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FROM RATIONALITY TO EMOTION: UNPACKING INVESTOR BEHAVIOR, STRATEGIC FINANCIAL MANAGEMENT, AND SOCIAL INCLUSION

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Abstract

This research aims to analyze whether investors trade based on rational expectation or portray the behavior of confidence, optimism, or pessimism before, during, and after the global financial crisis. The field of behavioral finance questions investors' decision-making ability and considers that investors' behavior influences their decisions. This research uses regression analysis to determine whether investors are rational or whether behavior such as confidence, optimism, or pessimism influences their choices before, after, or during the financial crisis. The results suggested that rational expectation and pessimism are rejected during all three phases. Investors are confident and optimistic before and after the financial crisis, and none of the three behaviors impacts investors during the financial crisis. This research contributes to the field of behavioral finance for intelligent decision-making. It will help understand how and why social issues behave the strategic management in a certain way.

INTRODUCTION

Behavioral finance encompasses integrating psychology, finance, and sociology (Ricciardi and Simon, 2000; Goyal, Kumar and Xiao, 2021; Ahmad, 2024) to comprehend individual financial behavior (Guzavicius, Vilkė and Barkauskas, 2014; Shah et al., 2024). This interdisciplinary approach recognizes the inseparability of investors' personalities and investment choices (Birău, 2012). A fundamental divergence between behavioral finance and standard finance lies in the concept of rationality. While standard finance assumes investor rationality, behavioral finance

acknowledges the presence of normal human behavior (Statman, 1999; Rahman et al., 2021). Standard finance relies on a unified theory and minimal tools to address financial inquiries (Statman, 1999). In contrast, behavioral finance examines the psychological perspective of how individuals interpret and respond to information when making investment decisions (Bashir et al., 2013; Ingale and Paluri, 2022). To comprehend the relevance of behavioral finance, rather than standard finance, in understanding the financial crisis, it is vital to recognize the influence of human emotions on decision-making and the potential for questioning rationality (Kapoor and Prosad, 2017; Atif Sattar, Toseef and Fahad Sattar, 2020).

Where the Global Financial Crisis of 200-8-09 adversely affected many economies worldwide, it also left its footprint in Pakistan. Pakistan's economy faced various adverse effects, including increased poverty, rising prices, fluctuations in oil prices, reduced remittance inflows, job losses, and a decline in export earnings (Azam et al., 2011; Grosse, 2017). Moreover, the State Bank of Pakistan acknowledged that the country's financial system had become more susceptible to external shocks than in previous periods (Azam et al., 2011). This vulnerability is exemplified by the decline of 65% in market capitalization of the Pakistan stock market between 2007 and 2009 (Parveen, Siddique and Malik, 2016; Sheikh et al., 2020; Javed, Shaukat and Ahmad, 2021). Similarly, another study found that the financial crisis significantly contributed to the Pakistan Stock Exchange (PSX) (previously Karachi Stock Exchange) volatility, requiring substantial time to subside (Ali and Afzal, 2012; Ghouse and Bhatti, 2024).

Pakistan holds a significant position in the textile industry, Asia's eighth-largest export of textile products. It is also the fourth-largest producer and third-largest consumer of cotton. With the textile sector constituting 46% of the total manufacturing industry, it is a major source of employment, providing jobs to 40% of the labor force. Additionally, while only 5% of textile companies are listed on the stock exchange, the country hosts 423 operational textile industries. Pakistan enjoys a diverse supply base encompassing various synthetic and natural yarns and fabrics, including cotton and rayon. This abundant raw material is a substantial advantage that positively impacts cost and operational lead time (BOI, 2020). There are 46 listed textile companies in PSX with a market capital of approximately 800 million US$ (PSX, 2023).

Considering the textiles sector's importance in Pakistan's economy and capital market, that also contributed 8.5% to the Gross Domestic Product in 2022 and employed 38% of the country's labor force (BOI, 2020) it is essential to study and analyze investors' behavior regarding the textile sector in the stock market to understand their financial behavior before, after, and during the financial crisis.

This study aims to determine whether investors trade based on rational expectations or portray a sense of confidence, optimism, or pessimism beyond rationality during and after financial crises to examine the relationship between investors' trading behavior and the trading volume in textile sectors listed on the PSX. A rational expectation is a behavior that depends on the informed prediction of future events (Muth, 1961). Investors who exhibit confident behavior make spontaneous buying decisions with "confidence" and sell when skeptical; both actions cannot be explained with rationality (Akerlof and Shiller, 2010; Oprean and Tanasescu, 2014). It is a sign of optimism when investors make risky investments because they believe their actions will yield positive results (Kubilay and Bayrakdaroglu, 2016). In contrast, pessimism is manifested when investors respond positively to the same situation based on their past experiences (Oprean and Tanasescu, 2014). Cognitive biases, optimism and pessimism play a significant role in decision-making (Bateson, 2016). Therefore, these elements must be considered to get a clear picture of the relationship between investor behavior and trading volume.

The research question for this study is “What are the patterns and indicators of different financial behaviors exhibited by investors across various phases of the 2008-2009 global financial crisis?”

The study's results will clarify whether investors acted rationally or exhibited behaviors influenced

by confidence, optimism, or pessimism. It further examines how these behavioral factors affected the trading volume of listed firms in the textile sector before, during, and after the 2008-2009 global financial crisis. Additionally, this research contributes to behavioral finance literature by providing sector-specific insights into trading behaviors within Pakistan. The findings will offer valuable insights for stock traders and policymakers to better understand market dynamics and investor behavior patterns during periods of economic stress to make informed decisions.

To determine if investors in textile companies displayed rational expectations before, during, or after the global financial crisis, regression analysis was conducted using trading volume as the dependent variable and confidence, pessimism, optimism, and rational expectation as the independent variable. Data from 74 PSX-listed companies from January 3, 2005, to December 30, 2011, was used for secondary analysis.

The study results showed that the rational expectation hypothesis was rejected in all three phases. Despite the financial crisis, investors remain confident and optimistic. None of the three behavior patterns makes any difference when the financial crisis strikes. All three phases of the financial crisis did not result in pessimistic investor behavior.

Behavioral finance research was generally done on a country's stock market, not a particular listed stock market sector. Sector-specific research can help to make an educated decision even in a crisis by knowing the ups and downs of different sectors. To understand investors' behavior, this research used the textile sector because the textile sector constitutes a significant share of PSX. This research aims to fill the gaps regarding the trading of listed textile stocks in three different phases of the global financial crisis. This paper contributes to the field of behavioral finance with the particularities of Pakistan for educated decision-making. Finally, this study will assist stock traders, and policymakers in understanding why investors behave as they do and why markets behave a certain way.

The rest of the paper is structured as follows; Section 2 presents the literature related to behavioral finance and the stock market, followed by the justification and explanation of the research methodology applied in the study. The next section discusses the results yielded after the regression analysis, followed by a conclusion, the rationale and reasoning for the same, and suggestions for stakeholders and stockholders.

LITERATURE REVIEW

Behavioral finance is the collaboration of finance and other social sciences and has deepened the understanding of financial markets (Tuyon and Ahmad, 2016; Costa, Carvalho and Moreira, 2019; Rahman et al., 2021; Shah et al., 2024). A study based on bibliometric analysis concluded that behavioral finance is the byproduct of behavioral economics, and it emphasizes the errors made in judgment and decision-making in financial investment (Ingale and Paluri, 2022). A 2012 study applied bibliographic analysis to explain the impact of psychology on investors' behavior in capital markets and concluded that the efficient market hypothesis contradicts the results. Furthermore, financial behavior further explores the psychological perspective of the investors' investment decision-making process (BIRĂU, 2012).

Before the inception and implementation of the behavioral finance idea, the efficient market hypothesis was one of the significant paradigms of traditional finance theories (Latif et al., 2011) as a research framework (Jurevičienė et al., 2014). It was a massive success in the first decade of its inception (Kapoor and Prosad, 2017). However, discrepancies emerged between the efficient market hypothesis and the reality, which led to the focus on psychology as an essential factor in financial theory (Guzavicius, Vilkė and Barkauskas, 2014). A systematic study conducted on the Malaysian stock market data from 1977 to 2014 suggests that relying only on the efficient market hypothesis to understand market behavior and to design strategies accordingly would have misled the investors and policymakers (Tuyon and Ahmad, 2016). Thus, behavioral finance emerged as a separate field that explains the investors'

behavior that may not have been explained otherwise with conventional approaches and theories. Behavioral economics and behavioral finance are both growing and considered important research fields.

The behavioral finance theory questions investors' rational decisions and explains that they make choices that are not always rational (BIRĂU, 2012). Investors make non-rational decisions due to emotional factors, including fear (Mitroi, 2014). Another study concluded that investors experience emotion and irrationality when subject to risk and uncertainty (Guzavicius, Vilkė and Barkauskas, 2014). Behavioral finance believes that people are normal, and their financial decisions are influenced by common psychological and cognitive biases, which may be irrational or suboptimal, contrasting with what traditional finance theories anticipate (Statman, 2014). Behavior finance challenges the presence of rationality in investors, but it is still worthwhile to investigate whether it exists in capital markets.

Several researchers have researched the topic of behavioral finance worldwide; similarly, various researchers have studied various facets of investors' behavior in Pakistan and reached varied conclusions. A study based on the survey of retail investors of the Lahore Stock Exchange (LSE) concluded that investors in LSE are not rational in their stock market trading and show behavioral biases in their investment decisions (Ahmed, Ahmad and Khan, 2011). Similar research on the weekly data of the Karachi Stock Exchange found the presence of overconfidence in investors but could not trace any positive contribution of the overconfidence to the conditional volatility of returns (Sheikh and Riaz, 2012). Another investigation into the Pakistan stock market found a positive correlation between investment performance and heuristic theory (e.g., overconfidence, representativeness, anchoring, gambler's fallacy, and availability bias) and a negative correlation with prospect theory (e.g., loss aversion, regret aversion, and mental accounting) (Aziz and Khan, 2016). Based on these studies, it can be concluded that Pakistan stock market investors express various aspects of behavioral finance in financial decisions (Anum and Ameer, 2017). To sum up, it can be concluded that Pakistani investors do involve in various aspects of behavioral finance in their decision-making (Anum and Ameer, 2017); as they lack awareness about the impact of behavior on their finances, retail investors may find it challenging to exercise significant control over their emotions or financial decision-making processes (Huma and Ayub, 2018).

Studies established that behavioral finance approaches could better explain the dot-com bubble burst of March 2000, the global financial crisis of 2008-09, and the Eurozone Crisis of 2009-10 than the standard finance approach (Singh, 2012; Bird, Du and Willett, 2017). Because in times of crisis, the market fails to perform according to the efficient market hypothesis, rather than the market signals pessimistic behavior as a reaction to good or bad news, these reactions (behaviors) are consistent with behavioral finance theories. Therefore, behavioral finance can explain the market performance in different phases of crises, where efficient market hypothesis fails to explain it.

The behavior of investors during the financial crisis can provide insight into behavioral finance's role. During the global financial crisis, an analytical study examined the role of overconfidence bias in 27 countries and concluded that it caused stock prices to fluctuate and caused asymmetric volatility in trading volume (Jlassi, Naoui and Mansour, 2014). A mixed-method study of investors' risk perception, risk tolerance, and return expectations in the Netherlands found that fluctuations in investors' perception led to substantial changes in trading and risk-taking behavior during the financial crisis (Hoffmann, Post and Pennings, 2013).

Stock markets in Pakistan are highly volatile and sensitive; they react to shocks and sudden news (Ghufran et al., 2016). A study reported that the Karachi stock exchange lost around 60% during the global financial crisis from 2007-09; it also affirmed that the crisis increased stock market volatility and resolved gradually over time (Ali and Afzal, 2012; Aswani, 2017). A different study examined the minimum spanning tree of 181 listed companies throughout the financial crisis to

determine if any correlation exists between them. The study found that the correlation is significant, and the commercial banking sector affected the other sectors of the Pakistan Stock Market (Memon and Yao, 2019). Based on Shana's entropy, it was discovered that weaving companies in the textile sector are the most volatile, while spinning, rayon, and synthetic are the least volatile (Memon and Yao, 2019). There can be no doubt that Pakistan's stock market experienced volatility throughout the global financial crisis.

This research intends to investigate various states of financial behavior at different phases of the global financial crisis of 2008-2009 in order to assess and trace the signs of different financial behaviors. The textile sector was selected for the analysis due to its importance in the economy of Pakistan at this time. This study is expected to help extend the understanding of behavioral finance, especially market volatility.

DATA AND RESEARCH METHODOLOGY

This research delves into the study of investors' behavior, specifically exploring the association between their trading behavior and the trading volume of stocks. The independent variables encompass the dimensions of investors' behavior, including optimism, confidence, pessimism, and rational expectations, while the trading volume of stocks represents the dependent variable. To assess the stationarity of the variables, unit root tests were conducted. Additionally, a descriptive analysis of the variables furnishes a sample summary. Furthermore, through regression analysis, the research endeavors to elucidate the influence of investors' behavior on their decisions, be it before, during, or after the financial crisis.

Daily trading data from January 3, 2005, to December 30, 2011, for listed textile firms on the Pakistan Stock Exchange (PSX) was used as a sample and subsequent analysis. The textile sector was mainly selected because of its significant role in Pakistan's economy, accounting for a large share of employment, exports, and industrial output. There were 213 textile companies listed on the PSX in 2005, and this number slightly decreased to around 200 by 2011. This change resulted primarily from voluntary and involuntary delisting events, such as bankruptcy, mergers, failure to meet listing standards, or companies choosing to repurchase shares and go private.

The final and more refined sample was of 74 listed textile firms based on data availability and minimum non-trading days, ensuring consistent and reliable observations across the seven years. The dataset was further organized to align trading data across the selected companies on a daily basis, resulting in a robust panel of 1,701 observations per company. This sector-specific (textile) approach brings valuable insights into the financial behavioral patterns of investors in a substantial industry within the PSX in the context of global financial distress..

It is hard to establish the end date of the global financial crisis as different financial markets recover on different dates (Frankel and Saravelos, 2010). Most of the studies that specially seek to find the beginning and starting dates of the 2008-09 crisis concluded that it started somewhere between February 7th, 2007 (HSBC's announcement of losses linked to the subprime mortgage) and August 9th, 2007 (BNP Paribas announces its inability to allow investors to withdraw) (Elliott, 2011; Guillén, 2011). However, for the analysis, studies benchmarked September 15th, 2008, as the beginning of the global financial crisis, when Lehman Brothers filed for bankruptcy. March 31st, 2009, is supposed to be the last day of the crisis; it coincides with the April 2nd, 2009, G20 Summit, where the leaders pledged more than one trillion dollars to subside the severe effects of the financial crisis and gradually return to normal (Aït-Sahalia et al., 2012). Considering different factors and scales of the crisis at different times, this study also considers September 15th, 2008 – March 31st, 2009, as the crisis period (during).

For the purpose of analysis phases are marked as:

Phase	Beginning	End	Observation

Before	January 3rd 2005	September 14th 2008	906
During	September 15th 2008	March 31st, 2009	122
After	April 1st 2009	December 30th 2011	673

Data for this research is obtained from the Business Recorder website, consisting of the daily closing prices and trading volumes of 74 textile companies. To analyze the trading volume, the daily trading volume of each company is aggregated to compute the total volume traded per day. The natural logarithm of the trading volume is employed as the basis for the subsequent linear regression analysis. Moreover, the daily closing prices of the selected companies were utilized to construct an index, following the KSE-100 Index approach as represented by equation 3.1. This comprehensive approach enables a robust examination of the relationship between trading volume and price movements within the textile sector, providing valuable insights into market dynamics.

$$\sum \frac{(\text{Number of Shares} \times \text{Share Price})}{\text{Base Period Value}} \times \text{Base Divisor}$$

Where, the number of shares is the free-float share in PSX and their respective price, base period value is their value at the previous working day, and Base Divisor is constant value 1000. Because of the unavailability of data about the volume of free-float shares during 2005-2001, outstanding shares were used as the proxy to calculate the market capitalization.

Moreover, officially, November 1st, 1991, is the base period of the KSE-100 index; however, for this study, January 3rd, 2005, was taken as the base period to correctly measure the difference in different phases of crisis and mitigate any previous fluctuations in the market. Additionally,

the index in this study was solely developed based on firms in the textile sector, whereas the actual KSE-100 index comprised 73 different sectors. So, the vase value was calculated by summarizing 74 (Number of Shares X Share Price) textile firms on January 3rd, 2005.

In the second stage, return on stock was calculated through this index, with this model;

$$R_t = [\ln(P_t) - \ln(P_{t-1})] \times 100 \quad (2)$$

Where;

R_t is the return at time t

$\ln(P_t)$ is the natural logarithm of price at time t

$\ln(P_{t-1})$ is the natural logarithm of price at time (t-1)

Description of Independent Variable

There is no agreed-upon method of measurement or quantification of financial/trading behavior that can be used as the base research. Therefore, two studies that used and suggested proxies for measuring different financial behaviors were followed (Oprean and Tanasescu, 2014; Dhaoui, 2015). This study developed a model where trading volume was considered the dependent variable, and trading behavior, optimism, confidence, pessimism, and rational expectation were the independent variables. The derivation of the variables is as follows;

Confidence

According to the confidence behavior approach (Oprean and Tanasescu, 2014), investors will overreact to the information they receive, resulting in a larger stock market trading volume. Heavy trading will likely take place on the current day if the previous day's returns are positive (including zero). However, if the returns are negative, the investor will continue to trade or refrain from pursuing the trading strategy.

Model of Confidence behavior;

If $R_{t-1} \geq 0$ = there will be a transaction

If $R_{t-1} < 0$ = there will be no transaction (3)

Optimism

An investor is supposed to be optimistic when thinking that his investment decisions will bring positive result (Kubilay and Bayrakdaroglu, 2016). Thus, if he/she has achieved a previously set profit target, he/she will increase the transaction volume. Otherwise, he will keep the trading regular or not trade at all. To quantify the optimism of investors, the following model (Dhaoui, 2015) was adopted;

If $R_{t-1} \geq \bar{R} + \sigma$ = there will be a transaction

If $R_{t-1} < \bar{R} + \sigma$ = there will be no transaction (4)

Where, R is return, $\bar{R}$ is the average return and σ is the standard deviation of the return of entire period

Pessimism

Investors' losses on the preceding day can lead to pessimistic trading behavior. The pessimist approach to financial behavior ascertains that the investor either curtails the trading or completely halts the trading for a while; in the case of better and higher results, they follow the everyday trading practice regarding volume. The minimum level of loss (Dhaoui, 2015) that triggered the investment decision was measured as follows;

If $R_{t-1} \geq \bar{R} - \sigma$ = there will be a transaction

If $R_{t-1} < \bar{R} - \sigma$ = there will be no transaction (5)

Rational Expectation

Rational expectation is an informed prediction (Muth, 1961). It refers to the idea that investors consider all available information and analyze it logically and thoughtfully when making financial decisions. It is based on the assumption that investors rationally process information and attempt to maximize their utility or profit based on their analysis of the available data. Rational expectation was quantified as;

$$E(R_t) = R_{t-1} + \varepsilon_{t-1} \quad (6)$$

Where, $E(R_t)$ is expected return of a rational investor at time t, R_{t-1} is the return on the previous day, and ε_{t-1} is a residual factor of at t-1, it was measured as a normal distribution with a zero mean and the standard deviation of the returns.

Econometric Model

To measure the effect of different finaical behaviors on the finacial decsions in terms of trading volumen regression analysis was applied with the following model;

$\ln(V_t) = \beta_0 + \beta_1(\text{confidence})_t + \beta_2(\text{optimism})_t + \beta_3(\text{Pessimism})_t + \beta_4(\text{rational})_t + \varepsilon_t$ .....(7)

Where;

$\ln(V_t)$	:	natural logarithm of the trading volume at time t
confidence_t	:	expected returns of overconfident investor at time t based on gains at time t-1
optimism_t	:	expected returns of optimistic investor at time t based on the information available to them at time t-1
pessimism_t	:	expected returns of pessimist investor at time t based on the information available to them at time t-1
rational_t	:	expected returns of rational investor at time t based on the information available to them at time t-1
ε_t	:	Error term

In order to systematically explore and investigate the research questions, the study developed the following set of well-defined hypotheses, which served as guiding principles and empirical

propositions for the analysis and examination of the data;

H_1 = Rational Expectations positively affect the investor's decision in different financial circumstances

H_2 Confidence positively affects the investor's decision in different financial circumstances
H_3 = Optimism positively affects the investor's decision in different financial circumstances
H_4 = Pessimism positively affects the investor's decision in different financial circumstances

*Different financial circumstances means before, after, and during the 2008-09 global financial crisis (GFC).

RESULTS AND DISCUSSION

Data was divided into three phases; before, during, and after the financial crisis. The three phases' daily return and trading volume were then summarized for the data's mean, minimum, maximum, skewness, and kurtosis. Below is the result of the descriptive analysis of the daily returns and trading volume of the three phases:

Table 1: Descriptive Statistics of Stock Returns

Status of GFC	Observations	Mean	Min	Max	Skewness	Kurtosis
Before	904	-0.046927	-21.53802	17.87200	-0.796609	39.39193
During	115	-0.133729	-54.80086	48.80368	-0.881170	46.55652
After	673	0.009671	-7.410295	5.373429	-0.497103	6.280349

Negative daily return before and during GFC indicates that, on average, the stock experienced a loss, and the stock's value decreased on most trading days during those periods. It can be attributed to the 2005 Pakistan stock market crash (Mangi, 2005). However, it does not necessarily imply that the stock has been performing poorly since then or is a bad investment. Small, yet positive returns indicates a recovery of the market and gain to the investors. Negative skewness through the observed periods implies that there are relatively more occurrences of positive or higher returns compared to negative or lower returns, but the negative returns are more extreme or pronounced. Results of the kurtosis also indicates abnormal distribution.

Table 2: Descriptive Statistics of Trading Volume

Status of GFC	Observations	Mean	Min	Max	Skewness	Kurtosis
Before	904	10689963	106700	82618400	2.346850	11.66197
During	115	3194053	100	18394300	1.776251	6.049492
After	673	9498988	391805	52901366	1.594495	6.835401

Mean figures are consistent with common sense and show a comparatively lesser trading volume during GFC than before and after. Skewness at all phases of GFC is positive, signaling that there

are relatively more occurrences of lower trade volumes than higher trade volumes. However, the higher trade volumes are more extreme or

pronounced. Kurtosis results are consistent and present an abnormal distribution.

4.2 Stationarity Test

Table 3: Augmented Dickey Fuller unit root test result at level

	Dependent Variable	Independent Variables				
Status of GFC	Trading Volume	Confidence	Optimism	Pessimism	Rational Expectation	Critical Value at 5%
Before	-6.647660	-26.55608	-25.83987	-16.39525	-17.30462	-4.42
During	-4.742055	-7.978455	-11.07362	-10.84282	-7.263047	-4.42
After	-6.693209	-23.96792	-23.59441	-22.49925	-23.30398	-3.45

The results reject the null hypothesis and affirm that all variables across all phases are stationary at the level.

4.3 Regression Results

In this study, OLS regression was employed to estimate the relationship between a dependent variable and one or more independent variables; it is a widely used econometric technique for estimating relationships among variables (Zhang and O'Donnell, 2020). OLS regression provides efficient and unbiased estimates of the regression coefficients, allowing the dependent variable to be interpreted in terms of the change in the independent variable for each unit change in the independent variable. In addition to testing the hypothesis and its statistical inference, the method also enabled us to determine the significance and evaluate the impact of independent variables on the dependent variable (Maulud and Abdulazeez, 2020). The results of OLS regression remain robust if the underlying assumptions, such as normality and homoscedasticity, are met precisely (Lee and Pustejovsky, 2023). OLS regression is a widely used statistical tool in the field of behavioral finance, valued for its simplicity, interpretability, and efficiency (Bapat, 2020; Aharon, 2021; Bucciol, Guerrero and Papadovasilaki, 2021; Sibande et al., 2023). As the Best Linear Unbiased Estimator (BLUE) under the Gauss-Markov theorem, OLS minimizes estimator variance for reliable predictions (Hansen, 2022). OLS produce consistent, robust, reproducible results and clear coefficient interpretation (Matveev and Sirota, 2020; Słoczyński, 2022), essential for the main and subfield of finance.

Regression analysis was conducted with E-Views-11; the results are presented in Table 3. Results showed that model is overall good Prob. F-stat. 0.03. The value of R^2 is 0.91, explaining more than 90% of the variation between the explained and explanatory variables. Durbin-Watson test results found negligible sum autocorrelation. Conclusively, the proposed model can be used for the study.

Table 4: Regression results of trading volume as dependent variable

Phases	Independent Variables	Coefficient	t-statistics
Before Financial Crisis	Constant	15.60628	124.9434***
	Confidence	0.416882	5.688358***
	Optimism	0.409001	2.952108**
	Pessimism	-0.048763	-0.384567

	Rational Expectation	0.006821	0.285695
During Financial Crisis	Constant	3.941385	0.587807
	Confidence	-0.067418	-0.100057
	Optimism	2.553208	0.775686
	Pessimism	8.827731	1.332119
	Rational Expectation	-0.147468	-1.396014
After Financial Crisis	Constant	15.75990	109.4640***
	Confidence	0.162984	1.858193*
	Optimism	0.369733	3.193761**
	Pessimism	-0.102777	-0.727405
	Rational Expectation	0.021857	0.412029

***, **, *, represent the significance level of 1%, 5%, and 10 % respectively.

Regression results show that investors do not exhibit rational trading behavior; the probability is insignificant at each phase of the GFC. Thus, it failed to accept the null hypothesis that rational expectations positively impact investors' decisions. Rational Expectations refers to the process by which stock traders form their expectations about future stock prices using all the information they have access to, including historical prices, company fundamentals, and economic data. Investors' personalities and individual traits cannot be detached from financial behavior (BIRĂU, 2012; Akhtar and Das, 2020; Jiang, Peng and Yan, 2024), which is why rational expectation in stock trading cannot be practiced if the trader himself or herself tends to have unfounded behavior; therefore, it will also be observed in stock trading and will be regarded as normal (Statman, 2014; Tauni, Yousaf and Ahsan, 2020). Results are consistent with previous studies of stock traders (Anderson and Thoma, 2021; Xie, Xia and Gao, 2021), which found that most traders mostly exhibit overconfidence, which refers to the belief that they can predict future stock prices correctly.

The analysis shows that investors displayed confident trading behavior before the GFC, with a positive and significant coefficient. Despite that, the trading volume was less affected by confident behavior after the GFC, with a statistically significant but small coefficient. It is statistically proven that investors did not behave confidently during the financial crisis. Trader with confident trading behavior demonstrates high self-assurance and certainty in their trading decisions (Wangi and Baskara, 2021). Confident traders believe in their analysis, strategies, and market insights, influencing how they buy, sell, and manage investments (Zhao and Zhang, 2020). As previous studies have concluded (Keeler et al., 2020; Nasir et al., 2022), investors do not practice confidently financial behavior during financial crises. Despite this, it was evident before and after the financial crisis.

Regression Results show that Optimistic financial behavior positively and significantly impacted the trading volume before and after the GFC. However, it was statistically insignificant during the GFC. These results are aligned with the fundamental financial behavior theories that recognize that people can react to financial crises and market downturns in various ways, and cognitive biases and emotions may influence their behaviors (Caferra, 2020; Pan, 2020). Optimistic financial behavior refers to the actions and decisions of individuals who display a positive and hopeful outlook regarding their financial situation and investment opportunities (Exler, Livshits and MacGee, 2021; Ianole-Calin et al., 2021). Optimistic individuals tend to have a favorable view of the future, believing that their financial goals can be achieved and that overall economic conditions will improve (Ahmed, 2021).

Results reveal that pessimism in financial behavior did not appear at any phase of GFC; it appeared

statistically insignificant. Pessimistic financial behavior refers to the actions and decisions of individuals with a pessimistic outlook regarding their financial situation and investment opportunities (Harrs, Müller and Rockenbach, 2021). Pessimistic individuals tend to be more cautious, skeptical, and apprehensive about the future, believing that adverse outcomes are more likely to occur (Chen, Tan and CAO, 2021). The findings align with previous studies (Ryu, Ryu and Yang, 2020; Brada, Gajewski and Kutan, 2021), e.g. stock traders did not display pessimistic financial behavior before, during and after financial and other natural or human-induced crises.

Table 5: Summary of Hypotheses

Hypothesis	Impact	Phases of GFC	t-statistics	Probability	Hypothesis Supported
H_1	Rational Expectations have a positive impact on investors' decision	Before	0.285695	0.7752	No
		During	-1.396014	0.1655	No
		After	0.412029	0.6805	No
H_2	Confidence has a positive impact on investors' decision	Before	5.688358	0.000	Yes
		During	-0.100057	0.9205	No
		After	1.858193	0.0636	No
H_3	Optimism has positive impact on investors' decision	Before	2.952108	0.0032	Yes
		During	0.775686	0.4396	No
		After	3.193761	0.0015	Yes
H_4	Pessimism has negative impact on investors' decision	Before	-0.384567	0.7006	No
		During	1.332119	0.1856	No
		After	-0.727405	0.4672	No

4.4 Discussion

During and after the 2008-2009 financial crisis, stock investors diverged significantly from rational expectations due to a complex interplay of psychological and economic factors. The crisis's unprecedented severity and abrupt onset triggered intense fear and uncertainty, prompting many investors to act on emotion rather than logic. This emotionally driven response was primarily shaped by loss aversion, where the fear of enduring additional financial losses outweighed potential gains, leading to an overly cautious approach. Investors, anxious about further market declines and uncertain about the crisis's duration, avoided risk even when rational expectations might have suggested otherwise.

Furthermore, herd behavior amplified market volatility, as individuals, doubting their own judgment in the face of uncertainty, followed the crowd. This collective behavior reinforced negative market trends, creating a feedback loop of panic and selling. Psychological biases, such as anchoring to pre-crisis stock valuations, led investors to cling to outdated benchmarks that no longer reflected market realities. Overconfidence, meanwhile, caused some to believe they could accurately predict the market's path, contributing to hasty and misinformed trades. The pervasive negative media coverage also fueled availability bias, as pessimistic information was more accessible and salient, leading to a heightened sense of crisis and encouraging a bleak, reactive outlook. Consequently, these intertwined psychological factors created a climate where rational decision-making was overshadowed by irrational responses, compounding the economic impact of the crisis itself and delaying market stabilization.

The crisis's complexity and systemic risk made it difficult to predict and understand market implications. In addition to loss aversion, some investors avoided taking action, which resulted in missed opportunities. In extreme market stress, deviations from rational expectations are more pronounced than during normal times. By recognizing behavioral biases and emotions, investors can become more aware of how they make decisions. Irrational behavior can be mitigated during financial crises by seeking professional advice, diversifying portfolios, and following long-term strategies.

Therefore, these results about rational expectations, are unsurprising; studies about Romania and the Brazilian stock market brought the same conclusions (Oprean and Tanasescu, 2014). Even stock investors of highly advanced economies, who are more informed and make educated decisions, displayed irrational or so-called normal financial behavior (Dhaoui, 2015). Some studies explained that investors applied a heuristics approach in decision-making, and investors with less financial knowledge and access to timely information followed the herd (Parveen, Siddique and Malik, 2016; Parveen and Siddiqui, 2017).

Before a financial crisis, stock investors often display confidence due to several factors, including a prolonged bull market, historical positive performance, and positive media coverage and expert opinions. The upward trend in stock prices during a bull market is evidence of a strong economy, contributing to an optimistic outlook. Past positive returns in the market also create a belief in future favorable outcomes. Positive economic news from media outlets and financial experts reinforces investors' confidence, leading to a positive feedback loop.

Confirmation bias, overconfidence, and perceived reduced risk during periods of low market volatility play a role in shaping investors' optimistic views. Investors may focus on positive news and underestimate potential risks, leading to an inflated sense of confidence in their decision-making abilities. Moreover, economic growth expectations and the presence of complex financial products can bolster investor confidence. However, it is important to acknowledge that this confidence is not always based on rational expectations, and investors may overlook warning signs and systemic vulnerabilities, leaving them susceptible to market downturns during a financial crisis.

Similarly, investors of PSX exhibited optimism and confidence just before GFC and did not catch the signal of the coming crisis. However, this is not the isolated case; investors in Japan displayed the same confidence and optimism behavior just before the GFC (Dhaoui, 2015), even though they are more informed and educated investors. Optimism and confidence lead investors to underestimate the risk. Figures about the PSX trade volume further elaborate that investors were trading with substantial volume during the GFC. However, the impact of confidence and optimism was statistically insignificant.

During a financial crisis, investors may not display rational expectations or express confidence, optimism, or pessimism due to the crisis's unprecedented and highly uncertain nature. The extreme uncertainty associated with financial crises makes it difficult for investors to form rational expectations or confidently predict market movements. Fear and panic can set in among investors as they witness sharp market declines and negative economic indicators, leading to emotionally driven decision-making rather than rational assessments.

The behavioral bias of loss aversion, which is the tendency to prefer avoiding losses over acquiring gains strongly, can be amplified during a crisis when potential losses feel more significant. This heightened aversion to losses can make investors excessively risk-averse and hesitant to take action. Moreover, the lack of historical reference points during a crisis can further challenge investors' ability to apply their typical rational expectations based on past patterns. Disruptions in the flow of timely and accurate information during crises can also hinder investors' ability to make well-informed decisions, leading to increased uncertainty and hesitancy. Additionally, frozen market liquidity and systemic impacts can further limit investors' ability to act on their beliefs or preferences, contributing to the complex and

divergent behaviors observed during financial crises. A financial crisis's unique and stressful environment can lead investors to exhibit behaviors that deviate from their usual rational expectations and expressions of confidence, optimism, or pessimism.

Consistent with the previous financial behavior studies, investors of PSX have neither rational expectations nor confidence, optimism, or pessimism. Because of a lack of guidance and awareness about "what to do," they preferred to wait and displayed herd behavior. It may also be the result of Econo-political uncertainty in Pakistan at that time (Wallace, 2020; Nawaz, Anwar and Aquil, 2021); investors avoided risk and opted for short-term returns, one followed by the other, leading to herding and resulting in stock market volatility (Ghufran et al., 2016; Parveen, Siddique and Malik, 2016).

After the GFC, stock investors' optimistic and confident financial behavior may be influenced by several factors. One key driver was the market's recovery, as economies stabilized and financial conditions improved. Rising stock prices and positive returns during the recovery period boosted investors' confidence in the market's resilience and growth potential. Additionally, government interventions played a crucial role. Governments and central banks implemented stimulus measures and policies to stabilize financial markets and support economic recovery. Investors were optimistic about the effectiveness of these interventions in restoring market stability and fostering economic growth.

Corporate earnings growth also contributed to investors' optimism. As economies recovered, many companies experienced improved financial performance and earnings, signaling a healthier business environment. Strong corporate earnings bolstered investor confidence in the economy's overall health and the potential for further stock value appreciation. Lower interest rates, another post-crisis measure taken by central banks, made equities more attractive relative to other investment options, making investors more optimistic about potential returns in the stock market. Improved economic indicators, such as GDP growth, employment rates, and consumer confidence, further supported investor optimism. Positive economic data provided reassurance about the prospects of businesses and the overall market.

Moreover, the crisis gave investors and market participants valuable lessons, leading to more prudent risk management practices and a heightened awareness of potential risks. While investors remained optimistic, many also approached their investment decisions with a cautious mindset. This long-term perspective, combined with a global recovery effort, instilled confidence among investors about the collective endeavor to rebuild and restore stability in financial markets worldwide.

These all factors played role and after the global financial crisis, PSX stock investors displayed positive behavior, and optimism was found to be statistically positive; the investor also exhibited confident behavior though the coefficient was smaller yet significant. These statistics appeared because PSX began to recover shortly after the GFC (Ghufran et al., 2016), but the improvement was gradual. Therefore, investors were cautious yet positive about the profit perspective. A significant increase in the mean value of the trade volume of individuals was observed after the GFC period, which indicates short-term new opportunities for investors (Dhaoui, 2015).

Pakistan's stock investors may not display pessimism due to various reasons. Firstly, the country's history of uncertainty regarding economic challenges and crises has equipped investors with a deep sense of resilience and adaptability, shaping their perceptions and responses to market volatility. This enduring resilience is rooted in a collective belief that the economy and stock market possess an inherent capacity for recovery, even after significant downturns. This belief is evident again with an unprecedented rise of PSX in October-November 2024, after a prolonged downturn during 2023 and the first three quarters of 2024. Consequently, investors may adopt a more optimistic outlook, perceiving each crisis as part of a broader economic cycle rather than as a permanent setback. Additionally, many investors understand that financial markets naturally experience cycles

of expansion and contraction in the long run. This cyclical perspective encourages them to remain optimistic about the potential for sustained growth, fostering a commitment to investment that remains steadfast even amidst short-term fluctuations. Investors maintain confidence in the country's capacity for economic recovery and future prosperity by concentrating on the economy's long-term trajectory.

Furthermore, the government's initiatives to stimulate economic growth and support the stock market can instill confidence. Pro-business reforms and policies to improve the investment climate might create a positive perception among investors. The presence of foreign investors in Pakistan's stock market may also influence local sentiment positively. Foreign investment inflows can signal confidence in the country's economy and encourage domestic investors to adopt a more positive stance. Additionally, specific sectors or industries within Pakistan may exhibit growth potential, attracting investors and offsetting pessimism in other market areas. While these factors contribute to optimism, it's important to recognize that investor sentiment can fluctuate based on changing economic and political factors, and rational analysis remains crucial in making well-informed investment decisions.

As a result of Pakistan's historical resilience, government support measures, reliance on essential consumer goods, and expectations of long-term growth potential, investors in the textile sector may not have appeared as pessimistic before, during, and after the 2008-2009 global financial crisis.

CONCLUSIONS

This research aimed to examine the relationship between trading volume and the financial behavior of investors in terms of their trading patterns; behavior includes rational expectation, confidence, pessimism, and optimism. Data for the analysis was extracted from 74 PSX-listed textile sector firms from 2005 to 2011 and divided into three phases of the global financial crisis: before, during, and after. The textile sector was selected because it is the largest sector in terms of the number of firms and volume in PSX and its significance in Pakistan's economy.

A financial behavior index was created to assess investors' behavior, and this index's returns were used to form four independent variables: confidence, optimism, pessimism, and rational expectation. The study employed regression analysis, with trade volume as the dependent variable and the four financial behavior variables as independent variables.

Results of the study revealed that investors did not portray rational expectations behavior at any phase of GFC. Additionally, investors of PSX did not exhibit pessimist behavior at any phase too. Furthermore, investors displayed confidence and remained optimistic in different phases of the global financial crisis 2008-09. These results are consistent with the existing literature that consistently shows that behavioral errors, such as optimism, pessimism, and overconfidence, tend to prevail over rational behavior in financial decision-making. Moreover, during times of crisis, investors' financial behavior is better explained by the theory of financial behaviors rather than the efficient market theorem. These conclusions and findings have been derived from extensive research conducted globally and within the context of Pakistan.

Based on the study's results, it is recommended that stock investors incorporate behavioral awareness into their investment strategies. Investors should be aware of their own investment biases like optimism and overconfidence. Training programs and workshops can help traders align their expectations according to market realities. Training programs should encourage investors to adopt risk-management techniques to minimize and mitigate potential losses. Using Behavioral finance Tools and analytical models can further strengthen rational decision-making.

Financial market regulators and policymakers can design and implement awareness programs to educate investors about financial behaviors. Awareness can lead to making informed and unbiased decisions. Transparency, accessibility, and symmetric availability of reliable data help temper emotional reactions in the market. Regulatory measures, like leverage and liquidity

requirements, can also be taken to mitigate systematic risks, especially during high market volatility.

This research is one of the first in behavioral finance regarding the Pakistan stock market, where investors are less informed and influenced by media and herds. This study can help to understand the particularities of developing countries' stock markets and know why investors behave the way they behave. It can facilitate the investors and owners to initiate policies that strengthen the industry profile, improving their stock market listing and returns.

Discontinued data is one of the limitations of the study. Additionally, it only examined three financial behavior among many, like depression and anxiety, to name a few. Furthermore, it is limited to the textile sector of PSX with the perspective of financial unrest. Future studies can explore other sectors and behaviors during normal times. The impact of financial literacy and knowledge of financial behaviors can also be assessed in the future.

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