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Measuring Investor Sentiments Using Macroeconomic Variables as Proxies In South Asian Countries

by

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This work is dedicated to my beloved family who have encouraged me to achieve this milestone and to my respected supervisor Dr. Saira Ahmed, who has been a constant source of inspiration.

CERTIFICATE OF APPROVAL

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(Maria Rafique Khan)

Abstract

The purpose of this research thesis is to examine the effect of investor sentiment on market return of Pakistan, India, Bangladesh, Siri Lanka and China using macroeconomic variables as proxies, using daily data for the period of 2010 to 2020. Macroeconomic variables included currency exchange, silver price, gold price, and world market index. The study uses random effect model to examine the relationship between investor sentiment and market return. The data have been tested through a random effects model. The Random effect model provide evidence of insignificant relationship between investor sentiment and market return. The results show that there is no positive relationship between currency exchange rate, gold price, silver price, and world market index. The results show that according to the random effects model there is no link between investor sentiments and returns in the stock market.

Keywords: Macroeconomic Variables, Investor Sentiment, Stock Market Returns.

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Abbreviations

GP	Gold Price
MSCI	Morgan stanley Capital International
SP	Silver Price
ST	Stock Turnover
WMI	World Market Index
XR	Exchange Rate

Chapter 1

Introduction

1.1 Introduction

Market sentiment, often known as investor sentiment, is a term used to describe how the overall behavior of the Investors reading a specific set of Securities or individual Stock. Market's sentiments and attitudes, or crowd psychology, as discovered by the activity and price movement of the securities traded in that market. Rising prices reflect optimistic market sentiment; whereas decreasing prices reflect pessimistic market sentiment in overall. When the Bullish trend is observed the prices are rising when the bearish trend is perceived the prices are falling.

Market sentiment refers to the overall consensus about a stock or the stock market as a whole. There are many technical indicators which can help out investors to measure and gain Returns beyond the market. Investor's sentiments are not always based on fundamentals. In the perspective of Investors market sentiment either bearish or bullish. In the recent studies examiners have done a lot of work on the role of financial markets to promote viable economic growth and developed channelized capital mobility, risk sharing, etc.

But, the volatility and fluctuations in stock markets critically affect sentiments, it means that it's importantly effect on the growth of the economy and provides the opportunity for unproductive speculative activities. In some extreme situations,

sentiments may drag financial markets too far away from their fundamental paths to create financial crises and thereby make real economic progress unsustainable.

Classical finance theory argues that there is no sentiment for Investors. According to classical fiancé theory investors are rational and diversify to enhance the statistical Properties of their portfolios. Competition among them leads to an equilibrium in which prices equal the rationally discounted value of expected cash flows, which the cross-section of anticipated returns determined by on the cross-section of undiversified risk.

If there are some investors are irrational, classical fiancé theory argues, their demands will be balance by arbitrageurs and similar conclusions for prices will be obtained. This study provides present evidence that investor sentiment essentially has strong effects on the cross-section of stocks of the companies. This study starts with simple theoretical estimates.

Given that overvalue or undervalue is the result of an uninformed demand shock in the existence of a necessary arbitrage limitation, a broad-based wave of sentiment is forecasted to have cross-sectional effects, as opposed to arise in stock prices or vice versa equally, when either sentiment-based demands very across stocks or arbitrage constraints vary across stocks. In practice, these two channels lead to quite similar predictions, because stocks that are likely to be most sensitive to speculative demand – those with highly subjective valuations – also tend to be the riskiest and costliest to arbitrage.

Concretely, then, theory suggests two separate channels through which the stocks of newer, smaller, highly volatile firms, firms in distress or with extreme growth potential, firms without dividends, and firms with like characteristics, would be expected to be relatively more affected by investor sentiment. The objectives of the research are to develop and demonstrate a framework for prediction of Investor Sentiment based on logical and solid grounds which is easy to discern and communicate, that makes sense and is based on a innovative idea which has not been tried before. Like finance theory, neoclassical finance theory also addressed that no such a place where investors sentiment because. It is discussed that share valuation present only basic and fundamentals and no any other thing. From

its beginning previous all famous theory builders mostly ignoring such kind of sentiments as a risk determinant and assuming is different ways on the ground level it is perfect mode of financial market. They considered non rational trade attitude will quick spreading. behavior will be quickly washed away. The main theme of this paradiam given below:

Initially, the financing markets are mostly informational and efficiently work and number two market determinants are rational. The prerequisite of market expansion, however making a one of the second foundation of updated financial economic and activeness promise that in stable asset price shows the every variable information concerning about the basic or initial value of underlying stock. In the existence of market structure, there should be the charges of marketing securities or stock whose level with intrinsic values, it is explain the sum of percentage value of the predicted cash flow.

Moreover, in an efficient market shares prices immediately shows various relevant information and these procedure make the perception of future prices of stock basis on previous and current information useless, like they even following the unplanned and random flow.

Modern finance theory is assertion that single investors behave rationally and he or she behaves rationally. This implies that in their decision making calculus they take into consideration and rely on all available relevant information they have access to. Rationality in financial markets is based on the hypothesis of rational expectations found in economic theory, which states that the predictions of economic agents regarding the future value of an asset are not systematically biased, that is, errors are not correlated.

Introducing in the model the additional factors of investors pursuing their own self-interest and the forces of arbitrage, classical financial theory formulates its final argument that irrational participants will be quickly expelled from the market and with them the opportunities of making risk-free profits. The issue, however, is that in the real world investors are constrained on their arbitrage activities due to the fact that financial markets are not frictionless. This is so because in order to earn risk-free profit professional arbitrageurs must use substantial funds, which

means that this activity automatically is exposed to risk. Moreover, because of the presence of transaction cost, information gathering cost, and financing cost arbitrageurs become very skeptical and to a large extent are discouraged from exploiting market mispricing. Therefore, arbitrage does not necessarily operate toward eliminating market anomalies (Shleifer andVishny,1997).

A group of researchers have been looking for alternate explanations of these market anomalies because of overvalue or undervalue of unexploited security arbitration options which are expressed in financial puzzles, such as the closed-end fund discount January Anomaly, the weekend effect and the underpricing of the IPO and the periodic occurrence of financial crises. One method is to use non-economic elements such as investor behavior which bypass the strong assumption of rationality and the presence of arbitration in the classic financial paradigm. More precisely, behavioral finance supporters have promoted this technique, which suggests that certain market operators can show irrational tendencies and may have an impact on market results, asset prices and the conduct of other investors through their behavior. This makes investor sentiment a major component that might explain the occurrence of distortions in the market, such as limited arbitration, which distinguish asset values from equilibrium.

Proponents of behavioral finance believe that arbitrageurs have additional constraints on their trades due to the existence of "noise" traders whose abnormal conduct results in increased risk exposure for all investors. Unfortunately these sound advertisers are frequently little speculators with next to zero venture preparing and accordingly their conduct is silly, on the grounds that truth be told their choices are made based on bits of gossip and not based on reality. Another issue emerges in light of the fact that commotion exchanging is profoundly coordinated and makes what is related with crowd conduct. Since the assumptions for sound investors about compensation are touchy to a similar circumstance with an inclination to go overboard or overcompensate, their exchange is not, at this point randomly dispersed across all resources and consequently mistakes arbitrageurs for their illogical conduct (De Long et al., 1990, 1991).

On the other hand, meanwhile, many researchers challenge the accepted definition of financial sentiment. From several studies we've uncovered a large number of

definitions, including vague assertions about investors' views as well as distinct psychological biases, which are extremely variable depending on the model employed. The picture present just extra cloudy when examining the numerous ways this type has been followed by academic scholars, specialist practitioners, and the news channel (Shefrin, 2008). Specifically, few researchers shows the investor thinking as the frequency to trade on gossips either the market information during the investment parties maybe use this less simply to shows the periods of euphoria or phobia.

The reasons for this scientific research, financial specialist opinion are characterized as the attraction of market members to hypothesize, and this mentality can be identified with the mental perspective of speculators. In this manner, it is contended that during market rises it is happiness that pushes nonsensical financial specialists to be remiss in their speculation procedures, though during redresses they base their venture choices on a more extensive range of contemplations and more cautious examinations (Schwarz, 2002).

For the sake of this study, investor sentiment is explained as market participants' tendency to speculate, and this attitude is related to investors' psychological state of mind. Moreover, it is proposed that euphoria causes irrational investors to be lax in their investment strategies during market upswings, but during market modifications, they base their investment decisions on a broader range of factors and more extensive assessments (Schwarz, 2002).

In a similar manner, Dellavigna and Pollet (2009) claim that in good times, investors become less attentive, which leading to stock mispricing. Additionally, explanation of sentiment as market determinants' expectations in relation to a norm, with the typical investor having zero sentiment and a bullish (bearish) investor expecting higher (lower) returns than the norm. Because individual investors dominate emerging markets and there is a shortage of quality information and professional financial analysts' services, the success of these markets is more likely to be impacted by general investor sentiment. In many emerging stock markets, short selling is either prohibited or restricted, and this is true for all practical purposes in the case of the Greek market.

There are two reason behind the studies of the sentiment of investors are important. First, they teach us about biases in the stock market forecasts of investors. Second, they tell us about opportunities to earn extra returns by exploiting those biases. These biases provide a huge opportunities for the investors to gain an extra ordinary returns on Securities.

Stock returns are prominent among factors that affect sentiment. But do investors forecast continuations of past returns or do they forecast reversals? Common investment proverbs provide no good answers because they reflect diametrically opposed perceptions of the processes underlying stock returns. For every proverb that implies one should expect reversals (e.g., "trees don't grow to the sky"), there is a proverb implying that continuations are the rule (e.g., "don't fight the tape")

1.2 Research Gap

Ever since Baker and Wurgler (2006) invented and presented a mechanism for measuring the Investor Sentiment, stirring academic discourse on sentiment predictability, investor behavior and market efficiency, there has been several attempts made by different researchers all over the world not only to improve upon the methods previously used but also suggesting new ways of tackling the problem. In the past studies the frequency of data used for finding empirical evidence is either on an annual, monthly or weekly basis. In this study we intend to use daily data for the first time based on the logical notion that the investor has to make investment decisions on a daily basis.

Apart from this, the larger the time span more questionable it becomes to make predictions. While the literature focuses mainly on developed countries, we plan to carry-out this study on a large sample of emerging economies as an attempt to satisfy and make up for the dimension of generalizability of research. Moreover, a simple yet solid research methodology is deployed to carry out empirical analysis. The proxies for gauging Investor Sentiment include the macro-economic variables such as crude price index, foreign exchange rate, and global gold prices which have not used in previous research studies.

1.3 Problem Statement

The impact of macroeconomic variables on stock market return on a daily basis remains the focus. However, the proxies for gauging Investor Sentiment include the macro-economic variables such as Stock turnover, foreign exchange rate, global gold and silver prices which have not been used in previous research studies. This situation requires investigation specifically in the context of the Asian markets.

1.4 Research Questions

The prime objective of the research is to conduct a comparative analysis of effect of macroeconomic variables on the stock market return of Pakistan (KSE-100 index), Bangladesh (DSE), India (BSE index), China (SSE Index) and Siri Lanka (CSE) which are as follows:

1. Is it possible to measure the Investor Sentiment using daily data?
2. How long can the Investor Sentiment be predictable?
3. Do we measure investor sentiment using macroeconomic variable as proxies?
4. Is it possible to gain abnormal returns using the proposed methodology on a consistent basis?
5. Whether we predict market return based on the Investor Sentiment measured using macro-economic variables as proxies?
6. Does exchange rate have an effect on market return on daily basis?
7. Does global gold prices have an effect on daily market return?
8. Does global silver prices have an effect on market return on daily basis?
9. Does world market index have an effect on daily market return? proxies?

1.5 Objectives of the Study

Based on the above questions following objectives are derived.

1. To provide insight about the relationship between investor sentiment and market return.

2. To explore the relationship between investor sentiment and macro-economic variable.

3. To investigate the effect of investors sentiments on market returns

1.6 Significance of the Study

This study adds understanding to the body of knowledge around by examining the effect of macroeconomic indicators (exchange rate, global gold price, global silver price, and world market index) over stock markets of selected Asian countries of Bangladesh (DSE), India (BSE), China (SSE Index) Siri Lanka (CSE), and Pakistan (KSE-100 index). The specific significance may be summarized as:

1. Investor sentiment has been measured using time series data in previous studies, and also previous studies have primarily focused on developed markets rather than developing countries.

2. This study is helpful to the investors of developing countries. They can make their investment decision according the outcomes of respective study.

3. A significant study is conducted on the impacts of investor sentiment on the returns of major stock market indexes of South Asia Countries, and a variety of proxies is used.

4. This study is carried out investigating major emerging markets for finding empirical evidence.

1.7 Plan of Study

This thesis is composed of five main chapters. First three chapters focus on the theoretical area of the relevant topic, whereas the last two chapters cover the empirical aspects of the study.

Chapter 1: It focuses on the fundamental idea of the study. This section introduces a topic by providing a background of the study, theoretical framework, research gap, problem statement, research questions, research objectives and significance of the study.

Chapter 2: This chapter narrates results of survey of topic including theoretical as well as empirical arguments from past researches.

Chapter 3: This chapter includes the definition of the variables and different methodologies adopted for investigation including descriptive statistics, correlation matrix, unit root test and principal component analysis for checking the effects of investor sentiment on the stock market returns.

Chapter 4: This chapter elaborates the outcomes from empirical results and explains the finding. On the basis of thesis objectives, the findings are observed on daily basis and in the context of linearity and non-linearity.

Chapter 5: This chapter summarizes research outcomes and recommends different market forecasting according to market conditions of each Asian country.

Chapter 2

Literature Review

Huang et al. (2014) investigated the proxy variable to identify the relationship between investor sentiment and stock returns using principal component analysis. They investigated that sentiment is significantly correlated with the return of the working period and found a negative correlation with one lag period. This study investigated the effect of sentiment on stock return using secondary data from 2005 to 2013. This study is conducted both locally and globally. The basic concept of this examination was adopted from the cyclic fluctuation in the U.S economy from 1953 to 1984. Hamilton bases this concept on and uses the Makov switching regime model to investigate the effect of investor sentiment and stock returns.

In this study, investor sentiments are identified through optimistic and pessimistic states using the GARCH M model. In an optimistic state, investor sentiment has a positive effect on stock returns, and in a pessimistic state, investor sentiment does not affect stock returns. This study also examined the relationship between sentiment and stock returns, using Makov's two-state models, i.e., using returns of different industries of different states.

Markov model applying two states, i.e., bull and bear market, to investigate the relationship between investor sentiment and stock market return of different industries return. The findings of this study are some industries like animal husbandry and fishery industry; the bull state has a positive relationship between sentiment and stock returns. On the other hand, the bearish state has a negative relationship between sentiment and stock returns.

Some other industries like metals and petrochemicals show a significant relationship between sentiment and returns in a bearish state. When there was a bullish trend, then that shows the insignificant relationship between sentiment and returns. Other industries like household appliances, food, beverage, and consumer goods, both bear and bull, define investor sentiment's positive effect on stock returns.

So each industry is required to construct its portfolio to check the effect of investor sentiment on stock returns.

Baker et al. (2012) investigated investor sentiment in various stock markets using global and domestic market indicators. The study used multiple emotional indicators using six stock markets: Canada, France, Germany, Japan, the United Kingdom, and the United States. This study assesses investors' perceptions of 6 single-world emotional indicators and six local indicators using annual data from 1980 to 2005. This study consists of various literature types in the first part to investigate the role of both local and global sentiment using six market indicators.

Secondly, to investigate authentication works using Siamese twins because sometimes emotional literature has failed to provide exercise. Fourthly it provides international time episodes in parts of the reclaimed stock, i.e., given to Baker and Wurgler (2006). They found that the US market describes other markets. In the last section, they describe how the emotions of the world grow and function.

This study re-examines the sentiments of investors using various proxies developed by B Baker and Wurgler. These proxies are premium volatility, initial public offerings (IPOS), and Market Turnover (TURN). The findings of this study are feelings that can be transmitted to all markets through a single structure. Hela et al. (2017) investigated the effect of the limit on restoring sentiment towards G7 countries. The study was conducted in Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States from 1987 to 2014. This study investigates investor sentiments on stock market recovery using the PSTR model (2005). This study was focused mainly on two points, Firstly, the impact of investor sentiment has a negative impact on market performance. Secondly, the impact of investor sentiment has a positive impact on market performance. In this study,

the data of three different countries were used to determine investors' ineffective market performance. These nations are neutral states, sound merchants, and over-confidence or superpowers.

The results of this study, Show positive results, the feelings of investors in the market recovery. If you use the second, the result is better, and the third nation shows a negative impact on the stock market, but the change between the first and second regimes is fast; on the other hand, the transition between the second and third countries is smooth. These results reflect the difficulties between investors' feelings in restoring shares, removing these difficulties using a variable agent.

Huang ET. Al investigated (2015) the impact of investor sentiment on restitution using, investor sentiment is a strong predictor of stock recovery. This study estimated the impact of investor sentiment associated with combined stock recovery using Baker and Wurgler proxies (2006). This approach is currently being developed by Kelly and Puitt (2013). A small square approach finds that investor sentiment has a more significant impact on the combined stock market than previous studies. The study also examines the square footage that is most widely used for significant economic fluctuations. It predicts both statistically and economically.

Statistically, a small square method helps measure the return of a cross-section in the industry, size, and intensity. Economically it measures more investment bias towards future cash flows than discounted prices. The findings of this study of investor sentiments are essential in different categories and essential for integrated market recovery. In this study, a less sophisticated approach contributes to developing affiliate investor sentiment into proxies rather than existing processes. Using this approach also promotes integrated market returns at the portfolio level.

Corredor and Santamaria (2015) also study the impact of investor sentiment on recovery in emerging markets. Their sample contains countries in central Europe. Their results align with the ethical view and report that the inclusion of investor status means a significant difference in the expected stock returns. However, they also revealed that the impact is not the same in all countries. Khan & Khan (2018) conducted a study on volatile economic changes in stock prices. The study

found various economic variations on Pakistani stock prices by analyzing monthly data from 2000 to 2016. There are three sentiment proxies: discounted portfolio discounts, a balance of non-exchange sales and purchases, a combined redemption of stock returns.

The data is used from 1933 to 1993 provided by Wall Street. Research provides tangible evidence that discounts and complete redemptions create a premium size between large firms and small firms that demonstrate the ability to define odd-lot ratios compared to the other two proxies. Art research has been conducted around the world on the role of investor sentiment. These days researchers are focusing on the short-term link between investor sentiment and stock recovery.

Concetto and Ravazzolo (2019) investigated the impact of investors' money on stock market returns and examined the predictive potential for emotional indicators in U.S. and E.U. market recovery. Data used for this study from January 1990 to December 2014 (300 months) for the U.S., and for the E.U. using data from June 2001 to April 2017 (191 months).

This study uses the emotional index in retrospective models to predict the return of U.S. and European markets. Many of the previous study ratings are explored, from direct emotion indicators, such as research, to indirect measures of investor sentiment, such as those listed by Huang et al. 2014; Baker and Wurgler 2006, 2007. This study differs from previous literature. This study controlled a set of variables commonly used to retrieve predictions and used a Bayesian basis to reduce parameter uncertainty due to the short sample, especially the E.U. market. For example, the U.S. Globally sentiment has a negative impact on market recovery, and B.W. results have a strong predictor effect. Thus, in the European market, evidence indicates a weak acquisition, and there is no relationship between investors' sentiments and the recovery of the stock market. Now the results show the effect of spillover between these two markets.

The study concluded that the U.S. and the E.U. are two parallel markets. This study justifies the weak effects on European markets. From an economic point of view, it will be affected by globalization and rapid communication. Europe will be more inclined to recognize the influence of American sentiment due to the strong

economy. Mehwish Aziz Khan and Eatzaz Ahmad (2018) investigated Pakistan's emotional index and investigated relations and returns from 2006 to 2016. They used direct and indirect indicators to measure the relationship between investors' feelings and returns. These indicators are the number of IPOs, closed discount, advance discount rate, dividend premium, interest rate, earning rate, profit, cash flow index, power index related to Google search index. From these indicators, create a monthly index on fundamental content analysis (PCA).

Kumar Naik and Padhi 2015 investigated the relationship between investor sentiment and stock volatility using monthly data from the National Stock Exchange (NSE) of India from July 2001 to December 2013. Measure the relationship between the situation and the volatility of stocks using the Efficient Market Hypothesis (EMH) presented by -Fama (1965) and the Capital Asset Pricing Model (CAPM). This study follows various previous studies.

Pandey and Sehgal (2019) researched investors' sentiments. They measured the role of a factor based on the inflation factor to explain the significant volatility of equity markets such as size, price, and price pressure in India. This study uses monthly data from July 2001 to December 2013 to measure investor sentiment to create three different investment indicators, using the Farm and French 3 factor model (FF3F).

Investor sentiment can be divided into three types, direct, indirect, and Meta. These three categories are used to measure investor sentiment by defining size, value, and price pressure. In previous studies, researchers measured investor sentiments using different measurement techniques (Lee et al., 1991) using closed-end funds. Such as proxy sentiment, (Pan and Poteshman, 2006) used put ratio, Volatility Index (VIX), open interest rate, and premium options as an emotional representative.

Gao and Ren et al. April 2016 investigated whether Google's search method for this study estimates the experience of 40 countries from 2004-2014. Previous studies (Keynes, 1936; Shiller, 1990; Baker and Wurgler, 2000) play an essential role in stock price divisions. For example, DeLong et al. (1990) and Shleifer and Vishny (1997) used various methods to measure investor sentiment. Baker and

Wurgler 2006 and Baker Wurgler and Yuan 2012 used a market-based index to measure the relationship between sentiment and return, choosing the US market and five non-US markets.

This examination researched whether the cutoff points for estimating limits to exchange altogether influenced momentary deals. It is hard for usual speculators to address the negative cost brought about by market feeling. The discoveries of this examination uphold the inescapable market feeling of direct estimation, causal proof, high recurrence, and expansive market openness.

Additionally helps the conduct of market members through web indexes. Anticipating influenza flare-ups utilized (Ginsberg et al., 2009), foreseeing monetary exercises, for example, vehicle deals (Choi and Varian, 2012) to check speculator consideration (Mondria, Wu, and Zhang, 2010; Da, Engelberg and Gao, 2011); estimating interest for financial specialist data (Drake, Roulstone, and Thornock, 2012); and distinguishing peer-related financial firms (Lee, Ma, and Wang, 2015).

Zou et al. (2017) investigated the different types of investor sentiments in IPOs using the Agent-based Computational Finance (ACF) method. In this study, the first-day IPO prices and long-term performance rates were used. In this study, Zou et al. chose the Chinese stock market because most private investors buy new shares without knowledge in China. This study follows various previous researchers (Han and Wang, 2004), (Pu and Han, 2002). They investigate that the Chinese stock market has not yet reached substantial volatility, which is why it is not well defined the low price of IPOs on the first day from the point of view of rational investors In previous studies, researchers investigated the behavior of investors; in this study, Zou et al. investigated a different type of investor behavior. The first is that institutional speculators positively affect the cost of IPOs in the essential market. Besides, if institutional speculators or individual financial specialists, a high inclination on the primary day of exchanging prompts lower IPO development. The third is that there is no connection between the suppositions of institutional financial specialists in the drawn-out market and the drawn-out presentation of the IPO. In long-haul markets in the financial business sectors, speculators can prompt long-haul IPOs underworking. Then again, the side of individual speculators significantly affects the drawn-out presentation of stocks,

which implies that the higher the opinion of individual financial specialists, the better the drawn-out exhibition of the IPO.

What's more, if the estimation of individual financial specialists is higher than a specific sum, the drawn-out proficiency of the IPO will change into long-haul execution. In this examination, they explored the various practices of financial specialists and the various impacts of IPOs.The outcomes being that if institutional and individual speculators are reasonable and stock less influence their conduct, that could improve market dependability.

Li (2015) looks at the effect of measuring investor behavior and financial policy on commodity prices. Their results show that investor sentiment has a more significant economic impact on inflation than financial policy shocks. Similarly, Lutz (2016) also investigates the asymmetrical impact of investor sentiment on various stock indicators. The results show that when the market is in a bullish state, the expected return is low in the whole market and at the cross-section of the stock recovery. Moreover, when the market is in a bearish mood, the influence of investors' sentiments on stock recovery is weak.

The studies mentioned above are very focused on the US market. However, many researchers cover the impact of investor sentiments abroad and provide sample evidence. For example, Jansen and Nahuis (2003) used a data set of 11 European countries and studied the value of commodity prices by considering the behavior of investors. They report that investors' sentiments are positively affecting the return of shares in all countries except Germany.

Similarly, Schmeling (2009) picked 18 industrialized countries and found consistent results. They report that investor sentiment causes contemporaneous returns to increase and future returns to decrease. Their results are robust at the aggregate market level and consistent at the portfolio level constructed based on size and value characteristics. Furthermore, they also find that the impact of investor sentiment is more important in countries that are less developed. Corredor, Ferrer, and Santamaria (2015) also study the influence of investor sentiment on equity returns in emerging markets. Their sample contains central European countries. Their results are consistent with behavioral theory and report that the inclusions

of investor sentiment significantly explain the variations in expected stock returns. However, they also disclose that the effect is not uniform across countries.

Khan and Khan (2018) directed an investigation on the effect of macroeconomic factors on stock costs. The investigation decided the impact of different macroeconomic factors on the stock costs of Pakistan by breaking down the month-to-month information from the time of 2000 to 2016.

There are three assumption intermediaries:

- Shut-end store limits
- The proportion of odd-part deals to buys expected
- Expected net recovery on stock returns

Information is utilized from the time of 1933 to 1993 provided by Wall Street. The study gives massive proof that limits and net reclamation instigate a size premium between enormous firms and small firms that shows the illustrative intensity of odd-part proportions is generally feeble contrasted and the other two intermediaries. Detailed exploration has been led far and wide on the job of financial specialist assessment. These days scientists center on the transient connection between speculator slant and stock returns.

Chiara Limongi Concetto and Francesco Ravazzolo (2019) explored the financial specialist supposition impact on securities exchange returns. They assessed the consistency intensity of opinion files on the U.S. and E.U. securities exchange returns. The information utilized for this examination from Jan 1990 to Dec 2014 (300 months) for the U.S. and the E.U. utilized information from June 2001 to April 2017 (191 months).

This examination utilizes the enthusiastic record in review models to anticipate the arrival of U.S. and European business sectors. A considerable lot of the past examination appraisals are investigated, from direct feeling pointers, such as research, to backhanded proportions of financial specialist conclusions, such as those recorded by Huang et al. 2014; Baker and Wurgler 2006, 2007. This investigation

varies from past writing. This examination controlled many factors customarily used to recover expectations and utilized a Bayesian premise to decrease boundary vulnerability because of the short example, particularly the E.U. market. For instance, the U.S. Universally conclusion negatively affects market recovery, and B.W. results have a solid indicator impact. Accordingly, in the European market, proof demonstrates a feeble securing, and there is no connection between the assumptions of financial specialists and the recovery of the securities exchange. Presently the outcomes show the impact of an overflow between these two business sectors.

The investigation reasoned that the U.S. also, the E.U. are two equal business sectors. This investigation legitimizes the frail impacts on European business sectors. From a financial perspective, globalization and quick correspondence Europe will be more disposed to perceive the impact of American opinion because of the stable economy.

Mehwish Aziz Khan and Eatzaz Ahmad (2018) investigated Pakistan's emotional index and investigated relations and returns from 2006 to 2016. They used direct and indirect indicators to measure the relationship between investors' sentiments and returns. These indicators are IPO number, closed fund discount, advance discount rate, dividend premium, interest rate, earnings rate, profit, cash flow index, power index related to Google search index. From these indicators, create a monthly index on Principal content analysis (PCA).

According to this study, out of ten, seven proxies are directly related to emotions, while the other three are emotionally related. This study shows a positive relationship between emotions and recovery from current emotions but a negative relationship with a defective mindset. Granger and Geweke's Causality tests show a strong collaborative relationship between market returns and investor sentiment. These results provide evidence that it is the result of previous returns. The study also provided evidence of a temporary interaction between investor sentiment and market return using the Geweke rate. That shows that current emotions affect the current return and vice versa. Granger's two-stage technique, the Phillips Ouliaris co mix test, and the Johansen trial of cointegration are utilized to test for

co incorporation. The Johansen trial of comix, created by Johansen (1988) and (1991), is favored by financial specialists since this test incorporates one stage of estimation and takes into account a few co integrating connections.

According to Kumar and Pundey (2011), analysts have led to an instability overflow between the U.S. and other developing markets and decided a unidirectional transmission of unpredictability from the U.S. to alternate nations. This finding shows up very naturally and backings our theory. Al-Zeaud and Alshbiel (2012) expressed that scientists have analyzed unpredictability overflows amongst developing and developing markets and established that developing markets impact the restrictive differences and returns of other territorial markets. Chittedi (2007) utilized a Granger Causality test and reasoned that the created markets of the U.S., Japan, and France impact the creating business sector of India. However, there was no proof that the created markets affected the other BRIC countries.

Mahedi Masuduzzaman (2013) investigated the short and long-run association among macroeconomic factors (exchange rate of BDT against USD, I.P., I.R., MS) on the Bangladesh stock market index and the period from 2006 to 2012. They presented that industrial production, consumer price index, and broad money supply define long-run relationships, but there is no short-run relationship with that Bangladesh stock exchange. The study found no short-run and long-run impact on the Bangladesh stock market between selected macroeconomic variables. The reason is, Bangladesh stock market not perfectly explain the economic fundamentals Hassan Chowdhury et al. (2014) Evaluated the impact of investor sentiment on Bangladesh stock market return. Sentiment proxies are (Trading index, Trade volume, turnover, number of IPO's, and change in moving average).

The study also measured the effect of investor sentiment on firm sizes. This study's findings show the unidirectional casual association between the trading index with Bangladesh stock market returns. There is also a bidirectional casual association between change in moving average and market return. A large portfolio gives a higher return on the portfolio side than a small-size portfolio because large stocks are more demanded in Bangladesh. Due to good accounting and financial information and practices. The study also suggests that sentiment-based

trading is a better option for investors and managers. The study also measured the dynamic relationship between the behavior of individual stock return and sentiment. The study also found a low correlation between selected proxies due to the price pressure effect.

Uygur and Tas (2014) investigated the effect of investor sentiments on economic elements of Istanbul stock exchange, elements containing beverages, banking, and food sector indexes, are more expressive elements as compare to Telecommunication or retail. Results indicate that investor sentiments are affecting the big listed companies of the Pakistani stock market.

Abbas et al. (2014) Furthermore measured the link between macroeconomic variables and stock market return. In which secondary data is used from the period of 2002 to 2012. The study used descriptive statistics, Pearson correlation, and regression test to calculate the macroeconomic factors that impact market return. The study has taken the stock market as the dependent variable and independent variables. The study found the connection between exchange rate and the stock market is the insignificant positive connection among inflation and the stock market is negatively insignificant treasury bills. The gold price has also negatively correlated with stock market return, and finally, GDP has a positively insignificant connection with the stock market return. Bolman et al. (2014) examined the relationship between investor sentiment and the stock market using financial crisis and used monthly data from 2003 to 2012. In the first step, the existence of stationary between data or not use ADF test. We move forward to the second step to find the long-run relationship between variables used in the cointegration test. The work of this study depends on a developed market.

This study is also found an abnormal connection between consumer confidence and the stock market. Finally, the study found consistency, structural breaks between both variables during the period of crises. According to the cointegration technique, consumer confidence is an alternative proxy for investor sentiment because it found the functional identity of consumer confidence.

Utku Uygur and Oktay Tas (2014) investigated the impact of investor sentiment on conditional volatility. The study utilized the EGARCH model to measure

investor sentiments' influence on conditional volatility in different banking, food, and beverage sectors. Conditional variance logarithmic shape by Nelson (1991).

This study adopts the noise trading approach to calculate the effect of noise traders on conditional volatility. The researcher used ISE trading volume to indicate the impact of investor sentiment on market returns & conditional volatility of stock markets. ISE all traders are more vital, both banking and industry sectors. So, the banking and industry sector is profitable for noise traders.

Lingaraja et al. (2015) used the daily time series data to investigate the stock market's performance and volatility behavior of 8 Asian markets from 2004 to 2013. GARCH, the Auto-correlation model, is used to measure the long-run relationship of volatility and market performance of developing stock markets. Past studies also measure the volatility and market performance of developing stock markets Taufiq Choudhry (1996). The results of this study are helpful for retail investors, governments, policymakers, and stakeholders.

Yu et al. (2015) use nine indicators (liquidity, financing function, and investment function) to measure the effectiveness of Chinese market return from 2003 to 2012. The study also used the three index factors (capital allocation, investment, financing level, and operation). After that, found the weight of each index to the development of the Chinese stock market.

The outcomes confirmed that capital allocation plays a vital role in the development of Chinese market returns. According to the study, 2003 to 2012 are the rising years for the Chinese market, but still, there are many issues to improve the Chinese stock market. Suriani et al. (2015) measured the connection between the stock and currency market of Pakistan. Monthly data is used from 2004 to 2009.

In the study, KSE 100 is taken as stock prices, and the currency rate of Rs is taken as $. To find stationary of data used, unit root test and ADF. Calculate the connection between exchange rate and stock prices used the granger causality test. According to the ganger causality test calculated no relationship between exchange rate and stock prices. Corredor P et al. (2015) measured the effect of investor sentiment on market returns in developing markets. They considered;

sentiment as an ordinary regression to predict the stock prices traded on emerging markets compared to developed European markets.

The study analyzed that sentiment indicates two spheres, i.e., worldwide and regional effect. Worldwide sentiment impact indicates a more significant impact than the local sentiments. The study found that the sentiment has not spread sign studies and measures the volatility and market performance of developing stock markets Taufiq Choudhry (1996). The results of this study are useful for retail investors, governments, policymakers, and stakeholders. Yu et al. (2015) use nine indicators (liquidity, financing function, and investment function) to measure the effectiveness of Chinese market return from 2003 to 2012. The study also used the three index factors (capital allocation, investment, financing level, and operation). After that, found the weight of each index to the development of the Chinese stock market. The outcomes confirmed that capital allocation plays a vital role in the development of Chinese market returns.

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that sentiment is spread through the behavioral technique. The given statement is proven, the local regulatory actions are essential to minimize the abnormal situation.

Pramod Kumar Naik and Puja Padhi (2016) extended the association between investor sentiment and market volatility for seven implicit market indicators over a time frame of (2002-2013) utilizing a principal component analysis. Then, with the help of PCA, construct sentiment proxies such as trading volume, turnover ratio, put and call option, NIPO's, mutual fund net investment, and price-earnings ratio. Then, in addition, we propose to examine negative-positive fluctuation towards the bullish and bearish trends.

The study recognized regression analyses such as VAR, EGARCH-M models, and OLS. According to the regression analysis, OLS estimation measure, the sentiment index has a significant effect on Indian market return either, sentiment index is positive and negative.

According to the E-GARCH models, the study finds out the positive impact of the excess market return; it also negatively affected volatility. Finally, VAR estimation shows the negative impact of excess return with a lagged sentiment. Therefore, the study is helpful for policymakers, retail investors, and decision-makers. Balcilar et al. (2016) measure the effect of investor sentiment on intraday dynamics in the gold market. In which they calculated the effect of fear & excitement in the stock market on gold return. The data is used from the year 2004 to 2011. The findings of the study, there are no significant causal effects of sentiments on daily gold returns. On the other side, there is a significant effect of causality from sentiment to intraday volatility in gold returns.

Shafique et al. (2016) suggest that the fluctuation in gold price affects the stock market. The relationship between stock market improvement and gold price for KSE 100 index utilizing econometric tests in this study includes:

- Unit root test.
- Augmented Dickey-Fuller test.
- Johnson Co-integration test.

- Vector autoregression model.

The study used monthly from the year 1993 to 2014.The stock exchange is considered the economic power of nations because it also affects capital mobilization and the economy's financial sector. The developing countries like Pakistan, their capital market is highly volatile, investors are investing their capital in gold. Invest in gold is the safest investment to make an expected revenue. In the economic crisis of 2007, investors lost billions of dollars. Nor (, 2012). Historical studies also suggest that if any uncertainty in stock indices worldwide, the gold price increases Shahzadi and Chohan (2013). The study determined no long-run relationship between the Karachi stock exchange and the gold market due to high volatility.

Feng Junwen and Li Xinxin (2017) investigated the investor sentiment and Shanghai Stock Exchange A-shares index like a stock return. They were using the trading volume data from 2010 to 2014: The characteristics of investor sentiments used ARMA, and VAR and granger causality test measure the connection between investor sentiment and market return. According to the simple granger test, the connection between sentiment and market return is more significant. They measured the asymmetric relationship between market return and investor sentiment. The study calculated the significant positive relationship between investor sentiment and market return; there is also a risk premium effect on market return in the China stock market.

Ahmed Salhin (2017) introduced the Managerial Sentiment, Investor Sentiment, and Stock Returns. Investor sentiments play an essential role in measuring stock returns. The study examines the reaction of sentiment; managers to investors and investor sentiment to managerial sentiment. The study was based on monthly data throughout 1985-2014. To find the causal relationship between sentiments used, the granger causality test for market return.

Results of this study, the relationship of stock returns, investor sentiments, and managerial sentiment varies across sectors. This study suggests that, for practitioners, policymakers to take long-term investigated models are useful for the economy's future. Anusakumar (2017) investigated the stock-specific and market-specific sentiment effect on market return in emerging Asian countries. Measure

the effect of stock-specific sentiment, and stock returns utilized the panel regression with fixed effects.

Past studies are primarily focused on the sentiment of the stock market or individual stocks Miwa (, 2016) and Sayim (2015). This study focused on both sentiments, stock, and market levels. Investigated the effect of sentiments on stock return using panel data from 2001 to 2011, choosing eight Asian countries: Malaysia, India, Indonesia, Philippines, Taiwan, Thailand, South Korea, and China.

According to the results of this study found that overall sentiments are positively related to the stock returns. Finally, the study found a significant positive association among stock-related sentiment & returns of 8 countries. However, the market-related sentiment fluctuates rapidly from one nation to another. So, market-related sentiment has a negative effect on returns in half of the sample countries. However, there is a positive relation has calculated among the selected sample and three individual nations. Results of the study show stock related and market-related sentiments behave sometimes. Differently, stock-specific have greatly influenced on market return rather than the market-wide sentiment.

Antonette Fernando (2018) examined the Siri-Lankan stock market's effect between macroeconomic variables, including interest rate, inflation, money supply, and exchange rate. The study investigates the monthly data estimation from 1998 to 2016, for estimation used, (VECM) and (EGARCH) models. According to the estimation models of this study, their results indicated, the stock return has negatively influenced interest rate and exchange rate. Wethers, the stock return has positively influenced the inflation rate and money supply. The study also found a significant impact between macro-economic variables and Siri-Lankan stock market and volatility. Shahani (2018) investigated the relationship between macroeconomic factors and the Siri-Lankan stock market. Past studies stated that the impact of macroeconomic factors on different Asian markets, such as Aurangzeb (2012), investigate the negative impact of interest rate and inflation on the stock market of South Asian countries. This study analyzed the strong association between macroeconomic factors and the Siri-Lankan market, and the reason is Sri-Lankan market differs from time to time because of fluctuation.

Ali Raza et al. (2019) investigated the effect of investor sentiment on stock market capitalization on the various sector of KSE 100. they were utilizing data from 1972 to 2014 and determining the solid provision for the prospective that power, fuel, and chemical sectors encourage the improvement in the Pakistani stock market compared to the other sectors. Lam et al. (2019) introduced the role of new liquidity in China's stock market return. Daily data is used from the year 1994 to 2014 to investigate the asset pricing model use time-series test, included (size, book-to-market, momentum, and liquidity risk factors). In addition, to the construction of a new liquidity proxy, this study chooses one proxy from four daily measures, i.e. (To (trading quantity), LM (trading frequency), ILLIQ (price impact), and HL (trading cost). Additionally, the study used the APC method to measure the new liquidity from four dimensions. The study also compares liquidity and multifactor asset pricing models such as (CAPM, FF3F, LIQ3F, LIQ4F, WML4F, and LIQ5F models.

Finally, the study suggests that the multifactor model is more workable for the Chinese market and suggests that LIQ4F is preferable to other asset pricing models. Results suggest that this study is beneficial for both individual and institutional investors for future investment decisions. Rehana et al. (2019) investigated the link between stock prices and exchange rate in Asian countries over 2007- 2016 for the association between variables used cointegration and correlation models. According to past studies, researchers found the link between market prices and exchange rates in developing countries (China, Brazil, and Russia).

The results indicate that the exchange rate and stock prices of Pakistan & India are not associated. Siri Lankan stock market found an association between these two variables. The suggestion that there is no effective exchange rate on stock prices also suggests that other macroeconomic factors are more valuable for the stock. L'opezCabarcos et al. (2019) work on investor sentiments in the theoretical field of behavioral finance. In the study, use the bibliometric analysis for investor sentiments in the theoretical field of behavioral finance. According to analysis, this research is based on behavioral finance and traditional finance, representing efficient market theory (Fama 1970 and Kahneman 1974).

The bibliographic coupling analysis discloses that the Journal of behavioral finance is the most relevant in terms of publications. The European Journal of Finance has also published a lot of articles on investor sentiments. According to analysis, the result shows that investor sentiment is a most trending topic because publications are increasing over the last few years—finally, investor sentiments also many extension possibilities, other areas like physics, computer science, and mathematics. These new research scops give new ways of measuring investor sentiments. Ngoc Bao Vuong and Yoshihisa Suzuki (2020) introduced the effect of market return in Asian countries. Data utilized for this study from 2004 to 2016. Six Asian market indexes are used to measure the impact of sentiment on Asian market return. The investor system is appropriate to predict the short-run market return.

The study utilized three proxies included (consumer confidence index, advance ratio, and volatility premium). Chang et al. (2011), Baker et al., (2012), and Corredor et al. (2015). According, the local and regional indices, sentiment has a strong effect on stock return. On the regional side, these variables (investor sentiment and market return) are not placed. Su et al. (2020) examined investors' sentiment on the financial market (gov bond markets, gold markets, and foreign exchange markets). Monthly data is used throughout 2005 - 2019, according to the granger causality test, not associated between investor sentiment and money markets.

Quantile causality test indicates that investor sentiments determine the three financial markets: government bond price, gold price, and Exchange rate. Investor heterogeneity also determines that there is no significant association between corporate bond price and investor sentiment. There is also found asymmetric relation between investor sentiment on the gold price. Hee-Soo Lee (2020) initiated the effect of COVID-19 on the US stock exchange.

In addition, using the DNS index and google trending data of COVID also investigated the co-relation between COVID-19 and different sectors of the US market. The study selects eleven sectors of the US market from 21 January to 20 May 2020. To predicting the stock market movement, use tweeter data as compared to the daily news sentiment index. The study also measured if the fluctuation in the daily news sentiment index to predict Us industry return estimated through

the time series regression model used Fama and French 3 factor model due to the excess return.

The study suggests that due to the impact of COVID-19 on the stock market. Firstly, investors focused on strategic investment planning, and secondly, visualizing changes in time lag difference. Ra'ef Bahrini and Assaf Filfilan (2020) stated that the novel COVID- 19 is not a human health crisis; it's a very costly crisis for an economic condition worldwide. They also found COVID-19 disturbing the financial markets and global economy. Daily data is used from 1 April 2020 to 26 June 2020. The investigated the COVID-19 cases, and deaths impact daily returns of major stock market indices on GCC countries.

According, to the panel data analysis, the new and total COVID-19 confirmed cases and deaths have a negative impact on the stock market of GCC countries. When the death cases are increased, then the stock market in GCC countries is declined. The study also suggests that GCC stock markets positively impact crude oil prices and negatively impact the global oil market and the global stock market. The study is beneficial for investors, policymakers, and financial authorities to manage the negative impact of COVID-19 on the stock market.

Haritha P H and Abdul Rishad (2020), using PCA to calculate how investor sentiment affects stock market volatility. The study defines the asymmetrical relationship between both variables; either sentiment is positive and negative. Positive sentiments indicate a positive effect on market return, and the negative sentiment index indicates less intensity on negative returns. Investors are more optimistic about the excessive return. The findings of the study examined the determination between market volatility and sentiment index. This study indicates an asymmetrical effect on sentiments and market returns. So, according to the study reveals, investors considered the market as weak efficient. Finally, the market condition describes the efficient hypothesis is not only defining the behavior of emerging markets.

Ilahi et al. (2020) using the rate of inflation, exchange rate, and interest rate as macroeconomic variables to measure the stock market return. The study used secondary data from the year 2007 to 2012. The study utilized the Multiple-linear

regression method to measure the association between variables. The multiple linear regression techniques show a weak connection between dependent and independent variables. The model shows that the exchange rate is insignificant. The study describes no link between exchange rate and stock market return. Inflation and interest rate also have little relation with stock market return (khan et al., 2012).

Sarah K. Hadi and Shabbir Ahmad (2021) using consumer confidence index how investor sentiment impact on stock market returns of Saudi Arabia. The data is used from 2016 to 2018, according to the CCI technique investor sentiments have significant effect in Saudi Arabia stock market return.

The results of this study asset pricing can influence the investor sentiment in stock return of Saudi Arabia. But sentiment is not the key variable for asset pricing in Saudi Arabia market returns, other market fundamentals like industrial production index and risk-free interest rate also influence the Saudi Arabia market return. Jiangshan Hu, et al. (2021) using MS-VAR model to investigate the link between investor sentiment, stock market return and stock market volatility. The study is conducted in China stock market. Data is collected from 2004-2014. The study analyzed on the basis of bull and bear market. According to the findings of the study the of market return on investor sentiment and stock market volatility is same in bull and bear market.

Wenli Huang, Yuqi Zheng (2020) measure the structural changes due to investor sentiment and crude oil futures price in pandemic. The data is used from 2019 to 2020.The Gregory-Hansen regime shift cointegration test is used to measure the structural changes due investor sentiment and crude oil prices in COVID19. The market condition describes that COVID-19 has directly influenced on oil prices and investor sentiments. So according to the findings of the study there is a structural change in pandemic in relationship between investor sentiment and crude oil prices. Chellaswamy (2020) investigated the impact of Chines macroeconomic factors on Shanghai stock exchange returns and Indian macroeconomic variables impact on NIFTY returns. The study investigates the monthly data for estimation from 1998 to 2018, for estimation used quantile regression approach. The results of

this study taken from two sample periods, pre-recession period is 1998-2008 and post-recession period is 2009-2018.

According to the results in on lower quantile Chine's consumer price index has significant impact on shanghai stock exchange returns, and in on upper quantile Indian price index has significant and positive impact on NIFTY returns and the interest rate of Chines and Indian market have no impact on Shanghai stock exchange returns and NIFTY returns. Furthermore, the results shows that chines exchange rate influence the Shanghai stock exchange returns and Indian exchange rate is insignificant.

Ullah et al. (2017) study influence of macroeconomic indicators upon equity markets of SAARC using OLS models for (2005-2015). The results indicate that exchange rate, foreign currency reserves, and interest rates are found to have a positively relation to the equity market. However, contrary to the results, rate of inflation and the supply of money is found to pose no substantial influence on equity market performance. Epaphra (2018) tries to see the relationship between Tanzanian stock exchange and the macroeconomic factors, rate of inflation, treasury bill rate, rate of exchange and money supply. The study uses monthly time series data for 5 years. The Johansson co-integration test and error correction model are used to explore the longer-run connection among economic indicators. The results indicate that economic indicators and the equity returns are cointegrating and a longer-term connection exists amid them. Findings of the study suggest that supply of money and exchange rate have influence on equity markets, Treasury bill have negative influence on the equity market. However, the rate of inflation have no effect on stock market performance.

Furthermore Jamaludin et al. (2017), focuses on the relationship between macroeconomic indicators (supply of money, Exchange rate, and inflation rates) and returns of equity market for 3 Asian Countries (Indonesia, Singapore, and Malaysia). By utilizing panel least squares regression technique, it shows that the rate of exchange poses a subsequent and positive effect on the functioning of the equity market. In contrary to the findings inflation rate pose a subsequent unfavorable influence on the equity market. Results also indicate no influence of money supply on the equity market. While exploring the association among the macroeconomic

indicators and stock exchange of SriLanka, Ismail et al. (2015) uses GDP, interest rate, balance of payment, rate of inflation, and the exchange rate to see their influence on Sri Lankan stock exchange. Results indicates a significant positive influence of GDP and exchange rate on the equity market. In contrary to results significant and negative effect of the rate of inflation is found. However, the balance of payment has no significant influence on Sri Lankan stock exchange.

The connection among the equity return and the exchange rate can be understood by analyzing the country economic nature. If the nature of the economy is export-centric then domestic currency depreciation will increase the demand for home country products and increases its attractiveness in the global market.

On the other hand, if the nature of the economy is import-centric then if there is an appreciation in the domestic currency it will make the country's economy stronger. In connection to the discussion above, Khalid and Khan (2017) explores the effect of macroeconomic indicators on the equity market with prime intent to probe the shorter- and longer-term association amid KSE-100 index and macroeconomic indicators by employing econometric techniques using ARDL and ECM. It has been shown that there is a significant and positive effect of the rate of exchange on the volatility of the equity market in the longer run. Similar results of the positive effect on the equity returns on the rate of exchange are found by Kibria et al. (2014), Gurloveleen and Bhatia (2015), Ullah et al. (2017), Megaravalli and Sampagnaro (2018), Jamaludin et al. (2017), and Ismail et al. (2015). In contrary to the discussion above a negative and longer-term association between the rate of exchange and equity market is found by Umer (2016) and SikalaoLekobane and Lekobane (2014). Moreover, there are some studies which indicate an insignificant implication of the rate of exchange on the equity market confirmed by Ali et al. (2010) and Izedonmi and Abdullahi (2011). Based on the above discussion, it can be concluded a positive, negative and an insignificant association amid exchange rate and an equity market.

Umer (2016) examine the influence of macroeconomic variables on equity returns in long and short run. The tests employed include Johannsen Co-integrating, Granger Causality Test, and the correlation. The results indicate a positive association amid the equity market and the supply of money. Similar results are

found in studies of Khan and Khan (2018), Kibria et al. (2014), Naik (2013), Patel (2012), and Ratanapakorn and Sharma (2007). However, in contrary to the above discussion, Sikalao-Lekobane and Lekobane (2014) test whether macroeconomic variables influence price behavior on the equity market of Botswana. For testing purpose, Johansen Co-integration Approach are used. The results indicate supply of money is negatively associated with stock market returns in long run. Moreover, there are some studies where the money supply doesn't have any impact on stock market. Some eminent studies include Khan and Zaman (2012), Gurloveleen and Bhatia (2015), Ullah et al. (2017), and Jamaludin et al. (2017). Based on the above discussion, it can be concluded that there is negative, positive and insignificant association among supply of money and equity market returns.

Chapter 3

Material and Methods

3.1 Data

Investigation is undertaken on secondary data for a period of 2010 to 2020. The macroeconomic variables used as proxies, in the study include stock turnover, exchange rate, global gold price, global silver price, world market index and market return of Pakistan, India, Siri Linka, Bangladesh and China.

The main sources of data include stock exchange of Pakistan (PSX), China Shanghai Stock Exchange (SSE), India Bombay Stock Exchange (BSE), Siri Lanka Colombo Stock Exchange (CSE), Bangladesh Dhaka Stock Exchange (DSE).

3.2 Description of Variables

The aim of the study is to find out the impact of investor sentiments on market returns using macro-economic variables as proxies for five South Asian countries, i.e., Pakistan, India, China, Sri Lanka, and Bangladesh. Only those countries are included whose data has been available at the time of study.

Countries with incomplete financial data are not included in the sample because they cannot serve the research purpose, and all proxies cannot be applied to insufficient data. The sample period is about ten years data from 2010 to 2020, and these formed 2,432 observations.

There are many past studies, which explore the interdependencies between a few variables, and are based on econometric techniques that established the relationship coefficients in examining financial literature. However, measure the effect of this study, we used panel data analysis techniques. These techniques choose as a fixed and random effect model.

3.3 Data Analysis

There are two steps involved in the research process. In the first step an attempt would be made to capture the Investor Sentiment using selected macro-economic proxies in the following manner.

$$ST = \beta 0 + \beta 1\ XRt + \beta 2\ GPt + \beta 3SPt + \beta 4\ WMI + et \qquad (1)$$

Where:

Stock turnover (ST), Exchange rate (XR), Gold price (GP), Silver price (SP), World market index (WMI). Coefficients of B0, B1, B2, B3, and B4, are constant that shows the association between the independent variables and dependent variables.

According to the model this study analyzed the independent variables and measured the future return. The analysis conducted on E views. In the second step it is investigated if the derived Investor Sentiment truly predict the market Return?

$$RMt = \beta 0 + \beta 1\ Sentiment + \beta 2\ Sentimentt\text{-}1 + \beta 3\ Sentimentt\text{-}2 + et \qquad (2)$$

3.4 Description of Variables

3.4.1 Investor Sentiment

This study used Stock Exchange turnover or share turnover as a proxy of investor's sentiments Barberis et al (1998)

Table 3.1: Stock Exchange Turnover

Variable	**Proxy**	**Measured by**
ST	Stock Turnover	NST /TOS
XR	Exchange rate	Rm of Market
GP	Gold Price	Return of Gold Prices
SP	Silver Price	Return of silver prices
WMI	World Market index	return of World market index

3.5 Stock Exchange Turnover ST.

This is the proven truth investment in stock market carries a chance of risk or loss. But on the other hand, it is a good source to generate capital gain as we as net worth for an investor who approached with statistical tools and in well-organized manner. For the knowledge of stock exchange and the mechanism of Stock market there are some basic guidelines for investors.

- Stocks, or shares of a company, represent ownership equity in the firm, which give shareholders voting rights as well as a residual claim on corporate earnings in the form of capital gains and dividends.

- Stock markets are where individual and institutional investors come together to buy and sell shares in a public venue. Nowadays these exchanges exist as electronic marketplaces.

- Share prices are set by supply and demand in the market as buyers and sellers place orders. Order flow and bid-ask spreads are often maintained by specialists or market makers to ensure an orderly and fair market.

Share turnover is a measure of stock liquidity of a specific stock exchange. How many numbers of shares traded in a specific day in a stock exchange? Simple u can

say that total number of shares traded in a single day is equal to Stock exchange turnover. It is calculated by dividing the total number of shares in concern stock exchange traded over a period by the average number of shares outstanding for Specific the period.

$$ST = NST / TOS$$

ST = Stock Turnover or Share turnover.
NST= No of shares trading in a specific day.
TOS= Total outstanding shares

3.6 Market Return

Where RM = Return of the respective countries stock market which is included in this study.

3.7 Exchange Rate (XR)

XR. = Currency Exchange Rate;

An exchange rate index is a way of measuring the performance of a currency against a basket of other currencies.

3.8 Gold Price (GP)

To determine the GP, daily return data of the World Gold Price are used

3.9 Silver Price (SP)

To calculate the SP, daily return data of the Silver Price are used

3.10 Descriptive Statistic

The descriptive statistic provides a summary of all variables according to the following measures mean, median, mode, kurtosis, minimum, maximum, skewness, variances, and Jarque bera. Mean shows the central tendency of the data. Skewness checks positive and negative values. The deviation is used to check the descriptive values, and high volatility shows high descriptive values. Kurtoses check peakedness, and flatness of the data and normality is checked by jarque bera. Negative skewness demonstrates a conveyance with a hilter kilter tail reaching out toward more negative esteems. Positive skewness shows a conveyance with an uneven tail reaching out toward more positive esteems. Kurtosis measure describes the relative peakedness or levelness of a conveyance compared with the normal distribution. Positive kurtosis indicates a relatively peaked distribution, whereas negative kurtosis indicates flatness of data. ADF test is used to check the stationary of data. If data is homoscedastic, then the GARCH model will not be applied to that data, whereas if data is heteroskedastic, then the GARCH model could be applied.

3.11 Correlation Matrix

This test is used to check the relationship between the given variables. The range of correlation is -1 to +1. But it is not a reliable technique because of some limitations.

3.12 Unit Root Test

The unit root test is used to determine whether the data is stationary. The data must be stationary in order to be useful. The Augmented Dickey Fuller (ADF) method is used to ensure that data is stationary. It must have a negative value. Dickey and Fuller created this test (1979). The unit root test is used for evaluating if the time series has the stationary or non-stationary data. In this study, the researcher has used panel data for the study, hence the panel data unit

root is applied using the Levin-Lin-Chu unit root test. Table 1 shows the unit root test in the panel data obtained. The null hypothesis of the unit root test indicates that the panels contain unit root and the alternative hypothesis shows that the panels are stationary. It is indicated from the table elaborated above that the variables are identified to have the P-value of 0.00 which rejects the null hypothesis. Therefore, it is indicated that the panel data shown above does not have the presence of unit root and has stationarity.

3.13 Principal Component Analysis (PCA)

Principal component analysis (PCA) is a multivariate method in which several interconnected quantitative dependent variables describing the observations are analyzed. PCA aims to find and extract the most significant information from the data by compressing the size and simplifying the data without losing the important information (Abdi and Williams 2010). It consists of several steps for conducting the linear transformations of a large number of correlated variables to obtain a comparatively few unrelated elements. In this way, information is clustered together into narrow sets and multicollinearity is eliminated. The principal goal of PCA is to summarize the indicator data through a common set of variables as efficiently as possible.

Chapter 4

Result, Data Analysis and Discussion

The following section of the study intends to present the analysis of the data extracted from different sources to compute the investor sentiment and its association with the stock exchange returns. First, research accumulated the data associated with the South Asian countries regarding the variables: exchange rate, stock prices of each country based on the index, world market index, gold prices, and silver prices.

As detailed in the methodology, the data considered in this research is based on daily frequency from January 2010 to January 2020, and this formed 2,432 observations.

The analysis comprises descriptive statistics, graphical assessment, and construction of the sentiment index using Principal Component Analysis (PCA) primary. Following the structure of the mentioned index, its impact has been tested on the stock return of the South Asian countries, including Pakistan, India, China, Bangladesh, and Sri Lanka.

The effect has been examined using Panel Data Analysis techniques. In this study, The methods that have been chosen are fixed and random effects models. The model has been selected based on the Hausman test. Lastly, a summary of all the results has been presented. Moreover, the analysis has been conducted on EViews.

4.1 Unit Root Test

TABLE 4.1: Levin-Lin-Chu Unit Root Test in Panel Data

Intercept	**P-Value**
Return	87.500.00
Exchange Rate	86.670.00
Gold Prices	83.780.00
Silver	83.780.00
World market index	85.960.00

The unit root test is used for evaluating if the time series has the stationary or non-stationary data. In this study, the researcher has used panel data for the study, hence the panel data unit root is applied using the Levin-Lin-Chu unit root test. This test indicates the presence of the unit root in the panel data which is over different time series and several cross sections as well developing the panel. This test has been indicated to be more suitable for the panel data regression which explains the presence of the stationarity across several time series in the cross-sections.

Table 4.1 shows the unit root test in the panel data obtained. The null hypothesis of the unit root test indicates that the panels contain unit root and the alternative hypothesis shows that the panels are stationary. It is indicated from the table elaborated above that the variables are identified to have the P-value of 0.00 which rejects the null hypothesis. Therefore, it is indicated that the panel data shown above does not have the presence of unit root and has stationarity.

4.2 Descriptive Statistics

Descriptive statistics include categories of variables (numeric, ordinal, intermediate, and proportion) and measurements of frequency, internal consistency, dissipation, and placement, according to Kaur, Stoltzfus, and Yellapu (2018). Descriptive

statistics allow healthcare decision-makers to examine specific populations because they reduce data into a uniform format. Therefore, before researching inferential statistical analysis, the first step should always be to calculate descriptive statistics to describe the relationship between the variables and sample. In order to comprehend the nature of the data based on 10 years, the researcher has computed descriptive statistics for each variable used in this study. As a result, the findings are listed in Table 4.1. According to the findings, the average exchange rate return of South Asian countries is 0.01 percent, with a 0.31 percent deviation.

In addition, the maximum daily exchange rate return is calculated to be 4.35%, whilst the lowest is computed to be -4.02%. Moreover, this variable is positively skewed with a thick tail based on skewness and kurtosis values, respectively. In terms of normality, the statistics of JarqueBera have been presented. The significance of this statistic has also been illustrated in the table. In the context of the exchange rate, the data is found to be non-normal or distribution-free since the sig value is below 5% (p-value$<$ 0.05).

The next variable presented in the following table is gold price returns. It can be inferred from the table that over the years (10 years span), the average daily return on gold prices is 0.02% with a standard deviation of 0.98%, which is higher than the mean showing noise in the data. The maximum daily return in this concern is calculated to be 8.32%, while the minimum return on the gold price is computed to be -7.81%. This further depicts that the range is high while the data is negatively skewed, having a thick tail based on the kurtosis value. In terms of normality, this variable is also computed to be non-normal (p-value$<$ 0.05). Concerning the stock returns based on the stock prices of market indices of the South Asian countries, the results have been presented in Table 1. In terms of average daily stock returns, the value is computed to be 0.04%, whilst the standard deviation is calculated to be 1.25%. The skewness is positive, while the tail of the data distribution of stock returns is thin as the kurtosis value is negative. Moreover, the maximum return is computed to be 13.15%, while the minimum is -11.33%. Regarding the normality of the data, it is found to be non-normal (p-value$<$ 0.05).

In the context of silver, the returns have been computed similarly as computed for other variables. Therefore, the average daily return on silver is 0.01%, while

the deviation is the highest amongst all, with a standard deviation value of 1.72%. The minimum return is computed to be -14.23%, while the maximum daily return is calculated to be 7.13%. This data series is found to be negatively skewed and has a thick tail. The data is furthermore, non-normal (p-value¡ 0.05).

In the perspective of the last variable, this is the World Market Index, where the stock returns based on the world index are computed, the average daily return in 0.10% which is the highest amongst all the variables. Moreover, the standard deviation is even higher, which is 1.68%, and the maximum value is computed to be 14.06%, and the minimum is computed to be -26.83%. This further depicts the high range. In terms of skewness and kurtosis, the data is negatively skewed and has a thick tail. In addition, the data is non-normal (p-value< 0.05).

Table 4.2: Descriptive Statistics

	Exchange Rate	**Gold**	**Stock Returns**	**Silver**	**World Market Index**
Mean	0.01%	0.02%	0.04%	0.01%	0.10%
Maximum	4.85%	8.32%	13.15%	7.13%	14.06%
Minimum	-4.02%	-7.81%	-11.33%	-14.23%	-26.83%
Std. Dev.	0.31%	0.98%	1.25%	1.72%	1.68%
Skewness	0.937	-0.164	-0.083	-0.743	-1.400
Kurtosis	30.945	9.209	12.826	9.675	33.767
Jarque-Bera	397453.20	19587.05	48930.55	23690.90	483598.10
Probability	0.000	0.000	0.000	0.000	0.000

4.3 Graphical Assessment

Since the researcher has considered daily data and indicates that the data vary concerning time, trends have been observed using line plots based on the average data of South Asian countries and other macroeconomic variables. Following the

trend in Figure 4.1, the data is noisy and high fluctuation is observed near January 2015.

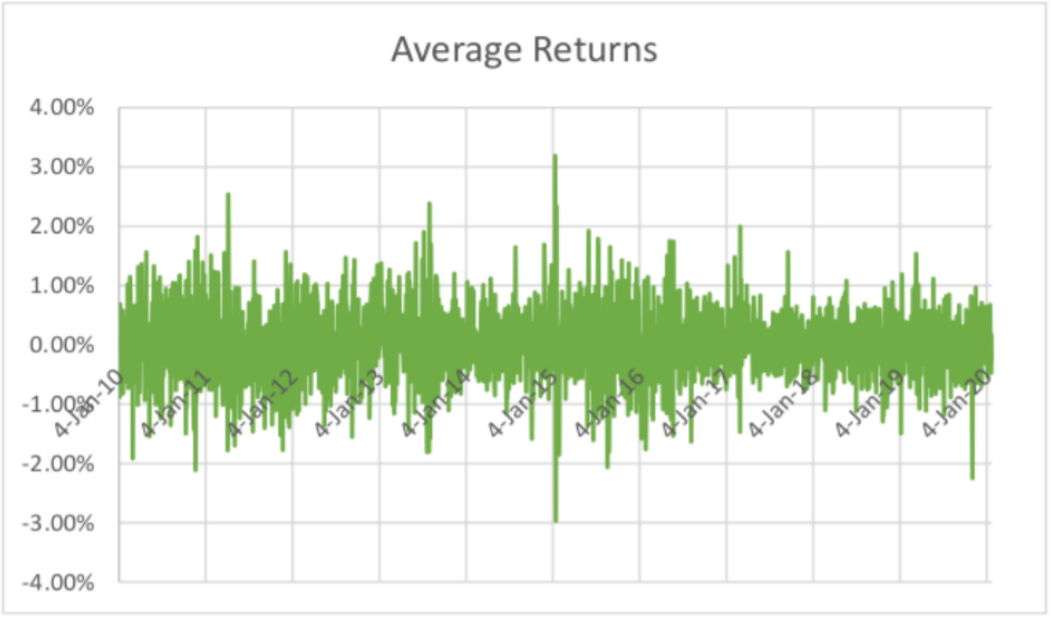

FIGURE 4.1: Average Returns of South Asian Countries' Stock Markets

In the context of the World Market Index, the graph has been presented in Figure 4.2. The noise is relatively less than the average returns of South Asia. This depicts relative consistency; however, near January 2013, a major drop in the returns is visible.

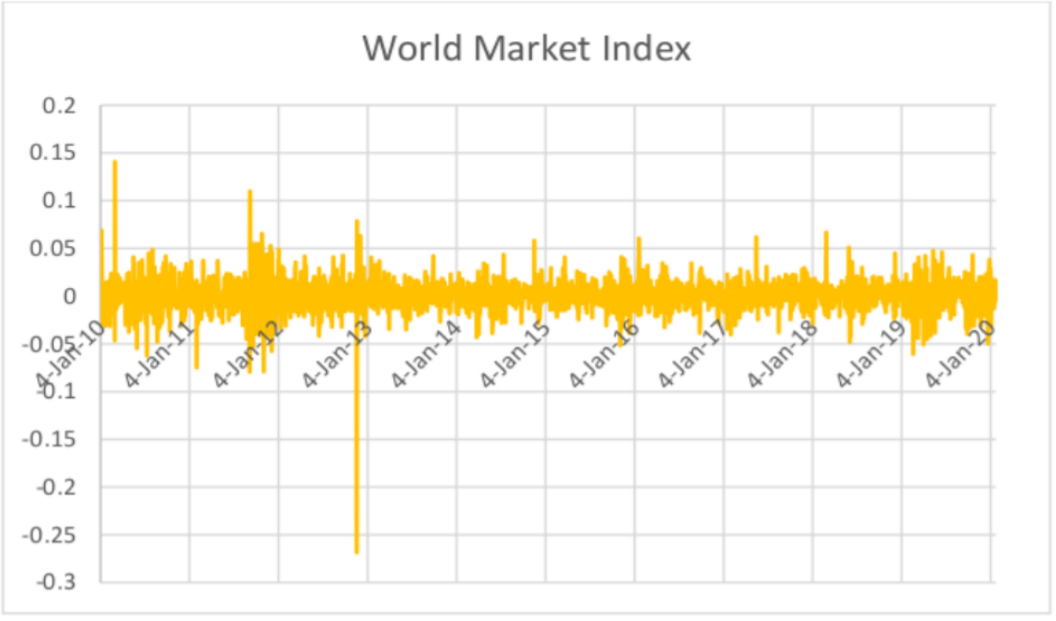

FIGURE 4.2: World Market Index Returns

Figure 4.3. depicts the graph of gold price returns in the context of gold price returns. The data is not as noisy as the stock returns on average shown in the previous figures, as shown in the figure.

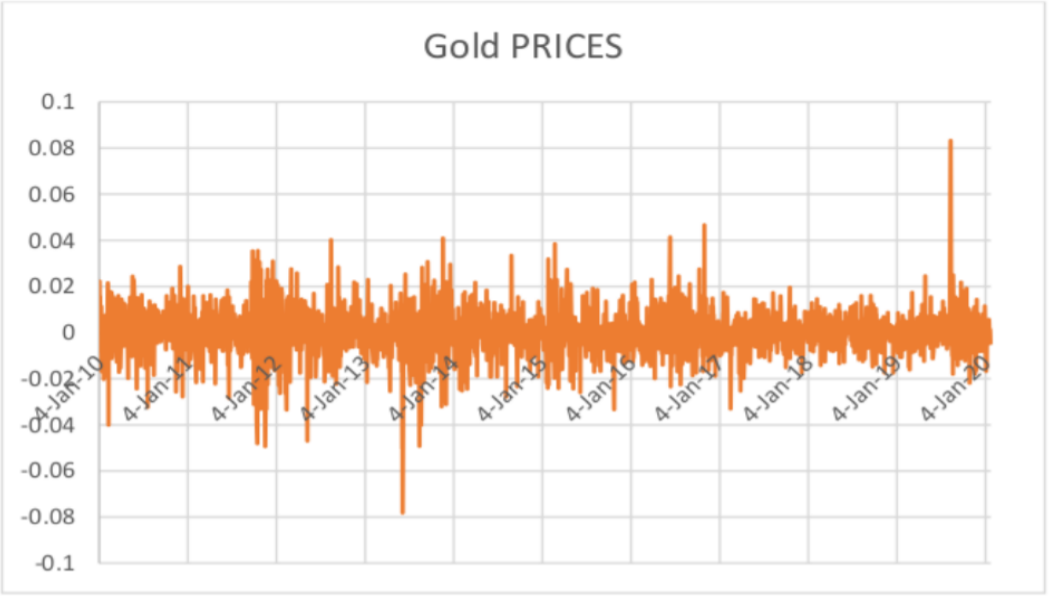

FIGURE 4.3: Returns of Gold

Figure 4.4 presents the graph in the context of exchange rate returns. According to the graph, the fluctuations are large, indicating that the data is noisy. This also shows that, among the macroeconomic variables studied, South Asian stock returns and exchange rates are extremely volatile.

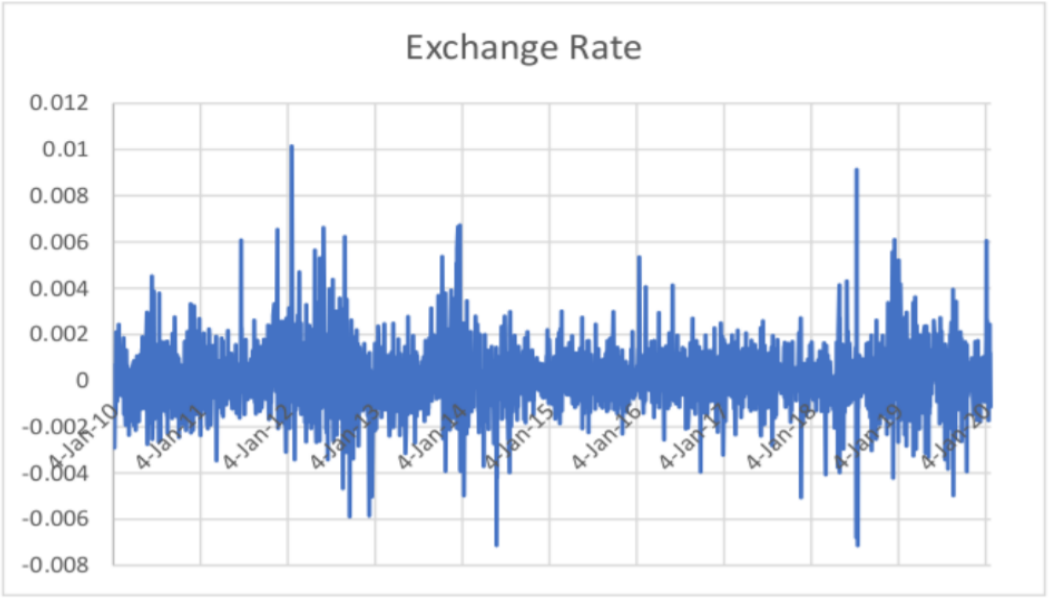

FIGURE 4.4: Exchange Rate Returns

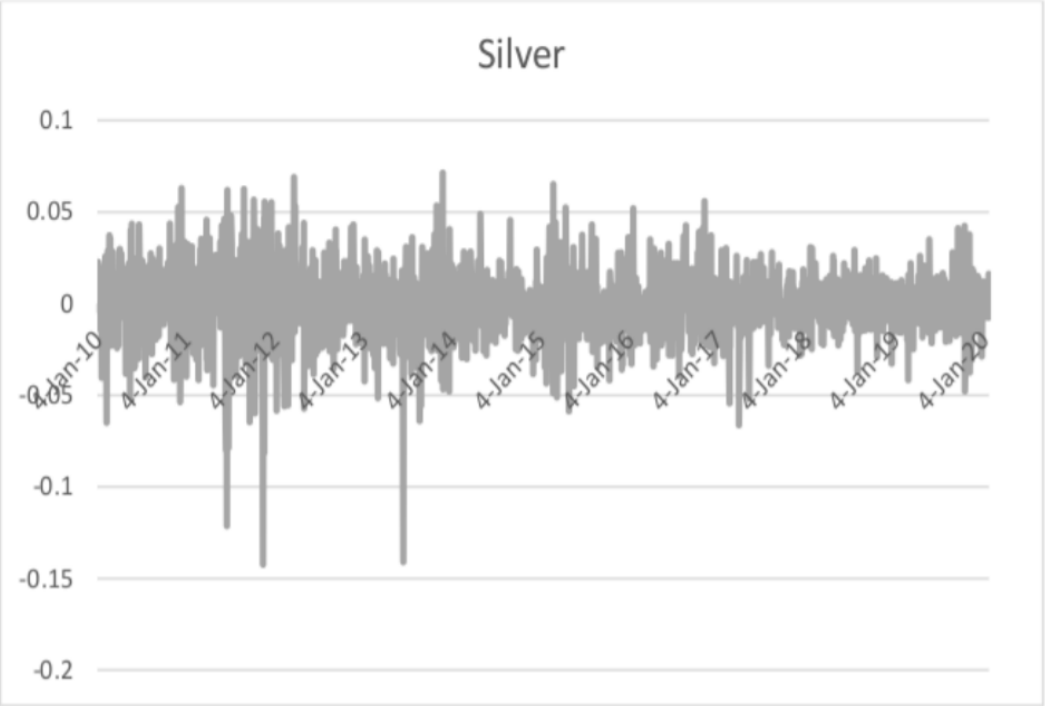

FIGURE 4.5: Silver Returns

Lastly, the returns computed for Silver have been presented in Figure 4.5. It is evident from the figure that the data is highly volatile whilst another commodity which is gold is found to be less volatile in terms of daily returns.

4.4 Construction of Investor Sentiment Index

The principal component with regards to the collection of points in a real p-space is considered as the sequence of direction vectors in which the vector is regarded as the direction of the line which aligns with the data while being orthogonal with regards to the first vectors.

It has been argued in the study of Teng et al. (2019) that the Principal Component Analysis (PCA) is considered as the process of computing the principal components and utilizing them to carry out the change of basis over the data. However, it uses the first few principal components sometimes while ignoring the rest of them. The principal component analysis helps to remove the correlated features along with improving the performance of the algorithm. It has also been stated in the study of Parhizkar, Rafieipour and Parhizkar (2020) that principal component

analysis helps in reduction of the correlated features. In addition to this, it reduces overfitting while improving visualisation.

The study of Khan and Ahmad (2019) has also used the Principal Component Analysis (PCA) for the purpose of measuring the sentiments of investors. Another study of Reis and Pinho (2020) employed the principal component analysis for the purpose of determining the sentiments proxies and their relationship with the stock return. The study of Reis and Pinho (2020) also used the principal component analysis for the purpose of determining the causal relationship between stock returns and sentiment proxies. In order to construct the sentiment analysis, the researcher has used Principal Component Analysis (PCA) which included four major components that are gold price, silver price, market returns and exchange rate of the South Asian countries. The Table 4.2 depicts the Principal Component Analysis (PCA) and on the basis of this Table 4.2, it can be determined that the proportion of exchange rate in the model is 25.9 percent as the proportion value is determined to be 0.259. On the other hand, the proportion of Gold is 25.2 percent in the model as the proportion of Gold was determined to be 0.252.

Table 4.3: Principal Component Analysis

Number	**Value**	**Difference**	**Proportion**	**Cumulative Value**	**Cumulative Proportion**
1	1.036	0.029	0.259	1.036	0.259
2	1.007	0.013	0.252	2.042	0.511
3	0.993	0.029	0.248	3.036	0.759
4	0.964	—	0.241	4.000	1.000

In this manner, the cumulative percentage of Gold and exchange rate was combined to be 51.1 percent. In addition to this, the proportion of silver in the Principal Component Analysis has been determined to be 0.248 which depicts that the proportion of Silver in the model is 24.8 percent. Therefore, the cumulative percentage of the exchange rate, gold and silver combined is 75.9 percent. Moreover, the proportion of World Market Index is determined to be 0.241 which depicts the

proportion of World Market Index in the entire model is 24.1 percent. It posits that the exchange rate is the most contributing variable having a proportion of 25.9 percent.

TABLE 4.4: Correlation Matrix between the Components of the Sentiment Index

	Exchange Rate	**Gold**	**Silver**	**World Market Index**
Exchange Rate	1			
Gold	-0.014	1		
Silver	0.004	0.007	1	
World Market Index	0.008	-0.027	0.016	1

Table 4.3 depicts the correlation matrix among the components of the sentiment index. In this manner, it can be determined from the above Table 3 that exchange rate has no significant association with the Gold as the value of correlation is determined to be -0.014 with the sig value below the threshold of 0.05.

On the other hand, the association of exchange rate with silver is also insignificant as value for correlation is determined to be 0.004 while having sig value below the threshold of 0.05.

In addition to this, the correlation among the exchange rate and world market index is also determined to be insignificant as value for correlation is 0.008 while having the sig value below the threshold of 0.05.

Moreover, the relationship of Gold with the Silver is determined to be insignificant as the correlation value is determined to be 0.007 having sig value below the threshold of 0.05. Additionally, the relationship of Gold with world market index is also insignificant as the value of correlation is determined to be -0.027 with the sig value below the threshold of 0.05.

Furthermore, the relationship of silver with the world market index is determined to be insignificant as the value of correlation is determined to be 0.016 having the sig value below 0.05. It implies that there is no relationship between the variables considered in this study.

4.5 Equation 1: Impact of Different Variables on Stock Turnover

The panel data regression is used in this study for evaluating the first model which explains the impact of the different variables on the stock turnover such as exchange rate, gold prices, silver and world market index. The data includes panel including different time series and panels for obtaining the data. The panel regression has been used by running random and fixed effect model and further testing their suitability using the Hausman Test. The Hausman test is used to detect the endogenous regressors, which help to predict the variables in the regression model. It is due to the reason that the endogenous variables have the values which are recognized by the other variables involved in the system. It has been argued in the study of Mujtaba (2020) that the Hausman test assists in terms of detecting the regressors in the regression model. Therefore, the accuracy of the Hausman test is a significant concern concerning the analysis of panel data (Rahman and Shamsuddin, 2019).

Table 4.5: Equation 1 Results

Returns	**Coef.**	**Std. Err**	**z**	**P**$>|z|$
Exchange rate	-0.02	0.037	-0.53	0.594
Gold prices	0.0023	0.012	-0.37	0.708
Silver	0.0043	0.007	0.00	1
World market index	0.0062	0.007	-0.06	0.952
_cons	0.000	0.000	3.220	0.001

Based on the Hausman test results it is obtained that the preferred model for the regression analysis is random effect model. This model explains that the exchange

rate has insignificant influence on the stock turnover with the P-value of 0.594. This model further elaborates that the gold prices has insignificant impact based on the P-value of 0.708. Silver has also been identified to have the insignificant impact based on the P-value of 1. It is furthermore presented that the world market index tends to have the insignificant influence on the stock returns based on the P-value of 0.952.

4.6 Evaluation of the Impact of Investor Sentiment on the South Asian Stock Market

The Hausman test is used for the purpose of detecting the endogenous regressors which help to predict the variables in the regression model. It is due to the reason that the endogenous variables have the values which are recognised by the other variables involved in the system. It has been argued in the study of Mujtaba (2020) that the Hausman test assists in terms of detecting the regressors in the regression model. The accuracy of the Hausman test is a significant concern with respect to the analysis of panel data. In this manner, the results of the Hausman test indicate that the null hypothesis is over rejected by the Hausman test if it is performed on the basis of its asymptotic critical values.

The following Table 4.4 indicates that the effect of sentiment index and its lags is insignificant on the stock returns showing that investor sentiment does not affect the stock returns. It is due to the reason that the sig value for cross-section random is determined to be 0.964 which is above the threshold of 0.05. Null hypothesis in the Hausman test is the preferred model is the random effect model. While the alternate hypothesis in the Hausman test depicts the model is a fixed effect (Awan et al., 2020).

Since the cross-section random effect is determined to be insignificant therefore the null hypothesis could not be rejected. In this manner, the model that has been chosen is a random effects model which is based on the Hausman test. The null hypothesis of the Hausman test supports that the preferable model is a random-effects model whereas the alternative hypothesis supports the fixed-effects model.

Table 4.6: Hausman Test

Test Summary	**Chi-Sq. Statistic**	**Prob.**
Cross-section random	0.281	0.964

The Table 4.5 depicts the random effect model which is considered in this study. In this manner, it can be determined from the Table 4.5 that the sentiment index is not significant at the level having B= 0.00, p= 0.988> 0.05. It depicts that the current values cannot be used for the purpose of predicting the stock market returns. On the other hand, the sentiment index is also not significant on its first lag as B= 0.00. p= 0.738 > 0.05. It depicts that the previous values also cannot be used for the purpose of predicting the returns of the stock market. Moreover, the sentiment index is also not significant on the second lag as the B= 0.00, p= 0.759> 0.05. It posits that the historical values could also be not used for the purpose of predicting the stock market returns. Overall, it can be stated that the sentiment index could not be used for the purpose of predicting the returns of the stock market. It is due to the reason that random effect model has determined that sentiment index is not significant on either of its lag which shows that sentiment index is not effective for the purpose of predicting the returns in the stock market.

Table 4.7: Random Effects Model

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
SENTIMENT _INDEX	0.0012	0.0037	0.015	0.988
SENTIMENT _INDEX(-1)	0.0039	0.0012	0.334	0.738
SENTIMENT _INDEX(-2)	0.0033	0.007	0.307	0.759
C	0.0044	0.007	2.141	0.032
R-squared	0.002%		F-statistic	0.062

Adjusted R-squared	-0.023%	Prob(F-statistic)	0.980

4.7 Hypothesis Testing

The study has tested several hypothesis developed from the panel regression analysis using different two models. The first model has tested the effect of exchange rate, gold prices, silver prices, and world market index on the stock turnover. The investor's sentiments are also tested to be predicted by the market return in the second model. The hypothesis are tested using the P-values obtained from the regression analysis as provided in the table below.

Table 4.8: Hypothesis Testing

Hypothesis	**Accept or Reject**
H1: Exchange rate has significant influence on the stock turnover	Reject
H2: Gold prices tends to significantly influencing on the stock turnover	Reject
H3: Silver Prices tends to have the significant influence on the stock turnover	Reject
H4: Stock turnover is significantly influenced by the world market index.	Reject
H5: Investors sentiments predicts the market return significantly	Reject

It shows that the hypothesis are not accepted within the provided sample as they have been shown to have the insignificant values. Therefore the hypothesis for the study are rejected as shown in the table above. This shows that exchange rate, gold prices, silver prices and world market index has insignificant relationship with each other. Hence, the hypothesis are rejected. One of the primary reasons

associated with rejection of hypothesis could be the underlying variables that have been used do not define the investors' sentiments as a whole.

4.8 Summary of the Results

Based on the above analysis, it is determined that concerning the principal component analysis, the exchange rate has most of the proportion in the entire model, which is 25.9 percent. In comparison, Gold has the second-highest proportion, which is 25.2 percent of the total model. On the other hand, Silver was determined to contribute 24.8 percent in the entire model, and the world market index had 24.1 percent of the portion in the whole model. On the other hand, Gold has no significant association with the Silver and world market index. Moreover, the relationship of Silver was also not determined to be substantial with the world market index.

The Hausman test determined that the random cross-section effect was not significant as the sig value was determined to be above the threshold of 0.05. In this manner, the null hypothesis of the Hausman test has been failed to reject, which implies that the preferable model is the random-effects model—lastly, concerning the random effect model. It is determined that the sentiment index is not significant at the present level, which shows that the sentiment index could not be used to predict the returns of a stock. On the other hand, the sentiment index was also not significant at the first lag, which depicts that the previous values could not be used to predict the stock market returns. Regarding the effect at second lag, it is determined that there is no significant effect of the sentiment index, which shows that historical values could not be used to predict the returns of the stock market.

4.9 Implications of the Results

The results obtained in this study are computed to be statistically insignificant. One of the primary reasons associated with insignificance could be the underlying variables that have been used do not define the investors' sentiments as a

whole. Another implication in these results is that along with the macro-economic variables, sentiment-specific variables could be included to form the index, which could be beneficial for the computation of the sentiment index. Moreover, another implication that can be drawn from the results is that the absence of the inclusion of control variables has resulted in such insignificant results. Therefore, with the inclusion of control variables, it is anticipated that the association can be made significant. In addition, it can be further stated that this study has used daily data, and it is not as affluent as monthly or quarterly data for the development of the index or explaining the South Asian stock returns. However, as a consequence, it can be inferred that the sentiment index formed based on the macroeconomic determinants does not define the sentiments and neither does it represent the fluctuations in the stock returns of the South Asian countries. Hence, it opens room for further research with the mixture of using both macro-economic and other proxies as the required variables.

4.10 Implications and Policy Recommendation

4.10.1 Implications and Policy Recommendation Pakistan

The macroeconomic variables exchange rate, global gold price, global silver price and world market index are found insignificantly influencing the Pakistani market. According to the principal component analysis (PCA) the exchange rate has most of the proportion in the entire model, which is 25.9 per cent. In contrast, Gold has the second-highest proportion, which is 25.2 per cent of the total model. On the other hand, Silver was determined to contribute 24.8 per cent in the entire model, and the world market index had 24.1 per cent of the portion in the entire model. In addition to this, the correlation analysis determined no significant association of exchange rate with gold, silver and world market index. On the other hand, there is no significant association of Gold with the Silver and world market index. Moreover, the relationship of Silver was also not determined to be significant with the world market index. However, as a consequence, it can be inferred that the sentiment index formed based on the macroeconomic determinants does not define

the sentiments and neither does it represent the fluctuations in the stock return of the Pakistan stock market.

4.10.2 Implications and Policy Recommendation India

The panel data regression is use to evaluating the impact stock turnover on different variables such as exchange rate, gold price, silver price and world market index. The data includes panel including different time series and panels for obtaining the data. The panel regression has been used by running random and fixed effect model and further testing their suitability using the Hausman Test. The Hausman test is used to detect the endogenous regressors, which help to predict the variables in the regression model.

The accuracy of the Hausman test is a significant concern concerning the analysis of panel data. In this manner, the results of the Hausman test indicate that the Hausman test over rejects the null hypothesis if it is performed based on its asymptotic critical values. The results of Hussman test indicates that the significant value for cross-section random is determined to be 0.964, which is above the threshold of 0.05.

Which means that sentiment index and its lags is insignificant on the stock returns showing that investor sentiment does not affect the stock return of India. The study recommended that, this study has used daily data, and it is not as affluent as monthly or quarterly data for the development of the index or explaining the India's stock return.

4.10.3 Implications and Policy Recommendation China

The correlation matrix among the macroeconomic variables such as exchange rate, global gold price, global silver price and world market index determine that the exchange rate has no significant association with the Gold as the value of correlation is determined to be -0.014 with the sig value below the threshold of 0.05.

On the other hand, the association of exchange rate with Silver is also insignificant as the value for correlation is determined to be 0.004 while having a significant

value below the threshold of 0.05. In addition to this, the correlation between the exchange rate and the world market index is also determined to be insignificant as the value for correlation is 0.008. While having the sig value below the threshold of 0.05. Moreover, the relationship of Gold with Silver is determined to be insignificant as the correlation value is determined to be 0.007, having a significant value below the threshold of 0.05.

Additionally, the relationship of Gold with the world market index is also insignificant as the value of correlation is determined to be -0.027 with the sig value below the threshold of 0.05.

Furthermore, the relationship of Silver with the world market index is committed to being insignificant as the value of correlation is determined to be 0.016, having the sig value below 0.05. It implies that there is no relationship between the variables considered in this study.

Correlation table is also reflective of the multicollinearity within the data set for the preliminary analysis of the models. It identifies the occurrence of the higher intercorrelation between the variables. It is identified that the correlation coefficient greater than 0.7 reflects the strong relationship between the variables.

According to the recommendations that along with the macro-economic variables, sentiment-specific variables could be included to form the index, which could be beneficial for the computation of the sentiment index. It is anticipated that the association can be made significant.

4.10.4 Implications and Policy Recommendation Siri Lanka

This study is statistically insignificant. According to the correlation matrix there is no association between the variables. The sentiment index was also not significant at the first lag, which depicts that the previous values could not predict the stock market returns. Concerning the effect at second lag, it is determined that there is no significant effect of the sentiment index, which recommend that historical values could not be used to predict the Siri Lankan stock market's returns.

4.10.5 Implications and Policy Recommendation Bangladesh

The random effect model determines that there is no relationship between investor sentiment and market return. Overall, it can be stated that the sentiment index could not be used for the purpose of predicting the returns of the stock market. It is due to the reason that random effect model has determined that sentiment index is not significant on either of its lag which shows that sentiment index is not effective for the purpose of predicting the returns in the stock market of Bangladesh. The study recommends that the inclusion of control variables, it is anticipated that the association can be made significant to predict the Bangladesh stock market return.

4.11 Organization of Theory

Classic finance theory presents that there is no sentiments for the investors. As per the classical finance theory, investors reacts rationally and diversify for increasing the statistical attributes of their portfolios. The competition among the investors lead to the equilibrium where prices equals the rationally discounted value of the desired cash flows which the cross-section of desired returns be determined through the cross-sections of the risk which is undiversified (Hua and Wang, 2018).

When there are some investors that are irrational, theory of the classical finance presents that their demands would be balanced through arbitrageurs and likely conclusion for the prices would be obtained. The study conducted above has provided with the evidence that sentiments of the investors have the stronger influences on the different cross-sections of the organization's stock (Ahmed and Ullah, 2013).

The study has added to the theory by presenting that the sentiments of the investors are influencing significantly through various stocks of the organizations. Provided that undervalue or overvalue is resultant of the uninformed shocks of demands in the existence of the required arbitrage constraints, a broad-based wave

of the sentiments has been predicted to contain the cross-sectional influences. The study has contribute to the theory and obtained that the cross-sectional influence are not obtained from the wave of the sentiments of the investors.

The theory presents two different mediums by which the stocks of the new, smaller, highly volatile organizations, firms in the distress or with the extreme potential of growth, firms that do not have the dividend and firms that have the similar attributes are expected to be more influenced through the sentiments of the investors. On the other hand, neoclassical finance theory has pointed that there is no evidence for the sentiments of investors.

It has been discussed that the share valuation shows the basic and fundamentals only. From the start of the traditional financial theorists has been ignoring the sentiments as the risk factors or have presumed it away on the groundings that in the perfectly modest financial markets (Ramiah, Xu and Moosa, 2015). This study contributes by stating that the returns are not much linked with the sentiments and agrees with this theory rejecting the prior theory.

4.12 Discussion Regarding Impact of Investor sentiment Macroeconomic variables as proxies on Stock Markets of Selected South Asian Countries

4.12.1 Investor sentiments and Pakistan's stock Market

Random effects model stated that the sentiment index could not be used for the purpose of predicting Pakistan stock market. It is due to the reason is relationship between, exchange rate, global gold price, global silver price, world market index, and stock turnover is insignificant with stock market of Pakistan. The reason of insignificance could be the underlying variables that have been used do not define the investors' sentiments as a whole.

4.12.2 Investor sentiment and India's stock Market

The random effect model also show the insignificant relationship between investor sentiment using macroeconomic variables as proxies are exchange rate, gold price, silver price and world market index with stock market return of India. The reason behind the insignificance these along with the macro-economic variables, sentiment-specific variables could be included to form the index, which could be beneficial for the computation of the sentiment index.

4.12.3 Investor Sentiment and Siri Lankan Stock Market

Random effect model report that there is exist insignificant relationship between investor sentiments and macroeconomic variables on market return of CSE index. The sentiment index was also not significant at the first lag, which depicts that the previous values could not predict the stock market returns. Concerning the effect at second lag, it is determined that there is no significant effect of the sentiment index, which shows that historical values could not be used to predict the Siri Lankan stock market's returns.

4.12.4 Investor Sentiment and Bangladesh Stock market

The random effect model reports that there exists a relationship of investor sentiment with the market return of DSE. The exchange rate has no significant association with the Gold. On the other hand, the association of exchange rate with Silver is also insignificant. In addition to this, the correlation between the exchange rate and the world market index is also determined to be insignificant.

Moreover, the relationship of Gold with Silver is determined to be insignificant. Additionally, the relationship of Gold with the world market index is also insignificant. Furthermore, the relationship of Silver with the world market index is committed to being insignificant as the value of correlation. Therefore, with the inclusion of control variables, it is anticipated that the association can be made significant. In addition, it can be further stated that this study has used daily

data, and it is not as affluent as monthly or quarterly data for the development of the index or explaining the Bangladesh stock market.

4.13 Investor Sentiment and China's Stock Market

The Random effect model reports that there exists insignificant relationship of Stock turnover and market return on the Shanghai stock exchange Index (SSE). The current values cannot be used for the purpose of predicting the stock market returns. Historical values also cannot be used for the purpose of predicting the returns of the stock market of China. This model explains that the exchange rate has insignificant influence on the stock turnover with the P-value of 0.594. This model further elaborates that the gold prices has insignificant impact based on the P-value of 0.708. Silver has also been identified to have the insignificant impact based on the P-value of 1. It is furthermore presented that the world market index tends to have the insignificant influence on the stock returns based on the P-value of 0.952. Therefore, with the inclusion of control variables, it is anticipated that the association can be made significant for stock market of China.

Chapter 5

Summary and Conclusions

The present research purpose is to see the influence of investor sentiment using macroeconomic variables as proxies in south Asian countries on their respective market returns. The countries included for analysis comprise Pakistan, India, China, Bangladesh, and Siri Lanka. The analysis is conducted on Daily data, from the period of 2010 to 2020 were used in this examination. The methodology applied includes Levin-Lin-Chu Unit Root Test in Panel Data obtained. It is indicated that the panel data does not have the presence of unit root and has stationarity. Principal component analysis (PCA) is use to construct the sentiment analysis. The study of khan and Ahmed (2019) used the principal component analysis to measure investor sentiments.

Ries and Pinho (2020) also used principal component analysis (PCA) to determine the relationship between the stock returns and sentiment proxies. This research used principal component analysis (PCA) to measure the investor sentiments, including the four essential components: gold price, silver price, exchange rate, and market return of south Asian countries. According to the results of principal component analysis, the exchange rate is the most contributing variable. According to the correlation analysis, there is no significant relation of the exchange rate with Gold, silver, and the world market index. On the other hand, there is no significant association of Gold with silver and the world market index. The relationship of silver was also not significant with the world market index. For data estimation, two techniques are normally used, one is the fixed-effect model, and the second

is the random effect model in this study selection of models using the Hausman test. According to the Hausman test, the random effects model is appropriate for this study. Finally the random effects model predicted that the overall sentiment index could not be measured by the returns of the stock market.

The reason is that the random effect model determines that the sentiment index is not significant on either of its lag, which shows that the sentiment index is not adequate for measuring the returns in the stock market. The findings of this study are statistically insignificant. There are several reasons for insignificance; the first reason for insignificance could be underlying variables that do not define the investor's sentiment as a whole. The second reason, according to the results, is that along with the macro-economic variables, sentiment-specific variables could be included to form the index, which could be beneficial for the computation of the sentiment index. Moreover, another implication that can be drawn from the results is that the absence of the inclusion of control variables has resulted in such insignificant results. Therefore, with the inclusion of control variables, it is anticipated that the association can be made significant. In addition, it can be further stated that this study has used daily data, and it is not as affluent as monthly or quarterly data for the development of the index or explaining the South Asian stock returns. However, as a consequence, it can be inferred that the sentiment index formed based on the macroeconomic determinants does not define the sentiments, and neither does it describe the fluctuations in the stock returns of the South Asian countries. Hence, it opens room for further research with the mixture of using both macro-economic and other proxies as the required variables.

5.1 Direction for Future Research

The relationship between investor sentiment and market return is provides evidence that further research is required in this domain because macroeconomic indicators of the selected countries report to have insignificant effect on the market returns. Secondly inclusion of more indicators is required to get further generalization of results. Finally conduct a comparative analysis for developed and under

developed countries to observe how macroeconomic indicators behave and effect the stock markets of these countries.

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