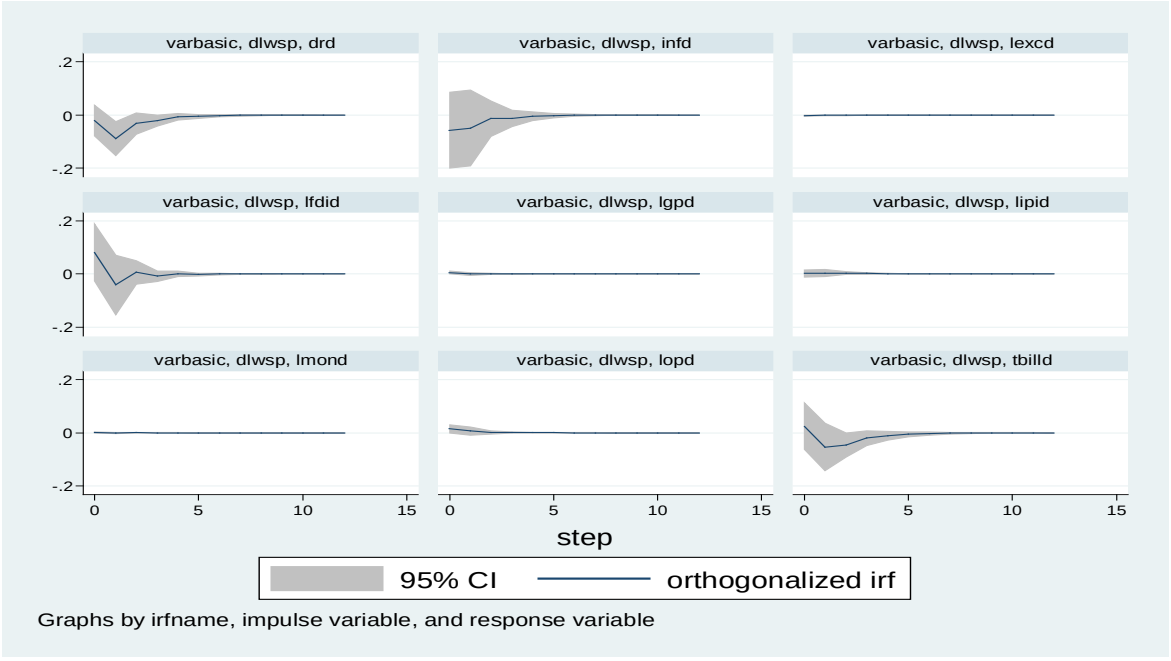
Impulse Response Function Test Analysis

The Impulse response function test analysis identifies the pathway of a variable response over a period of time following a shock to VAR system. The shock persistence shows how speedily the system revisits to equilibrium. With the purpose of study to what degree of innovations among macroeconomic variables within the system can explain the movements in the return of KSE. IRFs allow determining the magnitude, direction, and length of the time period that the return of KSE is distressed by a shock of any economic variable within the system, remains the other variables within the system constant. The IR functions are acknowledged by employing a Cholesky decomposition with KSE first ordered, because it contemporaneously influenced by all other variable shocks, followed by INT, INF, EX, M2, INT and finally OP. To be precise, shocks to oil prices will influence all other variables in the system; however, it's not influenced by them during the same period. The justification for this is: (1) Pakistan economy is a developing, and well growing manufacturing base economy (2) financial market in Pakistan has significant positions and played very important roles to manage portfolios and mutual funds because these instruments are used as the credit instrument in Pakistan (3) monetary policy of Pakistan not fully self-regulating. The monetary authorities of Pakistan select to peg the local currency with USA dollar; (4). Therefore, investors can share risk by investing and divide any earnings (losses) among them, consequently. (5) Pakistan economy constantly has a high level of inflation experienced within a range of 1% - 7% from 1997 to 2009 (SBP, 2010). Therefore, it is highly conceivable that stock market’s practitioners did not have access to significant and current reliable information to facilitate forecasting of the dynamic return's behaviour of Pakistan's stock market.

So, to draw conclusions from the result of IRFs and VAR model must be constant and reliable. Figure 3.2 show that the VAR model convinces the stability condition with two lags. Further, it is confirmed that IRFs declined to zero quickly from the system being shocked, might be proposed that this VAR model is steady because lags to find out through LR test at the 5 % level significantly (see table 3.4.2). Figure 3.3 shows estimated IR functions at the 5 % level of significant characterized by a line that demonstrates the reaction of the stock market to a transitory shock related to all macro variables within VAR system.

Figure 3.2: Inverse Roots of autoregressive characteristic polynomial of estimated VAR Model





In the above figure, the impulse response function is represented by line show and grey band is represented the 95% IRF confidence interval. It is noticed that it is statistically significant association between stock returns and INT, INF, FDI and T-bill rate in the short run. It means that IRFs point out that there are simultaneous effects of variables shock on return of the Pakistan stock market. Currently, stock returns have a small negative effect on INT and T-bill initially and then decrease, after a few months it becomes zero, and after that there is no long-lasting effect on the T-bill rate and INT. It is noticed that at about a month this response sharply increased and after at t=5 it becomes statistically insignificant and levels. Presently, stock returns have a small positive effect on FDI initially, and then it becomes negative and after few months decline to zero, and after that there is no long-lasting effect on FDI. It is noticed that at about two months this response sharply decrease and then increase, but after at t=5 it becomes statistically insignificant and levels. At the same time, stock returns have a small negative effect on INF initially and then increase, after a few months it becomes zero, and after that there is no long-lasting effect on INF. It is noticed that after about a month this response sharply increased and at t=5 it became statistically insignificant. However, in the short run, there is no significant association among return of stock and M2, OP, GP and IPI, it means there are no contemporaneous consequences of these variables' shocks on the return of Pakistan's stock market. These findings suggest that the Pakistan stock market is very weak and inefficient (informational), subsequently integrated with all existing macroeconomic variables. On the other hand, the short-run reaction of returns of the Pakistan stock market to its own shock is significant at the 5 % level of significance; however, it's persistent is less, and it dies out after two months. Table 3.5.1's results indicate the least association with estimated variables' residuals in the system, and this might be occupied as further indication in the absence of a contemporaneous influence of all variables on each other.

Table 3.5.1: Correlation matrix of the estimated reduced form VAR residuals

Variable	ΔRt	ΔINF	ΔM2	ΔIPI	ΔINT	ΔEX	ΔGP	ΔOP	ΔTB
ΔINF	-0.06								
ΔM	0.01	-0.03							
ΔIPI	0.08	-0.03	-0.04						
ΔINT	-0.14	0.18	0.07	0.04					
ΔEX	-0.25*	0.07	-0.05	-0.07	-0.04				
ΔGP	0.14*	0.15*	0.13	0.03	-0.02	-0.14			
ΔOP	0.17	-0.05	-0.02	0.04	-0.08	-0.12	0.16*		
ΔTB	-0.03	0.15	0.05	-0.04	0.28*	0.12	0.02	-0.08	
ΔFDI	0.08	-0.02	0.13	0.04	0.03	-0.05	0.24*	-0.04	0.24*

Note: Dependent variable is stock returns (Rt), independent variables include exchange rate (EX), inflation rate (INF), long term interest rate (INT), foreign direct investment (FDI), industrial production index (IPI), money supply (M), gold price (GP) and oil prices (OP).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

Forecast Error Variance Decompositions

FEVDs point out the comparative importance of each structural shock to the variables in the system. In this study, FEVDs determine the variation percentage in the returns forecast error of the Pakistan stock market that is due to its own shocks against shocks to macroeconomic variables within the system. For this reason, we estimate the variance of the n-step-ahead forecasts error to determine the importance of the macroeconomic shocks in the system.

The Variance Decomposition results of the Pakistan stock market shock effects on macroeconomic variable are shown in table 3.5.2 over a 24-month time period by employing the identical identification restrictions which were exercised in IRF analysis. In the begging month 1, all variables were contributed positively and negatively in the system with the returns of the Pakistan stock market shocks. In this analysis, shocks of Stock market are the main driver of KSE, and can be forecasted through the previous behaviour of the stock market of Pakistan; the money supply has the strongest influence on stock market returns.

The following four months later, money supply is still the strongest influence on the return of the Pakistan stock market with 43% variation, followed by the prices of gold 28% and least influence variable is the exchange rates about -84%. The reaming variables within the

system such as, IPI, inflation (INF), oil prices, short-term and long term interest rate and FDI add only around 4%, -2% , 2.2%, 1%, 1%, a0.4 % variation respectively in the return of the stock market. The size of the variable contribution in the system dramatically changes over 24 months; all variables within the system had a significant consequence of the return of Pakistan's stock market. It may be this is because of continuing speculative trading, which took over the stock market and may be due to fundamental transforms in the economy that foregoing the big changes in the Pakistan stock market.

Table 3.5.2: Variance decomposition

Month/Var	ΔRt	ΔINF	ΔM2	ΔIPI	ΔINT	ΔEX	ΔGP	ΔOP	ΔTB	ΔFDI
1	9.7	-0.3	37.0	11.4	0.3	8.4	14.0	2.5	-2.0	-0.3
4	-4.0	-2.0	43.9	4.0	-1.0	-85.0	27.8	2.2	-1.0	-0.4
8	5.5	-1.0	-47.0	5.0	-1.0	-64.0	-52.0	-4.0	0.5	-0.2
12	-3.0	1.0	-40.0	4.0	-0.2	-29.0	3.2	8.9	1.3	0.4
16	4.4	1.0	50.7	1.0	-1.0	83.6	5.2	-1.0	-1.0	-0.
20	-2.0	-0.3	-47.0	0.1	-2.0	-62.0	-2.0	1.1	-0.2	0.6
24	4.3	-0.4	6.6	3.0	0.1	-24.0	-9.0	1.7	1.1	0.2

Note: Dependent variable is stock returns, independent variables include exchange rate(EX), inflation rate(INF), long term interest rate(INT), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).

Overall, FEVDs analysis exposed weak indication toward stock market shocks of Pakistan for describing all variable variations within the system. Likewise, FEVDs point out that a shock to the stock market of Pakistan describes 6.6% for M2, 3% for IPI, 1.7% for OP, 1.1% for the short term interest rate, 0.2% for FDI, -0.4% for inflation, -9% for GP and -24% for exchange rate respectively only, after 24 months and fluctuates over the time periods. Overall, these findings suggest that macroeconomic variable shock significantly together affects domestic economic activities with the depreciation of the exchange rate that makes inflationary pressures on the economy of Pakistan. One insinuation is that the Pakistani stock market is not necessarily mediator among lenders and borrowers. An additional conclusion is that stock return is a very poor predictor of variability associated with variation in the system.

3.6: CONCLUSION

As stated, the objective of this study is to examine whether macroeconomic factors have an influence on the long and the short-run behaviour of the Pakistan stock market. The Johansen-Juselius co-integration test advocated that selected macroeconomic variables are having a long-run relationship, and these series do not move ‘‘too far away’’. The findings of selected macroeconomic variables having a pattern to adjust regularly and systems can be evoked to long run equilibrium position. There was a long-run negative and significant association between interest rates and exchange rate, while gold prices have a positive (significant) relationship with stock returns. These findings are not unexpected because existing empirical studies confirmed no consensus regarding the relationship of money supply and other variables with the returns of the stock market.

According to co-integration tests; the exchange rates have a negative relationship with stock return. This result implied that depreciation in Pakistan's currency may be able to focus long run foreign investments in the stock market. The trace and max-eigenvalue test recommended there was one co-integrating vector at the 5% level of significance, and other variables contributed significantly to the long-run equilibrium association with stock return. The Granger causality tests concluded that all variables having two ways causality with stock returns, and are co-integrated in the long run except industrial production. However, VECM test results signified a two ways short-run causal effect related to the money supply and inflation with the stock return of the Pakistan. These findings put forward that the stock market of Pakistan interrupted the efficient market hypothesis regarding money supply and inflation rate, and the returns of the Pakistan stock market can be predicted by using existing information about variables in the short run. Further, the vector error correction (VEC) test results conclude that at least five co-integrating vectors between stock return and other

macroeconomic variables are co-integrated with each other in this study. These findings are consistent with a large body of empirical studies such as, Mukherjee & Naka (1995), Hassan & Javed (2009), among others. In general, the above results point out that all macroeconomic variables significantly contributing into long run relationships with stock return of Pakistan except exchange rates. The results are not surprising, since the existing studies demonstrate the same relationship between macroeconomic variables and stock returns (Bartram & Bodnar, 2012).

The error correction model (ECM) confirmed further dynamic relationship analysis and pointed out that how equilibrium adjustment speed from short-term to the long-run state, if the co-efficient of the parameter of higher than equilibrium adjustment with high speed from the short-term to the long-run. These findings are consistent; however, the assets correlated with the fixed interest rates are not a major substitute for major investors; the co-integration test disclosed a significant negative association between discount rate and stock return in Pakistan. The rationalization of negative association, the economic agents would not think about investment into Pakistan's stock market when interest rates high, and consistent with the following studies such as, Humpe and Macmillan (2009); among others.

The impulse response function findings indicate a significant association between stock returns and INT, INF, FDI and T-bill rate in the short run; it means there are simultaneous effects of this variable shock on return of Pakistan's stock market. The stock returns have a small negative effect on INT and T-bill initially and decrease after a few months, and then become zero after that there is no long-lasting effect of T-bill and interest rate. Stock returns have a small positive effect on FDI initially, and then it became negative and after a few months. It is noticed that at about two months this response sharply decreases, and becomes statistically insignificant. At the same time, stock returns have a small negative effect on

inflation initially and then increase after a few months, which show that there is no long-lasting effect on inflation. Also, it is noticed that in the short run, there is no significant association among return of stock and M2, OP, GP and IPI, it means there are no contemporaneous consequences of these variables' shocks on the return of the Pakistan stock market. These findings suggest that the Pakistan stock market is very weak and inefficient, since the stock return is integrated with all existing changes in macroeconomic determinants. On the other hand, the short-run reaction of the returns of the stock market to its own shock is significant at the 5 %; however, it's persistent is less, and it dies out after two months.

According to Forecast Error Variance Decompositions (FEVDs) findings the variation in the returns forecast error of the Pakistan stock market is due to its own shocks against shocks to macroeconomic variables within the system. The Pakistan stock market shock's effects macroeconomic variable over a 24 month (two year) time period. These shocks are the main drivers of stock market and can be forecasted through the previous behaviour of the stock market of Pakistan. The macroeconomic variable such as, money supply has a strong influence on stock market returns, the following four months forward still money supply has a strong influence on return of stock with 43.0% variation, followed by the prices of gold 28% and least influence variable is the exchange rates -84.0%. The reaming variables such as, IPI, inflation, Oil Prices, short-term and long-term interest rates and FDI add only around 4%, 2.2%, 1%, 1%, and 0.4% variation respectively in return of Pakistan's stock market. The size of the variable contribution to the system dramatically changes over 24 months. It concluded that all variables within the system having a significant consequence on the stock returns due to continue speculative trading and fundamental transforms into an economy that foregoing the big changes in the Pakistan stock market.

Overall, FEVDs analysis related to all variables within the system exposed weak indication toward stock market shocks of Pakistan for describing all macroeconomic variable variations within the system. Likewise, FEVDs point out that a shock to the stock market of Pakistan described 6.6% for M2, 3% for IPI, 1.7% for OP, 1.1% for the short-term interest rate, 0.2% for FDI, -0.4% for inflation, -9% for GP and -24% for exchange rate respectively and fluctuates over the time periods. Overall, these findings suggest that macroeconomic variable shock significantly together affected domestic economic activities with the depreciation of the exchange rate that makes inflationary pressures on the economy of Pakistan. In general, these findings are consistent throughout the IRF analysis that revealed insignificant evidence on the relationship between the stock market and other variables over the time period of 1997-2012. One potential insinuation is that the stock market of Pakistan appears as a mediator among lenders and borrowers which is most important condition for any stock market to increase savings and allocate economic resources efficiently in the economy.

CHAPTER 4: THE DYNAMIC RELATIONSHIP BETWEEN MACROECONOMIC VARIABLES AND PORTFOLIO'S RETURNS

4.1: INTRODUCTION

This chapter provides an empirical analysis of portfolio returns by employing multivariate analysis. Three types of firm's portfolios are constructed based on firm size, firm risk level (beta), and industry level. According to Banz (1981), the small size firms are having higher risk adjusted returns as compared to large-size firms. In relation to this analysis, these variables can be employed in multiple regression analysis and pooled data through Ordinary Least Square (OLS) and pooled OLS techniques for examining the significance level of each factor. The different kinds of firm portfolios perform differently in different economic conditions. In the recent economic turmoil, this study develops a set of features likely to be helpful in distinguishing between different kinds of firm portfolios. These results help practitioners and academics to understand risk and return relationship across the portfolios. The current literature draws an attention to know the size effect on stock return for practitioners and academics. Furthermore, this study is important for local and foreign investors as risk managing and portfolio diversification strategies for many reasons. The correct measurement of stock return volatility is essential since economic agent investment decisions depend upon the perceptions about high ranks of financial volatility that have a tendency to affect the general erosion of investor confidence, as results, capital flow away from stock markets. Moreover, this study is also important for optimal asset allocation decisions in addition to options and features dynamic hedging strategies (Brealey & Marcus, 2007).

4.2: RELATED LITERATURE

The stock return volatility understanding might be very important for national policy makers and foreign investors whom decisions influence the return of the stock market. For this reason, it is important to understand the fundamentals volatility for stock valuation and other related derivative products in the stock market.

In noteworthy study, Chen et al., (1986) documented that macroeconomic variables represent the risks that rewarded in the stock market, by including the following factors: industrial production growth rate, the difference between the return on high and low-grade bonds, the difference between the return on long and short-term bonds and unexpected inflation. In relation to Chen et al., (1986) investigation, these risk factors happened due to variation in some financial and economic variables, for instance, industrial performance, interest rate, inflation rate, real economic activity, stock index and investor confidence.

Initially, the firm size effect was determined and reported by Banz (1981) and Reinganum (1981) in the USA; Banz (1981) documented the empirical linkage between stock return and total NYSE common stock value. Where, Banz found that the smaller firms, on average having higher risk adjusted returns, than large (size) firms. This ‘‘size effect’’ has been ongoing and not linear in the market value; this important effect originates in few small (size) firms, although there is a trivial variation in return among average and large sized firms. Whereas, Reinganum (1981) documented that smaller (size) firms can earn a higher return than large (size) firms. Similar studies such as, Siegel (1998), and Horowitz et al., (1996), found that small capitalize (size) firms do not perform better on average, while large capitalize (size) firms outperform consistently over time periods.

Fama (1981) documented that inflation rate and industrial production play a significant role in analysis of activity of the stock market. Furthermore, Geske & Roll (1983) found a

negative relationship between the growth rate of money supply and inflation rate with value of equity. Cheng et al., (2006) describe a dynamic relationship between macroeconomic variables and stock return of Malaysian stock indices from 1996-2005. Where, they reported a significant negative association between IPI, inflation rate, the price of crude oil, T-bill rate and stock return, but also have a long-run relationship except industrial production index. Chan et al., (1985) contend that the return of small size firms is different as compared to the large capitalize firms since both types of firms having a different level of risk, and small size firms are more responsive to economic recessions. Jensen et al., (1997, 1998) document that in expansionary monetary policy periods, the small capitalized firm premium positive and significant, and in restrictive policy periods small firms sometimes have a negative premium. In the influential paper of Chen et al., (1986) document that the spreads between long-term and short-term interest rates, expected and unexpected inflation, IPI and spread between high and low-grade bonds are priced in the stock returns of the USA. Whereas, Fama and Schwert (1977) provide the confirmation that stock prices have a significant negative relationship with expected CPI. Feldstein (1980) find that if the rate of inflation increases than stock prices decrease due to the interaction of inflation in the tax system. Further, the investors undervalue corporate stock during the inflationary period because investors are failing to meditate capital gain on corporate debt, and they also compare earnings ratio with nominal interest rate instead of real interest rate. All of this may lead us to conclude that inflation has a negative relationship with stock prices.

Mostly, in previous researches the relationship between the movements of oil price and stock prices was investigated by adopting economy or industry sector measures of stock prices. Sadorsky (2008) present evidence against the movements of oil price and stock prices.

Aggarwal (1981) investigate the correlation of stock prices and changes in exchange rates, for this purpose monthly USA data for both variables over the period 1974–1978 was

employed. The results show the positive association between USA stock prices and dollar exchange rate in the short run. A similar relationship was examined by Soenen and Hanniger (1988), where they found a strong negative and significant relationship between USA stock prices and exchange rate. However, by using the same data for a different period, a simultaneously significant and negative impact of change in the US dollar on stock prices was found.

In the case of the Finnish stock market, Martikainen et al., (1991) experimented by employing exploratory factor analysis along with (2) pre-specified macroeconomic factor analysis approach. They explored those factors that can affect finish stocks in a given time period 1977-81 and 1982-86. The following 11 macroeconomic factors used to experiment the APT model such as, indices of diversified stock market, interest rate, price indices and other domestic economic variables, for example, money supply and GNP, etc. Where they found that there was only one priced stock factor in first sub period, but all factors were priced in second sub period. These results were encouraging and maintained the equilibrium stock returns that were obtained through economic factors model.

Tursoy et al., (2008) test the APT in the Turkish stock market for 2001-2005 by using monthly data of 13 macroeconomic variables such as, M2, IPI, crude oil price, CPI, import, export, gold price, GDP, exchange rate, interest rate, foreign reserve, unemployment rate and market index, where they found the effects of macroeconomic variables on stock returns. Further, by employing OLS, they found some differences between industry sector portfolios.

Perez-Quiros and Timmermann (2000) document that small (size) firms robustly influenced due to rigid credit policy because of recession in the economy and if this recession condition extended, then small capitalized firms quickly lose collateral and small firm assets turn into risky, due to that, investors lost a higher premium on holding financial assets. Arshanapalli

and Nelson (2007) found that small firm's size portfolios outperform than a large-size portfolio for the non-recessionary period.

Chandra (2004) report the significant and bi-directional effect of inflation on the corporate sector, and certain industries may get a benefit (suffer) to another firm. Furthermore, Loflund (1992) document that global macro factors, for example, unforeseen fluctuations in real exchange rate, inflation rate, upcoming overseas economic movement and demand of export are very important and countrywide macro factors, for example, unanticipated inflation, surprising transforms in interim interest rate, and unforeseen changes in domestic real production should be significant.

Nishat et al., (2004) examine long-term symmetrical relationships between several macroeconomic factors and return of the stock market of Pakistan from 1973-2004. The following variables are investigated: industrial production index, CPI, money supply, and market earnings on investment. They find a "causal" relationship between macroeconomic forces and the return of the stock market. Further, they found the industrial production index to be a positive and inflation the negative largest determinant of stock prices in Pakistan. The reverse causality in macroeconomic variables and movements of stock prices was observed in the case of industrial production and stock prices (Nishat et al., 2004).

The small size portfolios and large size portfolios performed differently under different economic conditions. This study will develop a set of features that would be helpful in differentiating among large and small capitalize firms throughout such economic condition and turmoil. The firm's portfolio based studies such as Banz (1981); Reinganum (1981); Levis (1985); Chen et al., (1986) and Poon and Taylor (1991) point out that size of the firm strongly associated with expected returns. For Banz (1981), Reinganum (1981), Levis (1985) concluded, small (size) firm tends to have larger average returns as compared to large firms.

4.3: PORTFOLIOS CONSTRUCTION

This section describes the variables description, sample selection, portfolio's construction procedure and sources of data collection. In this chapter, the following stock market and macroeconomic variables are used :, the return of portfolios, inflation rate, short-term interest rate (TB), long-term interest rate (INT), exchange rate, industrial production index, money supply, FDI, gold prices and international oil price. The data of 140 firms stock prices and other variables were extracted from the database of Karachi Stock Exchange, DataStream, World Bank, IMF and State Bank of Pakistan (SBP). The monthly average stock price data of 140 most active firms were collected with more than 16-year, which is approximately 70% cumulative market capitalization of KSE 100 index companies.

Sample Preparation Procedure

The selection of historical monthly data was instructed to confine the long-term movements of volatility that were known to be significantly influenced firms' returns. We follow the following researchers approach: Martikainen et al., (1991), Ibrahim (1999), Faff et al. (2005), and Patra and Poshakwale (2006) to employ monthly data to investigate the volatility association. Initially, the 612 listed companies as samples were selected; however, 472 companies were dropped from the initial list of samples due to unavailability of data and also time from 1997 to 2012 (192 months). Further, the listed firms are classified according to a sector/industry classification code in KSE and PSIC 2010. Smaller numbers of companies (2 or less than 2) are combined as general sector/industry; the largest sample sector is personal good. Table 4.3.1 shows the firms selected in the sample from each sector/industry in this study.

From 1997-2012, KSE attained its highest and worst level in terms of index and market capitalization. Meanwhile, it was declared the paramount performing stock market in the world in three consecutive years. For that reason, we need more time periods for a reliable

result; this is relatively smooth and covers the period prior to the start with the liberalization program. This sample period covered the post-liberalization period, pre-post Musharaf government were anticipated economic and foreign policies after 9/11 incident has transported a radical economic change, and moreover, we investigate whether stock return behaviour has changed in the different sub periods due to these policies.

Further, a theoretical model was developed to examine the significant causal association between the stock returns (weighted average firm return) as a dependent variable. While the long-term interest rate (INT), exchange rate (EX), short term interest rate (TB), inflation rate (INF), money supply (M2), industrial production index (IPI), FDI, international gold prices (GP) and international oil prices (OP) are adopted as independent variables to study the significance impact on stock return. The data regarding all variables were collected through detailed study of published annual reports, KSE website, IFM data set, and DataStream from the period of 1997 to 2012. Further data related to these variables were identified from an economic survey of Pakistan and economic report published by the state Bank Pakistan.

GDP is ideally employed to compute the real economic activity; however, the monthly data of GDP was unavailable for Pakistan for that reason industrial production index (IPI) has been employed to capture real economic activity. Other macroeconomic variables have been selected by using the criterion of influence the stock return or future expectations regarding firm's cash flow. Inflation variables have been included in this study, because it was investigated that expected and unexpected inflation negatively affects the stock returns (Asprem, 1989), at the same time as expected inflation move up, then there is a decline in interest rates. Among others, Stulz (1986) and Kaul (1987) endeavour the negative relationship between stock returns and inflation. The interest rate is very important and most closely watched variable, and directly affects the everyday lives and has significant consequences for health of the economy. The high interest rate increased the discount factor

and as result stock price is low. This variable has been used by many researchers to test the APT model in different economies, such as, Martikainen et al., (1991). According to Barro (1990) and Fama (1990), stock returns and industrial production growth might be affected by interest rates. The Pakistan stock market has at highest level all time in the near past. Now investors are willing to invest into the stock market, consequently the demand increase, which leads to raise the stock prices. Fama and French (1989) documented that stock returns can explicate the cyclical variation in economic returns. Chen et al., (1985) contributed to the existing debate with the innovative demonstration that the variation in overall production and inflation can also describe the equilibrium pricing of stock, and further Chen (1991) documented that T-bill cyclical behaviour forecasts the cyclical deviation in equity risk premiums. Another important variable supply of money has been investigated as a leading factor; the supply of money influenced the demand of stock prices (Kaul, 1987; Geske and Roll, 1983; Fama, 1981) and it stimulates to increase stock prices (Martikainen et al., 1991).

This study based on secondary data and consists of 140 energetically traded firms from all industries, and covers the time period of sixteen (16) years from 1997 to 2012. The following industries; Automobile & parts, Banking, Industrial Engineering and Mining, Pharmaceutical, Oil & Gas, Personal Good, Food Producer, Construction & Materials, Chemicals & Fertilizer, Financial service & insurance, Electricity, Travel & Leisure and General Industrials are selected for data collection. These firms are classified into portfolios, and these portfolios are formed upon the basis of industry (sectors), size (market values) and firm risk coefficient (β_i). Because portfolios increase the precision of estimates (β_i) of pervious individual securities, which reduce the loss of information and eliminate the regression phenomenon in risk return tests caused instead of individual securities (Fama & MacBeth, 1973). It is observed that large portfolio estimates (βi) tend to be overstated, and lower portfolio estimates (βi) tend to be underestimated (Fama & MacBeth, 1973).

Table 4.3.1: Number of Firms in Each Industry/Sector.

	Industry Name	No of Firms
1	Industrial Engineering and Metals Mining	06
2	Pharmaceuticals and Biotechnology Industry	04
3	Gas& Oil Industry	07
4	Automobile and parts Industry	08
5	Construction and Materials	14
6	Chemicals and Fertilizer	12
7	Personal Goods	25
8	Banks	09
9	Financial service and insurance	16
10	Electricity	05
11	Food producer	16
12	General Industrials	13
13	Travel and Leisure	03
	Total	140

Firm size portfolios are based on firm's market value and constructing such a way that smaller companies are added into portfolio 1 and the largest companies are in portfolio 2, portfolio 3 and up to 15, following Fama and French (1992) and Chen et al., (1986). The 15 portfolios are constructed basis of the firm size decile approach. To employ the firm size criterion in organizing portfolios is an outcome of empirical studies, and this constriction approach is not encouraged by any theoretical reasoning and no matter what basis is used. The objective was to construct a group of portfolios with the differential spread of returns. Because the majority of researchers has pointed out that firm size is strongly associated with expected returns. Following researcher, such as, Banz (1981); Reinganum (1981); Levis (1985) and Chen et al., (1986) documented that small firms tend to have a larger average (excess) returns than large firms. Chen et al., (1986) and Poon and Taylor (1991) also carried out several tests to group the securities in relation to estimated betas (βi) and stock price level and declared firm market value was the best criterion for the formation of portfolios (Rachev et al., 2005).

Initially, we extract the firm market value's data from 1997-2012 as size from DataStream and ranked them on the base of market value in December of year t. This size ranking is used to construct the size decile's portfolio from January of year t through December of the following years (t+1). After that, firms are grouped into 15 groups in such a way that a small size portfolio contains small decile's firms, and large size portfolio contained large-size decile's firms according to D1, D5 and D10 ranking. These portfolios are revised in such a way that every year, according to market values of the companies from the beginning of each year. Finally, we make 15 portfolios, 5 each like small (S 1, S2, S3, S4 and S5), medium (M1, M2, M3, M4, and M5) and large (L1, L2, L3, L4 and L5).

For risk (*βi*) level portfolios, firstly we calculate the beta (βi) of each firm and then, estimate *(βi)* portfolios are constructed in such a way that smallest estimate (βi) of companies am in portfolio 1 and average and medium estimate (βi) companies are in portfolio 2, portfolio 3 and similarly high estimate (βi) companies are in portfolio 5 respectively.

Industry (sectors) portfolios are constructed in such a manner that similar firms which belonged to same industry are grouped together in the different group of portfolios, and this combination of industry is made according to Pakistan Industrial Standard Classification (PSIC, 2010). These portfolio construction methods already used by the renowned researchers such as Chen et al., (1986) and Poon and Taylor (1991), because the firm size is strongly associated with expecting returns (Banz, 1981; Reinganum, 1981) and small firms (size) tend to have outsized average/excess returns than large firms Levis (1985).

4.4: ECONOMETRIC METHODOLOGY

This part of our study demonstrates the econometric research methodology which was used to examine the impact of macroeconomic variables on stock returns of portfolios and the predictable behaviour of prices of stock. We used OLS, Fixed effect model, Random effect model, and their selection criteria are discussed later. The knowledge of stock price behaviour is very important in an emerging stock market. In fact, it provides knowledge to academic scholars with extra information under diverse economic situation where the fundamental premises do not exist, it allows to practitioners, portfolio managers, economic agents and analysts a fundamental of decision making to what extent they should trust on stock market performance and what internal or external factors on the whole significantly influence the stock returns. The findings of this study help provide economic agents in Pakistan stock market with a means of thinking to smooth the progress of stock market growth and condense the period before maturity. In a bid to study whether macroeconomic variable variations are a cause of risk in the Pakistani stock market, we employ the testing methodology recommended by Fama and McBeth (1973), afterwards employed by Chen et al., (1986), Chan et al., (1985) and among others afterward. The stock return value used as a proxy of the market portfolio to examine the relationship for the above constructed hypothesis, the following multivariate model initially has been used:

$$R_{it} = \left(INT_t, INF_t, EX_t, M_t, IPI_t, TB_t, FDI_t, GP_t, OP_t \right) \quad (4.1)$$

For this purpose, we employed the OLS technique to test the relationship between macroeconomic factors (long-term interest rate (INT), exchange rate (EX), short term interest rate (TB), inflation rate (INF), money supply (M), industrial production index (IPI), FDI, international gold prices (GP) and international oil prices (OP) and return of Pakistan stock market.

Pooled OLS Time Series Cross Section Model

A pooled OLS regression model employed on different firms and portfolio return and pooled together without controlling for individual differences. The model is expressed as:

$$R_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 X_{it} \mp \beta_k X_{kit} + \varepsilon_{it} \quad (4.2)$$

Where, R_{it} is stock return of firm i in time t and X_{it} is independent variable of i (INT, INF, TB, EX, FDI, OP and GP) in time. The ε_{it} is a disturbance term assumed to satisfy the regression model assumptions and it is a combination of "idiosyncratic" component u and an "unobserved heterogeneity". The model also includes time dummy and can be expressed.

$$R_{it} = \alpha + \sum \beta_i X_{it} + \sum dt_{it} + \mu_{it} \quad (4.3)$$

$$\varepsilon_t = \mu_{it} + v_{it} \quad (4.4)$$

Where, μ_{it} is unobservable of each firm effect, and v_{it} is known as a disturbance of firm i in different time periods. The unobserved effect interpreted as capturing features of a firm and constant over the time and they are not explicitly represented in the model. The estimates are consistent if the explanatory are uncorrelated with, ε_{it}.

Fixed effects and Random effect model with and without time dummy

If μ_i is assumed as fixed, then estimation of fixed effects can be utilized to control an unobservable individual firm or portfolio's effects. To consider endogeneity bias, the fixed effects panel models be employed, because this fixed effects model investigates the impact of those variables which change over time and drops those variables which do not change over time. The assumption is that the unobserved effects biased results and to control for that fixed effects model is used. The equation over the time can be written as,

$$\overline{R}_i = \alpha_i + \beta_1\overline{X}_i + \beta_2\overline{X}_i + \beta_k\overline{X}_i + \mu_i + \overline{v}_i \quad (4.5)$$

Therefore, subtracting (4.5) from (4.2) gives

$$R_{it} - \overline{R}_i = \beta_1(X_{it} - \overline{X}_i) + \beta_2(X_{it} - \overline{X}_i) + (u_{it} - \overline{v}_i) \quad (4.6)$$

In equation 4.7, the unobserved cross-section fixed effects, μ_{it}, and intercept, α_i, has now disappeared. The process of change expressed in equation (4.6) is known as "within effects" as it explains the variation in the mean of the dependent variable in terms of the variations in the means of independent variables relating to a given firm. Fixed effects model does not suffer from heterogeneity bias as they only estimate "within estimates". On the other hand, employing fixed effects is too expensive, because intercept, α_i, and other variables which do not change over, the time for each firm or portfolio will drop from this model. Even though this intercept does not importance, however the elimination of unvarying independent variables could be important. It is noted previously in panel data, heteroskedasticity and autocorrelation are a regular problem and GLS estimation can rectify the violations of primary assumptions and random effects model reports a serial correlation in the composite error term, for that reason, this corrects the serial correlation problem (Wooldridge, 2002).

$$\Delta R_{it} = \alpha_i + \beta_1 \Delta X_{it} + \beta_2 X_{it} + \Delta \mu_{it} \quad (4.7)$$

The above equation called the first difference model, and unobserved heterogeneity had disappeared and "Δ" Show simple change from t and $t-1$. Under the assumption of the presence of unobserved heterogeneity, the coefficient of β_1 and β_2 Values provides a better estimate when changes in exploratory variables are regressed on changes in firms' returns. Moreover, if we added 'dt' as time dummy in the above equation, then it would have A "two-way analysis of variance", and be labelled "within estimator."

The endogeneity problem which is very common in economic/ financial variables may not be addressed in a fixed effect model. This endogeneity can be occurred due to correlation of independent variable with the error terms in the regression model. It involves that the regression coefficient in any regression is biased, and model considered will suffer from endogeneity bias. To remove the heterogeneity bias problem due to higher-level variance, and with it any between effects, are controlled out by using the higher-level entities themselves in fixed effect (Allison, 2009). It is very important to explore the endogenous variables to the model. For this, we employed the instrumental variable (IV) GMM technique, which was first proposed by Durbin (1954), and separately by Wu (1973) and Hausman (1978) to control the problem of endogeneity in this chapter. The endogenous variable's lagged values have been used as the model provides natural candidates (Greene, 2000). Furthermore, the best choice of instrument is a variable that correlates highly with the endogenous variable and is uncorrelated with the disturbances (Greene, 2000). For instance, if inflation is the endogenous variable, then we expect to use lagged value as an instrument (Greene, 2000). The rationale is the current year inflation rate cannot affect last year return, however, last year return having an impact on current-year inflation rate. Similarly, the same rationale is employed to short and long-term interest rate that is lagged short-term and long-

term interest. The endogeneity in financial variables is a fundamental notion of a model which was developed by Boyd and Smith (1996) because these causes vice versa. In the present analysis, we use the Johansen co-integration methodology which involves several steps described in chapter 3. The variable is also endogenous since it does not only affect each other, but are also affected by each other. We feel that the most appropriate methodology is to test for co-integration among the variables. This methodology will give us an insight about the relationship of each of the variables with the others and how they behave within a system. In the present analysis, this methodology is particularly relevant because we wish to establish not only how these variables relate, but also which of the variable is endogenous. Endogeneity of the relevant variables is a basic assumption of the Boyd and Smith (1996) model because the financial sector development causes economic growth and vice versa. The GMM techniques eliminate both heterogeneity and endogeneity problems in panel data which are very common. The chosen methodology is the Johansen co-integration methodology because it can (i) account for the long-run relationships between the variables of interest, (ii) account for different relationships among the variables in the form of separate co-integrating vectors and (iii) provides us with statistical evidence as to which variables are endogenous. The remainder of this chapter discusses the findings, which take all the tests applied in this section into consideration to produce the final model selection.

4.5: EMPIRICAL ANALYSIS OF THE IMPACTS OF MACROECONOMIC FACTORS ON STOCK RETURNS

With reference to current discussion in the literature, a time series and panel regression models are employed to examine the impact of macroeconomic variables on firm return and portfolio's return. Where we investigate the relationship between stock return and macroeconomic variables and further null hypothesis are tested by using the monthly average return of each group of industry or portfolios from 1997 to 2012. The descriptive results of different portfolios are given below in table 4.5.1.

Table 4.5.1: Descriptive statistics of different portfolios stock returns

Portfolios	Mean	Std. Dev	Skewness	Kurtosis
Automobiles and Parts	87.87	72.52	0.77	-0.07
Banks	32.48	30.32	0.71	-0.57
Chemicals	62.85	32.62	0.32	-1.22
Construction and Materials	21.44	18.07	0.90	-0.15
Electricity	16.94	06.25	2.03	5.34
Financial Services & Insurance	35.46	34.48	3.01	10.62
Food Producers	791.7	807.2	1.96	3.26
General Industrials	76.50	53.30	0.70	-0.42
Industrial Engineering & Metals Mining	74.71	54.94	0.17	-1.46
Oil and Gas Producers	100.7	58.42	0.17	-1.05
Personal Goods	30.55	14.13	0.32	-1.08
Pharmaceuticals & Biotechnology	67.93	42.70	0.32	-0.98
Travel and Leisure	22.99	12.41	.53	-1.03
B1-Small Betas	10.79	04.97	-0.21	-0.89
B2 -below average	20.58	07.74	0.71	-0.55
B3- Average	18.05	12.92	1.32	0.51
B4-Above average	103.5	81.24	0.70	-0.71
B5-Large Betas	00.99	00.01	-0.47	-0.82
Large Size	46.23	28.89	0.50	-0.75
Medium size	175.98	147.55	1.27	0.91
Small Size	67.19	61.69	2.32	6.38

The descriptive result of portfolios in table 4.5.2 shows that sample kurtosis and skewness are statistically diverse from zero. Since kurtosis' of macroeconomic variables are less than three and series distributions exhibit and look like non-normality. The skewness of all industries has positive values and put forward that these variables have long right tails. Similarly, the first difference descriptive results of all variables and return of portfolios show that skewness and kurtosis of all samples are significantly different from zero correspondingly (table 4.5.2).

Table 4.5.2: First difference statistical features of macroeconomic variables

	Mean	Std. Deviation	Skewness	Kurtosis
ΔAuto	0.70	9.96	-.59	4.45
ΔBank	0.34	4.72	-2.72	19.1
ΔChemical	0.33	6.45	-.23	2.95
ΔConstruction	0.18	3.24	-1.05	6.27
ΔELE	-0.1	2.51	-.32	17.2
ΔFinancial service	0.16	8.66	-3.9	40.2
ΔFood Producer	19.1	93.7	2.84	22.7
ΔGen. Indus	0.30	8.92	.63	4.46
ΔIND	0.73	7.21	-.97	5.40
ΔOIL &Gas	0.60	10.1	-.88	5.41
ΔPersonal Good	0.25	3.16	-.37	6.67
Δ Pharmaceuticals	0.58	6.49	-.16	2.21
ΔTravel	0.11	3.46	-.92	13.1
ΔLarge size	0.50	4.94	-1.9	9.19
ΔMedium size	2.32	10.6	.50	5.54
ΔSmall size	0.83	4.60	.51	11.9
ΔB1	-0.1	1.45	.24	5.59
ΔB2	-0.1	2.09	-.60	3.85
ΔB3	0.07	1.90	-1.5	11.3
ΔB4	1.41	13.2	.68	14.9
ΔB5	0.01	0.00	-.19	11.8

Note: Auto is automobile sector, ELE is electricity sector, Gen Ind is general industry, IND is industrial sectors, B is less risky and b5 is highly risky firm's portfolios.

Since kurtosis' of macroeconomic variables are all less than three except Financial Services and insurance industry, the distributions of these time series look like non-normality (Stock

and Watson, 2006). The skewness, of all industries is negative values and suggests that variables have a long right tail.

The results reported in table 4.5.3 disclose information regarding the relationship's strength among all macroeconomic variables with the portfolios return. In particular, table 4.5.3 shows a strong positive and negative relationship between average portfolio stock return, M2, OP, GP, INF, DR, and FDI.

Table 4.5.3: Correlations between Macroeconomic factors and return of Beta portfolios

	B1	B2	B3	B4	B5
INF	-0.504**	0.220**	0.498**	0.550*	0.485**
IPI	-0.718**	0.425**	0.708*	0.831**	0.805**
EX	-0.82**	0.040	0.364**	0.592*	0.871**
GP	-0.875**	0.115	0.417**	0.677**	0.957**
INT	-0.354**	-0.401**	-0.152	0.013	0.218**
OP	-0.714**	0.382**	0.68**	0.654**	0.697**
FDI	-0.225*	0.399**	0.637**	0.588*	0.287**
M	-0.87**	0.245*	0.546**	0.768**	0.861**

Note: Dependent variable is stock returns across risk portfolios, independent variables include exchange rate (EX), inflation rate (INF), long term interest rate (INT), foreign direct investment (FDI), industrial production index (IPI), money supply (M), gold price (GP) and oil prices (OP).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

These results indicate a positive (significant) relationship between the return of all macroeconomic variables, but less risky portfolio having negative significant association and the results support the inclusion of these macroeconomic variables in our analysis.

Table 4.5.4: Pearson Correlations Matrix of the Macroeconomic factors

	M2	***INF***	***IPI***	***EX***	***GP***	***TB***	***OP***	***FDI***	INT
INF	0.564**								
IPI	0.780**	0.527**							
EX	0.835**	0.478**	0.780**						
GP	0.877**	0.572**	0.620**	0.711**					
TB	0.203**	0.475**	0.073	0.139**	0.318**				
OP	0.717**	0.569*	0.774*	0.798	0.813**	0.148*			
FDI	0.341**	0.468	0.455**	0.224	0.265**	0.059	0.353**		
Rt	0.791**	0.533**	0.781**	.796**	0.840**	0.133*	0.738**	0.500**	
INT	-0.108	0.295**	-0.25**	-0.15*	0.671**	0.893*	-0.170*	-0.107	-0.203**

Note: Dependent variable is stock returns, independent variables include exchange rate(EX), inflation rate(INF), long term interest rate(INT), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level
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4.5.1: TIME SERIES CROSS-SECTION EMPIRICAL ANALYSIS

In this analysis, a stock return is used as a dependent variable and macroeconomic variables are independent variable. The OLS model can be written as;

$$R_{it} = \alpha + \beta_1 INF_{it} + \beta_2 INT_{it} + \beta_3 M_{it} + \beta_4 FDI_{it} + \beta_5 GP_{it} + \beta_6 OP_{it} + \beta_7 EX_{it} + \beta_8 TB_{it} \quad (4.8)$$

Where, Rt is return of firm and portfolios, α is intercept and β1- β8 are coefficients of macroeconomic variables. The regression result shows that few macroeconomic variables are significant (P<0.05), and the association between stock return and inflation rate, long term interest rate (INT), short-term interest rate (TB) and exchange rate are negative (significant). These results are consistent with previous studies such as DeFina (1991); Chen et al., (1986); Fama and Schwert (1977) and Miller et al., (1976). However, money supply, the gold price and oil price are having a positive and significant relationship. These findings are similar results, which are found in previous studies such as Friedman and Schwartz (1963), Brunie et al., (1972) and Kraft and Kraft (1977), Mukherjee and Naka (1995). However, FDI and IPI have an insignificant relationship with stock return. In this analysis, R2 is 94%, which explained that 94% macroeconomic variables are competent to explain the association among variables and only 6% variation is due to some other factors, and further R2 confirmed that this model is good for analysis. Furthermore, it is also confirmed by using time dummy that the impacts of variables over the time period are same for long term. However, it is very important to distinguish statistically, the null hypothesis of no association is rejected and alternative will be accepted except for FDI and IPI null hypothesis. It concluded that there is a significant association (effect) among stock return and macroeconomic variables apart from FDI and IPI, and in addition to that this level of significance can be a change through adding more observations.

Time series cross section regression analysis of the relationship between stock market performance and macroeconomic variables across different portfolios:

The results related to risk portfolios are provided in table 4.5.4, which show the relationship between less risky firms returns with the inflation rate, FDI and oil prices at all levels of significant a long-term interest rate, gold prices and exchange rate are having a negative significant relationship with stock return; however, money supply, IPI and T-bill rate have insignificant relationship. The results of average risky firms return having a positive and significant association with the inflation rate, money supply, FDI and oil prices, and gold prices and exchange rate are having a negative significant relationship with stock return at all levels of significance. However, INT, IPI and T-bill rate are having an insignificant relationship. Similarly, these results show that stock returns of highly risky firms are having a statistically significant negative with exchange rate and a positive relationship with gold and oil prices. These results are consistent with financial theory and previous studies such as DeFina (1991); Chen et al., (1986); Fama and Schwert (1977), among others. However, other variables have insignificant relationship. According to Levis (1985), and Poon & Taylor (1991) point of view that most of the macroeconomic factors are completely influenced that small capitalize firms have less significant market betas or systematic risk as compared to be large capitalize firms. In this analysis, total number of observations is 192; R-squared is 93.7%, 83%, 96%, 98% and 95.7%, respectively, which explained that relationship between variables and also R-squared confirmed that this model is good for analysis. Currently, it is very important to distinguish that sample value is part of the population, assuming that null hypothesis of no association is rejected, and the alternative is accepted except for IPI, conclude that there is a significant relationship between the return of size portfolio and macroeconomic variables apart from FDI and IPI.

Table 4.5.1.1 showed that fewer macroeconomic variables are significant (P<0.05). These results demonstrate that these variables having a significant association between portfolio stock return and inflation rate, T-bill rate (only for the small size firms), and exchange rates are having negative significant relationship at all levels of significant, and money supply for large and medium firms, GP for the medium and small size firms; Oil price for all firm size and FDI for large firm portfolio had a positive significant relationship at all levels. The R-squared explained that more than 92% macroeconomic variables are able to explain the relationship between variables and only average 8% variation is due to some other variable and also R-squared confirmed that this model is good for analysis. These results are consistent with the financial theory and previous studies because many scholars have a strong point of view that the size of the firm is strongly associated with expected stock returns. Among others, Banz (1981) and Levis (1985) documented that small firms are likely to have a larger average/excess return on stock as compared to be large firms, these results are similar to Poon & Taylor (1991), the majority of macroeconomic factors having a positive/ (negative) influence on return of size portfolios.

The results of industry portfolios are provided in table 4.5.1.3, which shows the relationship between stock return of industry and macroeconomic variables, for example, inflation rate (telecom and food negative), INT only for telecom, personal good and travel, T-bill rate (for the bank, Chem., Tele, oil and Phram), money supply (for telecom only), FDI, GP and oil prices are having a positive significant relationship, while, the exchange rate has significant and negative relationship except food industry. The R-squared is more than 90% for all variables except telecom 56.5% and finance 75%, which explained that macroeconomic are able to explain the relationship between variable and only and also R-squared confirmed that this model is good for analysis. Here, it is very important to distinguish that the null hypothesis is rejected, and the alternative is accepted except for IPI, and conclude that there

is a significant association between stock return of industry portfolio and macroeconomic variables apart from IPI.

Table 4.5.1.1: Time series cross sectional regression analysis of the relationship between macroeconomics variables and stock market performance across different portfolios.

	Rt	B1	B2	B3	B4	B5	Large	Medium	Small
Cont.	-31.0**	12.2**	-1.658	-11.5**	-9.79**	-9.4**	-6.82**	-8.78**	-2.247
	(-78.7)	(-1.34)	(-1.46)	(-1.29)	(-1.12)	(-1.27)	(-1.46)	(-1.29)	(-2.26)
INF	-1.14**	0.97**	1.43**	3.32**	1.43**	-0.61*	0.47	-1.46**	-1.45**
	(-0.24)	(-0.01)	(-0.01)	(-0.01)	(-0.00)	-0.00	(-0.00)	(-0.00)	(-0.01)
INT	-3.03**	-2.65*	-0.243	-1.90	-0.497	-0.143	-0.869	-0.414	-0.712
	(-1.16)	(-0.02)	(-0.02)	(-0.02)	-0.02	(-0.01)	(-0.02)	(-0.05)	(-0.03)
TB	2.81**	-1.25	-3.09**	-1.28	-1.07	-0.524	0.369	0.466	-2.98*
	(-0.71)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.03)	(-0.02)	(-0.02)
M	36.21**	-0.001	0.933**	1.919*	1.57**	0.90**	1.23**	0.961**	0.279
	(-11.6)	(-0.15)	(-0.168)	(-0.15)	(-0.13)	(-0.15)	(-0.17)	(-0.15)	(-0.26)
FDI	0.451	0.018*	0.01	0.033**	0.03**	0.006	0.03**	-0.001	-0.021
	(-0.70)	(-0.01)	(-0.011)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.09)	(-0.05)
IPI	2.271	-0.031	-0.038	0.065	0.033	-0.015	0.122	0.011	-0.108
	(-6.02)	(-0.08)	(-0.087)	(-0.08)	(-0.06)	(-0.08)	(-0.09)	(-0.08)	(-0.13)
GP	34.41**	-0.48**	-0.29**	-0.932*	-0.39**	0.50**	-0.105	0.62**	0.85**
	(-9.14)	(-0.12)	(-0.133)	(-0.12)	(-0.10)	(-0.12)	(-0.14)	(-0.12)	(-0.21)
OP	21.85**	0.24**	0.255**	0.328**	0.31**	0.23**	0.51**	0.178**	0.58**
	(-3.96)	(-0.06)	(-0.058)	(-0.06)	(-0.05)	(-0.04)	(-0.05)	(-0.06)	(-0.09)
EX	-103.8*	-1.71**	-2.18**	-2.35*	-1.96**	-0.41*	-2.35**	-1.17**	-1.15**
	(-9.78)	(-0.13)	(-0.14)	(-0.13)	(-0.11)	(-0.13)	(-0.14)	(-0.13)	(-0.22)
Id	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Td	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.939	0.937	0.831	0.961	0.973	0.981	0.957	0.976	0.919

Note: Dependent variable is stock returns across risk portfolios and size portfolios. Independent variables include exchange rate (EX), inflation rate (INF), long term interest rate (INT), foreign direct investment (FDI), industrial production index (IPI), money supply (M), gold prices (GP) and oil prices (OP).
While Id is industry dummy and Td is time dummy. Numbers in parenthesis represents the standard error of each parameter coefficient.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

Table 4.5.1.2: Time series cross section analysis of the relationship between macroeconomics variables and stock return of firm's size portfolios

Var	L1	M1	S1	L2	M2	S2	L3	M3	S3	L4	M4	S4	L5	M5	S5
INF	-1.81**	-3.300	45.59	82.0**	0.417**	29.79	63.93**	-241**	37.87	81.66**	-251**	32.10	122.5**	-319**	66.2**
	(53.29)	(72.02)	(36.73)	(19.90)	(0.144)	(34.86)	(23.25)	(105.9)	(36.25)	(27.03)	(106.0)	(35.52)	(35.65)	(110.3)	(28.58)
INT	-5.24**	-7.01**	-1.801*	-5.49**	-0.044**	-1.303	-5.86**	-6.35**	-1.702*	-6.526**	-6.43**	-0.958	-8.348**	-4.568	-1.012
	(1.538)	(2.120)	(0.982)	(0.722)	(0.0067)	(0.930)	(0.774)	(3.190)	(0.970)	(0.909)	(3.235)	(0.953)	(1.229)	(3.452)	(0.767)
TB	2.360**	4.217**	0.578	2.601**	0.0119**	0.348	3.008**	3.688*	0.423	3.349**	3.682*	0.0870	4.556**	2.590	0.003
	(0.893)	(1.270)	(0.567)	(0.469)	(0.0043)	(0.537)	(0.506)	(1.869)	(0.557)	(0.585)	(1.884)	(0.549)	(0.798)	(2.016)	(0.444)
M2	-24.57	-120.7	-53.09	17.34	0.735**	-46.34	18.50	-173.5	-47.73	10.18	-165.1	-47.02	17.41	-170.8	-42.30
	(68.51)	(107.7)	(52.57)	(29.61)	(0.233)	(49.32)	(34.08)	(143.3)	(51.25)	(42.26)	(141.7)	(50.27)	(59.05)	(148.0)	(40.80)
FDI	-0.663	1.500	0.836*	2.183**	0.0117**	0.572	2.26***	-1.345	0.629	2.678***	-1.776	0.601	4.072***	-3.151	0.754*
	(0.956)	(1.015)	(0.481)	(0.569)	(0.007)	(0.515)	(0.600)	(1.892)	(0.537)	(0.713)	(1.967)	(0.501)	(1.081)	(2.172)	(0.448)
IPI	-10.53	8.372	-10.69	19.89**	0.240**	-10.90*	19.86**	-22.43	-10.95	22.26**	-22.79	-12.7**	32.76**	-39.0**	-5.547
	(8.880)	(9.454)	(6.649)	(3.299)	(0.0293)	(6.228)	(3.454)	(15.44)	(6.625)	(4.056)	(15.35)	(6.409)	(5.319)	(16.73)	(4.994)
GP	104.2**	108.6**	46.32**	18.40**	0.635**	43.03**	24.51**	189.3**	45.20**	25.34**	190.7**	42.90**	31.99**	191.6**	32.23**
	(10.50)	(11.30)	(7.805)	(3.894)	(0.033)	(7.454)	(4.271)	(19.43)	(7.793)	(5.074)	(19.40)	(7.584)	(6.740)	(21.24)	(6.011)
OP	12.32**	34.06**	4.792	18.95**	0.020	4.803	19.18**	28.42**	5.170	22.89**	25.44**	4.402	27.63**	18.98	5.850*
	(5.842)	(9.600)	(4.135)	(3.238)	(0.025)	(3.833)	(3.609)	(12.56)	(3.981)	(4.201)	(12.55)	(3.935)	(5.505)	(12.80)	(3.242)
EX	-78.8**	-92.7**	2.367	-85.8**	0.47**	8.890	-93.7**	-77.1**	4.379	-107.4**	-71.1**	12.26*	-127.7**	-45.95*	6.943
	(11.49)	(19.63)	(7.503)	(7.173)	(0.060)	(6.601)	(8.157)	(25.03)	(6.939)	(10.04)	(24.87)	(6.687)	(13.37)	(25.57)	(5.479)
Const	-176**	-260**	-202**	167.6**	8.253**	-213.9*	170.8**	-617**	-204**	210.9**	-643**	-219**	222**	-691**	-169.1*
	(47.78)	(60.90)	(31.54)	(21.89)	(0.197)	(28.88)	(23.99)	(93.95)	(30.77)	(29.95)	(94.94)	(29.80)	(41.28)	(102.9)	(24.32)
R^2	0.905	0.928	0.865	0.922	0.990	0.868	0.917	0.919	0.865	0.903	0.919	0.859	0.903	0.896	0.880

Note: Dependent variable is stock returns; independent variables include exchange rate (EX), inflation rate (INF), long term interest rate (INT), foreign direct investment (FDI), industrial production index (IPI), money supply (M), gold price (GP) and oil prices (OP). While Id is industry dummy and Td is time dummy. Numbers in parenthesis represents the standard error of each parameter coefficient. *** Significant at 1%, *** significant at 5% level and * significant at 10% level.

Table 4.5.1.3: Time series cross section analysis of relationship between macroeconomics variables and stock return of industry portfolio analysis

	Auto	Bank	Chem.	Cons	Tele	Fin	Food	Gen.Ind	Indus.	Oil	Pham	Person.	Travel.
INF	2.563**	1.918**	0.498	3.050**	-2.151**	4.257**	-2.943**	3.948**	1.782**	1.747**	3.438**	1.189**	2.825**
	(0.616)	(0.685)	(0.388)	(0.780)	(0.508)	(0.861)	(0.546)	(0.535)	(0.553)	(0.573)	(0.595)	(0.330)	(0.665)
INT	-0.147**	-0.141**	-0.011	-0.163**	0.101**	-0.072**	0.011	-0.087**	-0.125**	-0.024	-0.086**	-0.091**	-0.150**
	(0.028)	(0.029)	(0.015)	(0.035)	(0.028)	(0.034)	(0.019)	(0.023)	(0.025)	(0.025)	(0.027)	(0.012)	(0.024)
TB	0.021	0.079**	-0.017*	0.026	-0.087**	0.027	-0.005	0.021	0.015	-0.036**	-0.010	0.0177**	0.0120
	(0.019)	(0.019)	(0.010)	(0.023)	(0.017)	(0.021)	(0.012)	(0.015)	(0.017)	(0.016)	(0.018)	(0.008)	(0.016)
M2	0.633	1.404	1.082*	1.351	1.520	0.031	-0.435	0.747	0.927	1.424	1.289	0.487	0.257
	(1.018)	(1.121)	(0.611)	(1.270)	(1.154)	(1.549)	(0.731)	(0.973)	(1.031)	(0.927)	(1.002)	(0.533)	(0.750)
FDI	0.076**	0.089**	0.0135*	0.062**	-0.010	0.068**	-0.013	0.089**	0.054**	0.043**	0.062**	0.015**	0.036**
	(0.028)	(0.024)	(0.007)	(0.023)	(0.016)	(0.024)	(0.011)	(0.022)	(0.016)	(0.012)	(0.018)	(0.009)	(0.013)
IPI	0.718**	0.817**	0.167*	0.529**	-0.029	0.227	-0.005	0.578**	0.539**	0.398**	0.433**	0.257**	0.193
	(0.126)	(0.121)	(0.087)	(0.180)	(0.185)	(0.149)	(0.108)	(0.112)	(0.137)	(0.147)	(0.140)	(0.075)	(0.122)
GP	1.663**	1.110**	1.072**	0.986**	0.493**	0.0927	1.322**	0.576**	0.406**	0.299**	0.613**	0.353**	0.653**
	(0.136)	(0.128)	(0.079)	(0.169)	(0.126)	(0.142)	(0.088)	(0.117)	(0.126)	(0.110)	(0.143)	(0.067)	(0.096)
OP	0.065	0.602**	0.216**	0.652**	0.285**	0.503**	0.109	0.343**	0.497**	0.799**	0.373**	0.320**	0.077
	(0.111)	(0.102)	(0.064)	(0.133)	(0.112)	(0.123)	(0.075)	(0.087)	(0.093)	(0.101)	(0.103)	(0.047)	(0.094)
EX	-2.837**	-2.190**	-1.673**	-3.218**	-1.563**	-0.932**	0.0533	-1.666**	0.290*	-1.425**	-1.505**	-1.061**	-1.964**
	(0.221)	(0.210)	(0.130)	(0.258)	(0.186)	(0.300)	(0.151)	(0.186)	(0.156)	(0.143)	(0.215)	(0.080)	(0.187)
α	3.544**	-0.153	3.029**	5.852**	4.763**	4.663**	-2.247**	4.161**	-2.927**	3.732**	3.636**	3.989**	7.476**
	(0.761)	(0.776)	(0.439)	(0.972)	(0.775)	(0.953)	(0.515)	(0.718)	(0.663)	(0.581)	(0.743)	(0.338)	(0.631)
R^2	0.935	0.954	0.937	0.896	0.565	0.751	0.951	0.913	0.945	0.920	0.894	0.915	0.846

Note: Dependent variable is stock returns, independent variables include exchange Rate (EX), inflation rate (INF), long term interest rate (INT), foreign direct investment (FDI), industrial production index (IPI), money supply (M), gold price (GP) and oil prices (OP). While Id is industry dummy and Td is time dummy. Numbers in parenthesis represents the standard error of each parameter coefficient. *** Significant at 1%, *** significant at 5% level and * significant at 10% level.

4.5.2: PANEL FIXED EFFECTS AND RANDOM EFFECT REGRESSION ANALYSIS OF THE RELATIONSHIP BETWEEN MACROECONOMIC VARIABLES AND DIFFERENT PORTFOLIO RETURNS

Based on our theoretical framework, our model has following characteristics;

$$R_{it} = -9.11 + 2.26INF_{it} - 1.65DR_{it} - 1.80TB_{it} + 1.63M_{it} + 0.05FD_{it} + 0.02IP_{it} - 0.63GP_{it} + 0.32OP_{it} - 2.34EX_{it} + u_{it}$$

Where: stock returns as a dependent variable, while the long-term interest rate (INT), exchange rate (EX), short term interest rate (TB), inflation rate (INF), money supply (M2), industrial production index (IPI), FDI, international gold prices (GP) and international oil prices (OP) are adopted as independent variables. Table 4.5.2.1 show that the model fits the data well and the R^2 = 45% means that 45% of the total variation in the total firm returns are due to macroeconomic variables. The results indicate that the inflation rate, short term interest rates, long term interest rate, exchange rates, oil price, FDI and gold prices are significant. Likewise, INF, M2, FDI and OP exert a positive impact on stock return and TB, INT, GP and exchange rate exert a negative impact on stock return in Pakistan. The reaming macroeconomic factors in our panel models such as; industrial production indexes are not significant on stock return. As a goal, to investigate the effect of internal and external macroeconomic variables on stock return of individual firms, so it is practical to employ the cross-sectional specific coefficient method. The negative relationship between interest rate and stock return of firms, is consistent with the theory and earlier studies; Sharma (2002); Omran (2003); and Frimpong (2009). The exchange rate having a negative impact on stock return is consistent with the theory and previous studies such as, Fama and Schwert (1977), Chen et al., (1986), Nelson (1976), and Islam & Watanapalachaikul (2003). The oil prices have

a positive (significant) impact on stock return of sample firms; this involves that fluctuation in oil price affects the movement of stock price in Pakistan. These results are robust to a number of alternative specifications and consistent with studies, e.g., Hamilton (2000) and Basher &Sadorsky (2006). The panel fixed effects model was assessed to resolve this problem. But both fixed and random effect models (with and without time dummy) results are presented and discussed in table 4.5.2.1. For panel random effect and panel fixed effects, almost results shows that there is no variation among parameter coefficients and level of efficiency. Similarly the fixed effects estimate, such as the inflation rate is positive and significant related to stock return (b1 = 2.254), but it is slightly different with time dummy; coefficient is smaller than the random effect coefficient by 0.02, so far it is same efficient because the t-statistic associated with predictor variable with fixed effects is same as compared to the random effects model.

The long term interest rate is negatively significant related to stock return (b2 = -1.594), and short term interest rate (TB rate) is negatively significant related to stock return (b3 = -1.839), but slightly different results with time dummy. The coefficient is higher than the random effect coefficient by 0.04; so far, it is same efficient because the t-statistic associated with the predictor variable in fixed effects is same as compared to the t-statistic in the random effects specification model with and without time dummy. The money supply and FDI are positively associated (significant) with the stock return of firms (b4 = 1.626, b5 = 0.047) at 5% and 1% level of significance. The gold price is having a negative impact on stock return and oil prices associated positively and significant with the stock return of firms (b6 = -0.627, b7 = 0.321) respectively. The gold prices coefficient is slightly higher than the random effect coefficient with time dummy by 0.02, and oil price coefficient is slightly higher than the random effect coefficient with time dummy by 0.006, so for it is same efficient The exchange rate has the significant

negative impact on stock return of firms (b8 = -2.328). The exchange rate is slightly higher than the random effect coefficient with time dummy by 0.003, so for now it is the same efficient t-statistic associated with the predictor variable in both fixed effects and with and without time dummy. These variables are having an impact on stock return over the time period because time dummy variable is statistically significant. Table 4.5.2.1 and 4.5.2.2 provide the findings of three models to explore the presence of endogeneity.

Table 4.5.2.1: Panel regression analysis of the relationship between macroeconomics variables and stock returns – Whole sample

Variables	OLS	FE	FE (time dummy)	RE
INF	2.262**	2.254**	2.233**	2.254**
	(0.286)	(0.137)	(0.137)	(0.137)
INT	-1.652*	-1.594**	-1.590**	-1.594**
	(1.368)	(0.654)	(0.653)	(0.654)
TB	-1.792*	-1.839**	-1.801**	-1.839**
	(0.845)	(0.404)	(0.404)	(0.404)
M2	1.633**	1.626**	1.660**	1.626**
	(0.138)	(0.067)	(0.067)	(0.067)
FDI	0.0462**	0.0465**	0.046**	0.0465**
	(0.014)	(0.007)	(0.007)	(0.007)
IPI	0.0159	0.019	0.009	0.019
	(0.071)	(0.034)	(0.033)	(0.034)
GP	-0.627**	-0.627**	-0.646**	-0.627**
	(0.109)	(0.052)	(0.053)	(0.052)
OP	0.317***	0.321***	0.316***	0.321**
	(0.047)	(0.022)	(0.022)	(0.022)
EX	-2.336**	-2.328**	-2.331**	-2.328**
	(0.119)	(0.057)	(0.056)	(0.057)
Const.	-9.108**	-9.067**	-9.356**	-9.067**
	(1.149)	(0.559)	(0.561)	(0.559)
Obs.	26,397	26,397	26,397	26,397
R-squared	0. 451	0.425	0.428	0.450
Prob > F	0.000	0.000	0.000	0.000

Note: Dependent variable is stock returns, independent variables include exchange rate (EX); inflation rate (INF), long term interest rate (INT), industrial production index (IPI), money supply (M), gold price (GP) and oil prices (OP). FE is fixed effect and RE is random effect. Standard error of each coefficient is reported in parentheses.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

Table 4.5.2.2: Panel regression analysis of the relationship between macroeconomics variables and stock returns for different portfolios.

	Firm beta portfolios		Firm Size Portfolios		Industry Portfolios	
Variable	FE	RE	FE	RE	FE	RE
Constant	-1.413	-1.413	-6.461**	-6.461**	-8.606**	-8.606**
	(2.267)	(2.158)	(1.091)	(0.714)	(1.156)	(1.124)
INF	0.558*	0.558*	-0.788**	-0.788**	1.029**	1.029**
	(0.536)	(0.536)	(0.319)	(0.171)	(0.279)	(0.279)
INT	-1.241	-1.241	-1.303**	-1.303	-1.012	-1.012
	(2.568)	(2.568)	(0.441)	(0.821)	(1.338)	(1.338)
TB	-1.167	-1.167	-0.322	-0.322	-1.472*	-1.472*
	(1.586)	(1.586)	(0.388)	(0.507)	(0.827)	(0.827)
M2	0.86**	0.86**	0.852**	0.852**	1.372**	1.372**
	(0.259)	(0.259)	(0.140)	(0.083)	(0.135)	(0.135)
FDI	0.026	0.026	-0.013	-0.013	0.044**	0.044**
	(0.026)	(0.026)	(0.017)	(0.008)	(0.014)	(0.014)
IPI	0.047	0.047	-0.008	-0.008	0.035	0.035
	(0.132)	(0.132)	(0.035)	(0.043)	(0.069)	(0.0690)
GP	-0.300	-0.300	0.475**	0.475**	-0.138	-0.138
	(0.204)	(0.204)	(0.141)	(0.065)	(0.106)	(0.106)
OP	0.324**	0.324**	0.409**	0.409**	0.356**	0.356**
	(0.088)	(0.088)	(0.047)	(0.028)	(0.047)	(0.047)
EX	-2.043**	-2.043**	-1.515**	-1.515**	-2.131**	-2.131**
	(0.224)	(0.224)	(0.195)	(0.072)	(0.117)	(0.117)
TD	Yes	NO	Yes	NO	Yes	NO
Obs.	950	950	2,850	2,850	2,470	2,470
R-2	0.41		0.88		0.727	

Note: Dependent variable is stock returns; independent variables include exchange rate (EX), inflation rate (INF), long term interest rate (INT), foreign direct investment (FDI), industrial production index (IPI), money supply (M), gold price (GP) and oil prices (OP). Numbers in parenthesis represents the standard error of each coefficient.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

4.5.3: INSTRUMENTAL VARIABLES AND GMM ANALYSIS

Endogeneity and heterogeneity are very common problems of the macro economic variables (Greene, 2000; Body and Smith; 1996, among others). We employ GMM technique, which was firstly proposed by Durbin (1954) to control the problem of endogeneity among the explanatory variables and the problem of cross sectional heterogeneity. The best choice of instrument is a variable that correlates highly with the endogenous variable and is uncorrelated with the disturbances (Greene, 2000). For this reason, we use one to two period lags of the endogenous variables as instruments in our models. Regression outputs for industry/ size/ beta are presented in table 4.5.3.1; 4.5.3.2 and 4.5.3.3. We also report the Sargan tests for the validity of our selected instrumental variables.

Table 4.5.3.1: GMM estimates of size portfolios

Variables	Satge 1	Satge 2
FDI	-0.014	0.019
	(0.022)	(0.074)
GP	0.715**	5.466**
	(0.175)	(0.107)
OP	0.373**	-1.894**
	(0.069)	(0.053)
M2	0.628**	-05.25**
	(0.224)	(0.148)
EX	-0.022**	0.031*
	(0.003)	(0.003)
INF	0.008*	0.064**
	(0.007)	(0.003)
IPI	-0.007	-0.016
	(0.114)	(0.101)
INT	-0.019*	
	(0.011)	
TB		0.538**
		(0.005)
R2	66.7	86.5
F-value	3.614*	3.938*
Sargan test		P=0.12

Note: The dependent variable is the return of the firm (%); in parentheses robust errors are reported. Models1 is IV-GMM and model 2 is First stage GMM equation, Interest rate (INT) is the instrument variable for return (3). Sargan is reported for the validity of our selected instrumental variables. Standard errors are reported in in parentheses. *** Significant at 1%, *** significant at 5% level and * significant at 10% level.

In the above table, the results indicate that the exchange rate having a negative (significant) impact on stock return of firms in size portfolios. So far, it is the same efficient effect's the t-statistic associated with predictor variable is same in both fixed effects and variables are effects specification models. This is the only stock return determinant that is statistically large in absolute value in model parameter estimates.

Table 4.5.3.2: GMM estimates of industry portfolios

Variables	Satge 1	Satge 2
FDI	0.033	-0.195
	(0.031)	(0.020)
GP	0.278	5.196**
	(0.241)	(0.119)
OP	0.265**	-1.886**
	(0.098)	(0.058)
M	1.064**	-04.49**
	(0.314)	(0.160)
EX	-0.033**	-0.009**
	(0.003)	(0.003)
INF	0.010*	0.074**
	(0.007)	(0.004)
IPI	0.011	-0.092
	(0.164)	(0.105)
INT	0.039**	
	(0.018)	
TB		0.550**
		(0.006)
R2	62.89	76.34
F-value	2.560	3.168*
Sargan test		P=0.14

Note: Dependent variable is stock returns; in parentheses robust errors are reported. Models1 is IV-GMM and model 2 is First –stage GMM equation, Interest rate is the instrument variable for return. Sargan is reported for the validity of our selected instrumental variables.. Standard errors are reported in parentheses. . *** Significant at 1%, *** significant at 5% level and * significant at 10% level.

In the above table 4.5.3.2, the results indicate that the exchange rate having the significant negative impact on stock return of industry portfolios. So far, it is same efficient effect's the t-statistic associated with predictor variable is same in both fixed effects and variables are effects specification models. This is the only stock return determinant that is statistically large in absolute value in model parameter estimates.

Table 4.5.3.3: GMM estimates of firm Beta portfolios

Variables	Satge 1	Satge 2
FDI	0.019	-0.195**
	(0.074)	(0.033)
GP	0.083	5.196**
	(0.059)	(0.192)
OP	0.247	-1.887**
	(0.236)	(0.094)
M2	0.545	-04.49**
	(0.767)	(0.284)
EX	-0.031**	-0.009**
	(0.010)	(0.005)
INF	0.007	0.073**
	(0.015)	(0.006)
IPI	0.035	-0.093
	(0.390)	(0.169)
INT	-0.033	
	(0.39)	
TB		0.550**
		(0.009)
R2	79.541	86.134
F-value	3.614*	3.938*
Sargan test		P=0.16

Note: Dependent variable is stock returns. Models1 is IV-GMM and model 2 is First –stage GMM equation, Interest rate (Dr) is the instrument variable. Sargan is reported for the validity of our selected instrumental variables. Standard errors are r in parentheses. *** Significant at 1%, *** significant at 5% level and * significant at 10% level.

In the above table, 4.5.3.3, the results indicate that the exchange rate having a negative and significant impact on stock return of beta portfolios. So far, it is same efficient effect's the t-statistic associated with predictor variable is same in both fixed effects and variables are effects specification models. This is the only stock return determinant that is statistically large in absolute value in model parameter estimates.

4.6: CONCLUSION

In the financial sector of any economy, the stock market is the major stakeholder. The stock market of Pakistan has performed remarkably in the last decade, which is a positive economic indicator for the economy. The performance of Pakistan's stock market motivates the examination of the linkage between the returns of distinctive industries and macroeconomic factors within the firm as well as different portfolios such as size, industry and risk level. The overall results reveal that different portfolios exhibit different behaviour of the stock returns, and models are able to generate significant outcomes. The results of beta firm portfolios show that the less risky firm stock returns are positively (significant) associated with the inflation rate, FDI, oil prices and interest rate, while gold prices, and exchange rates have a significant negative relationship with stock returns. The average risky portfolio stock returns have a positive association with the inflation rate, money supply, FDI and oil prices, while gold prices and exchange rates have a negative relationship with risky portfolio stock returns. In the case of highly risky portfolios, stock returns have a negative relationship with the exchange rate and a positive relationship with gold and oil prices. These results conform to financial theory and are consistent with previous studies, such as, DeFina (1991) and Chen et al., (1986). It is very important to distinguish that the alternative hypothesis is accepted and concludes that there is a significant relationship (effect) between stock returns of size portfolios and macroeconomic variables apart from FDI and IPI.

The results of size portfolios show that a few macroeconomic variables have a significant association with portfolio stock return. These variables include the inflation rate, T-bill rate (only for the small size firms), and exchange rates have a significant negative relationship. The money supply (for large and medium firms), GP (for a medium and small size firm); oil prices (for all size firms) and FDI for large-size portfolio have a

positive significant relationship. These results are consistent with finance theory and previous studies; many researchers have a strong point of view that the size of the firm is strongly associated with expected stock returns. Scholes and Williams (1977) Banz (1981), Reinganum (1981), Levis (1985) among others documented that smaller capitalized firms are likely to have a larger average/excess return on stock when compared to be large capitalized firms, and further, they are not completely influenced that small firms have smaller systematic risk. According to Poon and Taylor (1991) macroeconomic factors had a positive and negative significant influence on stock return of size portfolios.

Moreover, the results of the regression of industry portfolios show the relationship between the stock returns of industry and macroeconomic variables. For example, the inflation rate has a negative relationship with telecom and food-industry, interest rates for telecom, personal goods and travel, the T-bill rate for the banking industry, Chemical industry, Telecomm industry, oil sector and pharmaceuticals Industry, money supply has a negative relationship with telecom, FDI, GP; oil prices have a positive significant relationship (impact), and Exchange rates have a significant negative relationship. Finally, it is very important to distinguish statistically that the null hypothesis (that there is no relationship) is rejected, and an alternative is accepted except for IPI, and conclude that there is a significant association between the stock returns of industry portfolios and macroeconomic variables apart from FDI and IPI. We can conclude that the size and beta (Bi) of the firms are strongly associated with expected stock returns. Finally, we used IV GMM techniques to eliminate both heterogeneity and an endogeneity problem in panel data. Further, we confirmed through Sargan test; these instrument variables are significantly proficient to remove the endogeneity issues in panel data.

CHAPTER 5: THE MACROECONOMIC VOLATILITY AND STOCK RETURN VOLATILITY IN PAKISTAN EMERGING STOCK MARKET

''It is very important to the stockholders that they are able to obtain a fair price for their shares as it is that dividends, earnings and assets to be increased. It follows that the responsibility of management includes the obligation to prevent…the establishment of either absurdly high or unduly low prices for their securities.'' (Graham and Dodd, 1951, p. 15)

Existing literature finds that stock returns and macroeconomic variables exhibit conditional heteroskedasticity, and stock returns may be influenced by its volatility. This chapter investigates the influences of macroeconomic volatility on stock return volatility in the Karachi stock market. It is observed in the descriptive analysis (in chapter III) that variables illustrate distinct values of kurtosis and skewness. The combination of all kurtosis and skewness might add to different volatilities across firms or industry level. As far as capturing the time-varying volatility, the GARCH model is more appropriate and applicable with regard to the stock returns of individual firms as well as different portfolios, including industry and size as discussed earlier.

This chapter is divided into three sections; next section discusses the literature. Section 5.2 presents the methodology used in this study. Section 5.3 presents the findings and discussions with relation to previous studies where theoretical implications are considered according to the risk-return relationship.

5.1: RELATED LITERATURE

Previous studies can be categorized into two major groups according to the market level of integration. The first group of researchers believes that the stock market integrates broadly and therefore, the global risk components describing the volatility of returns are more important than as country factors. The second group believes that fluctuations in economic indicators are the major cause changes in the performance of the stock market.

In the 1980s, a question was asked by Schwert (1989); ‘‘why does stock market volatility change over the time’’? Our study’s objective is to explicate the macroeconomic variables and time-varying stock return volatility in order to meet the challenge described by Schwert (1989) when it was observed that “the amplitude of the fluctuations in aggregate stock volatility is difficult to explain by employing simple models of stock valuation"(ibid). Further, we investigated the causality direction among return volatility and the volatility of macroeconomic.

Schwert (1989) maintain that inflation volatility forecasts stock volatility. However, stock volatility does not forecast inflation volatility. In various samples, the growing volatility of the money supply forecast stock volatility and similarly stock volatility also forecasts money growth volatility. The weak industrial production volatility elucidates the stock return volatility, whereas stock return volatility assists the forecasting of the volatility of industrial production in samples from 1920 to 1952. Overall, these findings point to a positive association between macroeconomic volatility and stock return volatility, with a strong direction of causality from the stock return to macroeconomic variables. Thus, uncertainty in the stock market is higher during recessions when compared to expansions.

It was previously stated that macroeconomic factors affected the volatility in equity returns. However, various studies report a relationship between macroeconomic conditions and volatility in equity return. Hamilton and Susmel (1994) and Sinha (1996) find that return is significantly affected by macroeconomic condition volatility; this is to say that during a recession, the equity return volatility is expected to be high. Errunza and Hogan (1998) examine stock returns of the European market by using VAR models from 1959–1993. The finding indicates that in the German and French stock market, Granger causes equity volatility because of the volatility of the money supply. In Italy and The Netherlands, Granger causes equity volatility because of industrial production volatility. No evidence was found about how historical macroeconomic variables can influence on the return of equity in the UK, Switzerland, Belgium and the United States.

Garcia and Liu (1999) investigated the macroeconomic determinants of stock market development. They found that real income, saving rates, financial intermediary development, and stock market liquidity are important determinants of stock market capitalization and that macroeconomic volatility does not prove to be significant. Further, they found that the developments of stock markets and financial intermediaries are more complementary rather than substitutes.

Cong et al., (2008) investigate interactive relationships between oil price shocks and the Chinese stock market by using multivariate vector auto-regression. The result shows that oil price shocks have an insignificant impact on the stock returns, except for the manufacturing index of oil companies. Oil volatility growth may increase assumptions in the mining index and petrochemical index, which raises their stock returns (Cong et al., 2008). By using different methodologies, the various researchers tried to investigate the relationship between stock volatility and some economic forces. Schwert (1989) tests the

relationship of stock volatility with both real and nominal economic volatility, financial leverage and stock trading activities. Schwert discovered that aggregate leverage was significantly correlated with volatility, and it explains a relatively small part to the movements in stock volatility. Further, Schwert (1990) investigate that the volatility of stock market jumps dramatically and quickly returns to low pre-crash levels. Fama (1990) found similar results and argued that the cash flows expected in the future are reflected by price of equity and macro condition can be forecasted due to variation in equity price.

The stock market volatility in the context of developed stock markets has been studied by many researchers. Officers (1973) find that during the depression, aggregate stock volatility increased, as did the volatility of money growth and industrial production. Further, it is found that before and after the depression, the level volatility of stock was same. Black (1976) and Christie (1982) finds that stock market volatility can be partially explained by financial leverage. There are few studies to find out how investors show their attitude toward risk in Asian emerging stock markets. Chowdhury (1994) examines the stock returns time-series behaviour of the Dhaka Stock Exchange, and observed the conditional heteroskedastic among first and second moments of stock returns. The significance of asymmetry in the coefficient shows that higher conditional volatility increases due to positive return shocks in the market (Chowdhury, 1994).

Zukarnain and Shamsuddin (2012) investigated the relationship between macroeconomic volatility and stock market volatility in Malaysia by using the monthly data from 2000-2012. The GARCH (1,1) model was employed to estimate the relationship between stock return volatility and macroeconomic variables volatility. Further, it has been examined by employing bivariate and multivariate VAR Granger causality tests as well as through regression analysis. They found volatility of inflation and interest rate to be purely

Granger-caused stock market volatility. The volatilities of macroeconomic variables as a group also do not Granger cause volatility in the stock market. The results of regression analysis show that only money supply volatility is significantly related to stock market volatility. The volatilities of macroeconomic variables as a group are also not significantly related to stock market volatility. The weak relationship between stock market volatility and macroeconomic volatilities is possible due to a lack of institutional investors to the market, and may also indicate the existence of the information asymmetry problem among investors.

Oseni and Nwosa (2011) examined macroeconomic variables and stock return volatility by employing the EGARCH (p, q) in Nigeria. They found a linkage between the volatility of stock returns and GDP. Further, they recommended that government should play a positive role in making stable stock market by escalating the supply of shares. Similarly, Balli et al., (2011) investigate the time-varying sectoral return spillover effect of integration between the EU and US, whereas they focus on the effects of local and global shocks on return volatility and trend spillover. They discovered that different volatility and spillover return are not considerable adequate to describe the return of the different sectors. Further, they documented that different indices of the equity sector react likely to global and local shocks when the trend integrated with spillover volatility analysis.

In previous studies, researchers focused on stock market integration and conditional volatility employing ARCH family models developed by Engle (1982) and Bollerslev (1986). Afterwards, Engle et al., (1987) developed the spillover analysis model and secondly Lin et al. (1994) employed to investigate the effect of spillover volatility between stock markets of Japan and USA. The effects of equity markets return

integration and volatility spillovers have been extensively studied by using the price indices of national stock, such as for the Euro stock markets Balli and Balli (2011), Baele (2005) and Fratzscher (2002), for emerging stock markets, Bekaert and Harvey (1997), and for Japan (local effects) and USA (global effects), Ng (2000) on the volatility spillover effects on the stock markets. Similarly, the integration of EU emerging and Russia's equity markets were investigated by Fedorova and Saleem (2010) from the spillover volatility perspective. While, Yilmaz (2010) recently discovered there are strong stock return spillover influences among Asian stock markets.

By using a different methodology, Schwert (1989) tests the stock volatility relationship with real and nominal macroeconomic volatility, economic activity, financial leverage and stock trading activity. Schwert discovered that aggregate leverage is extensively associated with volatility; this further describes a relatively small part to the movements in stock volatility. The aggregate stock volatility fluctuation amplitude is difficult to describe using simple models of stock valuation, especially during the great depression Schwert (1989).

ElHedi et al., (2011) investigate the volatility spillover between the returns of sector and oil prices by employing bivariate GARCH techniques. They discover that there is significant diffusion shock volatility among oil prices and a few sectors' indices and these findings sustain the initiative of cross-market hedging and common information sharing with investors.

Babikir et al., (2012) empirically investigate the significance of structural breaks in forecasting the volatility of stock return and found a high level of persistence and variability throughout the samples in estimates of the GARCH (1, 1) parameter. These

findings show that structural breaks are empirically significant to the volatility of stock returns. By contrast, Beltratti and Morana (2006) investigate the relationship of stock market volatility with macroeconomic volatility and found evidence of a twofold relationship between the stock market and macroeconomic volatility. They also found that stock market volatility impacts on macroeconomic volatility, and causality direction is stronger from macroeconomic to stock volatility.

Hassan et al., (2000) examine the empirical relationship between market efficiency issues and time varying risk-returns by employing GARCH models for Bangladesh. The results demonstrate a significant serial correlation in stock returns, involving as they did the inefficiency of the stock market. The study also confirmed that conditional volatility, and the returns on stock have a significant relationship. However, the return risk relationship is significant, but negative, and this result is not completely consistent with the theory of the investment portfolio. The analysis of volatility determinants and asset returns at various stages of a financial crisis in an emerging market provides insights regarding knowledge of worldwide crisis triggered by the crisis in emerging economies.

Table 5.1.1: General statistical test applied in Emerging stock market.

Study	Model	***Variable***	***Country***
Rizwan and Khan (2007)	EGARCH models	Exchange rate, interest rate, IPI, M2, MSCI index, and LIBOR	Pakistan
Hassan et al., (2000)	GARCH Models	Stock return	Bangladesh
Shah et al., (2006)	GARCH Model	GDP growth and inflation	Bangladesh
Zafar et al., (2008)	ARCH-GARCH	90 Days T-bill Rate	Pakistan
Wang (2011)	E-GARCH	Inflation and interest rate	China
Zukarnain & Shamsuddin (2012)	GARCH Model	GDP, inflation, exchange rate, interest rates, and money supply	Malaysia
Babikir et al., (2012)	GARCH Model	Stock prices	South Africa
Arouri et al., (2011)	GARCH method	Oil prices, stock return	GCC

(Source: Summarized by author)

This study attempts to identify determinants of risk as well as examining the relationship between risk and returns by employing different estimated AR (1) -GARCH models in reviewing the stock market and economy performance through different stages. We observe whether any factors such as macroeconomic, financial and industry can forecast the variation in stock returns of Pakistani companies. We employed macroeconomic variables in the conditional variance equation because in prior studies, different variables are used in asset return modelling and no one employed the macroeconomic variables to model conditional volatilities in an emerging stock market.

5.2: ECONOMETRIC METHODOLOGY

The literature points out that autoregressive conditional heteroskedasticity (ARCH) and generalized autoregressive conditional heteroskedasticity (GARCH) models are useful in examining the dynamic return relationship. ARCH family models are widely employed in the finance research field, (see Bera and Higgins (1993), Bollerslev et al. (1994), Pagan (1996), among others). The GARCH (p, q) model, which is employed in this analysis, is more appropriately considered for a number of reasons. Theoretically, the ARCH model in general is explicitly intended to forecast conditional variances by tolerating risk variation over time and provides more efficient estimators than those usually used to model for conditional means. The GARCH (p, q) approach integrates long and short-term memory in returns, whereas the ARCH in general approach permits limited lags in examining the conditional variance and is considered as for short-term memory. GARCH model is frequently employed in financial applications, whereas the expected asset returns is directly related to expected asset risk and the risk coefficient is a measure of the risk-return trade-off in the AR(1)-GARCH (1,1), the mean of the asset returns is identified as an explicit function of the conditional variance of the process in allowing for a fundamental trade-off between expected returns and volatility, it also captures the dynamic variation in the pattern of the risk premiums over the time period. Engle et al., (1987) extended GARCH framework, into GARCH-Mean (GARCH-M) model. It permits the series conditional variance to influence the conditional mean which is particularly appropriate for risk–return relationship modelling. GARCH-M models, modify the specification of the conditional mean equation to be

$$\mathbf{Y}_t = \mathbf{x}_t \beta + \psi_t^2 + \varepsilon \qquad (5.1)$$

Even though, in its current conditional variance, this linear form has dominated the literature, the arch allows the conditional variance to enter the mean equation through a nonlinear transformation and for this transformed term to be included contemporaneously or lagged.

$$Y_t = x_t\beta + \psi_0 g_t^2 + \psi 1 g_{t-1}^2 + \psi_2 g_{t-2}^2 + \ldots\ldots\ldots + \varepsilon_t \qquad (5.2)$$

The following transformation is very important and is frequently utilized as the root of the reason that researchers want to incorporate a linear term for the conditional standard deviation. For this reason, it is more appropriate to use a GARCH family model because this EGARCH model also captures the time-varying volatility and various studies evidence time-varying volatility. For example, in Braun, Nelson and Sunier (1995) indicate monthly time varying volatility of stock returns in the USA. Such type of evidence of time varying is also investigated by Bekaert et al., (2001) and Aggarwal, Inclan and Leal (1999) in emerging stock markets. The first step is to determine whether the (monthly) stock returns previously had time-varying volatility and whether shocks to the volatility are asymmetric. To do so, it is necessary to employ the standard GARCH and EGARCH models. This GARCH family model is also consistent with the volatility clustering observed in stock returns data, where large changes in returns are likely to be followed by further large changes. This model may work well with the stock return data and there might be instances when the shock to stock return volatility is not symmetric. This asymmetry occurs when downward movements in the stock market are followed by volatilities, which are higher than upward movements of the same magnitude. In other words, good news and bad news do not have the same impact on stock return volatility.

$$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 \qquad (5.3)$$

The simple standard EGARCH-M model is written as:

$$R_t = I_t'\gamma + \lambda\sigma_t^2 + \varepsilon_t \quad (5.4)$$

$$\log(\sigma_t^2) = \omega + \sum_{j=1}^{q} \beta_j \log(\sigma_{t-j}^2) + \sum_{i=1}^{p} \alpha_i \left| \frac{\varepsilon_{t-i}}{\sigma_{t-i}} \right| + \sum_{k=1}^{p} \gamma_k \frac{\varepsilon_{t-k}}{\sigma_{t-k}} \quad (5.5)$$

Where R_t is a stock return representing exogenous variables, is the conditional variance at time t, and ε_t is the error term at time t. In order to see the effects of macroeconomic variables on return volatility, equations 5.4 can be written, after adding more variables, as:

$$R_t = c + \zeta\pi + \varphi y + \kappa R_{t-1} + \lambda\sigma_t^2 + \varepsilon_t \quad (5.6)$$

Where y is the output growth and π is the inflation. We included one period lag value of stock return into the model. In this study, we have tried various combinations and as a result; it is found that EGARCH-M (2, 2) model fits the data best.

5.3. DATA DESCRIPTION

ADF, AC and PAC tests of stationarity in previous chapter (Chapter III) established that all series are not stationary at all levels, but at first different levels in this series. In this section, we examined the other statistical properties that are needed for the GARCH models. Table 5.3.1 presents descriptive statistics of the stock returns and macroeconomic variables for comparison. The Pakistani stock market return mean is 0.012. Standard deviation demonstrates that the stock returns of Pakistan were 8.5% volatile during the sample period; and a kurtosis 3.16 show that stock returns are strongly deviated from normality. The result of the Jarque-Bera normality test strongly rejects the null hypothesis of normality for the return of the Pakistan stock market. These results depart from normality and confirm that the stock return of firm series' is not normally distributed and exhibit leptokurtosis. Furthermore, it was found that this series has asymmetric tails skewed to the left, i.e., -0.34. From the market point of view, this indicated that investors in this market are able to earn negative returns, as shown below in table 5.3.1. The other variables' unconditional standard deviations are as follows: inflation rate is 11%, money supply is 2%, IPI is 10%, exchange rate is 1%, GP is 4% and short-term interest rate, OP FDI and long-term interest rate are 47%, 11.3%, 49% and 47% volatile during the sample time period respectively and have a coefficient of kurtosis, i.e.1.25 for inflation, which shows that stock returns are strongly departed from normality, 1.32 for money supply, 0.83 for IPI, etc. As a result, the Jarque-Bera normality test strongly rejects the null hypothesis of normality for all other macroeconomic variables. Further evidence from the stock returns volatility clustering of Pakistan market is noticeable; figure 5.2 demonstrates that high (low) volatility periods in the Pakistani stock market returns are followed by periods of high (low) volatility.

Further, as Rafique and Rehman (2011) concluded in their study, daily series are more volatile than monthly and weekly series. These results are consistent with Dawood (2007) and Rashid and Ahmad (2008), who confirmed the volatility clustering in the Pakistani stock market. This is understandable; if we look at absolute and squared returns in figure 5.3.1 and 5.3.2; evidence shows that there is a significant and positive long lasting autocorrelation.

Table 5.3.1: Descriptive statistics

Variables	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Pv
ΔRt	0.012	0.085	-0.34	3.16	77.58	0.000
ΔM2	0.011	0.02	0.79	1.32	15.10	5.3e-04
ΔINF	-0.03	0.113	0.39	1.25	16.08	0.003
ΔIPI	0.003	0.10	0.20	0.83	04.13	8.5e-04
ΔEX	0.005	0.013	2.27	6.79	4.622	0.099
ΔGP	0.008	0.04	2.18	8.22	19.93	4.7e-05
ΔINT	-0.10	0.47	-0.02	3.75	8.27	0.016
ΔOP	0.008	0.113	-1.20	5.83	11.12	0.004
ΔFDI	0.008	0.490	-0.22	7.52	764.1	0.000
ΔDR	-0.052	0.47	-0.79	7.21	13.50	0.001

Note: Jarque-Bera used to test the hypothesis of H0: is the stock returns normality.

A general finding in the current literature, emerging stock markets are more volatile as compared to developed stock markets (Kirchler and Huber, 2007). Further, stock returns are likely to decline as investors learn from their investing strategies. Therefore, the stock market shifts in the direction of a partial equilibrium and this shift continued until new current basic information are received, and the stock market takes a new path for another period with the same patterns (Kirchler and Huber, 2007).

Figure 5.1: Pakistani stock market return and its distribution over the period

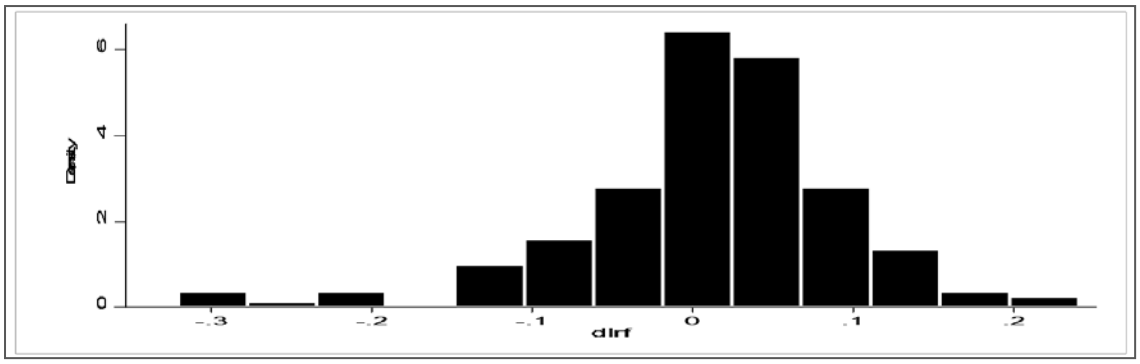


Figure 5.2: Pakistani stock market absolute and square return values

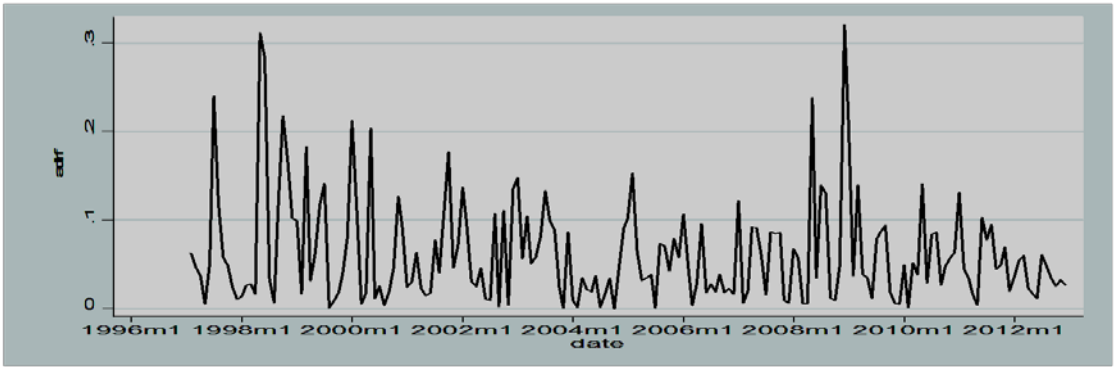
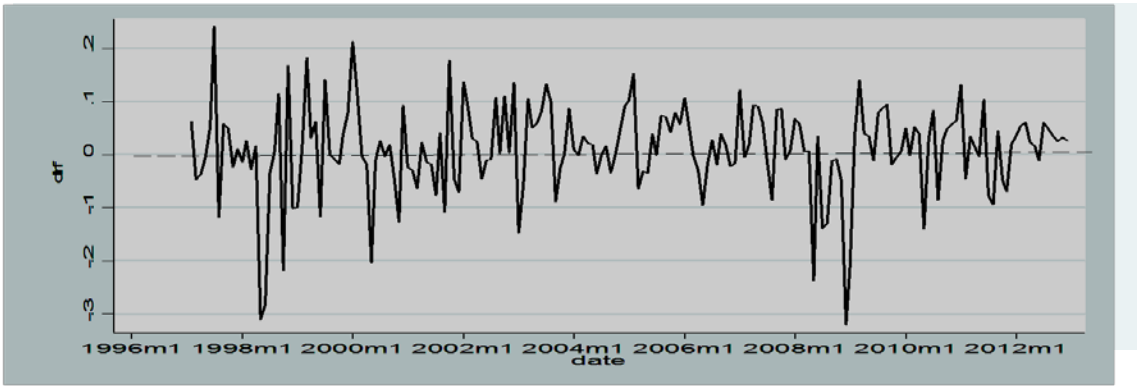


Figure 5.3: Pakistani stock market absolute and square return values



Further, results confirmed that Ljung-Box Q-statistics are correlated with the coefficients of ACF in terms of squared, absolute value returns, and thus reject the null hypothesis of ‘‘there is no autocorrelation up to lag 16’’, which is taken as evidence for volatility clustering occurrence.

Table 5.3.2: Breusch-Godfrey LM test for autocorrelation

Lags (p)	chi2	df	Prob. > chi2
	1 97.782	1	0.00

H0: no serial correlation

Table 5.3.3: Portmanteau test for white noise

Portmanteau (Q) statistic	526.27
Prob. > chi2	0.0000

This empirical analysis of stock returns of the Pakistan market is similar to the pioneering studies of Mandelbrot (1963) and Fama (1965) etc., who maintained that the returns of the stock market are not normally distributed and usually reveal volatility clustering, which is a very common characteristic of financial time series data (Rydberg, 2000). Therefore, it is justifiable to employ the GARCH family models to address questions regarding stock return volatility, as is done in the following sections.

5.4. MODELLING THE CONDITIONAL MEAN EQUATION AND ESTIMATED RESULTS

The GARCH model will be employed in order to determine and explain the above the dynamics of the conditional mean. In this step, we generate significant squared residuals to avoid the autocorrelation of dependent variables in variance equation. Employing the mean equation model to ensure convergence in estimating the GARCH model; since it might be more GARCH model parameters build likelihood function smoothly. Therefore, we try to establish a satisfactory conditional mean equation model that follows the different stages: such as identification, both the autocorrelation (AC) and partial autocorrelation (PAC) function which might provide hints as to the natural process of dynamic behaviour that should be adopted in the ARMA specification of return of Pakistan market.

Table 5.4.1: Autocorrelation function for Pakistani stock market return

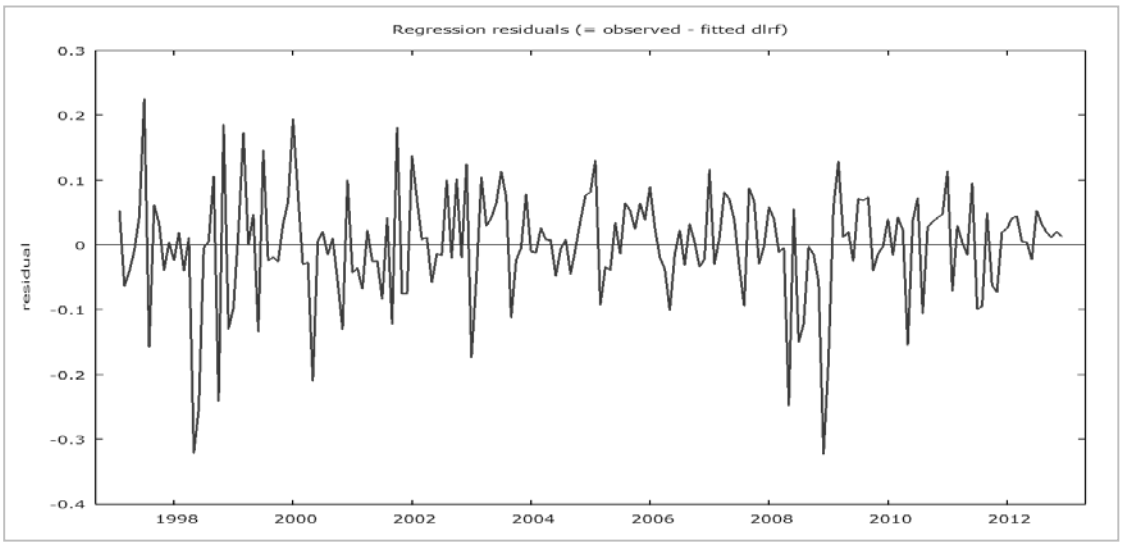
	Return at level			Return		
LAG	ACF	PACF	Q-stat.	ACF	PACF	Q-stat.
1	0.975 ***	0.975 ***	185.508*	0.126*	0.126*	3.062*
2	0.949 ***	-0.054	361.915*	0.033	0.018	3.2756
3	0.922 ***	-0.013	529.387*	-0.041	-0.048	3.5991
4	0.894 ***	-0.041	687.670*	0.030	0.041	3.7754
5	0.866 ***	-0.005	837.100*	0.054	0.049	4.3502
6	0.838 ***	-0.016	977.878*	0.041	0.025	4.6857
7	0.813 ***	0.029	1110.909*	-0.018	-0.026	4.7463
8	0.787 ***	-0.016	1236.399*	0.048	0.056	5.2035
9	0.761 ***	0.013	1354.935*	-0.022	-0.034	5.3032
10	0.739 ***	-0.019	1466.676*	-0.087	-0.093	6.8464
11	0.719 ***	0.086	1573.167*	-0.103	-0.078	8.9991
12	0.703 ***	0.048	1675.480	-0.058	-0.036	9.6895

Note: *** Significant at 1%, *** significant at 5% level and * significant at 10% level

Such analysis helped to discover the fact that the value of PACF is falling significantly after one lag within the margins of two standard errors (±2/vT). However, both the AC and the PAC function provide a major solution for the selection of appropriate lags in the

ARMA model; as such, we carried out further analysis by using the above information and selecting the maximum 12 lags based on Schwarz's information criteria (SIC), AIC and Hannan-Quinn (HQ) criteria techniques, We then estimated different combination of ARMA (1, 0) models.

Figure 5.4: Estimated residual from ARIMA model



Moreover, the ARMA (1, 0) model estimated that residuals act like "white noise" almost around zero as can be seen in figure 5.4. As a result, the ARMA (1, 0) model satisfies the most important statistical diagnostics test for investigating the major influence of macroeconomic variable's volatility of the stock returns the conditional variance. Therefore, estimated model results are presented in table 5.4.2, the p-value associated with AR (1) coefficient is statistically significant, which confirmed that the returns of the Pakistan stock market have a comparatively short memory (one month); this is realistic because the returns of the stock market must respond to information faster with respect to goods markets (Davis and Kutan, 2003).

Table 5.4.2: Estimated optimal ARMA (1, 0) models for stock returns

Const.	AR (1)	F-	Log-likelihood	AIC	SIC	HQC
0.010	0.139	2.34	201.08	-394.15	-381.14	-388.88
(0.154)	(0.13)	(0.02)				

Note: P-values, for parameters are shown in square brackets

Bollerslev (1987) and Engle (1993), amongst others, consider the standard specification of GARCH (1, 1), a prudent demonstration for the conditional variance modelling of time series with high-frequency. The AR (1) -GARCH (1, 1) procedure is employed as the standard model for the conditional volatility modelling of stock returns. The results provided in table 5.4.3 combine the results of the mean equation, and the variance equations of the AR (1) -GARCH (1, 1) model for the returns of the Pakistani stock market with a model fits diagnostic. Overall, this result leads to a number of conclusions. In the AR (1)-GARCH (1,1) model the mean equation estimate e demonstrates that for the AR (1), the coefficient is statically significant, and it indicates that the preceding period stock returns play a vital role in finding the current returns of the stock market (see mean equation in table 5.4.3). The same conclusion can be drawn from the variance equation results, where the variance equation parameters (ω, α, and ß) are positive and α, and ß are statically significant (see variance equation in table 5.4.3). Moreover, further results confirm the sufficient conditions for a non-negative conditional variance. Thus, the AR (1)-GARCH (1, 1) standard model looks likely to capture that the monthly clustering volatility, and sum of both ARCH(1) and GARCH (1,1) model coefficients is ($\alpha+ß = 0.92$) is less than one, which leads to the conclusion that unconditional variance (ϵ_t) is less than 1 i.e. it is stationary. While the sum of α and ß is near to one, this means that high time-varying stock return volatility is persistent. It can be concluded that the shock of stock market volatility has been building for a long time. The variance equation parameter α value is less in comparison to the β value, which also leads to the conclusion that stock market volatility can be disturbed by past volatility further due to the previous period related news.

Table 5.4.3: Estimates of the AR (1)-GARCH (1, 1) model

Mean Equation		Variance Equation		AIC	BIC	HQC	Llik.
Const	0.014**	ω	0.0005 ***	-400.7	-387.7	-395.4	204.35
	(0.03)		(0.40)				
μ	0.206	α	0.063*				
	(0.64)		(0.09)				
ɵ	-0.081	β	0.862***				
	(0.85)		(0.00)				
		α+β	0.92<1				

Note: Depended variable is stock returns; Sample: 1997:03-2012:12 (T = 190), VCV method: Robust.
P-value of parameters are associated with z-statistics and for diagnostic fitting values are linked with the 2-statistic shown in square brackets.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The above results validated that the estimated standards AR (1)-GARCH (1, 1) model effectively generated residuals. It is confirmed that ARCH influences depend on the ARCH-LM test up to maximum lag order 12, and the results confirm the capability of the GARCH (1, 1) model as a standard model to illustrate the dynamic behaviour of stock returns with macroeconomic factors and the magnitude of volatility in the system from 1997 to 2012. Moreover, these findings draw an attention to the returns of the stock market that express the ‘‘persistence and volatility clustering’’ and the hypothesis. Weak-form efficiency regarding emerging stock market is not acknowledged because the finding confirmed that earlier period information facilitates in forecasting future stock prices. Meanwhile, the hypothesis of mean variance doesn’t hold for the stock market of Pakistan as no evidence is found that investors are rewarded for taking increased risk.

5.5: IMPACT OF MACROECONOMIC VOLATILITY ON STOCK RETURN VOLATILITY

We used the GARCH (1, 1) model because it is suitable for finding out the conditional return volatility of the Pakistan stock market as well as for investigating the influence of macroeconomic factor volatility on stock return volatility. In particular, sets of the GARCH family models such as AR (1)-GARCH-S(1,1), AR(1)-GARCH-X(1,1) and AR(1)-GARCH-G (1,1) are estimated, and these estimated models differently integrate macroeconomic factors in variance equation. It was concluded by employing the Johansen-Juselius (1990) co-integration test that stock market returns and macroeconomic variables have a long-term relationship. We, therefore, conduct further analysis using the AR (1)-GARCH (1, 1) model, as recommended by Lee (1994). This model is associated with the deviation of stock return volatility from equilibrium, and is characterized by the magnitude of error correction terms. For these reasons, we added an independent variable such as, the lagged square of the error correction term into the variance equation and estimate the model subsequently. Furthermore, we estimate the ten (10) AR (1)-GARCH (1, 1) to explore the impact of the individual macroeconomic factor on return volatility. The following models are estimated afterward;

$$R_t = \mu + \theta_1 R_{t-1} + \varepsilon$$

$$\varepsilon_t | \Omega_{t-1} \sim N(0, h_{t^2})$$

$$h_{t^2} = \omega + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 h_{t-1^2} + \lambda_{ECT} Z_{t-1}^2 \qquad (5.8)$$

$$h_{t^2} = \omega + \omega + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 h_{t-1^2} + \lambda_n \Delta X_{nt} \qquad (5.9)$$

$$\omega > 0, \alpha_i, \beta_j, \lambda_n \geq 0 \rightarrow h_{t^2} \geq 0, i = 1 \ldots p, j = 1 \ldots . q, and\ n = 1, \ldots 10.$$

The parameter λ_{ECT} is a new characteristic of Lee's (1994) model that explains the deviation cointegrating association on the stock returns conditional volatility. Whereas λ_n parameter determines the short-run deviation effect from long-run association of co-integrated factors on the returns' conditional variance. Moreover, the $Z^2_{t-1}$is the lagged square of the ECT, and as derived from the long run relationship (equation 5.5.1). The parameter λ_n is employed in the analysis to measure the impact of change in the macroeconomic variable on the volatility of Pakistan stock returns such as, ΔX_{it}, ΔM_t, ΔINT_t, ΔINF_t, ΔTB_t, ΔOP_t, ΔEX_t, ΔGP_t, and ΔFDI_t. The results of these models are presented in table 5.5.1 and table 5.5.2, these models are classified into two important components; the statistical performance of the estimated AR (1) -GARCH (1, 1) models and the economic interpretation of their outcomes (equation 5.5.2).

Table 5.5.1. Impact of economic factors on stock returns in Pakistan stock market

Mean Equation		**Variance Equation**		**AIC**	**BIC**	**HQC**	**Llik.**
μ	0.014**	ω	0.0005	-400.7	-387.7	-395.4	204.35
	(0.03)		(0.40)				
ɵ	0.206	α	0.063*				
	(0.64)		(0.09)				
		β	0.862 ***				
			(0.00)				
		λ_{ECT}	0.425**				
			(0.01)				
		α+β	0.92 <1				

Note: P-values for parameters are in brackets and are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The results provided in table 5.5.1 show the estimates of the AR (1)-GARCH (1, 1) model. The mean equation results of GARCH model show that current return of stock is positively influenced by the previous period's returns of the stock market. The constant of mean equation is also positive and statistically significant (p-value=0.03), that is the sample mean of return of stock market and is behaving randomly. The variance equation

of AR (1)-GARCH (1, 1) model results satisfy the conditions, for example, positive and statistically significant except ω. The ARCH model parameter is positive and statistically significant and the sum of coefficients both for ARCH and GARCH is less than one ($\alpha+\beta < 1$), which confirms the GARCH model's stability condition. The effect of GARCH is more than ARCH($\alpha < \beta$), which confirms the suitability of the estimated AR(1)-GARCH(1,1) model, and the results of Ljung-Box statistics test suggest that there is no serial correlation obtained from the AR(1)-GARCH(1,1) model. The coefficient of deviation co-integrating association λ_{ECT} is statistically significant and positive; this means that the volatility of stock returns has a direct association with short-run macroeconomic variables and deviations in terms of equilibrium relationship. These findings are similar to the investigations Léon (2008); Niblock and Malik (2007); Kapital (1998) and Najand & Rahman (1991) found that there is a correlation between the volatility of macroeconomic variables and the volatility of stock market returns.

The results presented in table 5.5.2 show that AR (1)-GARCH (1, 1) model estimates when the macroeconomic variables are included in the equation generates positive and significant findings. The values of model parameters (α and β), or a sum of coefficients of ARCH and GARCH parameters ($\alpha + \beta <1$) are less than one, which implies that it is stationary. However, the sum of α and ß is near to one, which means that high time-varying stock return volatility is persistent. Therefore, it can be concluded that the stock market volatility shock will last a long time. The variance equation parameter α value is less than the β value, which also leads to the conclusion that stock market volatility can be influenced more by historical volatility than by the news related to the previous period. In relation to the impact of macroeconomic variables in the system are associated with model estimates and advocates the following findings (see table 5.5.2). There is a

negative and significant relationship between exchange rate (ΔEX) and the volatility of Pakistan stock market return, and this indicates that a 1% change in the exchange rate will cause a return volatility of the Pakistan stock market of about 14.5%. This indicates that the information related to currency depreciation is due to increase in stock return volatility.

Table 5.5.2: Impact of macroeconomic variables volatility on stock returns volatility

Cont.	**ΔEX**	**ΔINF**	**ΔINT**	**ΔTB**	**ΔFDI**	**ΔIPI**	**ΔGP**	**ΔOP**
0.131	-0.145	-0.005	-0.035	-0.014	0.008	0.053	0.050	0.049
[0.146	[0.501	[0.007]	[0.022]	[0.010]	[0.005]	[0.065]	[0.146]	[0.070]
(0.37)	(0.00)	0.581	(0.000)	(0.12)	(0.10)	(0.41)	(0.73)	(0.25)
ΔM	**Cont.**	**ARCH**	**GARCH**	**GARC-M**	**Llik**	**AIC**	**BIC**	**HQC**
0.027	0.154	0.025	0.097	19.59	229.2	-432.4	-390.0	-415.3
[0.357]	[0.146]	[0.001]	[0.114]	[24.86]				
(0.04)	(0.77)	(0.00)	(0.00)	(0.43)				

Note: Dependent variable is stock returns, independent variables include, exchange rate (EX), inflation rate(INF), long term interest rate (INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply (M), gold price(GP) and oil prices (OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

Another important macroeconomic factor is the long-term interest rate, which is negatively significant with the volatility of Pakistan's stock market. This result signifies that a 1% increase in interest rates causes a 3.5% volatility of Pakistani stock market returns. Another macroeconomic factor money supply result indicates that there is a positive (significant) association with the volatility of stock returns in Pakistan, with a 1%increase in the money supply, there is 2.7% effect on the volatility of the Pakistani stock market return. This indicates that the money supply has a clear influence on the growth of stock market returns.

The inflation rate and short-term interest rates have a negative association with the volatility of Pakistan stock market returns, but this association is not significant. This means these factors have an insignificant impact on the volatility of Pakistani stock

market returns from 1997 to 2012. Moreover, other global and local factors such as foreign direct investment (ΔFDI), industrial production index (ΔIPI), gold prices (ΔGP) and oil prices (ΔOP) have a positive association but an insignificant impact on stock return volatility. These results imply that the variation in the following macroeconomic factors, such as, (ΔFDI), (ΔIPI), (ΔGP), (ΔOP), ΔINF and ΔTB, does not dynamically explain the volatility of Pakistan market returns. It means that the addition of these factors to the system AR (1)-GARCH (1, 1) model does not explain further significant knowledge about the relationship behaviour of Pakistan market returns' volatility. Overall, the exchange rates and interest rate negatively (significant) associated with volatility of stock returns during the sample time period, while money supply is positively (significant) associated with volatility of stock returns. On the other hand, the variance equation indicates that associations between changes in exchange rate and stock return volatility should be tempered since the volatility persistency is more than one ($\alpha_1+ß_1 < 1$). It is concluded that the AR (1) coefficient is significant, which implies that previous returns of stock the stock market affect the current returns of stock market, and that variance equation parameters such as α and ß are statistically significant and positive, which met the non-negative conditional variance conditions. While, the sum of α and ß is near to one high time-varying stock return volatility is persistent. So it can be concluded that the stock market volatility shock will last a long time. The variance equation parameter α value is less than the β value; it can therefore be concluded that stock market volatility can be influenced more by historical volatility than by news related to previous period.

5.6: THE EMPIRICAL RESULTS OF SECTORAL RETURNS VOLATILITY

We investigated the proposition that time-varying sectoral spillover equity returns integration effect, as existing research on the effects of local and global shocks on return, volatility, trend spillover, and differing volatility and return spillovers are not adequate to describe the return of the different sector. Furthermore, it was demonstrated that different indices of the equity sector react to global and local shocks when the trend is integrated into the volatility spillover analysis. In this analysis, we investigate the macroeconomic variable volatility effect on sectoral equity return volatility, and these results may be valuable for investors to reduce the risk. Thus, in this study, we argue that this risk can be further reduced through portfolio diversification, and portfolio risk allocation, where literature postulates that in the presence of asymmetric shocks, investor portfolio diversification can be seen as insurance against asynchronous economic cycles across regions.

Table 5.6.1: The GARCH results of return of Travel and Leisure industry of Pakistan

Constant	**EX**	**INF**	**INT**	**TB**	**FDI**	**IPI**
-0.339	18.525	-0.164	-0.542	0.001	-0.094	0.216
[0.143	[7.904]	[0.118]	[0.196]	[0.119]	[0.034]	[0.852]
(0.02)	(0.02)	(0.17)	(0.01)	(0.19)	(0.01)	(0.80)
M	*GP*	*OP*	*GARCH-M*	*Constant*	*ARCH*	*GARCH*
6.829	-2.192	0.151	0.001	0.063	0.449	0.669
[5.085]	[3.360]	[0.819]	[0.009]	[0.099]	[0.184]	[0.056]
(0.18)	(0.51)	(0.85)	(0.04)	(0.52)	(0.00)	(0.00)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The GARCH Model results provided in table 5.6.1 are the results of the stock returns of the travel and leisure industry as a dependent variable. These results demonstrate that the ARCH (1) and GARCH (1) model's estimates are positive and significant ($p < 0.05$), whereas the lagged square residual term estimates are also positive and significant. The

GARCH conditional standard deviation results show a positive and significant association between risk and returns. These outcomes indicate that the multifactor model has a significant association between dependent variable and repressors. The regressor variables, exchange rate (ΔEX), interest rate (ΔINT) and foreign direct investment (ΔFDI) are also significant, although the exchange rate is positively and interest rate and FDI are negatively associated with the volatility of stock returns of the travel and leisure sector firms. The other independent variables; the short term interest rate (ΔTB), industrial production index (ΔIPI), money supply (ΔM2), gold prices and oil prices positively associated with stock returns, while inflation rate and gold prices negatively associated with stock returns of Pakistani firms.

Table 5.6.2: The GARCH Model results of Pharmaceuticals and Biotechnology sector

Constant	**EX**	**INF**	**INT**	**TB**	**FDI**	**IPI**
-0.156	-4.246	0.698	-0.682	0.258	0.015	1.628
[0.119]	[5.362]	[0.113]	[0.199]	[2.410]	[0.071]	[0.630]
(0.19)	(0.43)	(0.00)	(0.00)	(0.04)	(0.83)	(0.01)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
1.850	0.537	2.444	-0.004	-0.017	1.065	0.469
[7.307]	[3.888]	[0.960]	[0.006]	[0.032]	[0.339]	[0.068]
(0.80)	(0.80)	(0.01)	(0.47)	(0.58)	(0.00)	(0.00)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The results for Pharmaceuticals and Biotechnology industry shows that ARCH (1) and GARCH (1) estimates are positive and significant ($p < 0.05$) at 5 % level of significance; whereas the lag variances have positive and significant control on the volatility of Pakistan stock market returns. The GARCH-M results show a negative association between risk and returns. These outcomes indicate that the relationship between the dependent and regressed variable is very weak. The explanatory variables, inflation rate, interest rates (ΔINT), short term interest rate (ΔTB), industrial production index (ΔIPI)

and oil prices (ΔOP) are having a statistically significant and positive relationship apart from interest rates (ΔINT) which has negative associations with the volatility of the stock returns of the pharmaceuticals and biotechnology firm. The other independent variables, exchange rate (ΔEX) is negatively associated, however, FDI, ΔM2 and ΔGP are positively associated with the stock returns of pharmaceuticals and biotechnology firms.

Table 5.6.3: The GARCH results of Personal Goods sector

Constant	EX	INF	INT	TB	FDI	IPI
0.566	-19.590	0.353	-0.235	-0.121	0.056	-1.641
[0.437	[18.073]	[0.206]	[0.699]	[0.418]	[0.150]	[2.484]
(0.19)	(0.27)	(0.08)	(0.73)	(0.77)	(0.70)	(0.50)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
1.517	-6.881	2.314	-0.043	4.324	0.510	0.091
[14.104]	[6.182]	[2.045]	[0.036]	[0.848]	[0.172]	[0.135]
(0.91)	(0.26)	(0.25)	(0.22)	(0.00)	(0.00)	(0.50)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The results of the Personal Goods industry illustrated that ARCH (1) estimates are positive and statically significant; however, GARCH (1) estimates are positive and insignificant, whereas the estimate of lagged square residual's term is statically positive and significant. This means that there is an impact on the volatility of Pakistan stock market returns. The GARCH-M results indicate that the inflation rate (ΔINF) is positive and significant with the volatility of stock returns of the personal goods sector firms. However the exchange rate (ΔEX), interest rates (ΔINT), short term interest rates (ΔTB), industrial production index (ΔIPI), and gold prices (ΔGP) are negative and insignificantly associated with the stock returns' volatility of personal goods sectors companies. The money supply, oil prices and FDI are positively associated with the stock returns of personal goods companies.

Table 5.6.4: The GARCH-M Model results of Oil and Gas sector

Constant	EX	INF	INT	TB	FDI	IPI
-0.335	-17.332	-0.962	-1.967	-0.325	-0.110	0.081
[0.842]	[61.44]	[0.573]	[1.178]	[0.855]	[0.444]	[4.535]
(0.69)	(0.77)	(0.09)	(0.08)	(0.70)	(0.80)	(0.98)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
12.967	-11.869	3.296	0.001	3.172	0.375	0.668
[35.69]	[18.431]	[5.913]	[0.008]	[2.284]	[0.098]	[0.058]
(0.71)	(0.52)	(0.57)	(0.93)	(0.16)	(0.00)	(0.00)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The results of the Pakistani oil and gas industry indicate that the ARCH (1) estimates are significantly ($p<0.05$) positive, although GARCH (1) estimates are positive, but insignificant, whereas lagged square residuals term estimates are positive and significant. This means that lag variances have a significant and positive effect on the return's volatility of the Pakistan stock market. In the application of GARCH-M, the conditional standard deviation has been employed as multifactor equation like independent variable, and the results show a negative and insignificant association between risk and return. These findings indicate that the inflation rate is positive and significant with the volatility of stock returns of the oil and gas sector firms. The exchange rate (ΔEX), long term interest rate (ΔINT), short term interest rate (ΔTB), industrial production index (ΔIPI), and gold prices (ΔGP) are statistically insignificant ($p>0.05$), and foreign direct investment (ΔFDI, money supply (ΔM2) and oil prices (ΔOP) are positive and insignificantly associated with volatility of the stock returns of the oil and gas firms.

In table 5.6.5, the findings described that ARCH (1)-GARCH (1) estimates and lagged square residual's term estimates are positive (significant); whereas lag variances have a a positive (significant) effect on the return volatility. The GARCH-M results show there is

a negative and insignificant association between risk and return, but this association is very weak. The long-term interest rate is negatively associated with the volatility of stock returns of the Industrial and Metals Mining sector. The FDI, short-term interest rate, and gold prices are negatively associated with the volatility of stock returns of Industrial Engineering and Metal's sector. With regard to other variables, the inflation rate, industrial production index, exchange rate (ΔEX), money supply (ΔM2), and oil prices are positively associated with stock returns of Industrial and Metals sector firms.

Table 5.6.5: GARCH-M results Industrial Engineering and Mining sector

Constant	EX	INF	INT	TB	FDI	IPI
0.067	8.039	0.033	-0.615	-0.017	-0.169	0.734
[0.186]	[6.085]	[0.220]	[0.370]	[0.140]	[0.121]	[1.954]
(0.718)	(0.617)	(0.879)	(0.007)	(0.905)	(0.174)	(0.707)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
2.068	-0.619	0.533	-0.008	0.062	0.500	0.691
[7.941]	[6.040]	[1.166]	[0.010]	[0.091]	[0.241]	[0.105]
(0.795)	(0.918)	(0.647)	(0.394)	(0.494)	(0.038)	(0.000)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The results provided in table 5.6.6 are the stock returns of Food Producers sector of Pakistan. These results indicate that the ARCH (1) and GARCH (1) estimates are positive and significant; whereas lagged square residuals term estimates are positive and significant. This means that lag variances have a positive and statically significant impact on the stock market return volatility of Pakistan. The results also confirmed that the inflation rates (ΔINF) positively (significant) associated with volatility of stock returns of Food Producers sector firms. The exchange rate (ΔEX), short term interest rate (ΔTB), foreign investment (ΔFDI), industrial production index (IPI), money supply (ΔM2), gold prices (ΔGP) and oil prices (ΔOP) are positive and insignificantly associated with Pakistan's stock returns of the Food Producers firm and long term interest rate (ΔINT) is

insignificant and negatively associated with volatility of stock returns of the Food Producers sector firms.

Table 5.6.6: GARCH-M results of Food Producers sector

Constant	EX	INF	INT	TB	FDI	IPI
2.043	11.490	5.151	-8.611	0.287	1.063	16.08
[2.541]	[32.99	[1.933]	[5.704]	[3.436]	[2.096]	[22.73]
(0.421)	(0.970)	(0.008)	(0.131)	(0.933)	(0.612)	(0.480)
GP	**OP**	**M**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
56.166	1.193	-121.08	0.000	5.693	0.441	0.748
[62.499]	[26.675]	[103.76]	[0.001]	[19.676]	[0.083]	[0.033]
(0.369)	(0.964)	(0.24)	(0.914)	(0.772)	(0.000)	(0.000)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The multivariate GARCH model results provided in table 5.6.7 indicate that ARCH (1) and GARCH (1) estimates are positive (significant), whereas lagged square residual's term estimates are positive and significant (p<. 05). This means that lag variances have a significant and positive effect on the return's volatility of a Pakistan stock market.

The GARCH-M multifactor equation results show a positive and significant (p<. 05) association between risk and return. These results specify that the multifactor model represents a significant relationship between the dependent variable and repressors. The independent variables, such as interest rate (ΔINT), short-term interest rate (ΔTB), foreign investment (ΔFDI) and inflation rate (ΔINF) are significantly (p< .05) associated with the volatility of stock returns of the financial services and insurance sector. The other variables such as, ΔIPI, money supply (ΔM2), gold prices (ΔGP), Exchange rate (ΔEX) and oil prices (ΔOP) are insignificantly associated with Pakistan stock returns of the financial services sector.

Table 5.6.7: GARCH-M results of Financial and Insurance sector

Constant	EX	INF	INT	TB	FDI	IPI
-0.104	-12.212	-0.424	-1.133	0.648	0.104	1.227
[0.215]	[18.36]	[0.216]	[0.289]	[0.210]	[0.049]	[1.575]
(0.627)	(0.506)	(0.050)	(0.000)	(0.002)	(0.034)	(0.436)
GP	**M**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
-1.766	1.719	1.317	-0.013	0.434	0.574	0.527
[5.786]	[11.21]	[1.537]	[0.006]	[0.247]	[0.163]	[0.078]
(0.760	(0.878)	(0.392)	(0.022)	(0.079)	(0.000)	(0.000)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

In table 5.6.8, the results indicate that the ARCH (1) and GARCH (1) model's estimates are significant and positive at the 5% level of significance, whereas lagged square residual's term estimates are positive and significant. This means that lag variances have a significant and positive effect on return volatility. The GARCH conditional multifactor results show an insignificant association between risk and return. These results indicate the multifactor model insignificantly reveals a relationship between the variables. The independent variables, exchange rate and long term interest rate are statistically significant and have a negative associated with the volatility of the stock returns of the Construction and Materials Sector of Pakistan. The interest rate, industrial production index, money supply, inflation rate, gold prices and oil prices are positively associated with stock returns of construction and materials sector.

The results of the banking sector indicate that the ARCH (1) and GARCH (1) model's estimates are significant and positive, whereas the lagged square residuals;' term estimates are positive and significant. This means that lag variances have a positive effect on the stock return volatility of Pakistan.

Table 5.6.8: GARCH results of Construction and Materials sector

Constant	EX	INF	INT	TB	FDI	IPI
-0.021	-10.525	-0.083	-0.474	0.092	0.001	0.060
[0.110]	[5.765]	[0.146]	[0.193]	[0.113]	[0.034]	[0.744]
(0.852)	(0.068)	(0.569)	(0.014)	(0.414)	(0.980)	(0.936)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
6.895	-5.386	0.763	-0.018	0.034	0.404	0.682
[5.855]	[3.945]	[0.586]	[0.022]	[0.033]	[0.114]	[0.062]
(0.239)	(0.172)	(0.193)	(0.417)	(0.306)	(0.000)	(0.000)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

Table 5.6.9: GARCH-M results of banking sector

Constant	EX	INF	INT	TB	FDI	IPI
0.009	-6.173	-0.222	-0.262	0.074	-0.080	0.222
[0.069	[3.109]	[0.108]	[0.107]	[0.074]	[0.028]	[0.627]
(0.895)	(0.047)	(0.041)	(0.014)	(0.313)	(0.004)	(0.724)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
.527	0.553	0.546	0.003	0.006	0.359	0.749
[3.571]	[1.867]	[0.384]	[0.012]	[0.018]	[0.099]	[0.049]
(0.669)	(0.767)	(0.154)	(0.805)	(0.761)	(0.000)	(0.000)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The GARCH-M results show a positive, but insignificant association between risk and return. These results signpost that the exchange rate (ΔEX), long-term interest rate (ΔINT) and foreign direct investment (ΔFDI) negatively associated with the volatility of the stock returns of the banking sector. Other variables, such as the industrial production index (ΔIPI), money supply (ΔM2), gold prices, oil prices (ΔOP) and short term interest rate (ΔTB) are insignificant and positively associated with the stock return and the Banking sector.

Table 5.6.10: GARCH-M results of Chemicals and Fertilizer sector

Constant	EX	INF	INT	TB	FDI	IPI
-0.045	-48.062	-0.211	-2.405	0.164	-0.089	3.006
[0.506]	[24.81]	[0.507]	[0.823]	[0.454]	[0.157]	[2.899]
(0.929)	(0.053)	(0.678)	(0.003)	(0.360)	(0.570)	(0.300)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
27.916	-2.979	3.301	0.000	0.664	0.147	0.848
[22.04]	[10.21]	[2.336]	[0.013]	[0.631]	[0.062]	[0.060]
(0.205)	(0.770)	(0.158)	(0.985)	(0.292)	(0.018)	(0.000)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate (INT), short term interest rate (TB), foreign direct investment (FDI), industrial production index(IPI), money supply(M), gold price (GP) and oil prices (OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The multivariate GARCH model's results of the chemicals sector indicate that ARCH (1) and GARCH (1) estimates are significant (p<. 05), whereas the estimates of the lagged square residual term are positive (Significant). This means that lag variances have a positive effect on the stock return volatility. GARCH-M results indicate that the multifactor model is insignificant relationship between the dependent variable and repressors. The exchange rate (ΔEX) and long-term interest rate (ΔINT) are negatively (significant) associated with the volatility of the stock returns of the Chemicals and Fertilizer sector. The other variables, including the short term interest rate (ΔTB), industrial production index (ΔIPI), money supply (ΔM2), gold prices and oil prices (OP) are positive, but insignificantly associated with the stock returns of the Chemicals and Fertilizer Sector of Pakistan, however, inflation rate (ΔINF), FDI and Gold price (ΔGP) are negatively associated with the stock returns of Pakistan's Chemicals and Fertilizer Sector, but this association is statistically insignificant.

Table 5.6.11: GARCH-M results of Automobile and Parts sector

Constant	EX	INF	INT	TB	FDI	IPI
-0.083	-10.768	-0.198	-0.429	0.304	-0.042	0.910
[0.183]	[9.506]	[0.109]	[0.150]	[0.155]	[0.048]	[1.704]
(0.649)	(0.257)	(0.068)	(0.004)	(0.050)	(0.379)	(0.593)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
0.864	0.204	-0.022	0.001	0.018	0.482	0.689
[5.155]	[4.342]	[0.604]	[0.006]	[0.026]	[0.151]	[0.069]
(0.867)	(0.963)	(0.971)	(0.845)	(0.506)	(0.001)	(0.000)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

The multivariate GARCH model results provided in table 5.6.11 show that the ARCH (1) and GARCH (1) models estimates are significant and positive; whereas the estimates of the lagged square residuals term are statically positive and significant. This means that lag variances have a positive effect on the stock return volatility of Pakistan. The GARCH-M; results show a positive and statistically insignificant association between risk and return. These results indicate that the multifactor model shows an insignificant relationship between the dependent variable and repressors. The inflation rate (ΔINF) and interest rate (ΔINT) negatively and the short-term interest rate (ΔTB) positively (significant) associated with volatility of stock returns of the automobile and parts sector. The exchange rates (ΔEX), oil prices (ΔOP) and foreign investment (ΔFDI) are negatively (insignificant) associated with volatility of stock return of automobile and parts sector. The other variables positively associated with the stock returns of the country's automobile and parts sector.

Table 5.6.12: GARCH-M Model results of Electricity sector

Constant	EX	INF	INT	TB	FDI	IPI
0.261	-13.085	0.018	-0.789	-0.212	0.035	1.250
[0.169]	[7.890]	[0.084]	[0.350]	[0.224]	[0.052]	[1.185]
(0.122)	(0.079)	(0.166)	(0.024)	(0.345)	(0.500)	(0.292)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
-0.87	-2.22	0.749	-0.064	0.021	0.031	0.946
[6.239]	[3.318]	[0.800]	[0.047]	[0.018]	[0.025]	[0.025]
(0.890)	(0.500)	(0.349)	(0.179)	(0.254)	(0.216)	(0.000)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

Table 5.6.13: GARCH-M Model results of General Industry

Constant	EX	INF	INT	TB	FDI	IPI
-0.034	-7.31	0.141	-2.02	0.325	-0.014	-0.829
[0.378]	[14.99]	[0.647]	[0.470]	[0.375]	[0.112]	[2.450]
(0.928)	(0.626)	(0.828)	(0.000)	(0.358)	(0.870)	(0.735)
M	**GP**	**OP**	**GARC-M**	**Constant**	**ARCH**	**GARCH**
13.972	-8.574	3.058	-0.003	0.567	0.168	0.875
[16.779]	[9.392]	[2.051]	[0.006]	[0.345]	[0.048]	[0.027]
(0.405)	(0.361)	(0.136)	(0.000)	(0.931)	(0.000)	(0.000)

Note: Dependent variable is stock returns, independent variables include, exchange rate(EX), inflation rate(INF), long term interest rate(INT), short term interest rate(TB), foreign direct investment(FDI), industrial production index(IPI), money supply(M), gold price(GP) and oil prices(OP).
Standard Errors are in brackets and p-values in parenthesis are associated with z-statistics.
*** Significant at 1%, *** significant at 5% level and * significant at 10% level

Table 5.6.12‘s results show that the ARCH (1) and GARCH (1) estimates are significant ($p<.05$) and positive at 5% level, whereas estimates of the lagged square residual term are positive and significant. This means that lag variances have a significant and positive effect on the return volatility. The GARCH-M results show a negative (insignificant) association between risk and return. The independent variables, exchange rates and long-term interest rates negatively associated with the volatility of the stock returns of the electricity sector. The other independent variables, such as the short term interest rate (ΔTB), money supply and gold prices are negatively, while FDI, industrial production

index and oil prices are positively associated with the stock returns of the electricity sector. While , the results of the general industry's stock market returns indicate that the ARCH (1) and GARCH (1) estimates are positive at the 5% level of significance, whereas estimate of the lagged square residual term is positive (significant). This means that lag variances have a significant and positive effect on the return volatility of the Pakistan stock market. The GARCH-M results show a positive and significant association between risk and returns. These results indicate that the multifactor model has a significant relationship between the dependent variable and repressors. The long term interest rate (ΔINT) is also significant and negatively associated with the volatility of stock returns of General Industry. The other independent variables, such as exchange rate, DFI, industrial production index and gold prices are negatively(insignificant) and the short term interest rate, money supply and oil prices are positively associated with Pakistan's stock returns of general industry.

5.7. CONCLUSION

The stock market beneficiaries; such as investors, brokers/analysts and regulators – understandably experience a great deal of concerns about stock return volatility, perceived as it is to be a measure of risk. However, they are also worried about the "excessive" volatility that creates fluctuations in stock prices, which is apparently not accompanied by any important news about the firm or the market as a whole. The existence of excessive volatility undermines the usefulness of stock prices as a "signal" about the true intrinsic value of the firm. The volatility of the stock market is not evidence of the irrational stock market behaviour or inefficient stock markets. However, investor relations officers (IROs) are often put into a position of rationalizing episodes of heightened volatility in respective stock to management/shareholders. The macroeconomic forces driving stock return volatility over time and distinct firm characteristics are usually associated with higher or lower volatility.

The results demonstrate that the estimated GARCH model captures the volatility of returns of the stock market within the sample time period. In general, all macroeconomic variables in the GARCH model are important for explaining and modelling the volatility of returns of the stock market through a sample period and the estimate GARCH model with macroeconomic variables fit the volatility of the stock returns. The model AR (1) - GARCH (1, 1) estimated the long-term stock return volatility's relationships, and macroeconomic variables are co-integrated. The AR (1) -GARCH (1, 1) estimates give an explanation for short-run deviations in economic activity, as a stock market returns prediction might become difficult and macroeconomic variable volatility increases in the short-term. This means that with more volatile macroeconomic variables, it is very hard to predict the returns of the stock market of Pakistan. In Pakistan, investors might look at

the systematic risks to which they are exposed through short-term interest rates, money supply, inflation, oil prices, exchange rates and FDI when they constitute diversified portfolios. Further, financial regulators, practitioners and policy makers may need to consider these macroeconomic variables when formulating economic and financial policies. In previous studies, the majority of researchers have not known the ‘‘true effect’’ of industrial structure on stock markets in the economy (Balli et al., 2013). As Heston and Rouwenhorst (1994) point out, the industrial structure does not describe the much cross-sectional difference in the volatility of the returns of the stock market and found a very low correlation between countries due to country-specific variations. In relation to Adjaoute and Danthine’s (2001) point of view, the country domination effects have been moderated, but industry factors are less important for comparison than country factors. Moreover, current studies have shown that sectoral effects are dominant and become important in explaining stock returns.

The empirical results of all 13 sectors indicate that estimates of the ARCH-GARCH (1, 1) coefficient capture shock dependence and volatility persistence in the conditional variance equations, in most cases these coefficients are highly significant for all sector's returns except for electricity and personal goods sector. In general, the estimated conditional volatility series do not change very rapidly under the impulsion of the return innovations, given the small size of ARCH coefficients and tend to evolve gradually over time with respect to substantial effects of past volatility. The result shows that investors and fund managers seeking profit from trading in different assets and equity sectors may consider active investment strategies based on volatility persistence and current market trends. While the impact of past shock and volatility changes, the conditional volatility of the market is significant and results are broadly comparable to those shocks which

account for changes in the volatility of developed stock markets. These results offer many interesting insights, as they show that the past volatility of stock returns significantly affected the current volatility of the stock market in all cases, leading us to conclude that there is a long-term volatility effect. The lagged return of one-period's shocks in 11 sectors, apart from electricity generated significant influences on the Pakistani stock market's volatility. In addition, past shocks tended to raise sector return volatility for all; however, personal goods industry experienced no significant impact. Finally, the effects of past shocks on stock sector volatility are only moderate because the associated coefficients are much smaller than those related to past shocks and volatility. Similarly, results for macroeconomic variables on the returns of the different sector are somewhat distinct and significant bilateral volatility spillover is observed. In fact, past shocks and volatility are found to drive volatility changes in stock sectors, whereas unexpected changes in sector returns are influenced by volatility.

Overall ARCH (1) and GARCH (1) models estimate are positive and significant, while lagged square residual's term estimates are also positive and significant. This means that lag variances have a significant and positive effect on the return's volatility of the stock market. The GARCH-M results show that there is a positive and significant association between risk and return of the stock market in the Travel and Leisure sector, Financial Services and Insurance sector and General Industry sector. These results indicate that pharmaceuticals and biotechnology, banking, construction, electricity, industrial and mining and personal goods have a negative association between risk and return of the stock market. Moreover, interest rates are negatively associated with the volatility of the stock returns of all sectors apart from the food sector. The exchange rate is negatively associated with the volatility of the stock returns of the banking sector of Pakistan,

whereas FDI is negatively associated with the return's volatility of the travel and banking sector and positively associated with the returns volatility of the financial and insurance sector. The IPI is positively associated with the volatility of the stock returns of the pharmaceuticals and biotechnology sector. The short-term interest rate has a positive association with the volatility of the stock returns of the pharmaceuticals and biotechnology, automobile and parts, and financial and insurance sectors of Pakistan. Similarly, oil prices are positively associated with the volatility of the stock returns of the pharmaceutical and biotechnology sectors of Pakistan. The inflation rate is negatively associated with the volatility of the returns of banking and financial services. Moreover, financial sector companies operating in the Pakistan may manage risk more effectively than other sectors of companies, although they have somewhat similar price fluctuation's exposure. These results are possibly due to (1) the government legislation, which encourages investors in the financial service sector, in addition to government support provided to the financial sector through monetary and fiscal policy during the recent crisis. (2) Companies in the automobile and parts sector operating in Pakistan may manage return risk more effectively than other companies in other sectors, because they have dissimilar exposure to the fluctuating prices of stock of the financial sector, which plays an important role in reducing the sensitivity of this sector to the shocks of the stock market (Cameron and Schulenburg, 2009). The impacts of inflation, interest rates and some other variables are different when compared to the financial sector due to high fluctuations in prices and government rule and regulation. These results are anticipated due to price increases, which tend to strongly influence the confidence of investors and subsequently their eagerness for investing into financial products.

CHAPTER 6: INVESTOR SENTIMENT AND CROSS-SECTION RETURNS OF PAKISTAN STOCK MARKET

6.1: INTRODUCTION

Historically, empirical studies of behavioural finance have uncovered both under-reaction and over-reaction in stock prices. They have also demonstrated in detail how investors tend to inform beliefs, and how the passage of time affects these beliefs. In keeping with this tradition, we examine how investor confidence influences the performance of cross-sectional returns of the stock market. Many researchers forecast that investor sentiment has a highly significant influence on stock returns, whose valuations are extremely subjective and resistant to arbitrage (Baker and Wurgler, 2006). Thus, it has been found that at the beginning of this period, when proxies for the sentiment are low; returns are relatively high for small and new stocks, with high volatility stocks, non-dividend-paying and distressed stocks (Baker and Wurgler, 2006). On the other hand, in the case of high confidence, these types of securities earn a relatively low profit. Consistent with these predictions, we investigate how investor sentiments influence stock returns in Pakistan. In classical finance theory, there has traditionally been no discussion about investor sentiment, but to a certain extent, the theory demonstrates an inherent contest between rational investors; who want to diversify and optimize their portfolios through statistical properties, because the expected cash flows and return of stock only depend on systematic risks? Although few investors are irrational, according to the classical theory standpoint, the arbitrageurs offset the demands of security and have a significant impact on stock returns. In recent times, investor confidence has become a central point in research studies on asset pricing.

6.2: LITERATURE

In the existing literature, researchers have contended that variation in investor sentiments might trigger fluctuation in stock prices, and that investor sentiment may be an important factor in the stock price process. Some researchers have suggested that changes in investor sentiment might be a key to explaining short-term associations in asset prices when compared to other fundamental factors. In earlier studies, researchers found a weak association between the sentiments of investors and stock market returns. These variations in sentiments consequently offset each other and there is a lack of consensus among investors. Indeed, various researchers, among them Eichengreen and Mody (1998) contend that a variation in stock prices may trigger changes in elsewhere because such types of change engender shifts in the market's attitude towards risk due to fluctuations in investor confidence. These changes, related to risk-attitudes may generate a shift in asset prices in a better way than other fundamental aspects (Baek et al., 2005). Some other similar types of surveys have also distinguished that investor sentiment might be a key factor in the stock pricing process (Baker and Wurgler, 2006; Fisher and Statman, 2000). Similarly, numerous studies significantly emphasize the direct impact of sentiment on stock returns. For example, according to Clarke and Statman (1998), the sentiment index has statistically insignificant relationship with stock returns. However, according to Brown and Cliff (2005) and Bondt and Thaler (1985), the individual investors forecast future stock returns because stock returns cause the confidence of investors within short horizons. According to Lemmon and Portniaguina (2006), the sentiment index as a proxy of investor confidence is able to predict the returns of small stocks and a similar type of result is found in an international context (Schmeling, 2009 and Zouaoui et al., 2011). However, there are disadvantages of the survey method for measuring investor sentiment,

for example, the majority of researchers has opinions, weekly and monthly survey does not reflect the sentiment of investors; overall researchers have mixed opinions throughout the time period. A further possible problem of the survey method is the response rate of participants in the survey, and the fact that this method makes no differences between the optimism or pessimism investors. The survey method has major limitations, that's why as a substitute, the majority of researchers employed others stock market and economic variables as embedded sentiment proxies. Some researchers innovatively tried to investigate the association between exogenous changes in human emotions and stock prices. For example, Kamstra et al., (2003) point out that on average returns of the stock market is lower during Autumn and Winter. The international football results are employed as a mood variable by Edmans et al., (2007), who found out that major game' failure forecasts poor returns, mainly among small stocks, the next day. According to Greenwood and Nagel's (2009), at the peak of the internet bubble young investors were far more likely to buy stocks than older investors. In addition, Barber et al., (2009) and Kumar and Lee (2006) discovered an investor with retail experience will confidently, frequently buy and sell stocks. According to Kumar and Lee (2006) make recommendations for the retail investor sentiment, which include that measures should depend on the buying or selling pattern of investors. In relation to Brown et al.,'s (2003) point of view, overall measurement of market sentiment depends upon fund investors' movement, such a "safe" and "risky" stock funds. Meanwhile, Frazzini and Lamont (2005) observed a number of confirmatory indications by employing fund flows as an alternative proxy for the sentiment regarding individual stocks. They found evidence that funds with a specific stock experience hold strong inflows, and relatively poor performance. Moreover, some researchers employed trading volume (or liquidity) as an investor sentiment proxy. For example, Baker and Stein (2004) point out that if short-

selling is costlier than open and closing long positions, the majority of irrational investors (when they are optimistic) are likely to trade, and as a result liquidity increase. It is the stated view of Scheinkman and Xiong (2003) that the volume of the market exposes the fundamental difference of opinion in the case of short selling, where it is difficult to employ the ratio of market turnover as a proxy. Dividend premium is another proxy for measuring the sentiment of inventors, and it has been employed in different studies. The payment of dividend on stocks is a leading characteristic of safety, which changes the investor sentiment. This is a first measure based on stock prices that may have an adverse relationship with investor sentiment. According to Baker and Wurgler (2004a, 2004b), the dividend premium is the ratios of difference of market-to-book-value of dividend payers and non-payers. Fama and French (2001) documented that the dividend premium elucidates historical trends, but sometimes initial public offerings (IPO) produce extraordinary returns on their first-day's trading, changing investor sentiments. Interestingly, IPO average returns are highly associated with the volume of the IPO. Fundamentally, such proxies for investor confidence are not transmitted. A broader measure of ''equity issue over total new issues'' in equity financing is dependent on the portion of equity financing in total assets of the firm.

According to Baker and Wurgler (2000), the high share of equity in the capital structure portends low returns of stock, and this stream imitates the shifting of firms among equity and debt to decrease the overall capital cost. To a certain extent, the associated mispricing in companies may lead to associated managerial actions, which might be able to forecast mispricing corrections, which lead to estimate returns of the stock market. Another measure ''insider trading'' that provide better information in relation to the true value of the firm as a compared to external investors. Therefore, legalities aside, the

decision of a personal executive's portfolio might be to disclose their views regarding the firms mispricing. If the confidence of investors shows us how to associate with firms' mispricing, the patterns of insider trading might include a systematic component of investor confidence, and the capability of patterns of insider trading can forecast returns of the stock market (Miller, 1999). Neal and Wheatley (1998) observed that there are three major investor sentiment measures. These are the closed-end funds discount rate, the net mutual fund redemptions and the ratio of odd-lot sales and purchases. They discover that the discount rate of the closed-end fund and net redemptions sized premium had improved when compared to the odd-lot ratio. Similarly, according to Brown and Cliff's (2005) analysis, there are many direct and indirect indicators to measure investor sentiments. They found that direct indicators for sentiment measures, such as the survey method, are associated with indirect indicators for sentiment measurement. These indicators for sentiment measure are significantly associated with returns of stock and further, they found there is little predictive power for expected returns of stock. However, Qiu and Welch (2004) found an association between indirect measure indicators and the closed-end fund discount rate. Thus, they endorse the employment of the confidence index better as a sentiment measure, rather than the closed-end fund discount rate. Moreover, Baker and Wurgler (2006) build a linear sentiment model that combined six indirect indicators for measures of investor sentiment. These were the discount rate of the closed-end fund, the trading volume of IPOs, the turnover ratio of NYSE shares, the total number of shares outstanding and the dividend premium. They found that stock is hard to value, and that arbitrage responds more strongly to investor sentiment when compared to other stocks categories. Further, Baker and Wurgler (2006) showed that stock with small capitalization, younger, loss-making, high volatility, non-dividend paying, or stocks of firms in financial distress is expected to be disproportionately responsive to broad waves

of investor sentiment. They made the conclusion about this prediction after re-evaluation of theoretical and empirical evidence. According to Bandopadhyaya and Jones (2006), the variation in investor sentiment might change stock prices. For this purpose, they developed an equity sentiment index by using publicly available data to investigate price movements in portfolios. They found events can influence the underlying stock prices and quickly captured the variation in the investor sentiment measure, and these measures for investor sentiment are capable of explaining a significant and proportional variation in the stock return. According to Beer and Zouaoui (2012), the measurements of investor sentiment become a key examined area. For this purpose, they developed a new measure of sentiment by combining the proxies of direct and indirect sentiment measures and found that the composite sentiment index affects the returns of stocks and that it is very hard to arbitrage in a way that is consistent with the predictions of noise trader's models. Further, they found that the composite index has a superior predictive ability when compared to alternative measures of sentiment, which are largely employed in existing literature. We investigate the question of whether investor confidence has a significant impact on the returns of stock. This study starts with simple theoretical predictions, because mispricing is the outcome of an unacquainted demand shock in the existence of arbitrage constraint; we assume that the broad-based prediction wave of confidence has the cross-sectional impact when these confidence-based demands differ in cross-sectional stocks. In reality, stocks are expected to be more sensitive to speculative demand, and theory recommends that these are likely to be more affected through shifts in investor confidence.

6.3: RESEARCH METHODOLOGY

There are many popular methods for establishing investor confidence which had been applied in the literature. However, two common methods have been adopted to measure the investor sentiment in previous studies: survey-based and market-based confidence indices. Through a survey-based approach investor sentiment indices are collected with reference to the opinions (perceptions) of financial experts or household investors regularly, usually monthly or weekly. However, various researchers employed market-measure approaches, which are based on stock market transaction activities. For example, the put-call ratio was used by Dennis and Mayhew (2002), while Kumar and Persaud (2002) adopted the risk appetite index (RAI); net cash flow into mutual funds were employed by Suk and Tully (2003); Lashgari (2000) employed the Barron's confidence index, and Baker and Wurgler (2006) employed issuance %, RIPO and turnover methods to measure investor sentiment. Table 6.3.1 lists the methods employed to measure investor sentiment in various past studies.

Since it is very difficult to measure the patterns of confidence that drive mispricing in cross-sectional stock return directly, we examine predictability patterns in cross-sectional stock returns, which depend on beginning-of-period confidence as proxies. For instance, a young firm future returns are relatively low compared to those of old firms. This conditional proxy for beginning-of-period confidence high values would be constant with the existing relative over valuation of young firms. The return on highly risky firms is high when compared to low risk firms; this is another conditional proxy for beginning of period confidence high value, and any predictability patterns that reflect compensation for systematic risks.

Table 6.3.1: The investors sentiment measures used in past studies

Name of variable	How to measured	By
Consumer-Confidence Index	Survey by Conference Board	Fisher & Statman (2003)
Consumer Confidence Index	Survey by U Mich.- monthly	Charoenrook (2003), Fisher & Statman (2003)
Put/Call ratio	Puts outstanding Calls outstanding	Dennis & Mayhew (2002)
Mutual Fund Cash positions	% cash held in MFs	Gup(1973),Branch(1976),
	Net cash flow into MF's	Randall & Tully (2003) Neal
	Net redemptions/total assets	& Wheatley (1998)
AAII Survey	Survey of individual investors	Fisher & Statman (2003)
Investors Intelligence Survey	Survey of newsletter writers	Fisher &Statman (2000)
Barron's confidence index	Aaa yield – Bbb yield	Lashgari (2000)
TED Spread	T-bill and Eurodollar futures yield	Lashgari (2000)
Merrill Lynch Survey	Wall St. sell-side analysts	Fisher & Statman (2000, 2003)
Issuance %	Gross annual equities issued /Gross ann. debt and equ. issued	Baker and Wurgler (2006)
RIPO	Avg. ann. first-day returns on IPO's	Baker and Wurgler (2006)
Turnover	Reported sha.vol./avg. listed share	Baker and Wurgler (2006)
Closed-end fund discount	Y/E, value wt. Avg. discount on closed-end mutual funds	Baker and Wurgler (2006) and among others
Market liquidity	Reported share volume/# shares	Baker and Stein (2002)
NYSE seat prices	Trading volume/quoted bid-ask spread	Keim and Madhavan (2000)
Beta	CAPM	A range of researcher
Risk Appetite Index	Spearman Rank correlation volatility vs. excess returns	Kumar and Persaud (2002)
VIX–Investor Fear Gauge	Implied option volatility	Whaley (2000)
Investors Intelligence index	Bull minus Bear spread	Francisca-Zouaoui (2013)
EMSI	Historic volatility	Arindam and Jones(2005)
EMSI	Spearman Rank correlation volatility vs. excess returns	Persaud (1996)

(Source; Author work and few adopted from Bandopadhyaya and Jones (2006))

6.3.1: THE CONSTRUCTION OF THE INVESTORS CONFIDENCE INDEX

Investor confidence presents a historical description of crashes and bubbles. For the purposes of current study, firstly we construct the investor confidence index by using the 140 securities prices available in DataStream, then we examined how this measure could be employed to investigate movements in firm price and to consider the current events or news stories which may have influenced investor confidence and how quickly this measure captured the variation, as these measures importantly explain significant and proportional variation in prices. After constructing the investor confidence index, we then examined the cross-sectional stock returns differentiation from the beginning-of confidence period and onward. Our assumption is same as predicted in theory; previous outcomes confirm that the influence of confidence on larger firms will be low when compared to its influence on small and medium-size firms (Baker and Wurgler, 2006).

In behavioural finance, investor sentiment measurement and its influence on stock returns are the most important theoretical and empirical concepts. In earlier studies, researchers employed different proxies to measure the investor sentiments; out of these few are well accepted proxies. In this study, we construct the confidence index by using the same approach which was adopted by Persaud (1996) and later employed by Bandopadhyaya and Jones (2006). To moderate the likelihood that these proxies have a linkage to systematic risk and several macroeconomic conditions. Persaud (1996) established a measure for appetite (attitude) regarding risk from the currency market perspective. Here it was found that in the short-term, the appetite for risk in foreign exchange markets is a more influential force which disturbs the currency returns. Further, Persaud (1996) recommended that if this market's appetite for risk was stable, then the changes in the exchange rate would be determined only through unpredicted shifts in

economic risk. For instance, if this market appetite for risk rises with stable economic risks, then investors will feel overcompensated and this sense of overcompensation will rise to the extent that the level rises. For instance, investors get the advantage of what they see as an improving risk-return trade off, and currency values will change according to their level of risk. The Persaud's notion was also employed in other studies such as, Baek et al., (2005) where it was hypothesised that the risk appetite indices related to diverse contexts. In this study, the same Persaud (1996) methodology has been employed. This methodology and was employed previously in different studies, such as; Bandopadhyaya and Jones (2006) who constructed the investor sentiment index for a group of firms. The firm-level stock returns data was collected to investigate the role of investor confidence in cross-sectional stock returns and the ability of investor confidence to capture the financial market anomalies. For this purpose, we construct the investor sentiment (confidence) index (ISI) by using the 140 securities prices. These firms are divided into portfolios such as, size; sector and the level of risk (beta) [see section 4.3.1]. In case of each stock, the average standard deviation was computed by using monthly returns over the preceding three months' "historic volatility" for each sample period. We then rank the monthly return over historical volatility and calculated the Spearman rank correlation coefficient among the rank of the portfolio returns and rank the historic volatility returns for each portfolio, then multiplied the resulting number by 100.

Therefore, the ISI works out as follows:

$$ISI = \frac{\sum (R_i - \hat{R_i})(S_i - \hat{S_i})}{\left[\sum (R_i - \hat{R_i})^2 \sum (S_i - \hat{S_i})^2\right]^{1/2}} \qquad (6.1)$$

Where; R_i monthly return for security i, and S_i are the rank of historical volatility for security i, as well as $R_i\hat{}$ and $Si\hat{}$ are the population means return and historical volatility rankings.

6.3.2: SAMPLE SELECTION AND DATA DESCRIPTION

Sample selection

The major aim of this study is to investigate the relationship between investor sentiment and the returns of stock. The data of the monthly stock price of 140 firms who are representing all industries/sectors of Karachi stock exchange (KSE) were collected from 1997 to 2012. This time period covered the most important events in the Pakistan stock market, e.g., post financial liberalization and stock market development period (1997-1999), the KSE boom periods (2003-2006), economic depression period (2007-2008), recovery period (2009-2012) and growth periods. The major advantage of monthly data is that volatility can be determined accurately. However, in the past few researchers have considered daily time-series data of returns. The sample firms were picked following careful scrutiny with the maximum number of observations and time period. The data of stock return for all firms were collected through the website of KSE and DataStream because these databases provided the historical data from 1990 to onwards. In this study, we investigated the different market conditions through distinctive phases of market volatility and its impact on investor confidence.

Data Moderation Techniques

Generally, financial data is non-stationary, which can create spurious results. As such, we took several steps to ensure the time-series stationarity and the legitimacy of the resulting data. For example, we examined the properties of the time-series data of variables of different type of plots and found that all series seemed non-stationary. After this, the Dickey-Fuller and Augmented Dickey Fuller test for unit roots concluded that there is a unit root problem in this series data. To secure further confirmation, we plotted the

autocorrelation (ACP) and partial autocorrelation (PACF) graph pattern of said variables, and the results advocated that the ACF function falls steadily, and the series is said to AR (1) process. The autocorrelation function and partial autocorrelation function graph started with a high value at lag 1 and fell very slowly. These findings lead to confirmation that the said time series are non-stationary; these series' might be non-stationary in a mean or variance or both. In case of neither, the non-stationary and subsequently the auto-correlation function is falling down speedily, sometimes falling down enormously slowly (Bower-man and O'Connell 1979). Overall, the parametric approach supposes a certain level of understanding with the data, and whether the data might be judged to be stationary or may be non-stationary. We can see the long persistence in the series, and even though it does not contain a unit root, it does have long memories, whereby shocks to the series persist for at least 12 months. If the ACF has a hyperbolic pattern, the series may be fractionally integrated. Finally, the Granger causality test was employed to measure the causal relationship between stock returns and the Investor sentiment variable. The results in table 6.3.2.1 show that the DF model significantly does not reject the null hypothesis of non-stationary for any time-series data at levels. As a result, we can say that all variables series are non-stationary at data on the level. A similar technique was employed to test the data at first differences and the results illustrate that all variables are integrated of order one and there is no clear evidence to reject the null hypothesis of non-stationary for any of the series data on levels.

Table 6.3.2.1: DF Unit Root test result (t-statistic)

Variables	T- Statistic	Coefficient	Std. Error	P-value	[95% Conf. Interval]	
Rt	-0.340	-.0029	0.008	0.734	-0.020	0.014
ISI	-7.685	-0.474***	0.062	0.000	-0.596	-0.352

Note: Rt variable is stock return and ISI is investor sentiment index;
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

Consequently, it is concluded that all variables within the system are non-stationary at levels, and all variables have an integration of order one. In relation to existing literature, we adopted five different criteria to find out the optimal number of lags and length depending on the theory and process of AIC/BIC. The selection of the length of lags was made when three criteria agree (see chapter 3(3.4) for detail). It is discovered through LM test that there is no evidence to reject the null hypothesis of ‘‘no serial correlation’’ in the estimated residuals produced from the VAR (1) model. Further, we employed the Granger (1969) causality test and vector error correction model to examine the association between investor sentiment and stock return. In table 6.3.2.2, the causality test for ECM results present short and long run associations between stock return. Similarly, the first column results illustrate the short-run contribution of stock returns with other variables in the system. These short and long run causality test results are diverse in nature. The p-values provide signify signal of unidirectional significant short-run causal effects related to the ISI and the return of the stock market. According to the above findings, we can conclude that the Pakistan stock market is an ineffective stock market with regard to ISI, since the returns of the Pakistan stock market can be predicted by employing available information regarding factors in the short run over the time period. These results are consistent with empirical indication disclosed by Abdullah and Hayworth (1993), among others. On the contrary, all information available related to changes in the ISI and stock returns already incorporated in the Pakistan market prices.

Table 6.3.2.2: Multivariate VECM causality tests

Dependent variable	Independent variable	
	ΔRt	ΔISI
ΔRt	1	-.014
ΔISI	-.259	1

Note: Rt variable is stock return and ISI is investor sentiment index;
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

The above results show that the error correction term for cointegrating the equation with stock returns, and there is evidence that the existence of Granger causality between investor sentiments is negatively associated with stock returns in the long-term. The same results are expected from the Johansen-Juselius cointegration test and are consistent with previous evidence, such as Humpe and Macmillan (2009), among others. In this case, the co-integration presents evidence of a long-term association between the variables included within the system.

Table 6.3.2.3: Granger Causality Tests between stock return and ISI variables

Null Hypothesis	DF	chi2	P-values	Implication
ΔRt does not Granger Cause ΔISI	2	0.429	0.512	No causality
ΔISI does not Granger Cause ΔRt	2	4.7504**	0.029	Causality

Note: Rt variable is stock return and ISI is investor sentiment index;
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

The table 6.3.2.3 show that Pakistan's stock-return is self-determining from changes in investor sentiment variables. Moreover, the Granger causality test was done by employing up to the optimal 12 lags and the stock returns do not Granger-cause the investor sentiment index during this sample time period. Furthermore, investor sentiment index has a Granger-cause of stock returns, and it appears that Granger casualty runs one way. This finding could be viewed as an indicator that Pakistan's stock market previously integrated the effect of investor sentiment when efficient market hypothesis conditions were met.

6.4: EMPIRICAL RESULTS AND DISCUSSION

Our objective is to examine how the confidence of investors influences the returns of cross-sectional stock. Previously, it has been predicted that a wave of investor sentiment has a larger effect on stock returns, and evaluation is difficult to arbitrage. The results shown in table 6.4.1 results reveal that the overall mean value of the sentiment index is 4.532 with a minimum of 4.234 and a maximum of 4.605. It is observed that investor sentiment has a property of reverting to its mean and the deviating results presented here are consistent with the hypothesis of sentiment. Within this framework, sentiment distribution should have the longer right tail during periods of high sentiment.

Table 6.4.1: Statistical features of the macroeconomic variables

	Mean	**Min**	**Max**	**Std. Dev.**
Rt	3.872	2.609	5.034	0.733
ISI	4.532	4.234	4.605	0.076

Note: Rt variable is stock return and ISI is investor sentiment index;

Table 6.4.2: Pearson correlation between investor sentiment and cross sectional stock returns

	B1	**B2**	**B3**	**B4**	**B5**	**Small**	**Medium**
ISI	-0.546	0.366	0.595	0.680	0.619	0.525	0.632
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
	Larg	**AM**	**BK**	**CHE**	**CON**	**ELE**	**FIN**
ISI	0.692	0.244	0.212	0.190	0.222	0.090	0.142
	(0.00)***	(0.01)**	(0.00)**	(0.01)**	(0.00)***	(0.22)	(0.04)**
	FP	**GI**	**INE**	**OG**	**PG**	**TRA**	**Rt**
ISI	0.202	0.174	0.196	0.211	0.220	0.187	0.223
	(0.01)**	(0.01)**	(0.01)**	(0.00)***	(0.00)***	(0.00)***	(0.02)**

Note: AM refers to Auto mobile, BK refers to banking, CHE refers to Chemical, CON refers to construction, FIN is Financial service, FD is Food Producer, GI is General industry, OG is Oil &Gas; PG is Personal Goods; TRAis Travel & Tourism; While B1 less risky portfolios and B5- Highly risky portfolios. Dependent variable is stock returns and independent variable is investor sentiment index (ISI).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

Figure 6. 1: the relationship between investor confidence and stock return over the time period

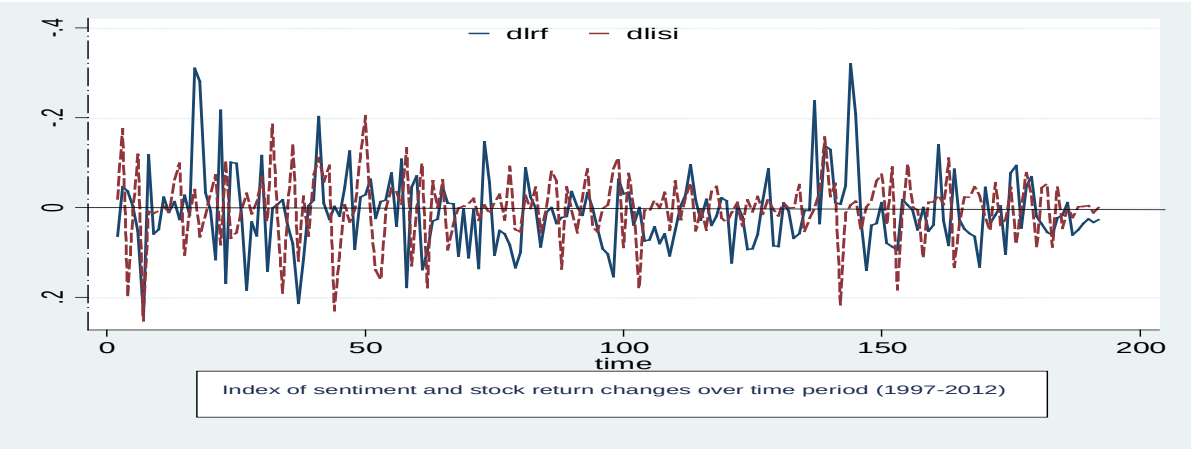


Figure 6.1 presents the relationship between the cross-sectional returns of stock and investor confidence over the time period. The investor sentiment index value ranges between low and high; -2.5 and 2.0 respectively, while the return of stock ranges from 3 (high) and -2 (low). Further risk is categorised as follows: if the value range is between 0 and -1 the stock market is graded as risk-neutral. Where the value range is between -1 and -2 the stock market is classified as moderately risk averse and where the range values are between -2 and -3 the stock market is believed highly risk-averse. Similarly, if investor sentiment index (ISI) values range 0 and +1, the stock market is classified as moderate risk-neutral. If the ISI value range is between +1 and +2, the stock market is classified as moderately risk-seeking, and if the ISI value range falls between +2 or more the stock market is classified as high risk-seeking. During the sample period, several stock markets were highly risk-averse and moderately risk- averse. These movements of the investor sentiment index capture all positive and negative news which are reported in all types of media. These movements are not only reflected in the investor sentiment index, they also affect the overall performance of individual firms. However, these changes are strongly replicated the fluctuation of the whole stock market index. Investor sentiment and stock returns have a significant correlation coefficient of 2.16%. In order

to further examine the instructive power of the investor sentiment index in detail, we first hypothesize the following equation:

$$Rt_{it} = \beta_0 + \beta_1 ISI_{it-1} + \varepsilon_t \quad (6.1)$$

Where, Rt_{it}= average return of firm i in time t; ISI_{it} is the average sentiment index of month t-1 on month t for firm i

Table 6.4.3: Regression results of stock return and investors Sentiment index

Variable		Coef.	Std. Err.	P>t	Model summary		
Rt	ISI	2.158***	0.581	0.000	F	R^2	Prob > F
	Constant	-5.908**	2.619	0.025	13.84	0.045	0.000*

Note: Dependent variable is stock returns and independent variable is investor sentiment index (ISI).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

Although these findings validate the supposition that ISI causes stock return, results point out that the ISI is statically able to describe relevant changes in the stock returns. The estimated results related to equation (6.1) are provided in table 6.4.3, which signify that the maximum variation in Rt is explained by ISI, that the coefficient is highly significant, and that monthly stock returns are primarily driven by the risk-seeking behaviour of participants in the stock market for that particular month. To further study the impact of the investor sentiments on the return of stock, the following equation was estimated by adding more lagged values of the ISI and stock return:

$$Rt_{it} = \beta_0 + \beta_1 Rt_{t-1} + \beta_2 Rt_{t-2} + \beta_3 Rt_{t-3} + \beta_4 ISI_{t-1} + \beta_5 ISI_{t-2} + \beta_6 ISI_{t-3} + \varepsilon_{it} \quad (6.2)$$

The ordinary least squares (OLS) technique was adopted in equation 6.2 to eliminate the associated autocorrelation problems. For this purpose, we employed a distributed lag model, because we want to measure the dynamic effect of temporary and permanent changes on stock returns. In Econometrics, these methods are used to estimate the marginal effect of an independent variable on the dependent variable. However, if there

has been this effect then we can examine whether this effect is immediate or if it emerges slowly. Further, we can examine, whether there is an initial effect that goes away after a period of time. The answers to these questions can be obtained to estimate the lag distribution relating dependent to the independent variable (Balestra and Nerlove, 1966).

Table 6.4.4: The relationship between investor confidence and stock returns

F		**R^2**	**Adj- R^2**		**Prob > F**
10.37		0.048	0.049		0.001
Variable	**Coefficient**	**P>t**	**Variable**	**Coefficient**	**P>t**
RT_{t-1}	0.028	0.661	ISI_{t-1}	0.037	0.661
RT_{t-2}	0.016	0.825	ISI_{t-2}	0.016	0.843
RT_{t-3}	0.003	0.967	ISI_{t-3}	0.003	0.974

Note: *** Significant at 1%, *** significant at 5% level and * significant at 10% level.

The results of table 6.4.5 show that there is no significant relationship between returns in the low-and average risky portfolios and confidence of investors. These results confirm that those firms with a below average risk (B1 and B2) are less sensitive to the influence of investor confidence. However, the other average-high risky portfolios are statically significant and positive. Further, it is confirmed that average-highly risky (B3, B4 and B5) firms are much more sensitive to influence of investor confidence. Further, it is observed that the coefficients for the low-risk portfolio returns are negative, and that average-high risk portfolios are significant at a 0.05 significance level for a one-tailed test. These results are largely in line with the hypothesis of this study. The investor confidence proxy reveals firm-specific characteristics across the sentiment-beta groups. The results demonstrate that the monthly average returns of portfolio stocks are positively associated with the sentiment beta. This is also confirmed through the regression results, which demonstrate that all group confidence indices are positively associated with returns except B1 and B2. This suggests that investors accepted a higher risk premium in order to respond to the additional risk caused by the unpredictable shifts in investor confidence.

Table 6.4.5: The relationship between investor confidence and risk (firm beta) portfolio's returns

Variable		Coef.	Std. Err.	P>t	Model summary		
B1	ISI	-0.532	0.424	0.211	F	R^2	Prob > F
	Constant	4.637**	1.915	0.016	1.57	0.05	0.211
B2	ISI	0.471	0.347	0.120	1.84	0.009	0.120
	Constant	-0.832	1.571	0.601			
B3	ISI	1.922***	0.576	0.001	11.14	0.041	0.001
	Constant	-6.067**	2.602	0.021			
B4	ISI	2.788***	0.703	0.000	15.73	0.053	0.000
	Constant	-8.363***	3.172	0.009			
B5	ISI	0.018**	0.007	0.012	6.45	0.023	0.011
	Constant	-0.094***	0.032	0.004			

Note: Dependent variable is stock returns and independent variable is investor sentiment index (ISI).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

In table 6.4.6, we can see a significant and positive relationship between the returns of size portfolios and investor confidence. This confirms that all size (large, medium and small) firms' portfolios are sensitive and influence investor confidence. However, the large-size firms are less sensitive and medium size and small size firms are highly sensitive statistically. These results are largely in line with the hypotheses of study, and this was re predicted in theory, as the outcomes of previous studies confirm that the influence of sentiment on larger firms will be lower when compared to small and medium-size firms (Baker and Wurgler, 2006). Theoretically, the sentiment coefficient increases monotonically and sharply as firm size decreases. These findings put forward that small size portfolios are likely to be more reactive to changes in investor confidence, and these findings are in agreement with the point of view of Baker and Wurgler (2006) who state ''small firms are hard-to-value and hard-to-arbitrage''. Historically, the Pakistani stock market has been beset by significantly disruptive historical incidences, including the Asian stock exchange crash in the 90s, nuclear test in 1998, floods and earthquakes were major events resulting in changes in prices of stock.

Table 6.4.6: The relationship between investor confidence and size portfolio returns

Variable		Coef.	Std. Err.	P>t	Model summary		
Large	ISI	1.950***	0.664	0.001	***F***	R^2	***Prob > F***
	Constant	-5.227**	3.010	0.043	8.61	0.043	0.004
Medium	ISI	2.537***	0.635	0.000			
	Constant	-6.659**	2.867	0.021	15.94	0.055	0.000
Small	ISI	2.268***	0.581	0.000			
	Constant	-6.390**	2.680	0.018	14.44	0.047	0.000

Note: Dependent variable is stock returns and independent variable is investor sentiment index (ISI).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

The standard finance models are unable to investigate the feeling (behaviour) of investors who extremely faced these crises. This typical assumption is based on "rational investor" who led by perception (feeling). This is why researchers tried to take into account the irrational behaviour of the investors. The results presented in table 6.4.7 point out that there is a statically significant and positive relationship between the returns of all industry portfolios and sentiment, except in the Electricity industry. This confirmed that all firms are sensitive, and their prices were influenced by investor confidence. However, it is observed that the Auto and Parts industry has a high value and that Personal Goods sector has less value of a coefficient, and statistically highly sensitive. These results are largely in line with the hypothesis of the study. From the above results, it is found that large-size firms are less sensitive, while medium-size and small size firms are highly sensitive and much influence. While the return of low beta portfolio firms is negatively associated with sentiment index, and average and high beta (risk) firms are positively associated with investor confidence at the 5 % level of significance. These results are largely in line with the hypothesis of study that when investor confidence is low (below average), small stocks earn particularly high subsequent returns, but when investor confidence is high (above average) then there is a low effect on all firms' return.

Table 6.4.7: The relationship between investor confidence and industry portfolio's returns

Variable		Coef.	Std. Err.	P>t	Model summary		
Auto and Parts	ISI	3.474***	0. 971	0.00	F	R^2	Prob> F
	Constant	-11.723**	4.396	0.01	12.83	0.063	0.003
Banks	ISI	3.344***	1.138	0.00			
	Constant	-12.290**	5.157	0.02	8.64	0.045	0.004
Chemicals	ISI	1.476**	0. 545	0.01			
	Constant	-2.701	2.471	0.28	7.33	0.037	0.007
Const. and Materials	ISI	2.446**	0.953	0.01			
	Constant	-8.457**	4.320	0.05	6.58	0.035	0.011
Financial Services	ISI	1.541**	0.648	0.02			
	Constant	-3.692	2.936	0.21	10.92	0.050	0.01
Food Producers	ISI	2.401***	0.758	0.00			
	Constant	-4.580	3.438	0.18	10.02	0.050	0.001
General Industrials	ISI	1.934**	0.733	0.01			
	Constant	-4.702	3.323	0.16	6.96	0.035	0.009
Industrial	ISI	2.797***	1.016	0.00			
Engineering	Constant	-8.802*	4.605	0.05	7.58	0.038	0.005
Oil and Gas	ISI	1.884**	0.697	0.01			
	Constant	-4.153	3.161	0.19	7.29	0.037	0.007
Personal Goods	ISI	1.352***	0.468	0.00			
	Constant	-2.825	2.121	0.18	8.34	0.042	0.004
Pharmaceuticals	ISI	2.158***	0.723	0.00			
&Biotechnology	Constant	-5.815*	3.275	0.08	8.92	0.045	0.003
Travel and Leisure	ISI	1.705***	0.529	0.00			
	Constant	-4.743*	2.397	0.05	10.39	0.052	0.001

Note: Dependent variable is stock returns and independent variable is investor sentiment index (ISI).
*** Significant at 1%, *** significant at 5% level and * significant at 10% level.

When investor confidence is low, cross-sectional return of stocks increases (see Fig 6.1). Similarly, in case of small size firms, the return is lower when confidence is high and higher return when confidence is low, as results high return volatility than low-return volatility stocks in others sized of the firm respectively, likewise, in case of higher sentiment these patterns of return completely reverse. Meanwhile, there are several characteristics that have the predictive power capability on investor sentiment. These major findings and patterns in a sample time period 1997 to 2012. The regression

approach allowed to control investor sentiment, and the size base sorted stocks employing the Fama-French (1993) model. Alternatively, a complex systematic risk pattern found in relation to time variation in the cross-sectional pattern of risk. The pioneering study of investor sentiments by Delong et al., (1988) hypothesized that investors were directed by trust in future cash flows rather than the certainty of prospective gain. Further, Delong et al., (1988) identify that prudent investors are not participating with the sentimental investor for the reason of risky and costly. As a result, these investors are incapable of to get back prices at fundamental values. Therefore, this is a major assumption in the literature of behavioural finance that there are no limits to arbitrage. This enthusiastic period of investor sentiments pulled the price to an unprecedented level. Same time arbitragers were not capable of correct the price of the stock market as a result of high prices and exit business. Hence, studying investor sentiment is very important to comprehend the current stock market behaviour. Overconfidence transmits investor belief and enhances the misconception regarding trading (Odean, 1998, 1999). Furthermore, Odean (1999) put forwards those investors who trade with a high belief they tend to lose extra. The bullish behaviour of stock market wrongly guides investor to keep on investing and raising trading volumes (Hon, (2012).

6.5. CONCLUSION

Understanding of investor sentiment and its impact on the stock market is essential. This chapter examines the role of investor sentiment as a behavioural and risk factor in stock return performance. The findings show that investor sentiment exhibits explanatory power in capturing the financial market anomalies such as, size, sector effects and firm level risk. We documented that investor sentiment affects the stock return at the market as well as firm level through different portfolios. It was investigated that current sentiment of investor predicts the returns of the stock market in following month, and these stock returns influenced by investing sentiment through the risk caused by investor sentiment in the form of volatility. It is assumed that investors are very sensible and stock prices should react to any information belonged to economic fundamentals. The results reveal that the investor sentiments have a tendency to revert to its mean and results are consistent with the hypothesis of sentiment. Moreover, during the sample period several time stock market was highly risk-averse and moderately risk- averse as compare to moderate risk-seeking. These movements in the investor sentiment index capture both positive and negative news reported through media, for example, the prices of stock excessively volatile in relation to future dividend changes. According to Wang et al., (2006), returns of stock caused the investor sentiment, some investors who trade in the stock market are associated with fundamental information related to earnings (profit) that can influence the behaviour of stock prices (Black, 1976), called ‘‘noise traders’’. According to Delong et al., (1988) point of view, the beliefs of noise traders have been erroneous and can force stock prices away from fundamental values, as a result volatility enhanced. The empirical results support the evidence that investor sentiment indeed plays a critical role in determining the behaviour of the stock prices. Hence, we try to get the

answer of important question, whether stock prices are influenced by investor sentiment. Further, the findings reveal that changes in investor trust and confidence positively associated with contemporary excess in the returns of the stock market. These changes are due to changes in ISI, and overall individual firm performance influence by positive and negative news events in the economy. These changes strongly replicate fluctuations in the stock market en masse. We also documented that there is a positive (significant) association between investor sentiment and stock returns, this association will improve the confidence level among investors next month excess return of the stock market. It can be concluded that a lot of variations in return are elucidated by the investor sentiment and monthly stock returns primarily driven by the risk-seeking behaviour among the stock market participants in a particular month. The findings from portfolio analysis indicate that medium risk portfolios (β3, β4) and high risk portfolios (β5) are statically significant and positive; while the average-highly risky firms are much more sensitive to influence of investor confidence. The portfolio result reveals that there is a positive (significant) relationship between returns of size portfolios and sentiment. It is confirmed that all size portfolios are sensitive and influence the investor sentiment. However, the large-size firms are less sensitive, medium size and small size firms are highly sensitive. Theoretically, the sentiment coefficient increases monotonically and sharply as firm size decreases. These findings put forwards that small size portfolios are likely to be more reactive to the changes in investor confidence and these findings are in agreement with the results of Baker and Wurgler (2006) who point out that ‘‘small firms are hard-to-value and hard-to-arbitrage’’. The history of the Pakistani stock market is full of unpredictable, devastating incidents, and these invariably have an impact on the prices of stock. The standard finance models were helpless in this regard and foremost way to explicate such phenomena is to investigate the feeling (behaviour) of investors who

mainly faced these crises. This standard assumption based on “rational investor” which led by perception and feeling among investors. The result of industry portfolios indicates that there is a positive (significant) relationship between returns all industry portfolios and sentiment. This confirmed that all firms are sensitive, and their stock prices influence by investor sentiment index. Further, it is observed that auto and parts industry has high values and personal goods sector has a lower coefficient value and a statistically highly sensitivity. These results are largely in line with the hypotheses of this study. In conclusion, large-size firms are less sensitive and medium size and small size firms are highly sensitive. The returns of less risky firms are negatively associated with investor sentiment, while average and high risky firms are positively associated with investor sentiment. These results are largely in line with the hypotheses of our study: when investor sentiments are below average, small-firm stocks primarily produce high returns. Subsequently, when investor sentiments are above average, there is a low effect on all firms return. When investor sentiments are low cross-sectional returns are higher, but the small size firms’ returns are lower when sentiments are high and there are higher returns when sentiments are lower. However, when investor spirits are high, these patterns of return completely reverse. There are several firms’ characteristics, which have a predictive power capability for investor sentiment. The investor sentiments pioneer Delong et al., (1988) hypothesize that investors are directed by the belief in future cash flows instead of risk reality regarding future gain. Therefore, a major assumption in the literature of behavioural finance is that there are no limits to arbitrage. This period of enthusiastic investor sentiments pulled the price an unprecedented level. At the same time, arbitragers were not capable of correcting the price of the stock market as a result of high prices and existing business. Therefore, the study of investor sentiment is very important for comprehending the behaviour of the stock market today. These findings

speak about the stock riskiness in relation to investor sentiments at the firm and industry level. Moreover, the impact of news is highly correlated with the movements of monthly stock returns and is significantly associated with investor sentiment. This study documented that investors be been keeping an eye on the movement of stock returns in Pakistan. The portfolio result indicates that when there is a risk in returns, the investor sentiment may lead to irrational decisions, and investors will suffer a loss. The results also predict that returns are reverting to zero and yet the investor sentiment is high or low. This will lead to a correction in the stock market, and investor will suffer losses. These findings may enable policy makers and practitioners to understand investor sentiment as a determinant of changes in performance of stock markets, because it was found that sentiment of investor is an important factor. The confidence of investors has been confounded with a tendency to take decisions (sell/hold) about securities when prices are rising (profit) or dropping (loss). In the literature, this concept has been examined in detail and there is a debate regarding whether returns impact on investor overconfidence or vice versa. This is the first study to provide an insight into the rationality of investors and examine investor sentiment (feeling) and stock returns in Pakistan.

The contribution of this study to the extant literature will be in its examination to the extent to which investor sentiment impacts on stock market returns and volatility. This study will contribute to the present understanding about investor confidence-stock market relation in a different way. Foremost, this study mainly focuses on the impact of investor sentiment on both the returns of stock and its volatility at the market level as well as firm level. Secondly, this empirical study examined investor sentiments and the behaviour of stock prices at the firm level. This type of knowledge is very important because nowadays investors tend to diversify their investment portfolios across the stock market.

Thirdly, this study employed investor confidence as a proxy and investigation may show a different impact on the stock market, in contrast to the belief among the public that contains both consumers and manufacturers. Lastly, this study has implications for policy makers. The investors labouring under over-confidence should discuss with professional to seek advice and need to adjust their positions in different stocks.

CHAPTER 7: CONCLUSION AND RECOMMENDATION FOR FURTHER STUDIES

This thesis investigates whether macroeconomic variables contribute to the long and the short-term behaviour of the stock returns of the Pakistani market in the period of 1997-2012. In particular, we construct the different portfolio according to different industries, different firm sizes, and different levels of risk to examine thoroughly how the levels of sensitivity are different across industries, firm sizes, and firm risk. On top of that, we examined how investor sentiments influence the performance of stock prices in different stock portfolios. Many researchers documents that investor sentiment has significant consequences for stock returns, (Baker and Wurgler, 2006). Variables such as, FDI, M2, IPI, TB, INT, INF, OP, EX, GP and investor sentiment index (ISI) are incorporated to examine their impact on stock returns in the Pakistan market. Further, the well-established VAR models, Engel-Granger causality tests, IRF test and FDEVD analysis were employed to examine the effect of the macroeconomic volatility on the return volatility of the Pakistan market both in the short run and long run. We also apply different models for robustness of our tests of the associations between macroeconomic factors and investor sentiment and stock returns.

7.1: CONCLUSION

In chapter III, we examine whether macroeconomic factors have an influence on the long and the short-run behaviour of the Pakistan stock market. Our results indicated that selected macroeconomic variables are having a long-run relationship, and these series do not move ‘‘too far away’’. The findings of VECM test signified a two ways short-run causal effect related to the money supply and inflation with the stock return. While the error correction model (ECM) confirmed a dynamic relationship. The impulse response function findings indicate a significant association between stock returns and INT, INF, FDI and T-bill rate in the short run. Overall, FEVDs analysis suggests, macroeconomic variable shock significantly together affected domestic economic activities with the depreciation of the exchange rate that makes inflationary pressures on the economy of Pakistan. In general, these findings are consistent throughout the IRF analysis that revealed insignificant evidence on the relationship between the stock market and other variables over the time period of 1997-2012.

In chapter IV, overall results reveal that different portfolios exhibit different behaviour of the stock returns, and models are able to generate significant outcomes. In case of beta portfolios, results indicate the less risky firm stock returns are positively (significant) associated with the inflation rate, FDI, oil prices and interest rate, while gold prices and exchange rates have a significant negative relationship with stock returns. While average risky portfolio returns have a positive association with the inflation rate, money supply, FDI and oil prices, while gold prices and exchange rates have a negative relationship with risky portfolio stock returns. In the case of highly risky portfolios, stock returns have a negative relationship with the exchange rate and a positive relationship with gold and oil prices.

Moreover, the results of the regression of industry portfolios show the relationship between the stock returns of industry and macroeconomic variables. For example, the inflation rate has a negative relationship with telecom and food-industry, interest rates for telecom, personal goods and travel, the T-bill rate for the banking industry, Chemical industry, Telecomm industry, oil sector and pharmaceuticals Industry, money supply has a negative relationship with telecom, FDI, GP; oil prices have a positive significant relationship (impact), and Exchange rates have a significant negative relationship. Finally, it is very important to distinguish statistically that the null hypothesis (that there is no relationship) is rejected, and an alternative is accepted except for IPI, and conclude that there is a significant association between the stock returns of industry portfolios and macroeconomic variables apart from FDI and IPI. We can conclude that the size and beta (Bi) of the firms are strongly associated with expected stock returns.

Our results from chapter V show that historical stock return volatility significantly differs from the current volatility of the stock, which allows the authors to conclude that there is a cross-sectional effect on long-term volatility. Looking at the interim of one-period lagged return shocks, only 11 sectors portfolios experienced a significant influence of stock return volatility, and historical shocks tend to raise the stock sector volatility of all sector portfolios apart, from the personal goods sector. Indeed, historical shocks and volatility are found to drive volatility changes in all sectors of the stock market, while volatility influenced unexpected changes in sector returns. The results from our GARCH model show that there is a positive and significant association between risk and returns of the travel and leisure sector, financial services and insurance sector, and general industry sector. While the oil and gas industry and automobile and parts sectors have a positive association between risk and return of the stock market. However, these effects on the returns of the different sectors are somewhat different and

significant bilateral volatility spillover is observed. Moreover, the long-term interest rate is negatively associated with the volatility of the stock returns of all sectors, other than the food production sector of Pakistan. The exchange rate is negatively associated with the volatility of stock returns of the banking sector of Pakistan, while foreign investment is negatively associated with the volatility of the stock returns of the travel and banking sectors of Pakistan and is positively associated with the stock return volatility of financial service and insurance sectors of Pakistan. The industrial production index and short-term interest rates are positively associated with the volatility of stock returns of the pharmaceuticals and biotechnology sectors, automobile and parts and financial service and insurance sectors of Pakistan. Similarly, oil prices (OP) positive and significantly associated with return volatility of pharmaceuticals and biotechnology sector of Pakistan. The inflation rate (INF) significantly and negatively associated with volatility of stock returns of banking and financial service, while positively and significantly associated with the volatility of stock returns of pharmaceuticals and biotechnology and food producer sectors of Pakistan. Moreover, financial sector companies operating in the Pakistan stock market may manage risk more effectively than companies in other sectors, although they have somewhat similar price fluctuation exposure. These results yield certain conclusions, such as illustrating the government legislation which encourages investors into the financial service sector efficiently, in addition to government support to the financial sector through monetary and fiscal policy during the recent crisis. Similarly, the automobile and parts sector companies operating in Pakistan may manage return-related risk more efficiently than other companies in other sectors, because they have dissimilar exposure to fluctuations in the price of stock to financial sectors. The impact of inflation, interest rate and other variables had been different, when compared to a financial sector, due to high fluctuations in price and government rule and regulation.

These results were anticipated due to high prices, which strongly influence sentiment of investors and subsequently their eagerness for investing into financial products, for example, in the banking and financial service sector. Overall, the AR (1)-GARCH (1, 1) model results signify the following outcomes; (1) The returns of the Pakistani stock market performed arbitrarily and returns of the previous month positively affect the current month return. (2) The return volatility is influenced by precedent volatility due to associated news from the previous period, and is highly persistent because conditional variance shocks took time to disappear. (3) The stock return volatility of Pakistan has a direct relationship with the volatility of the macroeconomic variables within the system. These findings are consistent with the previous studies with few implications such as; (i) it is very difficult to forecast stock market returns because the volatility of macroeconomic variable's increases in the short-term in the Pakistan economy, (ii) investors in Pakistan must investigate the systematic risks which were revealed by some macroeconomic variables, when constructing portfolios as strategies for risk diversification (iii) financial regulators and policymakers may consider these findings when they are framing economic and financial policies.

In chapter VI, we examine the role of investor sentiment as a behavioural and risk factor in stock return performance, as previously researchers predicted that a wave of investor sentiment has big influence on stock price because they are highly subjective and difficult to arbitrage (Baker and Wurgler, 2006; among others). The findings show that investor sentiment exhibits explanatory power in capturing the financial market anomalies such as, the size, sector momentum effects and level of risk at the firm level. Further, we investigated whether the sentiment of investors affects the stock return volatility of the market and firm level through different portfolios. The current sentiment of investors predicts the returns of the stock market in the following month, and returns

of stock are influenced by investor sentiment through the risk caused by investor sentiment in the form of volatility. These results reveal that investor sentiments have a tendency to revert to its mean and presented deviating results, which consistent with the hypothesis of sentiment; investors are very sensible and the returns of stock should react to any information regarding business fundamentals. Moreover, during the sample period, on a number of occasions stock markets were highly risk-averse and moderately risk-averse. This is an important finding regarding the contention that stock prices are influenced by investor sentiment. Further, our findings reveal that changes in investor sentiments are positively (significant) associated with the returns of the stock market. The findings suggest that positive and negative news events affect the overall performance of individual firms, and also affect the sentiment index. Further, these changes are strongly reflected in a fluctuation in the whole stock market index. The investor index and the stock market returns have a significant correlation which is consistent with the point of view put forward by Wang et al., (2006). Moreover, we document that periods of high sentiment are likely to be followed by low aggregate returns of the stock market over the time period of the sample. There is a positive and statistically significant association among investor sentiment and stock returns, this association will improve the confidence level among investors in the following month's excess returns of the stock market. It can therefore be concluded that a majority of the variation in stock return can be explained by the ISI, and this is highly statically significant. It can also be concluded that monthly stock returns are primarily driven by the risk-seeking behaviour of the contributors of the stock market for that particular month. The portfolio analysis finding indicates that average-high risk portfolios returns are positive, and much more sensitive to the influence of investor sentiment. The proxy of investor sentiment exhibits firm-specific characteristics across the sentiment-beta

groups. The monthly average returns of portfolio stock are positively associated with sentiment. This suggests that investors are obliged by the higher risk premium to take additional risk caused by the unpredictable shifts in investor sentiment. Similarly, size portfolio results reveal that there is a statically significant and positive relationship between returns on the size portfolios and sentiment. This confirms that all sizes (L, M and S) firms' portfolios are sensitive and to the influence of investor sentiment. However, the large-size firms are less sensitive and medium-size and small size firms are highly sensitive statistically. Theoretically, the sentiment beta increases monotonically and sharply as firm size decreases. These findings suggest that small size portfolios are likely to be more reactive to the changes in investor sentiment, and these findings are consistent with the results of Baker and Wurgler (2006) that ‘‘small firms are hard-to-value and hard-to-arbitrage’’. The results of industry portfolios confirmed that all firms are sensitive, and their stock prices influence by investor sentiment. However, it is observed that auto and parts industry has high value, and the personal goods sector has less value of a coefficient, and statistically highly sensitive. In conclusion, large-size firms are less sensitive, while medium size and small size firms are highly statistically sensitive and are significantly influenced. While the returns of low beta portfolio firms are negatively associated with sentiment index, and average and high beta firms are positively associated with investor sentiments. Moreover, these results reveal that when investor sentiments are low, small stocks earn particularly high returns, but when investor sentiments are high, there is a low effect on all firms’ returns. When investor sentiments are lower, cross-sectional returns of stocks are high, and similarly the returns of small size firms are lower when sentiments are high and vice versa. As a result, there is higher volatility in large size firms, and low-return volatility in the other-size firms. Where there is higher sentiment, these patterns of return completely reverse. Meanwhile, there are

several characteristics, which have a predictive power capability for investors' sentiment. Delong et al., (1988) hypothesize that investors are directed by the trusts in future cash flows instead of risking future gains. Further, they demonstrate that prudent investors are not participating with the sentimental investors for the reason that to do so would be risky and costly. As a result, these investors are incapable of getting back prices to fundamental values. Therefore, a major assumption in the literature of behavioural finance is that there are no limits to arbitrage. This period of positive investor sentiments pulled the price up to an unprecedented level. Hence, studying investor sentiment is very important for understanding the behaviour of the stock market today. These findings communicate the stock riskiness in relation to investor sentiments at the firm and industry level. Moreover, the results are better explained with the lagged values of the stock return changes which are very important implications in view of the fact that short-run adjustments in stock value are determined predominantly by investor sentiment. These findings facilitate researchers, policy makers and practitioners to understand investor sentiment as a contributing factor in stock performance, because the sentiment of investors has been an important factor in explaining changes in the conditional volatility and movement in economic sentiment. However, the confidence of investors has been confounded with a tendency to take decisions (sell or hold) regarding securities when prices are rising (profit/loss). This study provides insight into the rationality to the Pakistani investor and is the only study which investigates investor sentiment impact on stock returns in Pakistan.

The findings of this thesis provide policy implications for fund managers and potential investors who seek for profit through investment in different securities by considering current market trends and volatility persistence as active investment strategies.

7.2: LIMITATIONS OF THE STUDY

The results indicate that macroeconomic factors are associated with stock returns, and investor sentiment exhibits explanatory power in capturing the financial market anomalies. The major limitation of this study is the non-availability of monthly data as a proxy for economic activity, for example, GDP at shorter time intervals. Therefore, this limitation enhanced the insignificant results for the explanation of the stock return. It might be that a significant relationship between economic activities and stock returns would be revealed were we to use monthly statistics rather than another proxy or quarterly data. Another limitation of this study is the non-availability of statistics for measuring the expected value of the variables. The structure of the different factors related to the firm (industry) is a source of risk. For example, the banking industry is seriously influenced by interest rates, and the oil industry is influenced by prices of oil. Another major shortcoming is the investors sentiment index measurement. Previous studies proposed several proxies to capture the fluctuation of investor sentiment. There are some other reasonable measures as most of the proxies employed by different researchers. Therefore, to efficiently capture the sentiment, we employed that market measures technique (Persaud, 1996). How the investor sentiment is the reflection of the Pakistan market, and which factors may efficiently capture this impact, still requires further investigation. The only adequate proxies which may lead to accurate and reliable outcomes are interview based investor sentiment index measures. This has important implications since it appears that stock values are driven primarily by investor sentiment, rather than by the index's own price momentum. The practitioner should pay attention to investor sentiment as a determinant of changes in markets.

7.3: RECOMMENDATIONS FOR FURTHER STUDY

For further research, there are a few suggestions to enhance understanding regarding the dynamic relationship between economic activity and behaviour of the stock market in emerging economies. Certain influential economic indicators that are not currently added into the model; such as, lending and deposit volumes and GDP monthly data, etc. can be explored further. Though few non-priced factors have not been added to expected stock returns, these factors will help to explain stock return volatility and provide mechanical support to managers for portfolio diversification. These include, corporate governance, the legal environment and shareholders' rights because corporate governance and protection of investor issues are very essential to measure this relationship.

This study can also be extended further to study the effect of some additional variables instead of macroeconomic such as, political instability, governess and reform; these variables were not added into the model due to the unavailability of monthly data. Indeed, the addition of the following variables in the model would be a significant account for the impact of public sector activity.

It has been observed that a stock return is predominantly influenced by different factors not only at market and industry level but also at a firm level. As such, efforts should also be put into firm specific factors as they will build a confidence among potential investors into the firms and assist them to make better investment decisions.

Another potential research for similar studies in the future should be a comparative analysis of economies such as India, China and other Asian developing countries. Such a comparative study should compare the performance and behaviour of the Pakistan stock market with other emerging countries to see how they respond to shocks to real economic activity differently. This comparison is of great interest for

policymakers since these countries are working forward into unifying their economies and harmonizing their financial markets.

For further research, there are a few suggestions to enhance understanding regarding the dynamic relationship between economic activity and behaviour of the stock market in emerging economies. This can be enhanced by employing certain influential economic indicators that are not currently added into the model; such as, lending and deposit volumes and GDP monthly data, etc. Though few non-priced factors do not add to expected stock return, these factors will help to explain stock return volatility and provide mechanical support to managers for portfolio diversification. These factors include corporate governance, the legal environment and shareholders' rights because corporate governance and protection of investor issues are very essential to measure this relationship. The government of Pakistan should improve the financial system, and to adopt applicable measures for smooth functioning of the financial system in the economy. Likewise, the implementation of monetary policy should improve through better corporate governance, and clear responsibilities should be assigned to enhance coordination between different regulatory authorities such as, security and exchange Commission of Pakistan, the ministry of finance, and State Bank of Pakistan (SBP). One of the major potential research topics for similar studies in the future concern's economies such as India, China and other Asian developing countries. Such a study should compare the performance and behaviour of the Pakistan stock market with other emerging countries as they respond to shocks to real economic activity. This comparison is of great interest for policymakers since these countries are working forward into unifying their economies and harmonizing their financial markets. This study can be extended further to study the effect of some additional variables instead of macroeconomic such as, political instability, governess and reform; these variables were

not added into the model due to the unavailability of monthly data. Indeed, the addition of the following variables in the model would be a significant account for the impact of public sector activity. This comparison would be great interest for policymakers and harmonizing their financial markets. This study is also of interest since the Pakistan stock market is very promising markets for international portfolio diversification.

BIBLIOGRAPHY

Abbott, G.J. (1985). A Survey on Savings and Financial Development in Asian Developing Countries. *Savings and Development*, 9(4), 395 - 419.

Abdalla, I. S., & Murinde, V. (1997). Exchange rate and stock price interactions in emerging financial markets: evidence on India, Korea, Pakistan and the Philippines. *Applied financial economics*, 7(1), 25-35.

Abdullah, D. A., and Hayworth, S. C. (1993). Macroeconometrics of stock price fluctuations. *Quarterly Journal of Business and Economics*, 32(1), 50-67.

Adjasi, C., Harvey, S. K., & Agyapong, D. (2008). Effect of Exchange rate volatility on the Ghana stock exchange. *African Journal of Accounting, Economics, Finance and Banking Research*, 3(3), 28-47

Aga, M., & Kocaman, B. (2006). An empirical investigation of the relationship between inflation, P/E ratios and stock price behaviours using a new series called index-20 for Istanbul Stock Exchange. *International Research Journal of Finance and Economics*, 6(2), 133-165.

Aggarwal, R. (1981). Exchange-rates and stock-prices-A Study of the United-States Capital-Markets under Floating exchange-Rates. *Akron Business and Economic Review*, 12(3), 7-12.

Ahmed, E. & Rosser Jr. J. B. (1995). Non-linear speculative bubbles in the Pakistani stock Markets. *The Pakistan Development Review*, 34 (1), 25-41.

Ahmad, E., & Zaman, B.U. (2000). Risk, uncertainty and return at Karachi Stock Exchange, *The Lahore Journal of Economics*, 5(2) 107-126.

Ajayi, R. A., & Mougoue, M. (1996). On the dynamic relation between stock prices and exchange rates. *Journal of Financial Research*, 19(2), 193-207.

Alam, M. M., & Salah Uddin, M. G. (2009). Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries. *International Journal of Business and management*, 4 (3), 43-51.

Al-Majali, A. A., & Al-Assaf, G. I. (2014). Long-run and short-run relationship between stock market index and main macroeconomic variables performance in Jordan. *European Scientific Journal*, *10*(10), 156-171.

Amare & Mohsin (2000). Stock Prices and Exchange Rates in Leading Asian Economies: Short versus Long Run Dynamics. *Singapore Economic Review* 45 (2), 165-181.

Arestis, P., Demetriades, O., & Luintel, B. (2001). Financial development and economic growth: the role of stock markets. *Journal of Money, Credit and Banking*, 33(1), 16-41.

Arshanapalli, B. G., & Nelson, W. B. (2007). Small cap and value investing offer both high returns and a hedge. *The Journal of Wealth Management*, 9(4), 44-50.

Arouri, M. E. H., Lahiani, A., & Nguyen, D. K. (2011). Return and volatility transmission between world oil prices and stock markets of the GCC countries. *Economic Modelling*, 28(4), 1815-1825.

Asprem, M. (1989). Stock prices, asset portfolios and macroeconomic variables in ten European countries. *Journal of Banking and Finance*, 13(4), 589-612.

Atje, R., & Jovanovic, B. (1993). Stock markets and development. *European Economic Review, 37*(2), 632-640.

Babikir, A., Gupta, R., Mwabutwa, C., & Owusu-Sekyere, E. (2012). Structural breaks and GARCH models of stock return volatility: the case of South Africa. *Economic Modelling*, *29*(6), 2435-2443.

Baek, I. M., Bandopadhyaya, A., & Du, C. (2005). Determinants of market-assessed sovereign risk: Economic fundamentals or market risk appetite? *Journal of International Money and Finance*, 24(4), 533-548.

Baele, L. (2005). Volatility Spillover Effects in European Equity Markets. *Journal of Financial and Quantitative Analysis*, 40(2), 373–401

Baharumshah, Z., & Thanoon, A. M. (2006). Foreign capital flows and economic growth in East Asian countries. *China Economic Review*, 17(1), 70-83.

Bahmani-Oskooee, M., & Sohrabian, A. (1992). Stock prices and the effective exchange rate of the dollar. *Applied economics*, 24(4), 459-464.

Baker, M., & Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *The Journal of Finance*, 61(4), 1645-1680.

Baker, M., & Wurgler, J. (2000). The equity share in new issues and aggregate stock returns. *The Journal of Finance*, 55(5), 2219-2257.

Baker, M., & Stein, J. C. (2004), Market liquidity as a sentiment indicator. *Journal of Financial Markets*, 7(3), 271-299.

Baker, M., & Wurgler, J. (2004a). A catering theory of dividends. *The Journal of Finance*, 59(3), 1125-1165.

Baker, M., & Wurgler, J. (2004b). Appearing and disappearing dividends: The link to catering incentives. *Journal of Financial Economics*, 73(2), 271-288.

Balli, F., & Balli, H. O. (2011). Sectoral equity returns in the Euro region: Is there any room for reducing portfolio risk?. *Journal of Economics and Business,63*(2), 89-106.

Balli, H. O., Balli, F., & Louis, R. J. (2013). Time Varying Spillover Effects on Sectoral Equity Returns. *International Review of Finance*, 13(1), 67-91.

Balestra, P., & Nerlove, M. (1966). Pooling cross section and time series data in the estimation of a dynamic model: The demand for natural gas. *Econometrica: Journal of the Econometric Society*, 34(3), 585-612.

Bandopadhyaya, A., & Jones, A. L. (2006). Measuring investor sentiment in equity markets. *Journal of Asset Management*, 7(3), 208-215.

Banz, Rolf W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics*, 99(1), 3-18.

Bapna, D., Sood, V., Totala, D. N. K., & Saluja, H. S. (2012). Dynamics of Macroeconomic Variables Affecting Price Innovation in Gold: A Relationship Analysis. *Pacific Business Review International*, 5(1), 25-46.

Basher, S. A., & Sadorsky, P. (2006). Oil price risk and emerging stock markets. *Global Finance Journal*, 17(2), 224-251.

Barnes, P. (1986). Thin trading and stock market efficiency: the case of the Kuala Lumpur Stock Exchange. *Journal of Business Finance & Accounting*, 13(4), 609-617.

Bartram, S. M., & Bodnar, G. M. (2012). Crossing the lines: The conditional relation between exchange rate exposure and stock returns in emerging and developed markets. *Journal of International Money and Finance*, *31*(4), 766-792.

Bartov, E., & Bodnar, G. M. (1994). Firm valuation, earnings expectations, and the exchange-rate exposure effect. *The Journal of Finance*, 49(5), 1755-1785.

Barro (1990). The stock market and investment. *Review of Financial Studies*, 3(1),115-31.

Barber, B. M., Odean, T., & Zhu, N. (2009). Systematic noise. *Journal of Financial Markets*, 12(4), 547-569.

Beck, T., & Levine, R. (2002). Industry growth and capital allocation:: does having a market-or bank-based system matter?. *Journal of Financial Economics*, *64*(2), 147-180.

Bekaert, G., & Harvey, C. R. (1997). Emerging equity market volatility. *Journal of Financial economics*, 43(1), 29-77.

Bekaert, G., & Harvey, C. R. (2002). Research in emerging markets finance: looking to the future. *Emerging Markets Review*, 3(4), 429-448.

Bekaert, G., Harvey, C. R., & Lundblad, C. (2005). Does financial liberalization spur growth? Journal of Financial economics, 77(1), 3-55.

Bekaert, G., Harvey, C. R., & Lundblad, C. (2001). Emerging equity markets and economic development. *Journal of development Economics*, 66(2), 465-504.

Beltratti, A., & Morana, C. (2006). Breaks and persistency: macroeconomic causes of stock market volatility. *Journal of Econometrics*, 131(1), 151-177.

Beer, F., & Zouaoui, M. (2012), Measuring Stock Market Investor Sentiment. *Journal of applied Business Research*, 29(1), 51-68.

Bhattacharya, B., Mukherjee, J., (2002). Causal relationship between stock market and exchange rate, foreign exchange reserves and value of trade balance: a case study for India. [Online], available at /http://www.igidr.ac.in.

Binswanger, M. (2000), Stock returns and real activity: is there still a connection? *Applied Financial Economics*, 10(4), 379-387.

Black (1976). Studies of Stock Price Volatility Changes, Proceedings of the Meetings of the American Statistical Association, Business and Economic Statistics Section, 177–181[online] Available at https://brainmass.com, acess on 25/10/2012

Boyd, J., & Smith, B. (1996). The coevolution of the real and financial sectors in the growth process. *The World Bank Economic Review*, *10*(2), 371-396.

Bondt, W. F., & Thaler, R. (1985). Does the stock market overreact? *The Journal of finance*, *40*(3), 793-805.

Brealey, M. Marcus (2007). Fundamentals of Corporate Finance. *International Edition. New York: McGraw-Hill*.

Breitenfellner, Andreas, & Jesus CrespoCuaresmo (2007). Crude oil prices and the USD/EUR exchange rate. *Monetary Policy & the Economy*, 1(4), 102-121.

Brown, S. J., Goetzmann, W. N., Hiraki, T., Shirishi, N., & Watanabe, M. (2003). Investor sentiment in Japanese and US daily mutual fund flows (No. w9470). *National Bureau of Economic Research*.

Brown, G. W., and Cliff, M. T. (2005). Investor Sentiment and Asset Valuation. *The Journal of Business*, 78(2), 405-440.

Brurbridge, J., & Harrison A. (1984). Testing for the effects of oil-price raises using vector auto regression. *International Economic Review*, 25(2), 459-84.

Brunie, C. H., Hamburger, M. J., & Kochin, L. A. (1972). Money and stock prices: the channels of influence. *The journal of Finance, 27*(2), 231-249.

Bulmash & Trivoli (1991). Time Lagged Interactions between Stock Prices and Selected Economic Variables. *Journal of Economic Portfolio Management*, 17(4), 61-67.

Büyükşalvarcı, A. (2010). The effects of macroeconomics variables on stock returns: evidence from Turkey. *European Journal of Social Sciences*, 14(3), 404-416.

Campbell, J. Y., & Shiller, R. J. (1988). The dividend-price ratio and expectations of future dividends and discount factors. *Review of financial studies*, 1(3), 195-228.

Chan, Howard, and Robert Faff (2002). The sensitivity of Australian industry equity returns to a gold price factor. *Accounting &Finance*, 38(2), 223-244.

Chan, K., Chen, N. F., & Hsieh, D. A. (1985). An exploratory investigation of the firm size effect. *Journal of Financial Economics*, 14(3), 451-471.

Chandra P (2004), Investment Analysis and Portfolio Management. New Delhi: McGraw-Hill company ltd.

Charles, K. D., and Adjasi. (2009). Macroeconomic Uncertainty and Conditional Stock-Price Volatility in Frontier African Markets. *Journal of Risk Finance*, 10(4), 333 – 349.

Chen, N.F. (1983). Some empirical tests of the theory of arbitrage pricing. *The Journal of Finance*, 38(5), 1393-1414.

Chen, N. F., Roll, R., & Ross, S. A. (1986). Economic forces and the stock market. *Journal of business*, 59(3), 383-389.

Chen, N. F. (1991). Financial investment opportunities and the macroeconomy. *The Journal of Finance*, 46(2), 529-554.

Cheng, T. B., Ling, L. W., & Arsad, Z. (2006). Dynamics between Stock Price, Oil Price and Macroeconomic Activities: A VAR and Impulse Response Approach. In Proceedings of the 2nd IMT-GT Regional Conference on Mathematics, Statistics and Applications, University of Science Malaysia (pp. 167-17).

Cheung, Y. W., & Lai, K. S. (1993). Finite-sample sizes of Johansen's likelihood ratio tests for cointegration. *Oxford Bulletin of Economics and statistics*, 55(3), 313-328.

Chowdhury, A. R. (1994). Statistical Properties of Daily Returns from the Dhaka Stock Exchange. *The Bangladesh Development Studies*, 22(4), 61-76.

Chowdhury, S. S. H. and M. A. Rahman (2004), On the Empirical Relation between Macroeconomic Volatility and Stock Market Volatility of Bangladesh. *The Global Journal of Finance and Economics*, 1(2), 209-225.

Christie, A. A., (1982). The Stochastic Behavior of Common Stock Variances - Value, Leverage, and Interest Rate Effects. *Journal of Financial Economics*, 10(4), 407-432.

Clare, A. D., & Thomas, S. H. (1994). Macroeconomic factors, the APT and the UK stock market. *Journal of Business Finance & Accounting*, 21(3), 309-330.

Clarke, R. G., & Statman, M. (1998). Bullish or bearish?. *Financial Analysts Journal*, *54*(3), 63-72.

Cong, G., Wei, M., Jiao, L., & Fan, Y. (2008). Relationships between oil price shocks and stock market: An empirical analysis from China. *Energy Policy*, *36*(9), 3544-3553.

Copeland, E., Weston, F., & Shastri, K. (2013). *Financial Theory and Corporate Policy: Pearson New International Edition*. Pearson Higher Ed.

Cooper, R. V. (1974). Efficient capital markets and the quantity theory of money. *The Journal of Finance*, 29(3), 887-908.

Cruz, M., & Walters, B. (2008). Is the Accumulation of International Reserves good for Development? *Cambridge Journal of Economics*, *32*(5), 665-681.

Daghestani, A., Payne, B. C., & Castater, N. (2013). A Risk-Return Analysis Of Those Firms Ranked Highest For Price Growth Persistence In A Time Of Economic Recession. *Journal of Financial and Economic Practice*, *13*(1), 1-10

DeFina, R. H. (1991). Does inflation depress the stock market? *Federal Reserve Bank of Philadelphia Business Review*, 5(3), 3-12.

DeLong, J. B., Shleifer, A., summers, L. H., & Waldmann, R. J. (1988). The survival of noise traders in financial markets. *Journal of Political Economy*, 98(4), 703–38.

Demirgüç-Kunt, A., & Levine, R. (1996). Stock market development and financial intermediaries: stylized facts. *The World Bank Economic Review*, 10(2), 291-321.

Demirgüç-Kunt, A., & Maksimovic, V. (2002). Funding growth in bank-based and market-based financial systems: evidence from firm-level data. *Journal of Financial Economics*, 65(3), 337-363.

Demirhan, E., Aydemir, O., & Inkaya, A. (2011). The Direction of Causality between Financial Development and Economic Growth: Evidence from Turkey. *International Journal of Management*, 28(1), 3.

Denison, E.F. (1980). The contribution of Capital to Economic Growth. *American Economic Review*, 70(2), 220-231.

Dennis, P., & Mayhew, S. (2002). Risk-neutral skewness: Evidence from stock options. *Journal of Financial and Quantitative Analysis*, 37(03), 471-493.

Diacogiannis, G. P. (1986). Arbitrage Pricing Model: a critical examination of its empirical applicability for the London Stock Exchange. *Journal of Business Finance and Accounting*, 12(3), 489-504.

Divecha, A. B., Drach, J., & Stefek, D. (1992). Emerging markets: a quantitative perspective. The journal of portfolio management, 19 (1), 41-50.

Dimitova, D. (2005), The Relationship between Exchange Rates and Stock Prices: Studied in a Multivariate Model. *Issue in political economy*, 14 (1), 3-15.

Edmans, A., Garcia, D., and Norli, Ø. (2007). Sports sentiment and stock returns. *The Journal of Finance*, 62(4), 1967-1998.

Eichengreen, B., & Mody, A. (1998). Interest rates in the north and capital flows to the south: is there a missing link? *International Finance*, 1 (1), 35-57.

El Hedi Arouri, M., Jouini, J., and Nguyen, D. K. (2011). Volatility Spillovers between oil prices and stock sector returns: implications for portfolio management. *Journal of International Money and Finance*, 30(7), 1387-1405.

Enders, W. (2004). Applied Econometric Time Series, 2nd edition. John Wiley & Sons Inc, New York.

Elna Pretorius (2002). Economic determinants of emerging stock market interdependence. *Journal of Emerging Markets Review*, 3(1), 84-1053.

Emerging Stock Market Fact book, (1999). *International Finance Corporation*, Washington.

Engle, R. F. (1982). Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation. *Econometrica: Journal of the Econometric Society*, 50(4), 987-1007.

Engle, R. F., & C. W. J. Granger (1987). Co-integration and Error Correction: Representation, Estimation, and Testing. *Econometrica: journal of the Econometric Society*, 55(2), 251-276.

Engle, R. F., Lilien, D. M., & Robins, R. P. (1987). Estimating time varying risk premia in the term structure: the ARCH-M model. *Econometrica: Journal of the Econometric Society*, 52 (2), 391-407.

Engle, R. F. & Ng, V. K. (1993). Measuring and Testing the Impact of News on Volatility. *The Journal of Finance*, 48 (5), 1749-1778.

Erbaykal, E., Okuyan, H. A., & Kadioglu, O. (2008). Real Macroeconomic Variables and Stock Prices: Test of Proxy Hypothesis in Turkey. InYeditepe International Research Conference on Business Strategies, Istanbul, Turkey. [online] Available at www.ssrn.com.

Errunza, V.R. (1983). Emerging Markets: A New Opportunity for Improving Global Portfolio Performance. *Financial Analysts Journal*, 39(6), 51-58.

Errunza, V., & Hogan, K. (1998). Macroeconomic determinants of European stock market volatility. *European Financial Management*, *4* (3), 361-377.

Fama, E. F (1965). Random Walks in Stock Market Prices. *Financial Analysts Journal*, 21 (5), 55-59.

Fama, E. F (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, 25 (2), 383-417.

Fama, E. F., & MacBeth, J. D. (1973). Risk, Return and equilibrium: Empirical test. *The Journal of Political Economy*, 81(3), 607-636.

Fama, E. F (1976), Foundations of Finance: Portfolio Decisions and Securities Prices. New York: Basic Books, 319-338.

Fama, E. F., & Schwert, G. W. (1977). Asset returns and inflation. *Journal of financial economics*, 5(2), 115-146.

Fama, E. F (1981). Stock returns, real activity, inflation and money. *The American Economic Review*, 71 (4), 545-564.

Fama, E. F., & Gibbons, M. R. (1982). Inflation, real returns and capital investment. *Journal of Monetary Economics*, 9(3), 297-323.

Fama, E. F., & French, K. R. (1989). Business conditions and expected returns on stocks and bonds. *Journal of financial economics*, 25(1), 23-49.

Fama, E. F. (1990). Stock returns, expected returns, and real activity, *The Journal of Finance*, 45(4), 1089-180.

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of financial economics*, 33(1), 3-56.

Fama, E. F., & French, R. (2001). Disappearing dividends: changing firm characteristics or lower propensity to pay? *Journal of Financial economics*, 60(1), 3-43.

Ferson, W. E., & Harvey, C. R. (1991). The variation of economic risk premiums. Journal of Political Economy, 99(2), 385-415.

Fischer, B. (1989). Savings Mobilisation in Developing Countries: Bottlenecks and Reform Proposals. *Savings and Development*, 13(2), 117-131.

Fisher, K. L., & Statman, M. (2000). Investor sentiment and stock returns. *Financial Analysts Journal*, 56(2), 16-23.

Flannery, M. J., & Protopapadakis, A. A. (2002). Macroeconomic factors do influence aggregate stock returns. *Review of Financial Studies*, 15(3), 751-782.

Franck, P., and Young A. (1972). Stock Price Reaction of Multinational Firms to Exchange Realignments. *Financial Management,* 1(1), 66–73.

Frimpong, J.M. (2009). Economic Forces and the Stock Market in a Developing Economy: Cointegration Evidence from Ghana. *European Journal of Economics, Finance and Administrative Sciences*, 16(2), 123-135.

Fedorova, E., and Saleem K. (2010). Volatility Spillovers between Stock and Currency Markets: Evidence from Emerging Eastern Europe. *Czech Journal of Economics and Finance*, 60(6), 519–533.

Fratzscher, M. (2002). Financial Market Integration in Europe: on the Effects of EMU on Stock Markets. *International Journal of Finance and Economics*, 7(3), 165–93.

Geske, R., & Roll, R. (1983). The fiscal and monetary linkage between stock returns and inflation. *The Journal of Finance*, 38(1), 1-33.

Gjerde, Ø, & Saettem, F. (1999). Causal relations among stock returns and macroeconomic variables in a small, open economy. *Journal of International Financial Markets, Institutions and Money*, 9(1), 61-74.

Government of Pakistan (2007). Pakistan Economic Survey, Ministry of Finance, Islamabad.

Granger, C. W., Huangb, B. N., & Yang, C. W. (2000). A bivariate causality between stock prices and exchange rates: evidence from recent Asianflu. *The Quarterly Review of Economics and Finance*, 40(3), 337-354.

Graham, B., Dodd, D. L. F., & Cottle, S. (1951). *Security analysis,* New York: McGraw-Hill, 44-45.

Greenwood & Smith (1997). Financial markets in development, and development of financial markets. *Journal of Economic Dynamics & Control*, *21*(1), 145-181.

Greenwood, R., & Nagel, S. (2009). Inexperienced investors and bubbles. *Journal of Financial Economics*, *93*(2), 239-258

Habibullah, S., & Baharumshah (1996). Money, output and stock prices in Malaysia: an application of the cointegration tests. *International Economic Journal*, *10*(2), 121-130.

Hamao, Y. (1988). *Fifteen-year performance of Japanese capital markets* Graduate School of International Relations and Pacific Studies, University of California, San Diego, 88(5).

Hameed, A., & Ashraf, H. (2009). Stock market volatility and weak-form efficiency: evidence from an emerging market. *International Journal of Business and Emerging Markets*, *1*(3), 249-263.

Hamilton, J. D. (1983). Oil and the macroeconomy since World War II. *The Journal of Political Economy*, 91(2), 228-248.

Hammoudeh & Choi, K. (2006). Behavior of GCC stock markets and impacts of US oil and financial markets. *Research in International Business and Finance, 20*(1), 22-44

Harvey, A. C. (1990). *The econometric analysis of time series*. MIT press

Harvey, C. R. (1995). Predictable risk and returns in emerging markets. *Review of Financial studies*, *8*(3), 773-816.

Harvey, C. R. (1995a). The risk exposure of emerging equity markets. *The World Bank Economic Review*, 9(1), 19-50.

Hassan, K., Islam, M., & Basher (2000). Market efficiency, time-varying volatility & equity returns in Bangladesh stock market. *Applied Financial Economics*, 6(2)

Hassan, M. K., & Maroney, N. C. (2004). Thin trading, non-linearity and market efficiency of a small emerging stock market: Evidence from Bangladesh. *International Journal of Applied Business and Economic Research*, 2(2), 129-46.

Hendershott, T., & Riordan, R. (2013). Algorithmic trading and the market for liquidity. *Journal of Financial and Quantitative Analysis*, *48* (04), 1001-1024.

Henry, P. B. (2000). Stock market liberalization, economic reform, and emerging market equity prices. *The Journal of Finance*, *55* (2), 529-564.

Hondroyiannis, G., & Papapetrou, E. (2006). Stock returns and inflation in Greece: A Markov switching approach. *Review of Financial Economics*, 15(1), 76-94.

Hooker, M. A. (1996). What happened to the oil price-macroeconomy Relationship? *Journal of Monetary Economics*, 38(2), 195-213.

Hon, T. Y. (2012). The Behaviour of Small Investors in the Hong Kong Derivatives Markets: A Factor Analysis. *Journal of Risk and Financial Management*, *5*(1), 59-77.

Humpe, A., & Macmillan, P. (2009). Can macroeconomic variables explain long-term stock market movements? A comparison of the US and Japan. *Applied Financial Economics*, *19* (2), 111-119.

Hussain, F. & Uppal, J. (1998). Distribution of stock returns in an emerging market: The Pakistani market. *Pakistan Economic and Social Review*, 36(1), 47-72.

Hussain, F., & Saidi, R. (2000). The integration of the Pakistani equity market with international equity markets: an investigation. *Journal of International Development*, *12*(2), 207-218.

Hussain, F. (2000). The day of the week effect in the Pakistan equity market: An investigation. *The Lahore Journal of Economics*, 5 (1), 93-98

Husain, F., & Mahmood, T. (2001). The stock market and the economy in Pakistan. *The Pakistan Development Review*, 40 (2), 107-114.

Husain, F. and Qayyum, A. (2006). Stock Market Liberalisations in the South Asian Region. PIDE *Working Papers & Research Report*. Available at SSRN: http://ssrn.com/abstract=963577 , access on 11-10-2013.

Hussain, A., Lal, I., & Mubin, M. (2009). Short run and long run Dynamics of Macroeconomics Variables and Stock prices: Case Study of KSE (Karachi Stock Exchange). *Kashmir Economic Review*, 18(1), 43-61.

Hyde, S., Bredin, D., & Nguyen, N. (2007). Correlation dynamics between Asia-Pacific, EU and US stock returns. *International Finance Review*, 8, 39-61.

Ibrahim, M. (1999). Macroeconomic indicators and stock prices in Malaysia: An empirical analysis. *Asian Economic Journal, 13(2),* 219-231.

Iqbal, J., & Brooks, R. (2007). Alternative beta risk estimators and asset pricing tests in emerging markets: The case of Pakistan. *Journal of Multinational Financial Management*, *17*(1), 75-93.

Iqbal, J., Brooks, R., & Galagedera, D. U. (2010). Testing conditional asset pricing models: An emerging market perspective. *Journal of International Money and Finance*, *29*(5), 897-918.

Iqbal, J., & Haider, A. (2005). Arbitrage pricing theory: evidence from an emerging stock market. *The Lahore Journal of Economics* ,10(1), 155-185

Iqbal, N., & Nawaz, S. (2009). Investment, inflation and economic growth nexus. *The Pakistan Development Review*, 863-874.

Imam, M., & Amin, M. (2004). Volatility in the Stock Return: Evidence from Dhaka Stock Exchange. *Journal of the Institute of Bankers, Bangladesh*, 1-28.

International Finance Corporation (1984). *Report on Development Of The Money And Capital Markets*.

The International Monetary Fund (2004). *Country performance Report*. WASHINGTON, D.C.

Islam, M., & Watanapalachaikul (2003). Time series financial econometrics of Thai stock market: a multivariate error correction & valuation model. *CSES Annual Report.*

Ivanov, V., & Kilian, L. (2001). A practitioner's guide to lag - order selection for vector auto regressions. CEPR discussion paper . *London, Centre for Economic Policy Research*.

Jaffe, J. F. (1989). Gold and gold stocks as investments for institutional portfolios. *Financial Analysts Journal*, 45(2), 53-59.

James, C., Koreisha, S., & Partch, M. (1985). A VARMA analysis of the causal relations among stock returns, real output, and nominal interest rates. *The Journal of Finance*, *40*(5), 1375-1384.

Jefferis, K. R., & Okeahalam, C. C. (2000). The impact of economic fundamentals on stock markets in southern Africa. *Development Southern Africa*, *17*(1), 23-51.

Jensen, G. R., Johnson, R. R., & Mercer, J. M. (1997). New evidence on size and price-to-book effects in stock returns. *Financial Analysts Journal*, 53(6), 34-42.

Jensen, R., Johnson, R., & Mercer, M. (1998). The inconsistency of small-firm and value stock premiums. *The Journal of Portfolio Management*, *24*(2), 27-36.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of economic dynamics and control*, *12*(2), 231-254

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica: Journal of the Econometric Society*, 59(6), 1551-1580.

Johansen, S. (1992). Determination of cointegration rank in the presence of a linear trend. *Oxford Bulletin of Economics and Statistics*, *54*(3), 383-397.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on co-integration with applications to the demand for money. *Oxford Bulletin of Economics and statistics*, *52*(2), 169-210.

Kamstra, M. J., Kramer, L. A., & Levi, M. D. (2003). Winter blues: A SAD stock market cycle. *American Economic Review*, 93(1), 324-343.

Karachi Stock Exchange. (2009). Introduction. Retrieved February 2011 from Karachi Stock Exchange. [online] Available at www.kse.com.pk, acess on 29/11/2011

Kaul, G. (1987). Stock returns and inflation: The role of the monetary sector. *Journal of financial economics*, *18*(2), 253-276.

Keane, S. M. (1983). *Stock market efficiency: theory, evidence and implications*. Oxford: Philip Allan.

Khwaja, A. I., & Mian, A. (2005). Unchecked intermediaries: Price manipulation in an emerging stock market. *Journal of Financial Economics*, *78*(1), 203-241.

Khilji, M., & Nabi, I. (1993). The Behaviour of Stock Returns in an Emerging Market: A Case Study of Pakistan. *The Pakistan Development Review*, *32 (4),* 593-604.

Khilji, N. M. (1994). Nonlinear Dynamics and Chaos: Application to Financial Markets in Pakistan. *The Pakistan Development Review*, *33 (4)*, 1417-1429.

Kilian, L., & Park, C. (2009). The impact of oil price shocks on the US stock market. *International Economic Review*, *50*(4), 1267-1287.

Kitchen (1986). *Finance for the developing countries*. New York: John Wiley & Son.

Koutmos, G. F. (1999). Asymmetric price and volatility adjustments in emerging Asian stock market. *Journal of Business Finance & Accounting*, 26(1), 83-101.

Kumar, A., & Lee, C. (2006). Retail investor sentiment and return co movements. *The Journal of Finance, 61(5),* 2451-2486.

Kumar, M. S., & Persaud, A. (2002). Pure contagion and investors' shifting risk appetite: analytical issues and empirical evidence. *International Finance*, *5*(3), 401-436.

Kyereboah-Coleman, A., & Agyire-Tettey, K. F. (2008). Impact of macroeconomic indicators on stock market performance: The case of the Ghana Stock Exchange. *The Journal of Risk Finance, 9(4),* 365-378.

Lamba, S. (2005). An analysis of the short-and long-run relationships between South Asian and developed equity markets. *International journal of business*, *10*(4), 383-402.

Lee, B. S. (1992). Causal relations among stock returns, interest rates, real activity, and inflation. *The Journal of Finance*, *47*(4), 1591-1603.

Le, Thai-Ha, and Youngho Chang (2011). Oil and gold: correlation or causation? *Working Paper Series No. 2011/22*

Lemmon, M., & Portniaguina, E. (2006). Consumer confidence and asset prices: Some empirical evidence. *Review of Financial Studies*, *19*(4), 1499-1529.

Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *American economic review*, 88(3), 537-558.

Levis, M. (1985). Are Small Firms Big Performers*? Investment Analyst*, 76, 21-27.

Léon, N. D. K. (2008). The effects of interest rates volatility on stock returns and volatility: evidence from Korea. *International Research Journal of Finance and Economics*, *14* (14).

Lin, L., Engle, F., & Ito (1994). Do bulls and bears move across borders? International transmission of stock returns and volatility. *Review of Financial Studies, 7*(3), 507-538.

Liu, M. H., & Shrestha, K. M. (2008). Analysis of the long-term relationship between macro-economic variables and the Chinese stock market using heteroscedastic cointegration. *Managerial Finance*, *34*(11), 744-755.

Löflund, A. (1992). Arbitrage pricing theory in a small open economy: empirical evidence from the Swedish stock market. Research reports 26, *Swedish School of Economics and Business Administration.*

Mahmood, W., Mansor, W., & Mohd Dinniah, N. (2009). Stock Returns and Macro Economics Variables: Evidence from the Six Asian-Pacific Countries. *International Research Journal of Finance and Economics*, 30(2), 154-164.

Maria Carkovic and Ross Levine, (2002), Does Foreign Direct Investment Accelerate Economic Growth? *University of Minnesota, Working Paper.*

Martikainen, T., & Yli-Olli, P. (1991). Incremental significance of pre-specified macroeconomic factors in testing the arbitrage pricing theory: empirical evidence with Finnish data. *Applied Financial Economics, 1*(3), 139-147.

Maysami, R. C., & Koh, T. S. (2000). A vector error correction model of the Singapore stock market. *International Review of Economics & Finance*, *9*(1), 79-96.

Maysami, C., Howe, C., & Hamzah, A. (2004). Relationship between macroeconomic variables and stock market indices: Cointegration evidence from stock exchange of Singapore's All-S sector indices. *Jurnal Pengurusan,24*(1), 47-77

Mehta, K., & Sharma, R. (2011). Measurement of Time Varying Volatility of Indian Stock Market through GARCH Model. *Asia Pacific Business Review*, 7(3), 34-46.

Ma & Jalil (2008). Financial development, economic growth and adaptive efficiency: a comparison between China and Pakistan. *China & World Economy, 16(6),* 97-111.

http://www.sbp.org.pk

Mian, A. (2003). Foreign, private domestic, and government banks: New evidence from emerging markets. *Journal of banking and finance.*

Mian, S. N., Muhammad, M. N., & Usman, J. G. (2010). Relationship between economic growth and stock market development. *African Journal of Business Management*, *4*(16), 3473-3479.

Miller, E. M. (1999). Investment intelligence from insider trading. *Journal of Social Political and Economic Studies*, 24(4), 477-484.

Miller, K. D., Jeffrey, F. J., & Mandelker, G. (1976). The "Fisher effect" for risky assets: An empirical investigation. *The Journal of finance*, *31*(2), 447-458.

Mohammad, S. D., Hussain, A., & Ali, A. (2009). Impact of macroeconomics variables on stock prices: empirical evidence in case of KSE (Karachi Stock Exchange). *European Journal of Scientific Research*, 38(1), 96-103.

Mork K. (1989), oil and the Macroeconomy, when prices go up and down: Anextension of Hamilton's results. *Journal of Political Economy*, 97(51), 740-744.

Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica: Journal of the econometric society*, 34(4), 768-783.

Muller, A., & Verschoor, W. F. (2007). Asian foreign exchange risk exposure. *Journal of the Japanese and International Economies*, *21*(1), 16-37.

Mubarik, F., & Javid, A. Y. (2009). Relationship between stock return, trading volume and volatility: Evidence from Pakistani stock market. *Asia Pacific Journal of Finance and Banking Research*, *3*(3).

Mukherjee, T. K., & Naka, A. (1995). Dynamic relations between macroeconomic variables and the Japanese stock market: an application of a vector error correction model. *Journal of Financial Research*, *18*(2), 223-37.

Mustafa, K. &Nishat, M., (2008). Trading Volume and Serial Correlation in Stock Returns in Pakistan. *Philippine Review of Economics*, 45 (2), 25-39.

Muhammad, N., Rasheed, A., & Husain, F. (2002). Stock Prices and Exchange Rates: Are they related? Evidence from South Asian Countries. *The Pakistan Development Review*, 41 (4), 535-550.

Neill Fortune, J. (1988). The inflation rate of the price of gold, expected prices and interest rates. *Journal of macroeconomics*, 9(1), 71-82.

Ng, A. (2000). Volatility Spillover Effects from Japan and the US to the Pacific Basin. *Journal of International Money and Finance*, 19(2), 207–33.

Niblock, T. and Malik, M. (2007). *The Political Economy of Saudi Arabia*. Routledge, New Edition, London and New York.

Nishat, M., Shaheen, & Hijazi, S. T. (2004). Macroeconomic Factors and the Pakistani Equity Market [with Comments]. *The Pakistan Development Review*, 43(4), 619-637.

Nurudeen, A. (2009). Does stock market development raise economic growth? Evidence from Nigeria. *The Review of Finance and Banking*, 1(1), 015-026.

Oberuc, R. E. (2004). *Dynamic Portfolio Theory and Management: Using Active Asset Allocation to Improve Profits and Reduce Risk.* Mc-Graw Hills.

Officer, R.R. (1972). The Distribution of Stock Returns. *Journal of the American Statistical Association*, 67(340), 807-814.

Omran, M. M. (2003). Time series analysis of the impact of real interest rates on stock market activity and liquidity in Egypt: Co-integration and error correction model approach. *International Journal of Business*, *8*(3), 360-374.

Oseni, I. O., & Nwosa, P. I. (2011). Stock market volatility and macroeconomic variables volatility in Nigeria: an exponential GARCH Approach. *Journal of Economics and Sustainable Development*, *2*(10), 28-42.

Obstfeld, M. (1994). *Are industrial-country consumption risks globally diversified?* (No. w4308). National Bureau of Economic Research

Papapetrou, E. (2001). Oil price shocks, stock market, economic activity and employment in Greece. *Energy Economics*, *23*(5), 511-532.

Perez-Quiros, Gabriel and Allan Timmermann. (2000). Firm size and cyclical variations in stock returns. *The Journal of Finance, 55(3),* 1229-1262.

Parkinson, J.M. (1987). The EMH and the CAPM on the Nairobi Stock Exchange. *East African Economic Review*, 3(2), 105-110.

Persaud, A. (1996). Investors' changing appetite for risk. *JP Morgan Securities Ltd., Global FX Research.*

Poon, S. H., & Granger, C. W. (2003). Forecasting volatility in financial markets: A review. *Journal of economic literature*, *41*(2), 478-539.

Qiu, L., & Welch, I. (2004). *Investor sentiment measures* (No. w10794). National Bureau of Economic Research.

Rahman, M. M., & Salahuddin, M. (2009). The determinants of economic growth in Pakistan: does stock market development play a major role? In *Proceedings of the 38th ACE (2009)* (pp. 1-22). Economic Society of Australia (South Australian Branch).

Rafique, A., & Rehman, K. U. (2011). Comparing the Volatility Clustering Of Different Frequencies of Stock Returns in an Emerging Market: A Case Study of Pakistan. *Journal of Economics & Behavioral Studies*, *3*(6), 332-337

Rajan, R. G., & Zingales, L. (1996). Financial dependence and growth. *The American economic Review, 88(3),* 559-586.

Reilly, F. K., and Brown, KC (2005). *Investment Analysis and Portfolio Management* (8thed.), Thomson South-Western.

Reinganum, Marc R. (1981). Abnormal returns in small firm portfolios. *Financial Analysts Journal, 37(2),* 52-56.

Rogalski, R. J., & Vinso, J. D. (1977). Stock Returns, Money Supply and the Direction of Causality. *The Journal of Finance, 32(4),* 1017-1030.

Roll, R., & Ross, S. A. (1980). An empirical investigation of the Arbitrage Pricing Theory. *The Journal of Finance, 35(5),* 1073-1103.

Ross, S. A. (1976). The arbitrage theory of capital asset pricing. *Journal of economic theory*, *13*(3), 341-360.

Ross, S.A. (1986), and Westerfield, I. (1988), Corporate Finance. Times Mirror/Mosby College Publishing, USA

Rozeff, M. S. (1984). Dividend yields are equity risk premiums. *Journal of Portfolio management*, 11(1), 68-75.

Sadorsky, P. (2008). Assessing the impact of oil prices on firms of different sizes: It's tough being in the middle. *Energy Policy, 36*(10), 3854-3861.

Samuels, J. M. (1981). Inefficient capital markets and their implications. In *Risk, Capital Costs, and Project Financing Decisions*. Springer Netherlands.

Saunders, A., Cornett, M., & McGraw, A. (2006). *Financial institutions management: A risk management approach*. McGraw-Hill/Irwin.

Saryal, F. S. (2007). Does inflation have an impact on conditional stock market volatility? Evidence from Turkey and Canada. *International Research Journal of Finance and Economics*, 11, 123-133.

Scheinkman, J. A., & Xiong, W. (2003). Overconfidence and speculative bubbles. *Journal of political Economy*, 111(6), 1183-1220.

Schmeling, M. (2009). Investor sentiment and stock returns: some international evidence. *Journal of Empirical Finance*, 16(3), 394-408.

Schwert, G.W., (1990). Stock returns and real activity: A century of evidence. The *Journal of Finance*, 45(4), 1237–1257.

Schwert, G.W. (1989). 'Why does stock market volatility change over time? The *Journal of Finance, 44(5*), 1115-1154.

SethuDurai, S.Raja; Bhaduri, Saumitra. (2009). Stock Prices, inflation and output: Evidence from Wavelet analysis, Economic Modelling, 26(5), 1089-1092.

Shahbaz, M., Ahmed, N., & Ali, L. (2008). Stock market development and economic growth: ARDL causality in Pakistan. *International Research Journal of Finance and Economics*, 14(1), 182-195.

Sharma, G. D., & Mahendru, M. (2010). Impact of Macro-Economic Variables on Stock Prices in India. *Global Journal of Management and Business Research, 10*(7).

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance, 19*(3), 425-442.

Shen, J., & Yu, J. (2012). *Investor sentiment and economic forces*. Available at SSRN 199.

Shiller, R. J., Fischer, S., & Friedman, B. M. (1984). Stock prices and social dynamics. *Brookings Papers on Economic Activity, 1984(2),* 457-510.

Shiller, R. J. (1993). Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends? *Advances in Behavioral Finance,* 71(3), 107.

Siegel, J. J. (1998). *Stocks for the long run: The definitive guide to financial market returns and long-term investment strategies*. New York: McGraw-Hill.

Solnik, B. (1987). Using financial prices to test exchange rate models: A note. *The Journal of Finance, 42*(1), 141-149.

Soenen, L. A., & Hennigar, E.S. (1988). An analysis of exchange rates and stock prices: the United State experience between 1980 and 1986. *Akron Business and Economic Review, 19(4),* 7-16.

Sohail, N., & Hussain, Z. (2009). Long-Run and Short-Run Relationship between Macroeconomic Variables and Stock Prices in Pakistan: The Case of Lahore Stock Exchange. *Pakistan Economic and Social Review,* 47(2), 183-198.

State Bank of Pakistan. *Annual Reports, State Bank of Pakistan*, Karachi.

Stiglitz, J. E., (1985). Credit markets and the control of capital. *Journal of Money. Credit and Banking* 17(2), 133-52.

Stulz, R. M. (1986). Asset pricing and expected inflation. *The Journal of Finance, 41(1),* 209-223.

Stulz, R. M. (1999). *International portfolio flows and security markets*. Charles A. Dice Center for Research in Financial Economics, Ohio State University.[online] avilaible at http://papers.ssrn.com, acess on 12/05/2012

Subayyal, M., & Shah, A. (2011). The Cointegration between Exchange Rates and Stock Prices in Highly Volatile Markets: Evidence from Pakistan. *Middle Eastern Finance and Economics*, *15*, 156-163.

Tursoy, T., Gunsel, & Rjoub, (2008). Macroeconomic factors, APT & the Istanbul Stock Market. *International Research Journal of Finance and Economics, 22*, 49-57.

Uppal, J. Y. (1998). Stock return volatility in an emerging market: a case study of the Karachi Stock Exchange. *Managerial Finance, 24* (3), 34-51.

Wang, H., Keswani, A., & Taylor, J. (2006). The relationships between sentiment, returns and volatility. International Journal of Forecasting, 22(1), 109-123.

Wickremasinghe, G. (2011). The Sri Lankan stock market and the macroeconomy: an empirical investigation. *Studies in Economics and Finance, 28*(3), 179-195.

Wongbangpo, P. & Sharma, C. (2002). Stock market and macroeconomic fundamental dynamic interactions: ASEAN-5 countries. *Journal of Asian Economics,* 13(1), 27–51.

World Bank (2005). *Corporate Governance Country Assessment for Pakistan' Report on the Observance of Standards and Codes*. The World Bank, Washington D.C.

http://www.worldbank.org/ifa/rosc_cg_pak.pdf.

Yilmaz, K. (2010). Return and volatility spillovers among the East Asian equity markets. *Journal of Asian Economics*, 21(3), 304-313.

Yartey, C. A. (2008). The determinants of stock market development in emerging economies: Is South Africa different?. *IMF Working Papers*, 1-31.

Yu, Qiao (1997). Stock Prices and Exchange Rates: Experience in Leading East Asian Financial Centres. *Singapore Economic Review,* 4(1), *47-56*.

Zaighum, I. (2014). Impact of Macroeconomic Factors on Non-financial firms Stock Returns: Evidence from Sectorial Study of KSE-100 Index. *Journal of Management Sciences, 1*(1), 35-48.

Zouaoui, M., Nouyrigat, G., & Beer, F. (2011). How does investor sentiment affect stock market crises? Evidence from panel data. *Financial Review, 46(4),* 723-747.