THE IMPACT OF INVESTOR SENTIMENTS ON STOCK RETURNS AND VOLATILITY: DO ECONOMIC FORCES AND HERDING BEHAVIOR MATTER?

By

Sana Masood

REG NO: PIDE2017FMSMS02

MASTEROFSCIENCEINMANAGEMENTSCIENCES

(FINANCE)

Supervised by: Dr. Abdul Rashid

Co-Supervisor: Dr. Fazal Husain

DEPARTMENT OF BUSINESS STUDIES

PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS

(2019)

THE IMPACT OF INVESTOR SENTIMENTS ON STOCK RETURNS AND VOLATILITY: DO ECONOMIC FORCES AND HERDING BEHAVIOR MATTER?

By

Sana Masood

REG NO: PIDE2017FMSMS02

MS Scholar

A research thesis submitted to the Department of Management Sciences, Pakistan Institute of Development Economics (PIDE), Islamabad in partial fulfillment of the requirement for the degree of

MASTER OF SCIENCE IN MANAGEMENT SCIENCES

(FINANCE)

DEPARTMENT OF BUSINESS STUDIES

Faculty of Management and Social Sciences

Pakistan Institute of Development Economics Islamabad

2019

Pakistan Institute of Development Economics

CERTIFICATE

This is to certify that this thesis entitled: **"The Impact of Investor Sentiments on Stock Returns and Volatility: Do Economic Forces and Herding Behavior Matter?"** submitted by Ms. Sana Masood is accepted in its present form by the Department of Business Studies, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree of **Master of Science in Management Sciences**.

External Examiner:

Dr. Arshad Hassan
Dean
CUST, Islamabad

Supervisor:

Dr. Abdul Rashid
Associate Professor
IIUI, Islamabad

Co-Supervisor:

Dr. Razal Hussain
Joint Director
PIDE, Islamabad

Head, Department of Business Studies:

Dr. Nadeem Ahmed Khan
Head
Department of Business Studies
PIDE, Islamabad

Dedication

Dedicated from core of my heart to my beloved parents Mr. and Mrs. Muhammad Masood and my dear husband Mr. Umar Mirza.

Acknowledgements

All the praises are for the Allah Almighty; the most beneficent and the most merciful; who granted man with knowledge. All salutations are upon the Prophet (P.B.U.H.) whose teachings enlighten my thought and thrives my ambitions.

I sincerely wish to express my profound gratitude and appreciation to my supervisor Dr. Abdul Rashid for his support in all research activities. Without his help my MS thesis was next to impossible.

I am extremely grateful to my parents Mr. and Mrs. Muhammad Masood and my in-laws. My whole academic career till now would have not been possible without the love and support of my family, who believed in me blindly and they kept me going and were the force behind me.

Thanks to all of you!

Abstract

This study examines the relationship between investor sentiments, stock returns and stock volatility. Herding behavior and macroeconomic forces are also used as explanatory variables in this study. Stock returns and stock volatility are used as dependent variables. The main objectives of this research are to examine the impact of investor sentiments on stock returns and volatility and to analyse the impact of macroeconomic forces and herding behavior on stock returns and volatility. The data of non-financial sector of Pakistan has been collected from 2000 to 2017. Panel quantile regression has been used for determining the relationship among dependent and independent variables of the study. Different quantiles i.e. 0.25, 0.50 and 0.75 are used for desired results. Results of this study suggest that investor sentiments affect stock returns and stock volatility at different quantiles. Macroeconomic forces also affect stock returns and volatility at different quantiles but there is no significant relationship among herding behaviour, stock returns and stock volatility. This research will provide benefit to managers, investors and policy makers to make effectives decisions and policies for future investments.

Keywords: Investor sentiments, Non-financial, Explanatory, Volatility, Macroeconomic forces, Stock volatility, Significant, Policy makers, Investments, Stock returns and Herding

List of Tables

List of Figures

Table of Contents

List of Abbreviations

CAPM	Capital Asset Pricing Model
CPI	Consumer Price Index
CSAD	Cross Sectional Absolute Deviation
CSSD	Cross Sectional Standard Deviation
ER	Exchange rate
GDP	Goss Domestic Product
SHE	Shareholder Equity
Min.	Minimum
Max.	Maximum
TO	Turnover
Std. Dev	Standard Deviation
US	United States
UK	United Kingdom

CHAPTER 1

INTRODUCTION

Behavioral finance theory suggests that behaviour of investors in market can influence the decisions making of investors and hence the trading of stock can be affected in the stock market. Fluctuations in daily trading volume of securities influence the stock prices of securities. Investor sentiments play an important role in under-pricing or overpricing of stocks. If investors are optimistic about the market conditions then there is increase in the expected share prices and hence the return will increase. However if investors are pessimist about market conditions, then the stocks prices will tend to decrease, resulting in the negative returns (Deng, Huang, Sinha & Zhao, 2018). Conventional finance differs from behavioral finance but conventional finance can't be replaced by behavioral finance. Behavioral finance is related to the human psychological patterns and its role in making the financial decisions.

Market efficiency does not fully hold in the markets. The variations that are unexplained in the stock markets are responsible for this inefficiency. Cognitive errors are related with market anomalies. Market anomalies are responsible for influencing the assets trading decision and portfolio management. Incorporation of inefficiency in market can be done through analyzing overreaction, under reaction, overconfidence and mental accounting. Stock markets are inefficient according to past empirical researches. Stock prices keep on deviating from their original values over the period of time. There are several past studies that show the relationship between economic indicators and the stock returns. Economic indicators are GDP, interest rate and inflation rate etc. (Ali, Sun, & Chowdhury, 2018). A study analyzed the relationship between stock returns and investor sentiments. For examining the relationship between investor

sentiments and stock returns, investor confidence index has been used as a proxy for investor sentiments by Oliveira, Cortez and Areal (2013).

Economic forces have a strong impact on the stock returns. Elangkumaran and Jenitta (2014) showed that in Colombo Stock Exchange, there existed a relationship between stock returns and the macroeconomic forces. They found that the stock returns were influenced by GDP with a positive significant correlation among both. They also found that the stock returns were negatively correlated with interest rate. They indicated the positive correlation among GDP and stock returns through multiple regression analysis.

It is assumed to be disruption in the stock market due to presence of herding behavior. This behavior is responsible for market instability. There may be higher fluctuations in volatility due to presence of herding behavior. The valuation of assets can't be done properly with the presence of herding behavior. Diversification is affected with the presence of this type of behavior in market. Investors don't invest in multiple securities and hence maximize the diversification due to presence of higher correlation among the traded securities in market (Economou, Kostakis, & Philippas, 2011).

The concept of complete rationality in an investor's decision no longer prevails in finance today. Behavioral finance supports the view that investors are not fully rational. Behavioral finance also states that markets are not efficient enough due to investor moods and behavior. This research confirms the impact of investor sentiments on stock returns and volatility. Detailed study of investor sentiments and their impact on stock returns indicates that there exists relationship between stock returns and investor sentiments. Herding behavior has also been used as

explanatory variable in this study, while economic forces as explanatory variables also affect stock returns.

1.1 Historical Background

Investor sentiments are behaviors and feelings of investors in the market from which they make decisions for investing in the market. Previous literature has shown that when the investor sentiments are positive then the stock returns will also increase but this relationship does not hold for every security, trading in stock market. For instance, stocks having lower volatility will decrease their stock returns when sentiments increase (Baker & Wurgler, 2007).

Some psychological theories suggest that the risk preferences and an investor's judgment fluctuates with the change in sentiments. During the period of higher sentiments, investors are usually more risk averse and optimistic and vice versa. Both effects of sentiments have different implications for stock returns. Investor sentiments are one of the tools for predicting the future price of stocks. Herding behavior is the behavior in which the individuals mimic the actions of other people. They do what everyone is doing without considering their personal decisions (Banerjee, 1992).

Patterson and Sharma (2007) analyzed that herding behavior is depicted in those cases when most of the investors are investing in the same securities and stocks without their own private information. The time period of their investment is also same in such cases. Bikhchandri and Sharma (2000) explained the difference between the two types of herding. The first type was the "spurious herding" in which the investors come across with the same information sets while the second type of herding is "Intentional Herding" in which the investors intentionally mimic or copy the behaviors of other investors. Government policies and economic conditions of a country

affect the behavior of investors. Some empirical researches in past have shown the negative relationship among stock returns and the inflation rate. The change in the inflation rate will give rise to uncertainty in the market and hence the stock returns will decrease.

Wongbangpo and Sharma (2002) have also examined the negative relationship among the inflation rate and stock prices in their research. Later on some researchers analyzed that there was no negative relationship among stock returns and inflation rate. They concluded that the negative relationship is due to hedging of stock itself over the inflation rate. Trading activities are influenced by the investor sentiments resulting in fluctuation of stock returns in the market (Wu, Liu, & Chen, 2016).

Excessive volatility in stock shows the presence of higher sentiments of investors which results in deviation of stock prices from their core value. This shows that the markets are in-efficient. Researchers have expected that there is the significant and strong impact of investor sentiments on asset prices. They also affect the stock prices. For example, tech bubble crash in 2000 and black Monday in 1987 show the impact of behavioral biases upon future stock returns. There are 3 main types of investors in financial markets. The first type is the rational investors that make their decisions purely on fundamental knowledge for investing in markets. Second type is the emotional investors that take decisions on the basis of their emotions and perceptions. Third types of investors are the noise traders. These types of investors can take random decisions without any logics (Kuzmina, 2010).

Lakonishok Shleifer, and Vishny (1992) and Liao, Huang, and Wu (2010) analyzed that the investor decisions can be determined through sentiments. Sentiments play an important role taking the decisions. Some psychological studies have also shown the importance of sentiments

in decision making. There is a significant relationship sentimental and emotional factors and the decision making process (Schwarz, 2002).

The good and bad memories influence the investor decision making process. Many psychological aspects influence the investor's decision making process not only the facts and information (Shefrin, 2014). The majority of investors in Pakistan are individuals due to which there are too much biases in the decision making of investors. Hence it is important to analyze the sentiment waves. Capitalization on mis-pricing of stock is not possible always because of lack of information and authenticity of the information (Berger & Turtle, 2012).

A research, conducted by Nijam, Ismail, and Musthafa (2015) found the impact on stock returns due to macroeconomic variables. For this purpose, they collected data from 1980 to 2014. They used five macroeconomic variables for conducting the research. These 5 variables included exchange rate, GDP, interest rate, inflation rate measured by consumer price index and balance of payments. They found that the stock returns were positively correlated with exchange rate, GDP and interest rate while stock returns are negatively correlated with inflation rate and balance of payments. The insignificant variable in their study was balance of payments while determining it's impact on stock returns.

A research conducted by Sing (2009) showed the correlation of macroeconomic variables and stock returns in Indian Stock Market. The macroeconomic variables that he used in his study were money supply, industrial production index, wholesale price index, exchange rates and treasury bills. He found that the stock returns were positively correlated with wholesale price index, interest rate and money supply while there was a negative correlation among stock returns and exchange rate and industrial production index. It was also concluded that money supply is

the cause of rise in the share prices not in the short but in the long run. Another study conducted in Kenya by Chirchir (2012), showed the relationship among stock prices and the interest rates. The results of this study showed an insignificant relationship among stock returns and interest rate.

Another researcher Talla (2013) analyzed the relationship between stock market prices and the macroeconomic variables. For this purpose, he gathered data from Stockholm Stock Exchange. The data collected was from 1994 to 2012. It was on monthly basis. He found a negative correlation among stock returns and inflation as well as stock returns and currency depreciation. In the model, the interest rate was insignificant but as a whole it impacted the stock returns in negative way. Money supply was also insignificant in the model yet it impact the stock returns. He applied Granger causality test and fond a unidirectional relationship among stock prices and inflation rate.

1.1.1 Causes of Volatility in Stock Market

The fluctuation in stock market prices cause volatilities in stock prices and this volatility causes changes in the returns of investors in stock market. Price of securities in the market changes on daily basis where buyers and sellers participate daily to decide the value of stocks that they hold. They buy and sell with intension of making returns. If the demand for a stock is more in the market and more buyers are willing to buy that securities than the price of that security will move up and this price changes of the security will determine the security returns hence the volatility in stock market can be determined. Investor decisions are largely get affected by economics factors such as exchange rate, interest rate etc.

Ramanthan and Gopalakrishan (2013) analyzed that there are certain factors that affect the stock return volatility such as economic conditions, demand and supply, psychological factors and inflations etc. various market components as well as non-market components also affect the stock returns. Trading volume is also a cause of stock returns volatility. Information also plays an important role in determining the stock returns, causing returns volatility (Ross, 1989). The persistence in volatility is the significant characteristic of stock volatility.

1.1.2 Herding and Market Evolution

Financial literature says that in the previous years, the stock prices were increased and decreased in an irregular manner. Asymmetric information makes the investors to not invest in those stocks that are most plausible in the long run. But they invest in those stocks that have higher returns in the short run (Akerlof & Shiller, 2009). In finance and economics, it is generally considered to copy or mimic the actions or behaviors of other economic agents for taking decisions. Their decisions are based upon the actions of others. Some researchers have related it to the group of market traders that trade in the same pattern at the same time i.e. investing in same securities. The group of investors, investing in the same securities and their behavior are correlated with each other, usually have the herding impact in their decision making.

Another research showed the boom of the housing market. It was attributed to the behavioral contagion of the agents in the market. Shiller (2007) showed that the agents were optimistic about the boom in the market prices of the housing industry. The imitative behavior spread led the investor of housing industry to abandon their private information. This phenomenon became popular among the CEO's in corporate finance. Later on this phenomenon known as Reputation Phenomenon. It was observed that in bull market, herding behavior was more prominent. This herding behavior resulted in the higher volatility and higher trading volume. Thus herding

behavior triggers the higher volatility in the stock market resulting in the abnormal stock returns in the stock market.

Bikhchandari et al. (1992) examined a positive correlation among the higher returns and stock volatility due to the presence of herding behavior. They applied the herding behavior model to investigate the stock volatility and stock returns. The agents who work in the form of groups usually show herding behavior and hence the results are in higher volatility in stocks.

According to Hwang and Salmon (2004), sometimes herding behavior of investors exist in the stock market that results in the investment in same stocks while some other stock remain untraded. Through this phenomenon, the traded stocks raise their volatility while the untraded stocks have lower volatility. Through this, the overall volatility of stock market in the larger perspective, decreases because the untraded securities of the stock market are more in number as compare to traded securities in the market. The herding behavior may vary from industry to industry due to change in the behavior of investors.

1.1.3 Behavioral Biases

Abnormalities in behavior are called behavioral biases and different type of behavioral abnormalities combine to give rise herding behavior. Prechter (2001) analyzed that in the emotional situation, the system named as limbic system processes fast as compare to the another part known as neocortex in human brain. He also explained in his research that the herding behavior in human beings is inbuilt. This type of behavior can also cause the adverse feelings about a situation or event.

1.2 Gap Analysis

Behavioral biases affect the decision making of investors. Investor sentiments play an important role in determining future stock returns. Impact of investor sentiments on stock returns and volatility should be investigated in Pakistani Stock Exchange to make the rational decisions for investment. Related studies were conducted in Western countries and emerging countries. In Pakistan, there is limited scope of study on chosen topic. A study conducted by Raza, Shahzad, Tiwari, and Shahbaz (2016) examined the relationship between macroeconomic factors and stock returns in Chinese Stock Market. Pakistan Stock Exchange has different dynamics, so it was needed to investigate the relationship among investor sentiments and stock returns in the contextual settings. The decision making is biased in Pakistan because of the reason that mostly investors are individuals. Studies conducted in the past analyzed the impact of sentiments of investors and their trading behavior on returns of the stock market. A study was conducted on Pakistan stock market to find out the stock market return, volatility and the role of investors sentiments on it. Markets sentiments are inclusive thoughts of investors in the direction of a specific security/stock (Tariq & Ullah, 2013). Most of the studies were conducted on the European Stock Markets for analyzing the sentiments of investors and their effect on the stock market. This study analyzes the impact of sentiments of investors on stock returns and volatility of stock in Pakistan Stock Exchange and the impact of herding behavior and economic forces on stock returns and volatility. This study has been conducted in order to address the impact of investor sentiments on stock returns and volatility of stocks, so that the investors make rational decisions in future by considering the impact of macroeconomic forces.

1.3 Problem Statement

It is important to address the impact of investor sentiments on stock returns and volatility for better policy formulations by financial analysts. Pakistan is an emerging economy in which there are different dynamics of Pakistan Stock Exchange. Most of investors in Pakistan are individuals and they mimic the actions of other investors. It is the need of hour to investigate the relationship among investor sentiments and stock returns by adding up some addition explanatory variables i.e. herding behavior and macroeconomic forces. Panel quantile regression can better explain the relationship of dependent and independent variables at different quantiles in this study.

1.4 Objectives

The objectives of this research are as follows:

a. To examine the impact of investor sentiments on stock returns.
b. To analyze the impact of investor sentiments on volatility of stock.
c. To examine the effect of herding behavior and macroeconomic forces on stock returns and volatility.

1.5 Research Questions

Following are the research questions that this thesis is addressing:

- Do investor sentiments impact the stock returns?
- What is the impact of investor sentiments on volatility of stock?
- Whether the herding behavior and economic forces influence stock returns and volatility or not?

1.6 Significance

This study is significant due to its scope in behavioral finance. This study will be quite beneficial for financial analysts to analyze the herding behavior of investors and the impact of herding behavior on stock returns and volatility. It is also an addition to the literature regarding the impact of macroeconomic forces on stock returns and volatility. The study of investor sentiments on stock returns and volatility of stock is one of the most important topics in the understanding of behavioral finance. Herding behavior is the behavior in which investors mimic the behavior of other investors in the market. This study is also addressing the impact of investor sentiments on the future outcomes. Forecasting is widely used by investors as a major source of information for making investment decisions. It creates trouble when the optimal forecasts deviate. Herding behavior is widely being studied because investors mimic the actions or behaviors of other investors to minimize risk factor and hence this behavior leads to suboptimal forecast. Traditional economics and finance reflect that the investment decisions are rational.

This study is showing the importance of investor sentiments and how they impact the stock market returns in Pakistan. This research will be useful for the future purposes because it will serve as a base for analyzing sentiments of investors and how they influence the stock returns and volatility of stocks in Pakistan. The proxies used in this research for measuring the sentiment index are the price to earning ratio, equity share and turnover. This study will add value to the current and potential investors in Pakistan. Pakistan Stock Market is a fluctuating market in which the share prices are kept on changing daily basis depending upon the behavior of investors and some other considerable factors i.e. political factors, socio-economic factors or cultural factor etc. The results of this study show that the investor sentiment impact the stock returns and

volatility at market level. They also get affected by the herding behavior of investors and economic forces of the country.

This study will help the managers for policies and strategies formulation through analyzing investor sentiments, macroeconomic forces and herding behavior. It is subjected to enlighten the policy makers for Pakistan Stock Exchange management and the government. This research will provide an opportunity to the investors of developing countries to analyze the behavioral aspects for investing in the markets. These aspects play an important role in determining the market returns. This research is also beneficial for the managers for decision making activities.

1.7 Plan of the Study

This study is organized in the following manner:

Chapter 1: In this chapter, introduction, background, gap analysis, problem statement, objectives, research questions and significance are discussed.

Chapter 2: This chapter is addressing literature review.

Chapter 3: Data and methodology has been discussed in this chapter with explanation of variables of study.

Chapter 4: This chapter is about results, key findings and discussion.

Chapter 5: It is about conclusion, limitations, future research and policy implications.

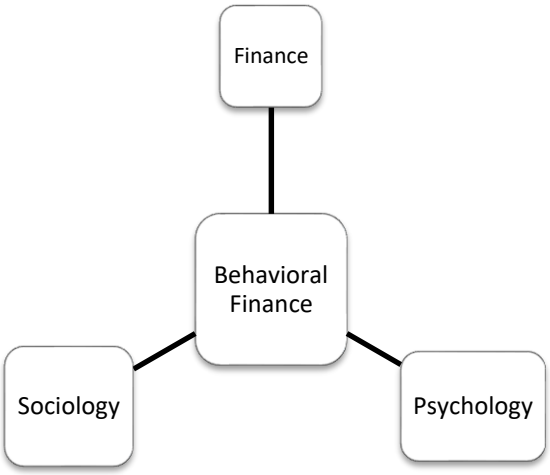
CHAPTER 2

2. 1 THEORETICAL BACKGROUND

2.1.1 Pied Piper Approach or Herding Behavior

Herding behavior is similar to the behavior of animals when they live in the form of groups. They mimic the actions of other without thinking at their own. Herding behavior is considered as the extreme market sentiment of investors (Chang & Lin, 2015). Empirical evidences have shown that people follow the behaviors and actions of others while making decisions. This type of behavior usually occurs when people try to minimize risk factor in their decision. It is known as herding behavior.

Figure 1: Emergence of Behavioral Finance



Ricciard and Simon (2000)

Stability in financial market and market efficiency also depends upon the existence of herding behavior in market. This type of phenomenon is also being widely studied in economics. So the

group decisions are not considered as the rational decisions. It is very general that people follow the behaviors and actions of other people. They ignore their own perceptions and judgements. Herding behavior violates the Efficient Market Hypothesis. This hypothesis states that there exists pure rationality in the market. But the investors depicting the herding behavior while making the investment decisions shows that the investors follow the decision of other investors because they expect the stock prices in the same way because of the reason that all the investors in the market possess same type of securities. Efficient market hypothesis is about the rationality while making decisions (Chang, Cheng, & Khorana, 2000).

2.1.2 Efficient Market Hypothesis

Efficient market hypothesis does not explain the existence of herding behavior in the market. Fama (1970) developed the Efficient Market Hypothesis. According to this hypothesis, most of the people show rationality in their decisions in order to increase the returns and to analyze the available information effectively and efficiently. He also concluded that the actual price of a security in market can determine its intrinsic value. The markets where efficiency is higher incorporate and reflect the true information. Some proponents of this hypothesis also suggested that the people will invest in those securities that are fairly priced rather than over-valued or under-valued securities.

This theory states that prices of stocks reflect true information to the investors for making the investing decisions and hence the investors don't earn the abnormal profits in long run. Their decisions are purely based upon the rationality. Efficiency of market has been explained at 3 major levels. These 3 major levels of market efficiency are strong, semi strong and weak level. In the strong form, it is considered that the stock prices reflect the public and private information for security pricing. Semi-strong form of market efficiency explains the security pricing is done

on public information. In the weak form, the pricing of securities is done purely on the historical or past data.

Technical and fundamental analysis are considered for doing security pricing. There are certain factors upon which Efficient Market Hypothesis Theory is based upon. Two of the most important factors are Arbitrage and rational behavior of investors. Rational behavior of investors means to remain rational while decision making and if someone takes irrational decision then the stock prices will not get affected by the irrational decision. The random behavior of investor will combine to cancel the effect of irrational decision on the stock prices. Most of the previous studies were in the favor of Efficient Market Hypothesis but later on, Behavioral Finance raised many questions on this theory. Some securities that have higher ratio of price to earnings are overpriced from their fair price. Inefficiency of this hypothesis is also supported by earning of securities. The anomaly in the behavior of earning of the securities contradicts this hypothesis that opens a new room to behavioral finance. This term includes sociology as well as some psychology. Behavioral finance opposes the idea of efficient market hypothesis theory.

2.1.3 Classical Financial Theory

According to classical financial theory, the prices of securities in market reflect the true information that is adequate for an investor to invest and all the investors are rational, hence the market is efficient. So there is no remarkable effect of investor sentiments on asset prices. There are many anomalies that have been unexplained with emerging financial markets. Some researchers started to investigate such anomalies and the behavioral finance came into being. Behavioral finance denied the idea of perfect rationality among investors because investors are influenced by their own sentiments and hence they can’t make the perfect decisions. They show biases in their decisions due to their overconfidence or under confidence in the market. There is a

risk factor in the investor sentiments that leads towards the irrational decision making (Fromlet, 2001).

2.1.4 Are all investors rational in their decisions?

According to standard finance theory, it is assumed that the economic agents maximize the utility because they are fully informed. They take decisions on fully rational basis because they are provided with all the necessary information that is needed in making decision for investing activities. Their sentiments don't affect their decisions. A term 'Bounded Rationality' was defined by Simon (1991). He defined this term for choosing the rational decision by considering the cognitive limitation of capacity and knowledge. In behavioral finance, the idea of bounded rationality was extended by many researchers. Mood, behavior and intuition of investors are greatly involved in their decision making and hence they affect the decision making decision consciously or unconsciously. For this reason, those economic agents are not rational in their every decision and hence can't make perfect decision every time.

1. Exogenous Limited Rationality is that when people make rational decisions but they are provided with limited resources such as knowledge, time, information or finance. They are not adequate for making the pure rational decisions. This situation leads them to not make the fully rational decisions.

2. Endogenous Limited Rationality is the rationality that involves unavoidably instincts and psychological characteristics that may lead to errors in decision making. This can also affect the valuation of assets and securities. Some psychological biases such as conservatism, overconfidence or optimistic thoughts can lead towards the irrational decision making.

2.1.5 Basic Theory of Herding Behavior

According to basic theory of herding behavior, people imitate the actions and behaviors of other people without analyzing the consequences of that particular behavior. This is based on Baye's Theorem. According to this theorem, there is two types of information that is available to people. One is the 'Private signal' that people experience in their life at their own while the other type of information is 'Public Information' which is history of actions that were taken by predecessors. Public information also carries the consequences of particular decisions.

There are two foundations that play an important role in behavioral finance according to Boyer et al. (2006). These two foundations are psychology and limited arbitrage. Securities that are mispriced cannot be addressed through limited arbitrage because it tells about the cost and risks. Whereas the behavioral finance addresses the mispricing of stocks through psychology. The reasons behind the financial market collapse can also be addressed through behavioral finance.

Some other researchers suggested that the investors are irrational in their decision making. The presence of such irrational investors makes a bubble collectively; depicting the herding behavior. Irrational behavior develops through social constraints and social conventions. According to Keynes in 1939, the investors are influenced by the social patterns in a society and they mimic the actions of other investors in the time of uncertainty. The forces of supply and demand play an important role stabilizing the prices of securities to an equilibrium level (Jarrow & Protter, 2017).

2.1.6 Behavioral Finance Theory

Behavioral Finance Theory was given by Richard Thaler, a founding father of behavioral finance. This theory tells about the impact of psychology of investors on their decision making.

Investor sentiments influence the markets. This theory argues that investors don't take decision on pure rationality most of the times. Hence the market efficiency does not hold in practical. De Long et al. (1990) created a model that explains the two types of investors. First are the rational investors and second are the irrational investors. The former one is free from sentiments and is arbitrageur. They take decision on their own experiences and cognitive skills. The later one is affected to the sentiments of market. They mimic and copy the actions of other investors in the market without thinking at their own. They also analyzed that the rational investors might face some limitations such as short selling, limited information related to stock prices, limits to arbitrage etc.

2.2 LITERATURE REVIEW

The most debatable topic in behavioral finance of these times is to understand the trading behavior of investors and the effect of the sentiments of investors on risk assets. Some researchers have also analyzed that the returns in the future markets may get affected through the investors sentiments. Javaira and Hassan (2015) found that the hedger's sentiments affect the return of the future markets. Yang and Zhou (2015) used the aggregated buy and sell order on the daily basis as the measure of trading behavior of investor in the China stock market and analyzed its impact on the Chinese stock index.

Karlsson, Loewenstein, and Seppi (2009) researched those investors that are sentiment-driven show aggressive behaviors while trading in the periods of high sentiments and they also actively participate in such period. Daniel and Hirshleifer (2015) analyzed that the asset managers and the individuals behave aggressively in the market even when the low net returns are expected associated with higher level of risk.

Shen, Yu, and Zhao (2017) analyzed the effect of some macro factors and how their pricing affects through the investor's sentiments. They concluded that the firms that experience higher risks have not higher returns in the long runs whereas the firms having the lower sentiments can earn more in the future. Antoniou, Doukas, and Subrahmanyam (2015) examined that during the pessimistic periods, the sentiments of the investors are optimistic in the market due to the higher beta and the higher stock returns in the market. The security market line attached with the capital asset pricing model goes upward in the pessimistic periods of the market. Ramiah, Xu, and Moosa (2015) examined that the market anomalies are the result of the higher risk. Noise traders are also responsible for market anomalies. Noise trading risk was determined through models but they were too mis-specified and restrictive.

Noise traders affect the stock market returns because their decisions are based upon their emotions rather than their rational thinking. Hence their emotions are very important in making the investment decisions in the stock market. Noise traders don't possess any kind of specialized knowledge about investment decisions (Gaser et al., 2009).

Noise traders usually earn the lower returns from the stock market as they don't have adequate knowledge about the stock market. It is also observed that in the longer run, they can also be driven out of the stock market. The stock returns in different stock markets are not same due to the difference in the sentiments of investors. These investor sentiments are one of the reasons in setting up the share prices and hence the stock returns. The capital flow system of the stock market is an important tool for judging the sentiments of investors (Baker et al., 2009).

Another research showed the impact of investor sentiments upon stock returns and volatilities under different states of market. Huiwen (2012) showed that is the noise traders in the market

have misperceptions about the asset pricing then it results in the deviation of the prices of assets from their fundamental value. Some noise traders in the market are optimistic about the stock returns and hence they deviate the stock prices from their fundamental prices little further.

Past researches have used different proxies for calculating and measuring the investor sentiments. Some of them have used Initial Public Offering returns, consumer confidence and trading volume etc. The sensitivity of stocks can be measured through sentiments beta. This beta shows the value of the sentiments through which it can become quite easy to tell whether the stocks are highly sensitive to sentiments or not.

Volatility of stocks is the price fluctuations and the range of change among the prices of securities over a given period of time. The highly volatile securities are those securities that have rapid downfall in their prices as well as the dramatic increase in their prices; in short the price fluctuations are quite visible. The stocks that are highly volatile in their nature are usually more risky as compare to the stocks that are less volatile (Gharbi, Sahut, & Teulon, 2014). All investors don't act in the same due to difference in their sentiments. Herding behavior addresses the trading behavior in collective manner. Individual investors follow the decisions of other investors in order to minimize risk. Some past researches have shown links between the dynamic volatility and herding movement in US stock market (Blasco, Corredor, & Ferreruela, 2012).

Another research conducted by Bialkowski et al. (2012) showed that the stock markets of Muslim countries usually show the higher returns and low volatility during the month of Ramadan. The reason behind this fact was the religious and optimistic beliefs of people that depicted in their investing decisions. Another most important reason is the calendar anomalies

that play a very important role in stocks volatility and stock returns in the different parts of the world.

Another research conducted in Taiwan showed the relationship between the investor sentiments and the stock prices. Yang and Wu (2010) concluded that there exists a sequential relationship between stock prices and investor sentiments. Those market that have higher stock returns in the weekdays are get affected by the days affect such as Saturday effect or Monday effect but the emerging market usually don't get affected by these Day's affect. Some past researches have shown that media is one of the most important factors in affecting the stock returns and stock volatilities. Media is also responsible for fluctuating the share prices in the stock market hence affecting the stock market returns (Tetlock, 2005).

According to classical finance, the calculations that are done on the rational basis estimate the value of stock returns close to their intrinsic value. On the other hand, the noise traders may estimate the value of securities as undervalue or overvalue because they don't make decisions on rational basis (Lahmiri, 2011). In reality, there are many complexities in the stock market and due to these complexities, it is not possible to collect all the sentiments of investors that determine the stock returns.

Da, Engelberg, and Gao (2014) used the search volume of the households of million users on the daily basis to analyze the market level sentiments. They also determined the increase in the volatility on temporary basis. Ni, Wang, and Xue (2015) used panel quantile regression model for determining the relationship between stock returns and investor's sentiments. They found that the stock returns can be predictable through investor sentiments in the markets. They found that the stock could be mispriced through investors sentiments by using the data from Chinese Stock

Market. Merkle (2017) analyzed that the overconfidence in the financial market can result in the least diversification and the higher risk taking by the investors. They used the data of online clients from UK and applied panel least square on their responses to find out the overconfidence measures.

Duxbury (2015) examined that men are 45% overconfident than women in their investment decisions. He used gender as the natural proxy for measuring the overconfident in investment. Overconfidence in the investment decisions can sometimes lead towards the under diversification in the market. He also concluded that at times overconfidence can result in the higher trading volume in the stock market. Guo, Sun, and Qian (2017) collected data of investor sentiments through the user's comments. They concluded that investor sentiments are one of the measures to predict the price of the stock. The situation, when the attention of investor is high then the stock prices can be determined through their sentiments.

Hu, Huang, Chang, and Lin (2015) examined that investors trading strategies and investors trading frequency can be determined through analyzing the investor sentiments in the market. They also determined the relationships between the individual investor's trading behavior how they affect the future returns if they remain unexplored. They used the intraday data from Taiwan stock exchange for determining the relationship between the positive feedbacks trading the investor's sentiments. Sen (2016) examined that the valuation of the stocks can be done through examining the behavior of the investors and the sentiments in the stock market. This research was conducted on the data of the third quarter of the financial year i.e. 2016-2017. He used the common variables such as dividend payout ratio, exchange rate and leverage ratio for the results.

Chari, Hegde-Desai, and Borde (2017) analyzed more aggressive media coverage of the events happening in a country will affect the stock prices and the investor's decision making. The chances of occurrence of the overreaction of the investors in taking decisions are higher in such condition. Kaplanski, Levy, Veld, and Veld-Merkoulova (2015) analyzed that happy and unhappy investors tend to invest equally in the stocks or not. Do they trust on economic facts and figures? They used survey-questionnaire method for finding the return expectation and risk expectations through the subjective surveys. They also examined the investments plans. They supported the Winter's Blue Hypothesis from which they concluded that sufferers may have lower returns in autumn due to seasonal affective disorder.

Kumari and Mahakud (2015) used the non-linear mean variance framework to determine the volatility in Indian Stock Market. An irrational aggregate for sentiment analysis was developed for analyzing the issue in the Indian Stock Market. GARCH model was used by them to capture the lag effect for sentiments. The concluded that stock market volatility is greatly affected by sentiments of investors. It was also concluded that past investor sentiments and past returns have negative and positive impacts on the volatility of stock market. If the sentiments of investors are negative then they will affect the market volatility in positive way.

Uhl, Pedersen, and Malitius (2015) analyzed that how do people think and act in the light of the actual human behavior. In some cases, the trading behavior of investors shows that how people act while the sentiments of investors show that what people think. Over the past few decades, the effect of the behavior factors of the investors and the sentiment factors have become quite obvious. Some studies have conducted the analysis of the effects of sentiments of investors in the developed markets. Recent studies have shown the results that sentiments of investors affect the stock markets of China and Korea through playing the systematic role in investment.

Das, Freybote, and Marcato (2015) suggested that there is the reverse effect of the investor sentiments factors on the contract returns in the future markets. They also found that the future markets are affected in the negative way through the future sentiments of investors for the future returns for 30 days lag. Frugier (2016) examined the stock of 46 companies listed on the European Equity Markets. He analyzed the volatility among the future returns and the market sentiments. He concluded that those portfolios that are managed with the investor sentiments are less risky and more profitable under specific conditions. Vieira and Pereira (2015) discussed the herding behavior in their research work. They collected data from small European markets. They determined the relationship among the investor sentiments and the herding behavior of investors through the results. They applied the causality tests and found that the sentiments are influenced through herding behavior of investor.

Ryu, Kim, and Yang (2017) researched on the Korean stock market in which they analyzed that if the sentiments of the investors in the stock market are higher than the market will increase the stock return of assets. They also analyzed that there is positive relationship between the stock return and the institutional trade. Trading behavior of investors has more effect on the returns of the stocks as compare to the sentiments of the investors.

Tiwari, Bathia, Bouri, and Gupta (2018) applied the casualty tests for determining the sentiments of investors across Asia, Japan and US. They used the monthly data for their analysis. They found that during the extreme financial crisis in the European Market, there were bi-directional spillovers. They findings indicated that the strong sentiments of investors in the time of extreme financial crisis tend to have lower returns. A few researchers have analyzed that the profits later on business sectors may get influenced through the financial specialists' estimations.

Liston (2016) discovered that the hedger's notions influence the arrival of things to come showcases in the genitive manner through week by week information. He had led the exploration on the day by day information and found that financial specialist's future notions influence the profits of things to come markets. They utilized the totaled purchase and sell request on the consistent schedule as the proportion of exchanging conduct of financial specialist the stock market and dissected its effect on the stock list.

Sun, Najand, and Shen (2016) inquired about those financial specialists that are opinion driven show forceful practices while exchanging the securities in security markets and they likewise effectively take an interest in such period. They concluded that the people act forcefully in the market when the low net returns are normal related with more elevated amount of hazard.

Kim and Kim (2014) examined the impact of some large scale factors and how their estimation influences through the financial specialist's assumptions. They inferred that the organizations that experience higher risks have not higher returns in the long runs though the organizations having the lower gains more later on. Da, Engelberg, and Gao (2014) inspected that during the critical periods, the viewpoints of the financial analysts are hopeful in the market because of the higher beta and the higher stock returns in the market. The security market line connected with the capital resource evaluating model goes upward in the critical times of the market. The market inconsistencies are the consequence of the higher risk. The stock returns in various financial exchanges are not same because of the distinction in the estimations of speculators. These speculator assumptions are one reason in setting up the offer costs and subsequently the stock returns. The capital stream arrangement of the securities exchange is a significant device for making a decision about the slants of speculators. (Stambaugh, Yu, & Yuan, 2014). Another

examination demonstrated the effect of speculator suppositions upon stock returns and volatilities under various conditions of market.

Bathia and Bredin (2013) demonstrated that is the brokers in the market have misperceptions about the benefit estimating then it results in the deviation of the costs of advantages from their principal value. Some investors in the market are hopeful about the stock returns and henceforth they go mistaken the stock costs from their essential costs minimal further.

It is hard to figure the investor assumptions and past examines have utilized various intermediaries for ascertaining and estimating the financial specialist notions. Some of them have utilized Initial Public Offering returns, customer certainty and exchanging volume and so on. Corredor, Ferrer, and Santamaria (2013) inspected that the effect of stocks can be estimated through suppositions beta. This beta demonstrates the estimation of the suppositions through which it can turn out to be very simple to tell whether the stocks are exceptionally delicate to conclusions or not.

Siganos, Vagenas-Nanos, and Verwijmeren (2014) demonstrated that the securities exchanges of Muslim nations as a rule demonstrate the higher returns and low instability during the long stretch of Ramadan. The purpose for this reality was the religious and hopeful convictions of individuals that portrayed in their contributing choices. Another most significant reason is the schedule oddities that assume a significant job in stocks unpredictability and stock returns in the various pieces of the world.

Some past studies have showed that media is a standout amongst the most significant factors in influencing the stock returns and stock volatilities. Media is additionally in charge of fluctuating the offer costs in the securities exchange thus influencing the financial exchange returns (Huang,

Jiang, Tu, & Zhou, 2015). As a general perception, there are numerous complexities in the financial markets and because of these complexities, it is absurd to expect to gather every one of the investors that decide the stock returns.

Sentiments of investors are the conduct and the sentiments of financial specialists in the market from which they take decisions for putting resources into the market. Past studies have demonstrated that when the financial specialist assessments are certain then the stock returns will likewise increment. However, this relationship does not hold for each security, exchanging the financial exchange. For example, the stock that have lower instability will diminish their stock returns. Some other hypotheses recommended that the hazard inclinations and financial specialist's decisions vary with the adjustment in suppositions (Dimic, Neudl, Orlov, & Äijö, 2018). During the time of higher returns, financial specialists are typically more hazard unwilling and idealistic and the other way around. The two impacts of opinions have various implications for stock returns. Financial specialist opinions are one of the apparatuses for anticipating the future cost of stocks (He, He, & Wen, 2019).

Herding behavior is common in stock markets in this time. Investors do what everybody is managing without thinking about their own choices. This code of conduct is portrayed in those situations when the greater part of the financial specialists are putting resources into similar stocks and securities without their own private data. The timeframe of their venture is additionally same in such cases. Some researchers have clarified the contrast between the two kinds of herding phenomenon (Clements, Hurn, & Shi, 2017).

Government strategies and financial states of a nation influence the conduct of investors and greatly impact their decision making power. Some studies analyzed the negative relationship

among stock returns and the exchange rate. The adjustment in the exchange rate will offer ascent to vulnerability in the market and consequently the stock returns will diminish.

Liu, Stambaugh, and Yuan (2018) analyzed the negative relationship among the exchange rate and stock costs in their exploration. Later on certain analysts broke down that there was no negative relationship among stock returns and exchange rate. They reasoned that the negative relationship is because of supporting of stock itself over the exchange rate. Exchanging exercises are affected by the financial specialist opinions bringing about variance of stock returns in the market (Apergis, Bonato, Gupta, & Kyei 2018). Unnecessary unpredictability in stock demonstrates the expectation of higher returns of investors which results in deviation of stock returns from their guiding principle. This demonstrates the business sectors are in-proficient (Bali, Hu, & Murray, 2019).

Investors have expected that there is the critical and solid effect of investor estimations on resource costs. They additionally influence the stock costs (Chung & Chuwonganant, 2018). There are 3 main types of investors in stock markets. The main kind is the discerning financial specialists that settle on their choices simply on basic learning for putting resources into business sectors. Second kind is the passionate investors that take choices based on their feelings and discernments. Third kind of financial specialists are the dealers. These kinds of financial specialists can take arbitrary choices with no rationales. It is thought to be interruption in the securities exchange because of the nearness of herding conduct. This conduct is in charge of market insecurity. There might be higher volatility in unpredictability because of quality of herding conduct (Basher, Haug, & Sadorsky, 2018). The valuation of advantages isn't possible appropriately with the nearness of this type of behavior. Change in stock returns and volatility get influenced with this kind of conduct in market. Financial specialists don't put resources into

numerous stocks and augment the enhancement because of quality of higher connection among the exchanged securities and stocks (Bekiros, Jlassi, Lucey, Naoui, & Uddin, 2017).

Gong and Dai (2017) concluded that the investor choices can be resolved through estimations. There is a critical relationship among stock returns and herding behavior. The great recollections impact he investor basic leadership process. Numerous behavioral biases impact the financial specialist's basic leadership process not just the certainties and data. Most of financial specialists in Pakistan are individual investors because of which there are a lot of inclinations in the basic leadership of investors. Consequently it is imperative to dissect the notion waves. Benefiting from mis-estimating of stock is absurd consistently in light of absence of data and reliability of the data and information.

The varieties that are unexplained in the financial exchanges are in charge of this inefficiency of market. Subjective mistakes are connected with market oddities. Market irregularities are in charge of impacting the advantages exchanging choice and portfolio. Consolidation of errors through behavioral biases in market should be possible through breaking down overcompensation and under response (Litimi, BenSaïda, & Bouraoui, 2016).

Market efficiency refers to the degree to which market prices reflect all available, relevant information. If markets are efficient, then all information is already incorporated into prices, and so there is no way to "beat" the market because there are no undervalued or overvalued securities available. This kind of behavior is additionally being generally examined in financial aspects. So the cooperative choices are not considered as the judicious choices. It is widely discussed that individuals pursue the practices and activities of other individuals. They overlook their own recognitions and decisions. Herding conduct damages the Efficient Market Hypothesis. This

theory tells that markets are highly efficient and people can make right decisions due to efficiency of markets. In any case, the financial specialists portraying the herding conduct while settling on the venture choices demonstrates that the investors pursue the choice of different financial specialists since they expect the stock costs similarly in view of the reason that every one of the investors in the market have same sort of stocks and securities in which they have invested. His hypothesis is about the judiciousness while deciding. This theory does not clarify the presence of herding conduct in the market (Balcılar, Demirer, & Ulussever, 2017).

Unpredictability of stocks is the value vacillations and the scope of progress among the costs of securities over a given timeframe. The profoundly unstable securities are those securities that have quick defeat in their costs just as the sensational increment in their costs; in short the value variances are very unmistakable. The stocks that are very unstable in their tendency are typically increasingly unsafe as contrast with the stocks that are less unpredictable. All financial specialists don't act in the equivalent because of distinction in their choices and behaviors. Herding conduct tends to the exchanging conduct aggregate way. Singular financial specialists pursue the choices of different investors so as to limit chance. Some past looks into have demonstrated connections between the dynamic instability and herding development in US financial exchange.

Stock returns assume a significant job in basic leadership of investors. Investors utilize stock returns data in expectations and money related examination since stock returns portray data about market execution. Stock returns are fundamentally the level of changing costs in a given time. So the count of financial exchange unpredictability is vital for settling on choices by members of market. Stock returns are vital for supervisors and investors of an organization. Through breaking down the instability of stock returns, partners can get data about market

patterns of past, present and future. As indicated by past analysts, the stocks that have low instability typically beat than the stocks that have high unpredictability stocks. The returns of organization is great when the instability of its stocks is low. There is high future returns of stocks that show low unpredictability or risk factor.

The uncertainty in stock exchange returns cause volatilities in stock costs and this unpredictability causes changes in the profits of investors in securities exchange. Cost of securities in the market changes on consistent schedule where purchasers and dealers partake day by day to choose the estimation of stocks that they hold. They purchase and sell with intension of making returns. At times the interest of stock is more in the market and more purchasers are happy to purchase that securities than the cost of that security will go up and this value changes of the security will decide the security returns thus the instability in financial exchange can be resolved. Financial specialist choices are to a great extent get influenced by financial matters factors, for example, swapping scale, loan fee and so on.

As indicated by Cremers, Halling, and Weinbaum, (2015), there are sure factors that influence the stock return unpredictability, for example, monetary conditions, demand and supply, behavioral biases and expansions and so forth different market parts just as non-profitable segments likewise influence the stock returns. Risk volume is likewise a reason for stock returns unpredictability. Data additionally assumes a significant impact in deciding the stock returns, causing returns unpredictability. The determination in instability is considered to be normal for stock unpredictability.

Past studies have also shown that the stock returns were expanded and diminished in an unpredictable way. Stock market data makes the investors to not put resources into those stocks

that are most volatile over the longer period. In any case, they put resources into those stocks that have higher returns in the short run. In account and financial aspects, it is commonly considered to duplicate or copy the activities or practices of other stock return activities for taking decisions. Their choices depend on the activities of others. A few financial specialists have related it to the gathering of market dealers that exchange a similar example simultaneously for example putting resources into same securities. The gathering of financial specialists, putting resources into similar securities and their conduct are related with one another, normally have the herding sway in their basic leadership (Benhabib & Spiegel, 2018). Another research demonstrated the crash of stock market. It was ascribed to the social virus of the specialists in the market.

Adam, Marcet, and Nicolini (2016) demonstrated that the specialists were idealistic about the crash in the market costs of the business. The imitative conduct spread drove the investor of manufacturing industry to forsake their private data. This marvel ended up prominent among the CEO's in corporate sector. Later on this marvel known as Reputation Phenomenon.

Financial powers strongly affect the stock returns. A study conducted by (Schmidt et al., 2017) on Colombo Stock Exchange, there existed a connection between stock returns and the macroeconomic powers. They found that the stock returns were affected by interest rate with a positive huge relationship among both. They additionally discovered that the stock returns were adversely related with loan fee. They demonstrated the positive connection among interest rate and stock returns through different analysis.

Zhong (2017) discovered the effect on stock returns because of macroeconomic factors. For this reason, they gathered information from 2001 to 2015. They utilized five macroeconomic factors for leading the exploration. These 5 factors included conversion scale, GDP, financing cost,

expansion rate estimated by purchaser value list and parity of installments. They found that the stock returns were emphatically related with swapping scale, GDP and loan fee while stock returns are contrarily corresponded with swelling rate and equalization of installments. The irrelevant variable in their examination was parity of installments while discovering its effect on stock returns.

Another examination led in Taiwan by Sim and Zhou (2015) demonstrated the relationship among stock costs and the loan fees. The aftereffects of this examination demonstrated an inconsequential relationship among stock returns and loan cost.

Another researcher Haw, Hawton, Gunnell, and Platt (2015) examined the connection between securities exchange costs and the macroeconomic factors. For this reason, he accumulated information from Chinese Stock Exchange. The information gathered was from 2000 to 2014. It was on month to month premise. He found a negative relationship among stock returns and economic forces just as stock returns and money deterioration. In the model, the loan fee was unimportant yet in general it affected the stock returns in negative manner. Cash supply was likewise immaterial in the model yet it sway the stock returns. There are different examinations that has been led on grouping behavior.

Dreger, Kholodilin, Ulbricht, and Fidrmuc (2016) analyzed the mean deviation of profits in securities exchange with the assistance of CSSD (model). Be that as it may, with the utilization of this philosophy, they didn't break down any huge effect of herding or mimicking behavior in American Stock Exchange. Later on, this philosophy was altered so as to get the precise outcomes. This procedure was pertinent on the developing business sector, for example, Asian markets.

Christoffersen and Pan (2018) utilized supreme deviation for estimating herding behavior. Standard deviation was recently utilized by analysts, subsequently they received total deviation for investigating the grouping behavior. The connection between outright market returns and total return deviation was inspected and it was finished up from the outcomes that there exists herding behavior in Taiwan Stock markets. Numerous past studies have utilized market return scattering strategies for breaking down herding behavior and they found the critical changes in stock costs with the nearness of grouping behavior among financial specialists.

Cerutti, Claessens, and Puy (2015) gave the reason that there exists grouping in stock returns during pressure periods in securities exchange. Because of this grouping among stock returns, the connection among the developments of stock costs was appeared in research. They presumed that pressure periods are the aftereffect of quality of grouping behavior of investors in financial exchanges where they don't take choices at their very own yet impersonate the conviction and activities of different financial specialists in market. Later looks into likewise demonstrated that the instability of stock within the sight of grouping behavior of financial specialists is low. The unpredictability of profits for this situation, is known as cross-sectional scattering. Exchanging is another approach to demonstrate the presence of grouping behavior in market.

Blake, Sarno, and Zinna (2017) considered the diverse example of herding under various states of financial exchange. The conditions that they considered for their investigation were exchanging volume and unpredictability. They reasoned that when the market is in 'Blast' condition, mimicking is increasingly noticeable as a result of higher instability is stocks and higher exchanging volume. It is seen that during the administration intercession in securities exchange, numerous individual financial specialists will in general settle on choices for speculation. Therefore, the degree of grouping behavior is higher in such condition. Another

examination led by Indārs, Savin, and Lublóy (2019). It was done for distinguishing the nearness of herding behavior in financial exchanges. They reasoned that there was no nearness of herding behavior in these business sectors. Exchanging examples and style of financial specialists additionally influence the herding behavior. Trough changes in grouping behavior, stock returns additionally vary.

Galariotis, Krokida, and Spyrou (2016) inquired about after exchanging styles of investors. They took reactions of various financial specialists for investigating different exchanging styles. They took information from individual financial specialists of Korean Stock Exchange. They inferred that the positive criticism was very noticeable from individual investors while their exchanging movement demonstrated a negative connection with the stock returns.

As this world is a worldwide town, so the data and information accessible to an investor can likewise effectively be shared through various media, for example, web. A few specialists have additionally demonstrated another purpose behind grouping behavior for example globalization. Generally a few investors don't get data through expensive methods yet they duplicate or copy the activities of different financial specialists through the data that is accessible to them and they do group. In this globalized world, data falls and can be move starting with one individual then onto the next inside no time. A few analysts presumed that in Chinese Stock Markets, herding is non-existent. They considered diverse economic situations to break down herding behavior. Their examinations demonstrated that the financial specialists in these stock trades show deviated behavior. Be that as it may, later on, when the presentation of securities exchange was not well, they dissected the nearness of grouping behavior in market. They additionally discovered that the combination of stock with low turnover is considerably more as contrast with different stocks in securities exchange (Metawa, Hassan, Metawa, & Safa, 2019).

Papapostolou, Pouliasis, and Kyriakou (2017) directed a research after grouping (herding) behavior. For this reason, they investigated Nordic Stock markets. She needed to examine the various states of grouping under various conditions in securities exchange. She reasoned that there exists a noteworthy example of grouping in Norway Stock Exchange however other securities exchanges didn't demonstrate any critical aftereffects of herding behavior. Finland securities exchange investigation demonstrated the nearness of herding in light of the fact that the outcomes were obtained during 2003 to 2012. The information of this financial exchange was orchestrated as sub-bunches as indicated by schedule year. Herding in Nordic nations and European Countries was practically same.

Bouri, Gupta, and Roubaud (2019) examined grouping in Indian Stock Markets. In typical long stretches of exchanging, there was no confirmations of quality of grouping behavior yet in the days when market is performing great, the herding behavior is very obvious and consequently the exchanging action is sure. Another investigation was led on US Stock market for estimating the herding behavior through intraday exchanging exercises. BenSaïda (2017) didn't discover any proof of essence of grouping behavior in US securities exchange at any level.

Some critical outcomes proposed that the development of market demonstrate the grouping behavior and its effect after exchanging action. Subsequently two kind of economic situations were demonstrated for example bear market and positively trending business sector. Be that as it may, there are a few confinements in such kind of market circumstances. Another examination proposed that herding exists in Chinese Stock Market when there is defeat in the stock returns. Financial specialists will in general copy the activities of others to limit hazard and keep away from misfortune (Nardo, Petracco-Giudici, & Naltsidis, 2016). This circumstance was inverse in Indian Stock market, where grouping was delineated when there was ascend in the market. It was

clear from the past looks into that in Asian markets, grouping behavior is very unique and this behavior is uneven when the profits of financial exchange either go down or go up (Blaurock, Schmitt, & Westerhoff, 2018).

Metawa, Hassan, Metawa, and Safa (2019) directed an examination on 13 nations of the world so as to look at the effect of grouping behavior on stock returns. As this examination was directed all in all on 13 nations, so there was no noteworthy effect of herding on stock returns. During their assessment of various parts of 13 nations, they found that grouping exists in oil and gas division, buyer material and essential material. They inspected individual market so as to discover the effect of herding in worldwide markets.

It is clear from past investigates that herding is very obvious in developing markets. Herding behavior is no critical in the created markets, where hazard is least as contrast with developing markets (Ghufran, Awan, Khakwani, & Qureshi, 2016). It was seen that in buyer showcase. Herding conduct was progressively conspicuous. This herding conduct brought about the higher instability and higher exchanging volume. Hence herding conduct triggers the higher unpredictability in the financial exchange bringing about the strange stock returns in the securities exchange. Balcilar, Bouri, Gupta, and Roubaud (2017) analyzed a positive relationship among the higher returns and stock instability because of the nearness of herding conduct. They connected the herding conduct model to research the stock unpredictability and stock returns. The operators who work as gatherings for the most part show herding conduct and consequently the outcomes are in higher unpredictability in stocks.

Sometimes herding conduct of investors exist in the securities exchange that outcomes in the interest in same stocks while some other stock remain untraded. Through this wonder, the

exchanged stocks raise their unpredictability while the untraded stocks have lower instability. Through this, the general instability of financial exchange in the bigger viewpoint, diminishes on the grounds that the untraded securities of the securities exchange are more in number as contrast with exchanged securities the market. The herding conduct may differ from industry to industry because of progress in the conduct of financial specialists (Blasco, Corredor, & Ferreruela, 2017).

Stock returns play an important role in decision making of investors. Investors use stock returns information in predictions and financial analysis because stock returns depict information about market performance. Stock returns are basically the percentage of changing prices in a given time. So the calculation of stock market volatility is of great importance for making decisions by participants of market. Stock Volatility is basically the fluctuations that stocks show in their returns in market (Adjasi, Harvey, & Agyapong, 2008). Volatility of stocks is different for each stock in market. Stock returns are of great importance for managers and investors of a company. After analyzing the volatility of stock returns, stakeholders can get information about market trends of past, present and future. According to past researchers, the stocks that have low volatility usually outperform than the stocks that have high volatility stocks. The performance of company is good when the volatility of its stocks is low. There is high future returns of stocks that exhibit low volatility (Bohl, 2009).

Another research showed that herding behavior occurs infrequently (Cipriani & Guarino, 2005). They also told that herding behavior occurs because the investors try to save their reputation in real market. They analyzed that the investors in the market don't take decision from their private information, they follow the actions and behaviors of other investors in order to save them from

any big loss. Due to this phenomenon, the stock prices in the market reflect the inefficiency of information.

Schmeling (2009) found the relationship between regret aversion and herding behavior. For this relationship, they also considered cognitive factor, conservatism and disposition effect. Conservatism behavior is the behavior in which people follow the other's behavior and old traditions rather than considering the present information. Disposition effect is the response in which investors sell the things on profits avoiding the tax benefits rather than losses.

There are various studies that has been conducted on herding behavior. Christie and Huang (1995) observed the mean deviation of returns in stock market with the help of CSSD (model). But with the use of this methodology, they didn't analyze any significant impact of herding in American Stock Exchange. Later on, this methodology was modified in order to get the accurate results. This methodology was applicable on the emerging market such as Asian markets. Chang et al. (2000) used absolute deviation for measuring herding behavior. Standard deviation was previously used by researchers, hence they adopted absolute deviation for analyzing the herding behavior. The relationship between absolute market returns and absolute return deviation was examined and it was concluded from the results that there exists herding behavior in Taiwan and South Korea Stock markets.

Many past researches have used market return dispersion methods for analyzing herding behavior and they found the significant changes in stock prices with the presence of herding behavior among investors. Christie and Huang (1995) gave the reason that there exists clustering in stock returns during stress periods in stock market. Due to this clustering among stock returns, the correlation among the movements of stock prices was shown in research. They concluded

that stress periods are the result of presence of herding behavior of investors in stock markets in which they don't take decisions at their own but mimic the belief and actions of other investors in market. Later researches also showed that the volatility of stock in the presence of herding behavior of investors is low. The volatility of returns in this case, is known as cross-sectional dispersion.

Trading is another way to show the existence of herding behavior in market. Tan, Mason, and Nelling (2008) studied the different pattern of herding under different conditions of stock market. The conditions that they considered for their study were trading volume and volatility. They concluded that when the market is in 'Boom' condition, herding is more visible because of higher volatility is stocks and higher trading volume. It is observed that during the government intervention in stock market, many individual investors tend to make decisions for investment. For this reason, the level of herding behavior is higher in such condition.

Deminer and Kuttan (2006) carried out for identifying the presence of herding behavior in stock markets. They analyzed two stock exchanges of China i.e. Shenzhen Stock Exchange and Shanghai Stock exchange at sector level. They concluded that there was no presence of herding behavior in these markets. Trading patterns and style of investors also affect the herding behavior. Trough changes in herding behavior, stock returns also fluctuate.

Ulku and Weber (2012) researched upon trading styles of investors. They took responses of different investors for analyzing multiple trading styles. They took data from individual investors of Korean Stock Exchange. They concluded that the positive feedback was quite visible from individual investors while their trading activity showed a negative relation with the stock returns.

As this world is a global village, so the information and data available to an investor can also easily be shared through different media such as internet. Some researchers have also shown another reason for herding behavior i.e. globalization. Usually some investors don't get information through costly means but they copy or mimic the actions of other investors through the information that is available to them and they do herd. In this globalized world, information cascades and can be transfer from one person to another within no time. Some researchers concluded that in Chinese Stock Markets, herding is non-existent. They studied different market conditions to analyze herding behavior. Their studies showed that the investors in these stock exchanges show asymmetric behavior. But later on, when the performance of stock market was not well, they analyzed the presence of herding behavior in market. They also found that the convergence of stock with low turnover is much more as compare to the other stocks in stock market (Fu & Linn, 2010).

Lindhe (2012) conducted a research upon herding behavior. For this purpose, she analyzed Nordic Stock markets. She wanted to analyze the different conditions of herding under different circumstances in stock market. She concluded that there exists a significant pattern of herding in Finland Stock Exchange but other stock markets didn't show any significant results of herding behavior. Finland stock market analysis showed the presence of herding because the results were re-arranged during 2001 to 2005. The data of this stock market was arranged in the form of sub-groups according to calendar year. Herding in Nordic countries and European Countries was almost same.

Prosad, Kapoor, and Sengupta (2000) studied herding in Indian Stock Markets. In normal days of trading, there was no evidences of presence of herding behavior but in the days when market is performing well, the herding behavior is quite visible and hence the trading activity is positive.

Another study was conducted on Australian Stock market for measuring the herding behavior through intraday trading activities.

Henker, Henker, and Mitsios (2006) didn't find any evidence of presence of herding behavior in Australian stock market at any level. As suggested by Mobarek Mollah, and Keasey (2014), European markets show asymmetric behavior of investors during extreme period of crisis.

Some significant results suggested that the movement of market show the herding behavior and its impact upon trading activity. Hence two type of market conditions were indicated i.e. bear market and bull market. But there are some restrictions in such type of market situations. Another research suggested that herding exists in Chinese Stock Market when there is downfall in the stock returns. Investors tend to mimic the actions of others to minimize risk and avoid loss (Lao & Singh, 2010). This situation was opposite in Indian Stock market, where herding was depicted when there was rise in the market. It was evident from the past researches that in Asian markets, herding behavior is quite different and this behavior is asymmetric when the returns of stock market either go down or move up.

Chiang and Zheng (2010) conducted a study on 32 countries of the world in order to examine the impact of herding behavior on stock returns. As this study was conducted as a whole on 32 countries, so there was no significant impact of herding on stock returns. During their examination of different sectors of 32 countries, they found that herding exists in oil and gas sector, consumer material and basic material. They examined individual market in order to find the impact of herding in global markets.

It is evident from past researches that herding is quite visible in emerging markets. Herding behavior is no significant in the developed markets, where risk is minimum as compare to

emerging markets. Emerging markets have some characteristics (Bikhchandani & Sharma, 2000). Some these characteristics are: these markets have poor accounting standards, higher cost of acquiring information, poor regulations and lower level of transparency in such markets. Chang et al. (2000) found similar results in their study of comparison of developed markets with emerging markets. They took US, Hong Kong and Japan as developed market while Taiwan and South Korea as emerging markets. A recent research conducted by using market data from 2000 to 2010 showed the herding behavior exists in Asian Emerging Market mainly China and India too. This research supports the view point of Lao and Singh (2010). Herding phenomenon has been explained in past studies using various techniques, models and methods.

Bikhchandani and Sharma (2000) examined market capitalization and its relations with the tendency of companies to herd. They concluded through their research that smaller stocks have more significant results of presence of herding behavior a compare to larger stocks. Smaller stocks have usually incomplete and lack of proper information and hence the good or bad news affect the larger stocks more quickly. By reviewing previous literature on herding behavior, it is infer that herding is analyzed by different authors through different techniques and models. A research showed herding is basically the inclination that investors show towards selling or buying a stock at the given time and the actions of investors are parallel to the expectations. Through this, the pattern of trading activities was analyzed. Wermers (1999) introduced another method named 'Portfolio-Change Measure'. In this method, the portfolios that investors made for investing activity, were assigned specific weights for measuring herding intensity in each stock. This model has some limitations. One of the limitations is that it gives results based upon spurious herding. Purpose of investigation herding behavior in stock markets is obvious.

Through this, the investors can develop a deep understanding about the behavior of market. Asset pricing in market can also get affected through these type of behaviors.

2.3 Hypotheses Development

Following are 4 hypotheses, formulated for this research based upon research gap:

H_{01} = There is a significant impact of investor sentiments on stock returns.

H_{02} = There is a significant impact of investor sentiments on stock volatility.

H_{03} = There is a significant relationship among economic forces and stock returns and volatility.

H_{04} = There is a significant relationship among herding behavior and stock returns and volatility.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Models

Rashid, Chughtai, and Fayyaz (2017) analyzed the impact of investor sentiments on different industries in Pakistan. They also used economic forces as explanatory variables in their study. They used firm-level data for constructing industry level sentiments. They obtained national sentiments by combining the sentiments of each industry. They also found the impact of sentiments on future stock returns. We have extended their model and constructed 2 models in our study by adding up some additional explanatory variables i.e. herding behavior and macroeconomic forces. In our first model, stock returns of 'i' firms at time 't', is taken as dependent variable while in second model, stock volatility of 'i' firms at time 't' is acting as dependent variable. We have constructed 2 empirical models of our study that are stated as follows:

$$SR_{it} = \beta_0 + \beta_1 SHE_{it} + \beta_2 PE_{it} + \beta_3 TO_{it} + \beta_4 GDP_t + \beta_5 ER_t + \beta_6 CPI_t + \beta_7 CSAD_{it} + \in_{it} \quad (1)$$

where:

SR_{it} is returns of stocks 'i' at time t. SR_{it} is dependent variable in Model (1).

$\beta_0, \beta_1, \ldots\ldots\ldots\ldots \beta_7$ are coefficients.

SHE_{it} is shareholder equity of stock i at time t and is also used for determining the size of firms.

PE_{it} is price-earning ratio of stock i at time t and is used for growth.

TO_{it} is turnover of stock i at time t and is used for liquidity.

GDP_t is gross domestic product of Pakistan at time t

ER_t is exchange rate of Pakistan at time t.

CPI_t is consumer price index (measure of inflation) at time t.

$CSAD_{it}$is cross sectional absolute deviation of stocks i at time t.

All of the above mentioned variables are explanatory variables of Model 1 that come on right hand side of equation. SHE, PE and TO are investor's sentiment proxies while, GDP, ER, CPI are macroeconomic forces used as explanatory variables and CSAD is a measure of herding behavior.

$$SV_{it} = \beta_0 + \beta_1 SHE_{it} + \beta_2 PE_{it} + \beta_3 TO_{it} + \beta_4 GDP_t + \beta_5 ER_t + \beta_6 CPI_t + \beta_7 CSAD_{it} + \in_{it} \quad (2)$$

where:

SV_{it} is stock volatility of stocks i at time t. SV_{it} is dependent variable in model (2).

$\beta_0, \beta_1, \ldots\ldots\ldots\ldots \beta_7$ are coefficients.

SHE_{it} is shareholder equity of stock i at time t.

PE_{it} is price-earning ratio of stock i at time t.

TO_{it} is turnover of stocks i at time t.

GDP_t is gross domestic product of Pakistan at time t

ER_t is exchange rate of Pakistan at time t.

CPI_t is consumer price index (measure of inflation) at time t.

$CSAD_{it}$is cross sectional absolute deviation of stocks i at time t.

SHE, PE and TO are investor's sentiment proxies while, GDP, ER, CPI are macroeconomic forces, used as explanatory variables and CSAD is a measure of herding behavior.

3.2 Estimation Method

Panel quantile regression analysis is used as an alternative approach to other regression methods such as ordinary least square method. Panel quantile regression analysis is not an estimation of regression of a quantile, as the name represents. In this approach, the weighted distances are minimized and weights differently the distances between predicted values of regression line and observed values. We have applied this technique on 3 different quantiles i.e. 0.25, 0.50 and 0.75 quantiles in order to get more precise and accurate results at different levels. We constructed two models for our study and applied panel quantile regression at 3 different levels. We have used unbalanced panel data. Most suitable software for this technique is STATA. Herding behavior has been measured through cross sectional absolute deviation of returns.

3.3 Data and Sample

Data collection was a time taking process for conduction of this research. Stock returns of 457 firms were collected from official website of Pakistan Stock Exchange from 2000 to 2017 on daily basis. Stock volatility has been calculated through stock returns and then whole data was annualized in order to match with other data. Following formula has been applied for volatility:

$$\sigma = \sqrt{\frac{\sum_{i=0}^{n}(r_i - m)\text{^}2}{n-1}}$$

σ = Standard Deviation of stock returns

r_i = Stock Returns

m = Mean of all data points

n = Total Number of days in a year

Economic forces that are used in this research as explanatory variables are exchange rate, gross domestic product (GDP) and consumer price index (CPI). Firm level data of Pakistani firms has been used for analyzing the impact of investor sentiments on stock returns and stock volatility. For measuring the investor sentiment, we have used the firm level financial indicators named; market turnover, price to earning ratio and equity share. The data has been collected from the entire non-financial firm listed in Pakistan Stock Exchange Commission. The time span for our data ranges from 2000-2017. The data on market turnover was collected from the official website of Pakistan Stock Exchange. While the other data such as, shareholder's equity, outstanding shares and long-term debt were collected from Financial Statement Analysis of non-financial firms. STATA has been used for estimating results. Panel Quantile regression at 0.25, 0.50 and 0.75 have been applied in order to get more precise results of regression. The value of R- square is an indication of degree of change in dependent variable due to independent variables. F-test has been used for determining the significance of models at different quantiles. The data used for conducting our analysis is unbalanced panel data.

3.3.1 Stock Returns and Stock Volatility

A researcher named Davis (2001) gave definition of stock returns. According to him, it is the loss or gain on a stock or security that consists of income over the period or the capital gains or dividends on the investment, in the form of percent. Markowitz in 1952 gave theory of stock return behavior. His theory presents a single period model while the investors usually form the portfolio in the start of time. The objective of the investor is to increase the expected returns of portfolio that he forms. Risk and return are measured through variance and standard deviation of portfolio.

Later on, Capital Asset Pricing Model (CAPM) was developed on the basis of Markowitz framework. This models predicts that the securities issued by government is a risk-free security. In this model, it was also suggested to use the Markowitz strategy for forming the portfolios by the investors in order to minimise the risk. The returns in stock market are not same or homogenous. They depend upon the type of security and the market conditions. They may vary from investor to investor. The level of risk, associated with each security is different, so the returns are also different. The returns are subjected to the risk factor in the stock market. When there is convergence of investors towards the same stocks, then the prices of stock may rise or fall drastically by affecting the trading activity of this particular stock. When the herding phenomenon prevails in the markets, the stock are not priced fairly on the fundamentals (Yao, 2010).

Stock returns in this study are calculated through following formula:

$$SR_{it} = \ln[\frac{P_{i,t}}{P_{i,t-1}}] \quad \text{(i)}$$

where:

$SR_{i,t}$ is the return of stocks i at time period t.

$P_{i,t}$ is the closing price of stock i at time period t.

$P_{i,t-1}$ is the closing price of stock i on the previous day, proceeding the current day.

For this study, stock prices from PSX are collected from 2000 to 2017 on daily basis for calculating stock returns on daily basis of listed firms. Stock Volatility has been used as second dependent variable in this study. It is calculated through daily stock returns. We took standard deviation of daily stock returns of listed firms in STATA and then the daily frequency stock volatility has been annualized in order to match it with other annual data.

3.3.2 Sentiment Proxies

There is too much diversity in the concept of investor sentiment so it is difficult to measure it. Many researchers have used different tools to measure the sentiments through indirect and direct ways. They used the direct ways i.e. measuring the moods and beliefs of investors through their mood proxies and surveys. Indirect ways are those ways through which the researcher measures the fluctuations caused by investor sentiments in the equity markets.

a. Many researchers have conducted survey analysis in order to measure the sentiments of investors. Brown and Cliff (2004) also used the investor survey to explain the sentiments of investors. Through this direct survey, investors tend to conceal their actual response and hence the response of each investor may vary from the actual behavior and attitude of the investor. Burghardt (2011) indicated the problems in conducting the surveys. He analyzed the errors that can be raised due to interviewer, questionnaire and interviewee.

At times, the investor cannot understand the question and may answer the question in the wrong way. Investors don't have the accurate perceptions and the expectations about the future market returns. Keeping in mind such errors, they are not able to respond the questionnaire in the proper way.

b. Behavioral finance is the study of behavior and attitude of investors. Volatility premium (Baker, Wurgler, & Yuan, 2012) and liquidity (Baker & Stein, 2004) are very good measures for measuring the investor sentiments. They also measure the prevalence psychological effect in the equity markets. Firm level data have been used for market level variables for quantifying the stock market mania.

Past researchers have shown that the indirect proxies for measuring the investor sentiments capture the expectations of investors related to the future market returns in the equity markets. Mispricing of the stock is generally captured through sentiments.

3.3.3 Construction of Sentiment Indices

Sentiment proxies are affected by the business cycle fluctuations (McLean & Zhao, 2014). 3 of the most important firm level proxies i.e. price to earning ratio, equity share and turnover are used for measuring the investor sentiments. These 3 proxies have been explained in detail as follows:

3.3.3.1 Price-to-earnings Ratio

Price-to-earnings ratio (PE) has been used by Khan and Ahmed (2018) to estimate the sentiment of investors. It tells that to what extent the investors are willing to pay per unit of current earnings and also tells about the future expectations related to company's growth and performance. The higher degree of PE ratio tells the overvaluation of asset pricing and hence a

higher level of sentiment exists in market. Higher the multiple of price to earning ratio, higher will be the enthusiasm of investors for the stock.

When the prices of security is higher as compare to its earnings, then it makes the investment more risky and hence the investors are doubtful about making an investment activity. Some other researches showed that the investors select stocks for investment through price to earning ratio of stocks. Omete (2013) concluded that the investor pay greater attention to PE ratio and found a significant relationship among stock prices and PE ratio. This ratio is calculated with the help of following formula:

$$PE_{it} = \frac{Share\ Price_{it}}{Earning\ per\ share_{it}} \qquad \text{(ii)}$$

Earning per share has calculated through following formula:

$$EPS_{it} = \frac{Earning\ (previous\ 12\ months)}{Outstanding\ shares} \qquad \text{(iii)}$$

Valuation of stock is also done by investor sentiments. It tells the expectations of investors about company's growth. This ratio reveals a relative degree of overvaluation in asset pricing which means existence of higher level of sentiments in market. An increase in price-to-earnings ratio means that the investors are anticipating higher growth in returns in future. This ratio indicates that the dollar amount as per expectation of investor to invest in a firm for receiving one dollar from the company's earnings. Therefore it is considered as a price multiple because it shows the degree of interest to invest in a company.

This ratio also helps the investors to determine the market value of stock in comparison to the company's earnings. Higher P/E ratio indicates that the stock is overvalued and vice versa. Overvaluation of stock is concerned with higher level of sentiments of investors. Hence the

higher degree of P/E ratio depicts the presence of higher level of sentiments in the stock market and the investors are optimistic about the stock returns.

3.3.3.2 Market Turnover

It is the second proxy that has been used for measuring the investor sentiments. It is the total value of trade that takes placed in a period. Usually it is considered as the volume of trade of stocks in the stock market. Higher turnover in the market shows that the investors are optimistic about the future market returns. High Market Turnover indicates the positive attitude of investors in the market and vice versa. The liquidity of stocks is affected by the optimistic and pessimistic behaviors of the investors in the stock market.

$$TURN_{it} = ln\left[\frac{Volume_{it}}{Capitalization_{it}}\right] \quad \text{(iv)}$$

Higher trading volume and higher market liquidity are considered as one of the reasons for overvaluation of the stocks. With short sale constraints, the optimistic investors will actively participate (Finter et al, 2012). If the liquidity is high then the investor will show over reaction of investors that will ultimately result in the over valuation of the stocks. Baker and Wurgler (2012) have used the market turnover ratio for measuring the investor sentiments.

Market Capitalization

It is used for valuation of assets and securities. Psychological biases greatly affect the valuation of securities in the market. When the security in the market is overvalued than it shows the existence of optimistic behavior of investors in the market. But when the security is undervalued, it shows the presence of pessimistic behavior of investors in market. It is one of the most important measurements in determining the returns on investments by the investors. Daily buying and selling of securities give the price fluctuations in the stock returns that create a useful

set of information for making investment decisions. It is usually the representation of public consensus of the equity of a company. According to Efficient Stock Market Theory, it has been concluded that all the relevant information is depicted through stock prices. It represents the total value of the outstanding shares of a company, so its calculation is the most difficult part in valuing the stock.

3.3.3.3 Equity Share

It is defined as the part of financing that is provided by the owners of firms. It is the division of gross equity issuance by the gross long-term issuance plus gross equity. The firms that are overvalued use equity financing to finance their new projects. According to trade-off theory, the firms that are using more leverage and less equity for financing their business activities exhibit the negative growth. Equity is the source behind positive sentiments of investors. The change in the equity share of the firms causes the undervaluation or overvaluation of the firms. The decisions related to issuance of equity have a strong impact on the prices of stocks (Baker and Wurgler, 2004). Variation in the investor sentiments is caused due to variation in the financing decisions. According to capital structure market-timing theory, the participants in the market are overvaluing the equity shares then they will issue more equity shares.

$$SHE_{it} = \frac{Gross\ Equity\ Issuance_{it}}{Gross\ Equity\ Issuance_{it} + Long\ term\ debt_{it}} \quad \text{(v)}$$

3.3.4 Herding

This is used as the explanatory variable in this study. To identify herding behavior, Chang et al., (2000) proposed methodology. Chang et al., (2000) contend that the model that is suggested by Christie and Huang (1995) urges characterizing what is implied by the stock market push. They used CSAD. Christie & Huang (1995) discuss that CSSD captures only extreme market

movements. Many studies discuss that CSAD is much more useful than CSSD in regard to above reason. CSAD condition is demonstrated as follows:

$$CSAD_{it} = \frac{1}{N}\sum_{i=0}^{N} |R_{i,t} - R_{m,t}| \quad \text{(vi)}$$

Cross sectional absolute deviation (CSAD) for 'i' firms on 't' period and expresses the dispersion. $R_{i,t}$ is the return of the firm 'i' on time 't'. $R_{m,t}$ is the average of the cross sectional return of the market portfolio consisting of N shares during the time 't'. If market participants tend to follow aggregate market behavior and ignore their own priors during periods of large average price movements, then the linear and increasing relation between dispersion and market return will no longer hold. Instead, the relation can become non-linearly increasing or even decreasing.

Table 1: Summary of CSAD

Variable	CSAD
Observations	6553
Mean	0.116
Std. Dev.	0.058
Min.	0.000
Max.	0.593

The summary of statistics of cross-sectional absolute deviation has total number of observations i.e. 6553. The positive value of Std. Dev. depicts that there exists herding behavior in Pakistan Stock Exchange.

3.3.5 Economic Forces

Economic forces in this study are acting as the independent variable. We have chosen 3 macroeconomic factors in order to find their impact on the stock returns and volatility. These 3 macroeconomic factors are GDP, CPI (used as a measure for inflation), and exchange rate.

3.3.5.1 Gross Domestic Product

The first indicator is GDP. It is Gross Domestic Product and the sum of the total value of services and goods products by a country during the given time period. The increase in the equity of a firm is an indication that the firm is performing well. When the businesses perform well and use their equity for financing projects rather than the debt financing, it has the positive impact on the country's GDP and it is then expected to grow. Increase in the GDP of a country is the indication of economic stability of the country. Through this condition, the investors also gain confidence to invest in the company and hence the GDP of the company increases. It is one of the factors that influence the stock market prices. The data have been collected from 2000 to 2017 from the official website of World Bank. The highest GDP rate was from 2009 to 2010. There are some political, social, economic as well as other factors to influence the GDP rate.

3.3.5.2 Consumer Price Index

Consumer price index is the measure of inflation in a country. This can impact the stock returns in positive as well as negative manner. It depends upon the ability of the investor to hedge in the stock market. In emerging countries, volatility in the stock returns is much higher as compare to the volatility in stock returns in developed market. It was analyzed that during 1930's, there were severe crisis of inflation and almost every country suffered from the inflation crisis. Actual stock returns minus inflation rate is real stock returns. S&P 500 returns were examined for past few decades and it was concluded that the higher returns were during the period of inflation of 2% to

3%. When there is increase in the inflation rate, the purchase power of people decreases. High inflation rates make the stock least attractive for the people to invest in. in Pakistan, Stock market is the important component of economy. When the demand of a stock increases, the price of stock also increase because more people are willing to buy that particular stock. Change the stock returns reflects the change in the inflation rate. Some studies haven't found any significant relationship among stock returns and inflation rate but some researchers have found a significant relationship. In our study, we have used CPI as a measure of inflation rate. We have used CPI as Independent variable in our study. A research conducted by Mahmood, Nazir, Junid and Javed (2014) showed that during 2008 to 2013, inflation has negatively impacted the stock returns in Pakistan. Data from 2000 to 2017 have been collected for conducting research. In 2000, it was low and gradually it started to increase. It means the inflation stated to increase year by year and in 2017, it was the highest as compare to rest of years.

3.3.5.3 Exchange Rate

A study conducted by Ahmad, Rehman and Raoof (2010), examined the relationship between stock return, interest rate and exchange rates in Pakistani economy. For this, the data of short term interest rate, exchange rate (Rs/US $) and stock market returns (KSE-100) over the period of 1998-2009 was collected. A multiple regression model is applied to test the significance of change in interest rate and exchange on stock returns. The results show that both the change in interest rate and change in exchange rate has a significant impact on stock returns over the sample period. For our research, we have collected data from 2000 to 2017 from official website of World Bank and exchange rate is acting as an independent variable in our study. This exchange rate trend is also increasing in comparison with dollar. 2017 has the higher exchange rate due to increase in inflation rate.

Table 2: Summary of Variables

	Variables	Variable Notion	Measurement
Dependent Variables			
	Stock Returns	SR	$SR_{i,t} = \ln[\frac{P_{i,t}}{P_{i,t-1}}]$
	Stock Volatility	SV	Standard Deviation of $SR_{i,t}$
Independent Variables			
Investor's Sentiments Proxies	Price-to-Earning ratio	PE	$PE_{it} = \frac{Share\ price_{it}}{Earning\ per\ share_{it}}$
	Shareholder's Equity	SHE	$SHE_{it} = \frac{Gross\ Equity\ Issuance_{it}}{Gross\ Equity\ Issuance_{it} + Long\ term\ debt_{it}}$
	Turnover	TO	$TURN_{it} = ln\left[\frac{Volume_{it}}{Capitalization_{it}}\right]$
Economic Forces	Gross Domestic Product	GDP	Gross Domestic Product (GDP) is the monetary value of all finished goods and services made within a country during a specific period
	Inflation	CPI	The CPI measures the average change in prices over time that consumers pay for a basket of goods and services, commonly known as inflation.
	Exchange rate	ER	In finance, an exchange rate is the rate at which one currency will be exchanged for another.
Herding Behavior	Cross-sectional Absolute Deviation	CSAD	$CSAD_t = \frac{1}{N}\sum_{i=1} N\ \|R_{i,t} - R_{m,t}\|$

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Correlation matrix

Correlation matrix shows correlation among the variables of study. This table tells the degree of association among variables, magnitude of association and the negative or positive relation among variables. Following correlation matrix is showing the correlation among dependent variables i.e. Stock Returns (SR) and Stock Volatility (SV) with independent variables i.e. Shareholder's Equity (SHE), Turnover (TO), Price to Earning Ratio (PE), Gross Domestic Product (GDP), Exchange Rate (ER), Consumer Price Index (CPI) and Cross-sectional Absolute Deviation (CSAD). TO and SHE are positively correlated with each other with 0.345. It means if SHE increases, TO will also increase. TO is basically the selling of shares that results in increasing the equity.

SHE is positively correlated with PE with 0.99. TO and PE are also positively correlated with each other. Increase in PE will increase TO for the firm. SHE and SV are negatively correlated with each other. Increase in equity will decrease the volatility of stocks. TO and SV are positively correlated but with a lower magnitude. SHE and SR are positively correlated. Increase in equity will result an increase in the returns. It means that the firm is profitable if its equity is increasing through greater turnover. There exists a negative correlation among SR and TO in the above model. SR and PE are positively related with each other. SHE and GDP are negatively correlated with each other. If GDP increase, SHE will decrease. There exists a positive correlation between GDP and TO. There exists a positive correlation between GDP and PE but the magnitude of this relationship is very low. SV and GDP are positively correlated.

Increase in volatility will increase GDP and vice versa. SR and GDP are negatively correlated with each other. Increase in GDP will decrease the SR for Pakistani firms and vice versa. SHE is positively correlated with ER. TO and ER are negatively correlated with each other. PE and ER are negatively correlated with each other. Volatility of stocks is negatively correlated with ER and vice versa. SR and ER are directly proportional to each other. GDP is indirectly proportional to ER. Increase in ER will decrease the GDP of the country and vice versa.

SHE is positive related with CSAD. This means the herding behavior of investors decreases if equity of the firms increase. Increase in the firm's equity is an indication that the herding behavior in market is decreasing. TO is negatively correlated with CSAD. There exists a negative correlation between PE and CSAD. There correlation between SV and CSAD is also negative. SR is negatively correlated with CSAD. GDP and CSAD are positively correlated with each other. Increase in GDP will increase the herding behavior in the market. ER and CSAD are negatively correlated with each other. This means if ER increases, herding behavior of investors will decrease. CPI and CSAD are negatively correlated with each other.

Following table is reporting the correlation among the variables chosen for this research of Pakistani non-manufacturing sector from the year 2000 to 2018.

Table 3: Correlation Matrix

	SHE	TO	PE	SV	SR	GDP	ER	CPI	CSAD
SHE	1								
TO	0.345	1							
PE	0.9991	0.1688	1						
SV	-0.0992	0.0191	-0.001	1					
SR	0.1076	-0.1419	0.0155	0.0053	1				
GDP	-0.0611	0.0304	0.0088	0.0142	-0.242	1			
ER	0.1466	-0.2112	-0.0002	-0.0095	0.7754	-0.3509	1		
CPI	0.1482	-0.2248	-0.0008	-0.0113	0.7623	-0.3822	0.988	1	
CSAD	-0.0112	-0.0941	-0.0117	-0.0203	-0.0326	0.0102	-0.0219	-0.0234	1

4.2 Descriptive Stats

Table 4: Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max	Obs
SV	0.1082	0.3066	0.0234	3.634	6441
SR	2.0619	1.5281	0.0956	4.781	5876
PE	5.0456	3.4589	3.4531	9.304	5511
TO	0.4184	0.7670	-0.997	3.764	5751
SHE	0.6523	0.4562	0.2043	0.981	5521
ER	78.723	19.211	53.651	106.2	6553
GDP	4.0750	0.9013	2.3723	5.787	6553
CPI	96.267	38.554	51.512	156.91	6553
CSAD	0.0181	0.0163	0.0012	0.0513	6547

Note: In the above table, SV is Stock Volatility, SR is Stock Return, PE is Price to Earning Ratio, TO is Turnover, SHE is Shareholder's Equity, ER is Exchange Rate, GDP is Gross Domestic Product, CPI is Consumer Price Index and CSAD is Cross-sectional Absolute Deviation.

4.3 Panel Quantile Regression

There are some advantages of using panel quantile regression analysis. One of the biggest advantage of using this method is that it allows for understanding relationships between variables outside of the mean of the data, making it useful in understanding outcomes that are non-normally distributed and that have nonlinear relationships with predictor variables. There are other methodological advantages to quantile regression when compared to other methods of segmenting data.

Miyazaki (2019) used panel quantile regression analysis for clarifying the response of gold return to financial indicators. For this purpose, he used different quantiles in order to get precise results. The quantiles that he used in his paper were 0.05, 0.10, 0.25, 0.50, 0.75, 0.90 and 0.95. He obtained different results at each quantile. We have used panel quantile regression analysis in order to determine a precise relationship among variables at different quantiles. We used 3 different quantiles. Due to time constraint, we used these 3 quantiles in order to explain our results in a precise manner.

Quantile regression allows us to identify the impact of investor sentiments on stock returns and stock market volatility in the tails of the distribution. Such relationships were not captured by OLS and robust regressions. One might argue that separate regressions could be run stratifying on different segments of the population according to its unconditional distribution of the dependent variable. Panel quantile regression at 0.25 shows above results for 2 DV's i.e. stock volatility and stock returns. Price to earnings ratio is significant with a probability value of t-stats 0.099 and is significant at 0.10 level in Model 1. Turnover is insignificant in model 1, it means it has no impact on stock returns at 25%. Exchange rate is highly significant because the value of probability of t-stats is 0.000. It is quite evident from past researches that exchange rate influence

the stock prices. As the value of β is 0.551. This means when the exchange rate increase, stock returns will also increase and it is significant at 0.01 significance level. GDP is significant at 0.10 significance level. There is positive significant change in stock returns due to change in GDP. The value of co-efficient or β of GDP in Model 1 is 0.0392. It is evident from past literature that in the long run, corporate earnings or stock returns will increase if there is economic growth or increase in GDP of the country.

Consumer price index (CPI) is the measure of inflation in a country. It is also significant with p-value 0.036 in Model 1. It is positively significant in model 1. CSAD is a measure of herding behavior. It is insignificant in Model 1 at 0.25 quantile. Shareholder's equity (SHE) is significant at 0.25 quantile with p-value 0.000. It is negatively significant with stock returns in Model 1. The value of R square is 42% that means the significant variables in Model 1 are responsible for 42% change in Stock Returns at 0.25 quantile. The value of F-stats for Model 1 at 0.25 quantile is 604.19, which is quite high. It means the null hypothesis is rejected and we accept our alternate hypothesis at 0.25 quantile. The probability value of F-stats is 0.0000 that means Model 1 is significant at 0.25 quantile.

In Model 2, dependent variable is stock volatility. Price to earning ratio is insignificant and it has not impact on stock volatility at 0.25 quantile. Turnover is also insignificant at 0.25 quantile in Model 2 with p-value 0.914. Exchange rate is significant with p-value 0.000 at 0.25 quantile. B of exchange rate in Model 2 is 0.551, it means when the exchange rate increases, stock volatility also increases and vice versa. Literature review showed that the stock show more volatility when the exchange rates are increasing. GDP is also significant but with negative β-value i.e. -0.152. GDP has negative impact on stock volatility. When GDP increases, stocks become less volatile at 0.25 quantile in Model 2 and vice versa. Consumer price index (CPI) has been used as a

measure of inflation in this study. CPI is significant with p-value 0.000 at 0.25 quantile. B-value for CPI is negative, it means CPI is negatively significant at 0.25 quantile in Model 2. If inflation increases, the stocks become less volatile because there exists an indirect relationship among inflation and stock volatility at 0.25 quantile. The value of R-square is 22.9% that means the significant independent variables in Model 2 are responsible for causing 22.9 change in stock volatility at 0.25 quantile. In Model 2, the value of F-stats is 575.59, which is quite high. The probability of F-stats is 0.0000 which means, Model 2 is significant at 0.25 quantile.

Above results are for panel quantile regression at 0.50. In Model 1, price to earning ratio is significant with p-value 0.01. β of PE in Model 1 is 1.32E-05 that indicates a positive value. Hence PE is positively significant in Model 1 at 0.50 quantile. Turnover is also significant in Model 1 at 0.50 quantile with p-value of t-stats 0.002. Co-efficient of turnover is 0.01927. It means that increase in turnover of firms will increase stock returns. P-value of exchange rate is 0.000 which means, it is significant at 0.50 quantile. As β is positive for ER in Model 1, so it indicates a positive correlation between exchange rate and stock returns at 0.50 quantile in Model 1. Increase in exchange rate will also increase stock returns. GDP is also significant as its p-value is 0.000. The sign of coefficient of β is positive in Model 1, it indicates a positive correlation among GDP and stock returns at 0.50 quantile. When GDP of a country increases, then the stock returns also get increase and vice versa. Inflation is also significant in above model measured through CPI. The p-value of CPI is 0.000 which is statistically significant. Negative sign with β indicates a negative correlation with stock returns. When inflation rate of a country increases, then Stock Returns decrease at 0.50 quantile. It is evident from past researches that there is negative relationship between inflation and stock returns. Hyperinflation causes

negative stock returns. The value of probability of t-stats for Cross sectional Absolute Deviation is 0.465 that indicates that herding behavior is insignificant at 0.05 quantile.

Shareholder's equity is significant because its p-value at 0.50 quantile is 0.001. The value of co-efficient is negative that indicates a negative correlation among stock returns and shareholder's equity at 0.50 quantile in Model 1. The value of R-square is 49% which is good. It indicates that the significant variables in Model 1 at 0.05 quantile are responsible for 49 change in stock returns. The value of F-stats for Model 1 at 0.50 quantile is 20921.3, which is quite high. It means the null hypothesis is rejected and we accept our alternate hypothesis at 0.50 quantile. The probability value of F-stats is 0.0000 that means Model 1 is significant at 0.50 quantile.

In model 2, dependent variable is stock volatility. PE ratio is insignificant because p-value of t-stats is 0.998 which is statistically insignificant at 0.50 quantile. Turnover is also insignificant at 0.50 quantile because p-value is 0.998.exchnage rate is significant at this quantile with p-value of t-stats is 0.000. The coefficient of ER is positive that indicates a positive relation with stock volatility. When exchange rate increases, volatility of stock is also increases because they are directly proportional to each other. GDP is also statistically significant at 0.50 quantile with negative coefficient, indicating a negative impact on stock volatility. The situation, when GDP is increasing, then the stock become less volatility at 0.50 quantile as indicated in above table. CPI is also significant at 0.50 quantile but with a negative coefficient sign. This means that when inflation increases, the stocks become less volatile. Herding behavior is insignificant in Model 2 at 0.50 quantile. Shareholder's equity is also insignificant at 0.50 quantile in Model 2 with p-value of t-stats 1.000. The value of R-square in Model 2 is 45% which means the significant IV's in Model 2 at 0.50 quantile are responsible for 45% change in Dependent Variable i.e. stock volatility. The value of F-stats for Model 2 at 0.50 quantile is 3270.19, which is quite high. It

means the null hypothesis is rejected and we accept our alternate hypothesis at 0.50 quantile. The probability value of F-stats is 0.0000 that means Model 2 is significant at 0.50 quantile.

The results of panel quantile regression at 0.75 quantile show that in Model 1, PE ratio is insignificant because the value of probability of t-stats is 1.000. It has no impact on stock returns at 0.75 quantile. Turnover is also insignificant because its p-value is 1.000 which is statistically insignificant and has no impact on stock returns at 0.75 quantile. Exchange rate is significant because p-value of t-stats is 0.098. The sing of β is negative for ER at 0.75 quantile indicating a negative relationship between exchange rate and stock returns in Model 1. GGP is significant because its p-value is 0.000 and the sign of β is positive, indicating a positive correlation among stock returns and GDP. CPI is also significant with p-value 0.000 and negative β sign, indicating a negative correlation among stock returns and inflation. When inflation increases, the stock returns decreases and vice versa. CSAD is insignificant because p-value is 0.456 which is statistically insignificant at 0.75 quantile in model 1. It has no impact on stock returns. SHE is significant because its p-value is 0.001 which is statistically significant with negative β. It indicates when shareholders equity increases, stock returns decrease and vice versa at 0.75 quantile in Model 1. The value of R-square is 34% which means the significant independent variables at 0.75 quantile are responsible for 34% change in stock returns in Model 1. The value of F-stats for Model 1 at 0.75 quantile is 234.99, which is quite high. It means the null hypothesis is rejected and we accept our alternate hypothesis at 0.25 quantile. The probability value of F-stats is 0.0000 that means Model 1 is significant at 0.75 quantile.

In Model 2, price to earning ratio is insignificant because the value p is 0.998. It has no impact on stock volatility at 0.75 quantile. Turnover is also insignificant at 0.75 quantile with p-value 1.000. Exchange rate is significant at 0.75 quantile with p-value 0.000 and with positive sign of

coefficient. This means there exists a positive correlation between volatility and exchange rate at 0.75 quantile. When exchange rate increases, the stock become more volatile at 0.75 quantile. GDP is also significant with p-value 0.000 and the sign of β is negative. It indicates that there exists a negative significant relationship between GDP and stock volatility at 0.75 quantile. CPI is also significant at 0.75 quantile with p-value 0.000 and with negative coefficient sign. This indicates an indirect relationship between inflation and stock volatility. CSAD is insignificant with p-value 1.000 and has no impact on stock volatility at 0.75. Shareholder equity is significant at 0.75 quantile with p-value 0.010 and positive sign of coefficient. Is shareholder's equity increases, the stock become more volatile at 0.75 quantile in Model 2. The value of R-square is quite less as compare to 0.25 quantile and 0.50 quantile.it is 4%, so the significant IV's in Model 2 at 0.75 quantile are responsible for 4% change in stock volatility. The value of F-stats for Model 2 at 0.75 quantile is 45.45, it means the null hypothesis is rejected and we accept our alternate hypothesis at 0.75 quantile. The probability value of F-stats is 0.0000 that means Model 2 is significant at 0.75 quantile.

Table 3: Panel Quantile Regression at 0.25, 0.50 and 0.75 Quantiles

Models	**Model 1**			**Model 2**		
Variables	**SR**			**SV**		
Quantiles	**0.25**	**0.50**	**0.75**	**0.25**	**0.50**	**0.75**
Constant	-3.925	-6.1956	-2.0694	-2.3451	-6.2447	-0.5949
	[-16.82]	[-118.97]	[-5.56]	[-46.60]	[-80.56]	[-1.30]
	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.195)
PE	3.7081	1.3298	1.7392	6.5121	1.1121	-6.7202
	[1.65]	[2.58]	[0.00]	[0.00]	[0.03]	[-0.00]
	(0.099)	(0.010**)	(1.000)	(0.998)	(0.998)	(1.000)
TO	0.0277	0.01972	-3.32167	0.01192	1.48015	1.61014
	[0.97]	[3.08]	[-0.20]	[0.11]	[0.01]	[0.23]
	(0.335)	(0.002**)	(1.000)	(0.914)	(1.000)	(1.000)
ER	0.5512	0.1096	-0.0184	0.2114	0.2799	0.1247
	[7.88]	[64.70]	[-1.65]	[54.43]	[121.00]	[9.10]
	(0.000***)	(0.000***)	(0.098)	(0.000***)	(0.000***)	(0.000***)
GDP	0.03924	0.16139	0.3753	-0.1524	-0.5573	-0.5261
	[1.72]	[31.63]	[10.29]	[-11.16]	[-68.48]	[-10.92]
	(0.086)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)
CPI	0.00749	-0.00692	0.0459	-0.9473	-0.1262	-0.04813
	[2.10]	[-8.70]	[8.07]	[-46.87]	[-104.86]	[-6.75]
	(0.036**)	(0.000***)	(0.000***)	(0.000***)	(0.000***)	(0.000***)
CSAD	-0.8519	-1.9825	-1.5412	-0.238	3.4313	8.0513
	[-0.07]	[-0.73]	[-0.00]	[-0.03]	[-0.03]	[0.00]
	(0.944)	(0.465)	(1.000)	(0.973)	(0.981)	(1.000)
SHE	-1.3309	-8.0610	-6.4822	-4.8011	-5.1922	0.0112
	[-1.18]	[-3.20]	[-0.02]	[-0.05]	[-0.03]	[2.78]
	(0.000***)	(0.001**)	(1.000)	(0.958)	(1.000)	(0.010**)
R2	0.4184	0.4901	0.3366	0.2297	0.4592	0.0400
F-statistics	604.19	20921.3	234.99	575.59	3270.19	45.45
Prob. (F-stats)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note = ***Significant at 0.01 level; **Significant at 0.05 level; *Significant at 0.10 level, ( ) indicates p-value of t-stats while [ ] indicates t-stats.

CHAPTER 5

CONCLUSION

Investor sentiments and economic forces acted as explanatory variable in Model and has significant impact on stock volatility while herding behavior as explanatory variable has insignificant impact on stock volatility. Christie and Huang (1994) identified herding behavior through calculation of Cross-sectional Absolute Deviation (CSAD). Herding behavior has been calculated through this methodology in STATA. Panel Quantile Regression was run at 0.25, 0.50 and 0.75 quantile. Through this, the data was divided into 3 quantiles in order to remove discrepancies from big data set. The data was collected on daily basis of share prices and then volatility was calculated and annualized to merge with other annual data of financial statements. Value of R-square has been reported while reporting regression results in order to sow the degree of variability in dependent variables due to independent variables. This paper had also addressed the existence of herding behavior in Pakistan Stock Exchange. Herding is the behavior, in which investors copy or mimic the actions of other investors in market without considering their own thoughts and information. This approach is also known as pied piper approach. Estimation of results in panel quantile regression at different quantiles have shown that there is no significant impact of herding behavior on stock returns and volatility while literature review have shown its significant impact on stock returns and volatility in some countries such as US, China and Finland.

It is the common view that investors in market mimic other investors in order to avoid risk and uncertainty in markets. During the entire investigation, it is quite clear from results that investor sentiments have a significant impact on stock returns at different quantiles. Pakistan is an

emerging country, so the relationship among stock returns and investor's sentiments is strong and also the relationship among economic forces and the stock return and volatility is significant. Theory of classical finance addresses two main postulates. First postulate is that the financial market are efficient and the information that they provide is efficient for rational decision making while second postulate is that the investors are rational. In classical finance, there is no space for investor sentiments.

Macroeconomic forces play an important role in country's economy. When inflation in a country increases, the price of goods also increases. It affects the stock prices because people tend to buy things more expensive and the stock returns decrease because the demand of stocks decrease. This trend has been seen in many countries in crisis. This is also supported by our results. Shareholder's equity, Price to earning ratio and Turnover have greater impact on stock returns and volatility. All the models at different quantile are significant.

Limitations of the Study

There are several other investor sentiment proxies that are used for measuring the investor sentiments in the past literature such as volatility premium, mutual funds flow etc. but in this study we have chosen 3 most important sentiment proxies that have greater impact on stock returns and volatility as per literature review. There are several other explicit investor sentiment proxies such as surveys, questionnaires and interviews but we have used implicit proxies for our research. There are several macroeconomic variables that impact the stock returns and volatility such as interest rate, industrial production rate etc. but we have chosen 3 of the most important proxies for macroeconomic conditions i.e. GDP, CPI and exchange rate. Despite the hard work and great effort that has been put in this work in analyzing the impact of investor sentiments on stock returns and volatility, the role of economic forces and herding behavior, some other

interesting issues were not being addressed in this thesis due to time constraint and availability of data. It is viable for future researchers to explore the impact of investor sentiments and stock returns for long run. Future research can address the issue that whey stock returns are more prone to investor sentiments and microeconomic as well as macroeconomic forces.

Policy Implication

This research will be quite helpful for future investors and researchers. The most important benefit that they will get from this research is to make effective decisions while investing in stocks. When turnover of a stock is increasing or decreasing then they can predict the change in future stock returns and volatility. If inflation in a country is increasing, then they can infer that the stock prices will decrease in such situation. Economists can also get help from this thesis to develop the sound knowledge about impact of macroeconomic forces on stock returns and volatility. There is a significant impact of macroeconomic forces on stock returns and volatility, so government officials and policy makers should improve macroeconomic conditions in order to get positive impact on stock returns. Baker et. al. (2012) used other indirect sentiments of 6 countries i.e. Germany, US, France, Canada, UK and Japan. Through this research, a sentiment index on global basis cab be made in order to find its impact on other stock markets in the world.

Future Research

This research takes into consideration 3 proxies of investor sentiments due to limited availability of data. Other investor sentiment proxies can be taken for future research in order to draw most purposeful results. Non-manufacturing firms has been considered for this research. In future this research can be done on financial sector for analyzing investor sentiments and their impact on returns of banks. From past literature, it has been analyzed that in emerging countries, the impact of investor sentiments on stock returns and volatility can even be stronger as compare to

developed countries because there is lack of institutional investors in emerging markets. In addition to this research, the relationship between other market anomalies and investor sentiments can be investigated in future. Macroeconomic forces and herding behavior can also be used as controlled or dummy variables while investigating the relationship among stock returns and investor sentiments for future research. It is evident from past literature that in some markets, herding prevails and impacts stock returns but in this research, results have shown that herding prevails in Pakistan Stock Exchange but it does not impact stock returns and volatility of stocks. Few economic forces are taken for carrying out this research and they acted as explanatory variables. But for future research, more macroeconomic forces can be taken for carrying out research. Panel quantile regression can be applied at more precise quantiles in order to get more detailed results at each quantile. Due to time constraint we have applied panel quantile at 0.25, 0.50 and 0.75 quantile in order to get detailed results of regression and R-square. Surveys, questionnaires and interviews can also be conducted in order to get direct response from investors.

REFERENCES

Adam, K., Marcet, A., and Nicolini, J. P. (2016). Stock market volatility and learning. *The Journal of Finance*, 71(1), 33-82.

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

Ahmad, M. I., Rehman, R. U., and Raoof, A. (2010). Do interest rate, exchange rate effect stock returns? A Pakistani perspective. *International Research Journal of Finance and Economics*, 50, 146-150.

Ali, M., Sun, G., & Chowdhury, M. A. A. (2018). Dynamic interaction between macroeconomic fundamentals and stock prices in Bangladesh. *Indonesian Journal of Management and Business Economics*, *1*(1), 66-84.

Antoniou, C., Doukas, J. A., and Subrahmanyam, A. (2015). Investor sentiment, beta, and the cost of equity capital. *Management Science*, 62(2), 347-367.

Apergis, N., Bonato, M., Gupta, R., and Kyei, C. (2018). Does geopolitical risks predict stock returns and volatility of leading defense companies? Evidence from a nonparametric approach. *Defence and Peace Economics*, 29(6), 684-696.

Avramov, D., and Chordia, T. (2006). Asset pricing models and financial market anomalies. *The Review of Financial Studies*, 19(3), 1001-1040.

Arshad, S. (2016). Stock Markets in Islamic Countries: An Inquiry Into Volatility, Efficiency and Integration. *Springer*.

Balcilar, M., Bouri, E., Gupta, R., and Roubaud, D. (2017). Can volume predict Bitcoin returns and volatility? A quantiles-based approach. *Economic Modelling*, 64, 74-81.

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

Baker, M., Wurgler, J., and Yuan, Y. (2012). Global, local, and contagious investor sentiment. *Journal of Financial Economics*, 104(2), 272-287.

Bali, T. G., Hu, J., and Murray, S. (2019). Option implied volatility, skewness, and kurtosis and the cross-section of expected stock returns. Georgetown McDonough School of Business Research Paper.

Balcılar, M., Demirer, R., and Ulussever, T. (2017). Does speculation in the oil market drive investor herding in emerging stock markets?. *Energy Economics*, 65, 50-63.

Bathia, D., and Bredin, D. (2013). An examination of investor sentiment effect on G7 stock market returns. *The European Journal of Finance,* 19(9), 909-937.

Basher, S. A., Haug, A. A., and Sadorsky, P. (2018). The impact of oil-market shocks on stock returns in major oil-exporting countries. *Journal of International Money and Finance*, 86, 264-280.

Bekiros, S., Jlassi, M., Lucey, B., Naoui, K., and Uddin, G. S. (2017). Herding behavior, market sentiment and volatility: Will the bubble resume?. *The North American Journal of Economics and Finance,* 42, 107-131.

Benhabib, J., and Spiegel, M. M. (2018). Sentiments and economic activity: Evidence from US states. *The Economic Journal,* 129(618), 715-733.

BenSaïda, A. (2017). Herding effect on idiosyncratic volatility in US industries. Finance Research Letters, 23, 121-132.

Białkowski, J., Etebari, A., and Wisniewski, T. P. (2012). Fast profits: Investor sentiment and stock returns during Ramadan. *Journal of Banking and Finance*, 36(3), 835-845.

Blake, D., Sarno, L., and Zinna, G. (2017). The market for lemmings: The herding behavior of pension funds. *Journal of Financial Markets*, 36, 17-39.

Berger, D., and Turtle, H. J. (2012). Cross-sectional performance and investor sentiment in a multiple risk factor model. *Journal of Banking and Finance*, 36(4), 1107-1121.

Bikhchandani, S., and Sharma, S. (2000). Herd behavior in financial markets. IMF Staff papers, 47(3), 279-310.

Blasco, N., Corredor, P., and Ferreruela, S. (2017). Herding, Volatility, and Market Stress in the Spanish Stock Market. In Handbook of Investors' Behavior During Financial Crises (pp. 151-168). Academic Press.

Blaurock, I., Schmitt, N., and Westerhoff, F. (2018). Market entry waves and volatility outbursts in stock markets. *Journal of Economic Behavior and Organization*, 153, 19-37.

Bohl, M. T., Brzeszczyński, J., and Wilfling, B. (2009). Institutional investors and stock returns volatility: Empirical evidence from a natural experiment. *Journal of Financial Stability*, 5(2), 170-182.

Boyer, B. H., Kumagai, T., and Yuan, K. (2006). How do crises spread? Evidence from accessible and inaccessible stock indices. *The Journal of Finance*, 61(2), 957 -1003.

Bouri, E., Gupta, R., and Roubaud, D. (2019). Herding behavior in cryptocurrencies. Finance Research Letters, 29, 216-221.

Brown, G. W., and Cliff, M. T. (2004). Investor sentiment and the near-term stock market. *Journal of Empirical Finance*, 11(1), 1-27.

Burghardt, M. (2011). Retail investor sentiment and behavior: an empirical analysis. *Springer Science and Business Media*.

Bruner, R. F., Li, W., Kritzman, M., Myrgren, S., and Page, S. (2008). Market integration in developed and emerging markets: Evidence from the CAPM. *Emerging Markets Review*, 9(2), 89-103.

Cerutti, E., Claessens, S., and Puy, M. D. (2015). Push factors and capital flows to emerging markets: why knowing your lender matters more than fundamentals (No. 15-127). International Monetary Fund.

Chang, E. C., Cheng, J. W., and Khorana, A. (2000). An examination of herd behavior in equity markets: An international perspective. *Journal of Banking and Finance*, 24(10), 1651-1679.

Chang, C. H., and Lin, S. J. (2015). The effects of national culture and behavioral pitfalls on investors' decision-making: Herding behavior in international stock markets. *International Review of Economics and Finance*, 37, 380-392.

Chiang, T. C., and Zheng, D. (2010). An empirical analysis of herd behavior in global stock markets. *Journal of Banking and Finance*, 34(8), 1911-1921.

Chari, S., Hegde-Desai, P., and Borde, N. (2017). A review of literature on short term overreaction generated by news sentiment in stock market.

Christie, W. G., and Huang, R. D. (1995). Following the pied piper: Do individual returns herd around the market?. *Financial Analysts Journal*, 51(4), 31-37.

Christoffersen, P., and Pan, X. N. (2018). Oil volatility risk and expected stock returns. *Journal of Banking and Finance*, 95, 5-26.

Chughtai, S. (2017). The impact of investor sentiment on return of different industries in Pakistan. *NICE Research Journal*, 1-23.

Chung, K. H., and Chuwonganant, C. (2018). Market volatility and stock returns: The role of liquidity providers. *Journal of Financial Markets*, 37, 17-34.

Chirchir, D. (2012). The Relationship between share prices andinterest rates : Evidance from Kenya. kenya: School Of Business, University of Nairobi.

Cipriani, M., and Guarino, A. (2005). Herd behavior in a laboratory financial market. *American Economic Review*, 95(5), 1427-1443.

Clements, A., Hurn, S., and Shi, S. (2017). An empirical investigation of herding in the US stock market. Economic Modelling, 67, 184-192.

Corredor, P., Ferrer, E., and Santamaria, R. (2013). Investor sentiment effect in stock markets: Stock characteristics or country-specific factors?. *International Review of Economics and Finance*, 27, 572-591.

Cremers, M., Halling, M., and Weinbaum, D. (2015). Aggregate jump and volatility risk in the cross-section of stock returns. *The Journal of Finance*, 70(2), 577-614.

Daniel, K., and Hirshleifer, D. (2015). Overconfident investors, predictable returns, and excessive trading. *Journal of Economic Perspectives*, 29(4), 61-88.

Da, Z., Engelberg, J., and Gao, P. (2014). The sum of all FEARS investor sentiment and asset prices. *The Review of Financial Studies*, 28(1), 1-32.

Davis, J. L. (2001). Mutual fund performance and manager style. *Financial Analysts Journal*, 57(1), 19-27.

Demirer, R., and Kutan, A. M. (2006). Does herding behavior exist in Chinese stock markets?. *Journal of International Financial Markets, Institutions and Money*, 16(2), 123-142.

Deng, S., Huang, Z. J., Sinha, A. P., and Zhao, H. (2018). The interaction between microblog sentiment and stock return: An empirical examination. MIS quarterly, 42(3), 895-918.

Dimic, N., Neudl, M., Orlov, V., and Äijö, J. (2018). Investor sentiment, soccer games and stock returns. Research in International Business and Finance, 43, 90-98.

Dreger, C., Kholodilin, K. A., Ulbricht, D., and Fidrmuc, J. (2016). Between the hammer and the anvil: The impact of economic sanctions and oil prices on Russia's ruble. *Journal of Comparative Economics*, 44(2), 295-308.

Duxbury, D. (2015). Behavioral finance: insights from experiments II: biases, moods and emotions. *Review of Behavioral Finance*, 7(2), 151-175.

Economou, F., Kostakis, A., and Philippas, N. (2011). Cross-country effects in herding behavior: Evidence from four south European markets. *Journal of International Financial Markets, Institutions and Money*, 21(3), 443-460.

Elangkumaran, P., and Jenitta, J. N. (2014). Macroeconomic Variables and stock prices: A study of Colombo stock exchange(CSE) in Sri Lanka. *Internation Journal of research in Commerce, IT, Management*, 4(1), 71-74.

Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance1. *Journal of Financial Economics*, 49(3), 283-306.

Finter, P., Niessen-Ruenzi, A., and Ruenzi, S. (2012). The impact of investor sentiment on the German stock market. Zeitschrift für Betriebswirtschaft, 82(2), 133-163.

Fromlet, H. (2001). Behavioral finance-theory and practical application: Systematic analysis of departures from the homo oeconomicus paradigm are essential for realistic financial research and analysis. *Business economics*, 63-69.

Frugier, A. (2016). Returns, volatility and investor sentiment: evidence from European stock markets. Research in International Business and Finance, 38, 45-55.

Fu, T., and Lin, M. (2010). Herding in China equity market. *International Journal of Economics and Finance*, 2(2), 148-156.

Galariotis, E. C., Krokida, S. I., and Spyrou, S. I. (2016). Herd behavior and equity market liquidity: Evidence from major markets. *International Review of Financial Analysis*, 48, 140-149.

Ghufran, B., Awan, H. M., Khakwani, A. K., and Qureshi, M. A. (2016). What causes stock market volatility in Pakistan? Evidence from the field. Economics Research International, 2016.

Glaser, M., Schmitz, P., and Weber, M. (2009). Individual Investor Sentiment and Stock Returns-What Do We Learn from Warrant Traders?.

Gharbi, S., Sahut, J. M., and Teulon, F. (2014). RandD investments and high-tech firms' stock return volatility. Technological Forecasting and Social Change, 88, 306-312.

Gong, P., and Dai, J. (2017). Monetary policy, exchange rate fluctuation, and herding behavior in the stock market. *Journal of Business Research*, 76, 34-43.

Guo, K., Sun, Y., and Qian, X. (2017). Can investor sentiment be used to predict the stock price? Dynamic analysis based on China stock market. Physica A: Statistical Mechanics and its Applications, 469, 390-396.

Haw, C., Hawton, K., Gunnell, D., and Platt, S. (2015). Economic recession and suicidal behavior: Possible mechanisms and ameliorating factors. *International Journal of Social Psychiatry*, 61(1), 73-81.

He, Z., He, L., and Wen, F. (2019). Risk compensation and market returns: The role of investor sentiment in the stock market. Emerging Markets Finance and Trade, 55(3), 704-718.

Henker, J., Henker, T., and Mitsios, A. (2006). Do investors herd intraday in Australian equities?. *International Journal of Managerial Finance*, 2(3), 196-219.

Huang, D., Jiang, F., Tu, J., and Zhou, G. (2015). Investor sentiment aligned: A powerful predictor of stock returns. *The Review of Financial Studies*, 28(3), 791-837.

Huiwen, Z., and Sun, L. (2012). The Influence of Investor Sentiment on Stock Return and its Volatility under Different Market States. Business Intelligence and Financial Engineering (BIFE). In Fifth International Conference (pp. 337-341).

Hu, W. Y., Huang, C. J., Chang, H. Y., and Lin, W. J. (2015). The effect of investor sentiment on feedback trading and trading frequency: Evidence from Taiwan intraday data. Emerging Markets Finance and Trade, 51(sup1), S111-S120.

Indārs, E. R., Savin, A., and Lublóy, Á. (2019). Herding behavior in an emerging market: Evidence from the Moscow Exchange. Emerging Markets Review, 38, 468-487.

Jarrow, R. A., and Protter, P. (2017). A Rational Asset Pricing Model for Premiums and Discounts on Closed-End Funds: The Bubble Theory.

Javaira, Z., & Hassan, A. (2015). An examination of herding behavior in Pakistani stock market. *International journal of emerging markets*, *10*(3), 474-490.

Kaplanski, G., Levy, H., Veld, C., and Veld-Merkoulova, Y. (2015). Do happy people make optimistic investors?. *Journal of Financial and Quantitative Analysis*, 50(1-2), 145-168.

Khan, M. A., and Ahmad, E. (2018). Measurement of Investor Sentiment and Its Bi-Directional Contemporaneous and Lead–Lag Relationship with Returns: Evidence from Pakistan. Sustainability, 11(1), 1-20.

Keynes, J. M. (2018). The general theory of employment, interest, and money. Springer.

Kim, S. H., and Kim, D. (2014). Investor sentiment from internet message postings and the predictability of stock returns. Journal of Economic Behavior and Organization, 107, 708-729.

Koedijk, K. G., Kool, C. J., Schotman, P. C., and Van Dijk, M. A. (2002). The cost of capital in international financial markets: local or global?. *Journal of International Money and Finance*, 21(6), 905-929.

Kumari, J., and Mahakud, J. (2015). Does investor sentiment predict the asset volatility? Evidence from emerging stock market India. *Journal of Behavioral and Experimental Finance*, 8, 25-39.

Kuzmina, J. (2010). Emotion's component of expectations in financial decision making. *Baltic Journal of Management*, 5(3), 295-306.

LAHMIRI, S. (2011). NEURAL NETWORKS AND INVESTOR SENTIMENT MEASURES FOR STOCK MARKET TREND PREDICTION. *Journal of Theoretical and Applied Information Technology*, 27(1).

Lakonishok, J., Shleifer, A., and Vishny, R. W. (1992). The impact of institutional trading on stock prices. *Journal of financial economics*, 32(1), 23-43.

Lao, P., and Singh, H. (2011). Herding behavior in the Chinese and Indian stock markets. *Journal of Asian economics*, 22(6), 495-506.

Liao, T. L., Huang, C. J., and Wu, C. Y. (2011). Do fund managers herd to counter investor sentiment?. *Journal of Business Research*, 64(2), 207-212.

Lindhe, E. (2012). Herd Behavior in Stock Markets: A Nordic Study.

Liston, D. P. (2016). Sin stock returns and investor sentiment. *The quarterly review of economics and finance*, 59, 63-70.

Litimi, H., BenSaïda, A., and Bouraoui, O. (2016). Herding and excessive risk in the American stock market: A sectoral analysis. Research in International Business and Finance, 38, 6-21.

Liu, J., Stambaugh, R. F., and Yuan, Y. (2018). Absolving beta of volatility's effects. *Journal of Financial Economics*, 128(1), 1-15.

Mahmood, I., Nazir, F., Junid, M., and Javed, Z. H. (2014). Stock prices and inflation: A case study of Pakistan. *Journal of Asian Business Strategy*, 4(12), 217-223.

McLean, R. D., and Zhao, M. (2014). The business cycle, investor sentiment, and costly external finance. *The Journal of Finance*, 69(3), 1377-1409.

Merkle, C. (2017). Financial overconfidence over time: Foresight, hindsight, and insight of investors. *Journal of Banking and Finance*, 84, 68-87.

Metawa, N., Hassan, M. K., Metawa, S., and Safa, M. F. (2019). Impact of behavioral factors on investors' financial decisions: case of the Egyptian stock market. *International Journal of Islamic and Middle Eastern Finance and Management*, 12(1), 30-55.

Miyazaki, T. (2019). Clarifying the Response of Gold Return to Financial Indicators: An Empirical Comparative Analysis Using Ordinary Least Squares, Robust and Quantile Regressions. *Journal of Risk and Financial Management*, *12*(1), 33.

Mobarek, A., Mollah, S., and Keasey, K. (2014). A cross-country analysis of herd behavior in Europe. *Journal of International Financial Markets, Institutions and Money*, 32, 107-127.

Nardo, M., Petracco-Giudici, M., and Naltsidis, M. (2016). Walking down wall street with a tablet: A survey of stock market predictions using the web. *Journal of Economic Surveys*, 30(2), 356-369.

Ni, Z. X., Wang, D. Z., and Xue, W. J. (2015). Investor sentiment and its nonlinear effect on stock returns—New evidence from the Chinese stock market based on panel quantile regression model. Economic Modelling, 50, 266-274.

Nijam, H. M., Ismail, S. M., and Musthafa, A. M. (2015). The Impact of Macro-Economic Variables on Stock Market Performance; Evidence From Sri Lanka. *Journal of Emerging Trends in Economics and Management Sciences*, 6(2), 151-157.

Oliveira, N., Cortez, P., and Areal, N. (2013, June). Some experiments on modeling stock market behavior using investor sentiment analysis and posting volume from Twitter. In Proceedings of the 3rd International Conference on Web Intelligence, Mining and Semantics (p. 31). ACM.

Omete, F. I. (2013). The Effects Of Earnings Per Share, Dividend Per Share And Price To Earnings Ratio On Share Prices: The Case of Firms Listed At Nairobi Securities Exchange. *Innovational Study of Innovative Research and Studies*, *2*(9), 30-44.

Papapostolou, N. C., Pouliasis, P. K., and Kyriakou, I. (2017). Herd behavior in the drybulk market: An empirical analysis of the decision to invest in new and retire existing fleet capacity. Transportation Research Part E: Logistics and Transportation Review, 104, 36-51.

Prechter Jr, R. R. (2001). Unconscious herding behavior as the psychological basis of financial market trends and patterns. *The Journal of Psychology and Financial Markets*, 2(3), 120-125.

Prosad, J. M., Kapoor, S., and Sengupta, J. (2012). An examination of herd behavior: An empirical study on Indian equity market. In International Conference on Economics and Finance Research (Vol. 32, pp. 11-15).

Ramiah, V., Xu, X., and Moosa, I. A. (2015). Neoclassical finance, behavioral finance and noise traders: A review and assessment of the literature. *International Review of Financial Analysis*, 41, 89-100.

Ramanathan, K., and Gopalakrisnan, M. (2013). Volatility in Indian stock market–a study of post and pre-recession period. *International Journal of Management Research*, 3(1), 133-143.

Rashid, A. Chughtai, S. and Fayyaz, M. (2017). The impact of investor sentiment on return of different industries in Pakistan. *NICE Research Journal*, 1-23.

Raza, N., Shahzad, S. J. H., Tiwari, A. K., and Shahbaz, M. (2016). Asymmetric impact of gold, oil prices and their volatilities on stock prices of emerging markets. Resources Policy, 49, 290-301.

Ricciardi, V., and Simon, H. K. (2000). What is behavioral finance?. Business, Education and Technology Journal, 2(2), 1-9.

Ross, S. A. (1989). Information and volatility: The no-arbitrage martingale approach to timing and resolution irrelevancy. *The Journal of Finance*, 44(1), 1-17.

Ryu, D., Kim, H., and Yang, H. (2017). Investor sentiment, trading behavior and stock returns. Applied Economics Letters, 24(12), 826-830.

Schmidt, P. S., Von Arx, U., Schrimpf, A., Wagner, A. F., and Ziegler, A. (2017). On the construction of common size, value and momentum factors in international stock markets: A guide with applications. Swiss Finance Institute Research Paper, (10-58).

Schmeling, M. (2009). Investor sentiment and stock returns: Some international evidence. *Journal of Empirical Finance*, *16*(3), 394-408.

Sen, P. (2016). Importance of Investors' Sentiment Where Significance of Micro and Macro Variables is Low for Building Trading Strategy. *Indian Journal of Research in Capital Markets*, 3(1), 36-46.

Shen, J., Yu, J., and Zhao, S. (2017). Investor sentiment and economic forces. *Journal of Monetary Economics*, 86, 1-21.

Siganos, A., Vagenas-Nanos, E., and Verwijmeren, P. (2014). Facebook's daily sentiment and international stock markets. *Journal of Economic Behavior and Organization*, 107, 730-743.

Sim, N., and Zhou, H. (2015). Oil prices, US stock return, and the dependence between their quantiles. *Journal of Banking and Finance*, 55, 1-8.

Singh, G. (2009). The impact on macroeconomic fundementals on stock price revised: A study of indian stock market. India: Unitedworld School of Business.

Statman, M. (1995, December). Behavioral finance versus standard finance. In AIMR conference Proceedings (Vol. 1995, No. 7, pp. 14-22). Association for Investment Management and Research.3-324.

Shefrin, H. (2015). Investors' Judgments, Asset Pricing Factors and Sentiment. European Financial Management, 21(2), 205-227.

Stambaugh, R. F., Yu, J., and Yuan, Y. (2014). The long of it: Odds that investor sentiment spuriously predicts anomaly returns. *Journal of Financial Economics*, 114(3), 613-619.

Sun, L., Najand, M., and Shen, J. (2016). Stock return predictability and investor sentiment: A high-frequency perspective. *Journal of Banking and Finance*, 73, 147-164.

Talla, J. T. (2013). Impact of Macroeconomic Variables on the Stock Market Prices of the Stockholm Stock Exchange (OMXS30).

Tan, L., Chiang, T. C., Mason, J. R., and Nelling, E. (2008). Herding behavior in Chinese stock markets: An examination of A and B shares. *Pacific-Basin Finance Journal*, 16(1-2), 61-77.

Tariq, B., & Ullah, N. (2013). Investor overconfidence and stock returns: Evidence from Pakistan. *IOSR Journal of Business and Management*, *8*(1), 77-84.

Tetlock, P. C. (2007). Giving content to investor sentiment: The role of media in the stock market. *The Journal of Finance*, 62(3), 1139-1168.

Tiwari, A., Bathia, D., Bouri, E., and Gupta, R. (2018). Investor Sentiment Connectedness: Evidence from Linear and Nonlinear Causality Approaches (No. 201814).

Uhl, M. W., Pedersen, M., and Malitius, O. (2015). What's in the news? Using news sentiment momentum for tactical asset allocation. *Journal of Portfolio Management*, 41(2), 100.

Ülkü, N., and Weber, E. (2013). Identifying the interaction between stock market returns and trading flows of investor types: Looking into the day using daily data. *Journal of Banking and Finance*, 37(8), 2733-2749.

Vieira, E. F. S., and Pereira, M. S. V. (2015). Herding behavior and sentiment: Evidence in a small European market. Revista de Contabilidad, 18(1), 78-86.

Wermers, R. (1999). Mutual fund herding and the impact on stock prices. *The Journal of Finance*, 54(2), 581-622.

Wongbangpo, P., and Sharma, S. C. (2002). Stock market and macroeconomic fundamental dynamic interactions: ASEAN-5 countries. *Journal of Asian Economics*, 13(1), 27-51.

Wu, P. C., Liu, S. Y., and Chen, C. Y. (2016). Re-examining risk premiums in the Fama–French model: The role of investor sentiment. *The North American Journal of Economics and Finance*, 36, 154-171.

Yang, C., and Gao, B. (2014). The term structure of sentiment effect in stock index futures market. *The North American Journal of Economics and Finance*, 30, 171-182.

Yang, A. S., and Wu, M. L. (2011). Exploring the relationship between investor sentiment and price volatility. *Quantitative Finance*, 11(6), 955-965.

Yang, C., and Zhou, L. (2015). Investor trading behavior, investor sentiment and asset prices. *The North American Journal of Economics and Finance*, 34, 42-62.

Yao, S. (2010). New sight of herding behavioral through trading volume. Economics Discussion Paper, (2010-11).

Zhong, X., and Enke, D. (2017). Forecasting daily stock market return using dimensionality reduction. Expert Systems with Applications, 67, 126-139.