RESEARCH ARTICLE

The Impact of Informational Source and Portfolio Management on Individual Investors' Trade Frequency: A Moderating Effect of Behavioral Biases

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Abstract: Individual investors become significant players in the stock market and a paradigm of finance is shifting from traditional to behavioral finance. This study investigates the impact of information sources and portfolio management on individual investors' trade frequency with moderating effect of behavioral biases at the Pakistan stock exchange. The researcher used descriptive statistics, confirmatory factor analysis, and linear regression to test the hypotheses of the study. Furthermore, the process macro is used to test the moderating effect of behavioral biases on investors' trade frequency. The findings of this study divulge that information source and portfolio management influence the trade frequency of individual investors, and representativeness and overconfidence biases moderate the effect of portfolio management and trade frequency, information source, and trade frequency respectively. This study contributes to the existing literature on behavioral finance in understanding the investigated concepts as well as exploring the trade frequency of individual investors affected by behavioral biases. This study can be helpful for individual investors in how they can take reliable, factual, and rational decisions to enhance their trade frequency.

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1 Introduction

Information is the key element for rational decision-making. Acquisition of relevant information is an important determinant that increases the trade frequency of individual investors according to traditional and behavioral models of investment (Abreu & Mendes, 2012; Tauni et al., 2015). Most commonly, Investors discuss and exchange information about stocks with their neighbors, relatives, friends, and colleagues and take bits of advice from them. Financial advisors, analysts, bankers, and financial planners provide their services for making investment decisions. Therefore, investment decision-making is considered complex decisions making for individual investors, and these are affected by different factors (rational as well as irrational) which bestow their role in making the market inefficient. This inefficiency of the market is characteristic of the investors' behavioral biases. With the emergence of new concepts in finance, the finance paradigm is shifted from traditional to behavioral finance. Investors are considered "rational" in traditional finance while according to behavioral finance, there are different biases that influenced the investors' decisions. There are numerous traditional finance theories (CAPM, APT, Markowitz portfolio theory), which ponder that individual investors are rational investors who always take care of their risk and return while making decisions (Mumtaz & Ahmed, 2020). Financial concepts evolve based on different assumptions, according to these assumptions' investors are rational and make rational and unbiased decisions. Investors are considered rational and unbiased when they stab to make themselves update with the latest information and take those decisions which are acceptable.

In contrast to traditional finance, according to (Bakar & Yi, 2016) behavioral finance advocates that emotional and contingent factors affect the investors' decisions and the reason behind this are some psychological and social aspects. Behavioral models aligned the behavior of investors with decision-making models of psychology. These models depict how market participants behave in actuality. Different psychological factors as well as their behavioral biases influence the individual investors 'decisions, therefore, they can make poor investment decisions that contradict with expected utility hypothesis, and due to these psychological factors, they cannot possess all relevant market-based information at all times. Investors adjust their portfolios by managing information and taking high-risk investments and it is expected to trade more frequently (Press, 2004). It is obvious from the existing literature that individual investors practice different information as well as strategies to make rational investment decisions. They received this information from their friends, relatives, and financial advisors. They adopt information search strategies, which are based upon their contact through phones or visits, or other different sources that investors used to collect the relevant information. The literature concluded that investors' trade frequency has been impacted by the quality of the source of information, if there is an authentic source of information then there would be more trade frequency and vice versa (Epstein & Schneider, 2008). The latest literature reveals that there is a gap to investigate the impact of information sources and portfolio management on the trade frequency of individual investors of the Pakistan Stock Exchange. Additionally, this study also incorporated the moderating effect of some behavioral biases (representativeness, overconfidence, and herding) on the trade frequency of individual investors. The different information sources influence the trading pattern of individual investors and their trading pattern varies depending upon the different behavioral biases.

In this paper, the impact of information sources and portfolio management on individual investors' trade frequency in the stock market of Pakistan is discussed. Because in the recent past it is observed that individual investors such as retail investors (households) are actively participating in financial markets because of their mounting concerns about retirement backing. However, individual investors' behavioral

biases (representativeness, overconfidence, and herding) moderate the relationship between information source, trade frequency, and portfolio management and trade frequency respectively.

The basic objective of this study is to investigate the impact of information sources and portfolio management on individual investors' trade frequency with moderating effect of behavioral biases at the Pakistan stock exchange.

Individual investors become the strong player in the Pakistan stock exchange as they mobilize resources in the economy and their role and participation increase day by day (Calvet et al., 2017). PSX is important for the development of an economy. Activities of the stock market assist to determine economic activities. The objective of this study is to examine the impact of information sources and portfolio management on individual investors' trade frequency with the moderating role of behavioral biases. There are numerous studies (Akhtar & Das, 2019; Kumar & Goyal, 2016) conducted on individual investor's decision making, investment behavior with moderating effect of different behavioral biases, but very limited studies are conducted in Pakistan on individual investors' trade frequency with moderating effect of behavioral biases. This study is an addition to management science literature, especially behavioral finance literature, and furnishes empirical evidence that how information sources and portfolio management influence the trade frequency of individual investors and the behavioral biases moderate the effect of this relationship. Behavioral biases are the important factors, which influence the decision-making process unconsciously---this study includes the behavioral biases herding behavior, overconfidence, and representativeness. The stock market of Pakistan is unique and different from other stock markets around the world because of uncertain economic conditions and complex structure (Waqar et al., 2017), therefore, this study bids new theocratical acumens of individual investors 'behavior which are due to the unique behavior of stock market of Pakistan. This study is endorsed by Waqar et al., (2017) who investigated individual investors 'satisfaction with the help of structural and efficient market factors.

This paper has carried out various sections. The rest of the sections are organized as follows. The section-2 builds a comprehensive literature review and empirical appraisal of the existing literature regarding the different dimensions of behavioral biases. The section-3 explains the data collection and methodology for research, analysis, and interpretation of the data have been also discussed in section 4. Lastly, section 5 concludes the study.

1.1   Review of Literature

Numerous studies have been found on traditional concepts and theories of finance. The rational decision-making process is the base of different theories of economics and finance. These theories assume that investors are always realistic and make their decisions rationally. Investors show concern towards all aspects while making decisions about their investments (Kim & Nofsinger, 2008). Traditional finance is supported by these theories, (Markowitz theory, APT, EMH) but there are some anomalies and different behavior of financial markets has been observed that can only be explained by behavioral finance (Shukla et al., 2020). Usually, the intellectual model provides the base to analyze the financial behavior of investors, investors' financial behavior is based on this model. The intellectual model contains different psychology, sociology, and financial factors. The representations of intellectual models are considered irrational because their perception, thinking, and preferences are irrational therefore they act like irrational persons (Farlin, 2006). There are different factors (culture, religion, emotions) that lead investors toward irrational decision-making in different scenarios (Macgoun, 1992). According to Montier (2002), there are so many studies have been conducted in the field of behavioral finance but people are still unaware

and don't know the concept of financial behavior, financial literacy, and different factors which lead investors toward irrational decisions.

When a person simultaneously holds dual cognition (ideas, beliefs, and views), which may be at odds with one other in their psychology, it creates a condition known as cognitive dissonance (Aronson 1968). According to the loss aversion theory, people may respond differently to identical situations depending on whether they view them from the perspective of success or failure (HDFC securities 2011). The vast majority of investors may be risk averse while seeking profits, but they may change their minds as they work to avoid failure and become enthusiasts for taking risks. The individual's excitement to spend varies greatly depending on their enthusiasm for recognition as a result of studying financial problems (Horowitz & McConnell 2002).

People have a variety of characteristics that are related to their investment behavior. Pessimistically connected to stocks in equities is the non-financial sector's exponential nature of earnings (Patel, 2019). Investor Personality Types, Demographics on Investment Behavior The persons establishing the firm based on their own risk and resources may be associated with a little investment of share equity, likely due to personal traits like risk-taking (Heaton and Lucas 2000). The family unit and early stages of every person's life were heavily influenced by their investment practices (Bouchard Jr 1998). Investment behavior is strongly influenced by a person's demographic traits (such as their education and literacy) concerning money problems (Campbell 2006).

On the other hand, Van Rooij et al. (2011) claim that the only personal characteristic that can influence stock market involvement is education. The arrangement of assets inside this stock market may be influenced by the person's normal resources (Poterba et al. 1995). The degree of risk wealth may have an impact on how many people participate in the stock market (Guiso & Jappelli 2002).

The distribution of resources may be impacted by a person's danger-disliking traits (Barsky et al. 1995). Participation in the equities market may be affected by an individual's behavioral traits (threat dislike) (Charles et al. 2003). In terms of happiness and enjoyment concerning financial settings, money magic, and spending behavior, gender has a considerable influence on investing behavior (Hira and Mugenda 2000).

The actions of female individual investors tend to be more carefully considered, which results in a negligible purchasing and selling rate and higher profits (Barber and Odean 2001). Due to factors related to demography (such as marital status, job-related mixing of options, and overall status), women affect individual aspects of investing (Sunden and Surette, 1998). Dwyer et al. (2002) found that as the knowledge gaps in financial markets and investments dissipate, the impact of gender categorization is dramatically destabilized. The marital status of the family has an impact on their financial behavior (Love 2010, Iqbal 2014).

According to Meier et al. (1999), husband subjugation was previously exposed to the greatest extent in self-governing affiliations and in decisions where the wife's dictating role was mentioned more frequently than in traditional husband-and-wife relationships. According to Powell and Ansic (1997), the risk intensity level of a married couple's joint nest of capital instruments is among that of a pair of individuals' nests of financial assets. According to Meier et al. (1999), relatives with even more skills than their peers may wield substantial influence over investment decisions.

Males are more likely than females to believe they are skilled in financial affairs, according to Beyer and Bowden's (1997) research. According to Barber and Odean (2001), males tend to overestimate their ability

to make financial judgments, and married men and women influence each other's investing decisions. In this way, their excessive confidence is falling as a result of sexual category differences.

Literature documented the strong and positive link between information sources and trade frequency (Vanasco, 2015). Information from an authentic source increases the trade frequency as compared to information received from a less reliable source (Epstein & Schneider, 2008). (Abreu & Mendes, 2012) conducted a study on information source matters for trading or not? They examined the link between trade frequency and information sources used by investors. They concluded from their study that investors who invest more in acquiring information, invest and trade more in financial products. They also concluded that there is a strong and positive relationship between information source and trade frequency and trade of financial products is more sensitive with information source investors possess.

According to Lai and Wang (2014), Buying and selling are linked with each other and impact the investment behavior of the investors. While on the other side, unauthentic and verbal information may lead to poor and inappropriate decisions (Higgins 1996). Some psychologically supported approaches may price the securities and permit in favor of jointly threat disliking (Hirshleifer, 200, Mohsin et al. 2019). He added the properties of divergent rates of rectification on behalf of features as well as long-term and overreaction in the financial markets.

Investors usually make their portfolios on the available information and their trade frequency hits due to their decisions. Different biases affect their decisions and put them from worse to best or best to a worse situation (Shah & Ismail 2020).

1.1.1 Moderating Role of Representativeness bias on the Trade Frequency of Individual Investors

According to Shefrin (2005), one source of potential bias is representativeness bias, which can be described as mental cutoffs, implying that decisions are made based on various stereotypes. Representativeness places too much faith in stereotypes and leads to forecasts that are inappropriate for the situation at hand (Shefrin, 2008, Iqbal et al, 2019).

Representativeness bias is further classified into two major groups. The first is base-rate neglect, and the second is sample-size neglect. In base-rate neglect, the decision-maker considers false and extraneous information during the estimation of investment consequences, or it can be defined as investor decisions that are influenced by various stereotypes (Pompeian, 2006). Sample-size neglect bias occurs once decision-makers make decisions based on a few generalized examples (Barberis & Thaler, 2003) or "incorrectly assume that small sample sizes are representative of populations" (Pompeian, 2006).

1.1.2 Moderating the Role of Overconfidence on the Trade Frequency of Individual Investors

Biais et al. (2005) stated that the components (preconceptions) of the investor temperament type are overconfidence, the way not just buying and selling but as well the despicable portfolio presentation. Correspondently, overconfidence has a destructive fender-bender on the share's operations presentation in the stock market (Fenton-O'Creevy et al., 2003).

Overconfidence is a behavioral bias, and it is a noticeable reality for every investor. It is the situation in which investors as he is sellers or buyers in the stock market think that they possess authentic and relevant information, therefore, they become more overconfident. Therefore, they can make investment decisions in bulk, and their trade frequency increase. In a different scenario, an individual asserts that undesirable destiny is held responsible for the collapse while achievements are their recognition. In the eye of Barberis

et al. (1998), individual investors become more confident (overconfident) most of the time as they possess updated information as compared to previous information related to financial markets. According to Cohen & Kudryavtsev (2012) document that illogicality may not be documented while making the findings for the stock investment. According to their findings investment in equity shares is driven by anticipation, preceding know-how in the stock market as well as awareness concerning the historical recital of preferred market indicators. According to Iqbal et al., (2021), when the market goes upward direction, investors' behavior is optimistic on the other hand when the market goes downward, the investors' behavior is pessimistic and it depicts the bullish and bearish trend of the market.

Researchers claim that behavioral biases like overconfidence cause a higher transaction volume, as evidenced by earlier studies. De Bondt and Thaler (1995) assert that the crucial cognitive element needed to appreciate the trade conundrum is overconfidence. According to Statman, Thorley, and Vorkink (2006), who provide actual findings for the US market, more trading volume contributes to improved returns as investment competence raises the level of overconfidence.

Researchers Barber and Odean (2001) contend that gender is a suitable substitute for behavioral biases and they counsel that males trade more than women. Our study examines whether psychological gender effectively categorizes investor variations and explains why investors trade in various ways. This method differs significantly from that of Barber and Odean (2001), who divided their specimen into men and women based on the assertion that men are more overconfident. They established that, as a consequence of increased trading, male investors outperformed female investors. Investors might be overly confident in their investment abilities. Investors believe they have above-average investment skills due to a self-attribution bias. According to Taylor and Brown (1988) and (Deaves, Lüders, & Luo, 2009 and Graham, Harvey, & Huang, 2009), people have implicitly positive views of themselves. Overconfidence may also have a moderate effect on individuals' trading behavior. Indeed, Forbes and Kara (2010) contend that individual investors' self-confidence moderates' investment fiscal knowledge, which in turn influences investors' trading efficacy.

1.1.3 Moderating Role of Herding Effect on the Trade Frequency of Individual Investors

Investors tend to follow the crowd without considering their judgments. In the stock market, herding refers to the tendency of investors to follow the decisions of other investors. This aspect of investors is the subject of extensive research because investors rely more on collective information than private information Shiller (2000), Kahneman & Tversky (1979) and Raheem et al, 2020).

This can lead to price deviations from fundamental values and a risk of lower returns. Anum and Ameer (2017) researched the Pakistan stock exchange to investigate the impact of behavioral biases on individual investors' decision-making and stock performance. They collected data from Pakistan stock exchange individual investors and analyzed the data using SPSS. They concluded that behavioral biases (heuristics, prospect, herding) have a significant impact on investor decisions and investment performance, but only prospect has a negative relationship with investment performance.

1.1.4 The hypothesis of the Study

H1: There is a significant impact of information sources on trade frequency.

H2: There is a significant impact of trade frequency on trade frequency.

H3: Overconfidence moderates the relationship between Information sources and trade frequency.

H4: Overconfidence moderates the relationship between Portfolio management and trade frequency.

**H5:** Herding moderates the relationship between Information source and trade frequency.

H6: Herding moderates the relationship between portfolio management and trade frequency.

H7: Representative moderates the relationship between Information source and trade frequency.

H8: Representative moderates the relationship between portfolio management and trade.
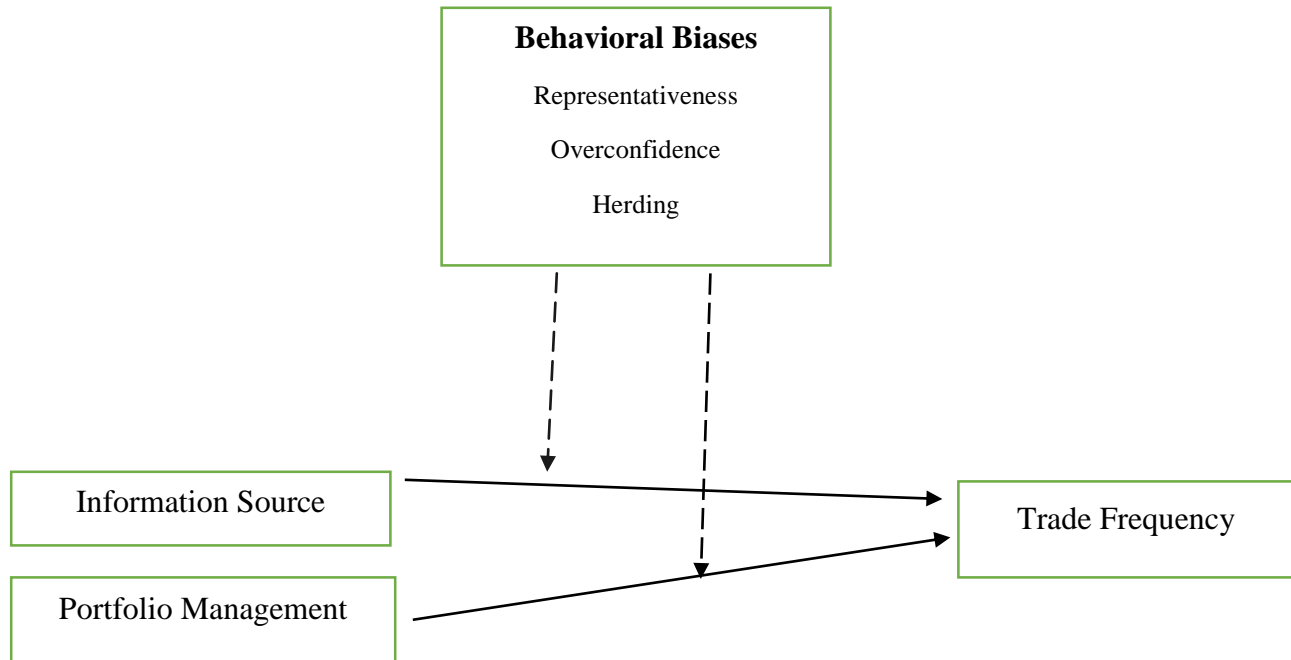
1.1.5   Conceptual Framework

2 Methodology of the Study

This section covers information relating to sampling technique, survey design, and data collection. The method regarding confirmatory factor analysis and regression model has also been highlighted.

This research is used cross-sectional data which is based on a primary survey of stakeholder analysis. This type of research focuses on respondents' opinions on particular issues. The population consists of individual investors of the Pakistan stock exchange, belonging to different industries.

Convenience sampling was resorted to collect the data. The data was collected through a predetermined plan and specific criteria. In total, 200 questionnaires were distributed to the individual investors by approaching them in their offices, through the internet. These individual investors belong to different cities in Pakistan i.e., Islamabad, Lahore, Rawalpindi, etc. All of them responded were considered the sample of individual investors investing in different industries. However, 110 questionnaires were received. The response rate was 55 %.

The data for this study has been collected through the structured questionnaire which was developed by (Zaheer et al., 2017). Five-point Likert scale has been used in this research as it is a recognized, understandable, and appropriate scale (Zaheer, Rehman, & Saif,2008). The questionnaire is adopted and has two sections, in section 1 demographic information (age, education, experience, professional field, and sector) of individual investors is provided. While in section two structural efficiency of the market has been measured through different items. There are six factors (information management, portfolio management, trade frequency, representativeness, overconfidence, and herding) that are measured by 32 items.

2.1 Data Analysis Techniques

The data was gathered through structured questionnaires and then analyzed this data by using different techniques (descriptive statistics, explanatory factor analysis, confirmatory factor analysis, reliability test, and multiple regression analysis). For analyzing the data, SPSS-25 and AMOS-24 software have been used for this research.

3 Results of the Study

3.1 Preliminarily Analysis

The demographic characteristics of individual investors regarding age, educational level, experience, professional field, and sector of their investment in the Pakistan stock exchange. The age of 45.5 % of the individual investors fall in the below 30 years line and represented the majority among all respondents. Most of the respondents (27.3%) had a higher education than a Master's degree followed by master's (23.6%) and graduates (18.2%). Around 76.4% of individual investors have less than five years of experience, while only 14.5% of individual investors have more than 10 years of experience. Approximately, 5.5% of investors are general investors, 10.9 are self-owned, 30.9 are government officials while 38.2 are academics, and 7.3 are salaried individuals. Roundabout 41.8 are those individual investors

who are invested in financial institutions, 16.4 individual investors 'field is mutual funds while the remaining others belong to technology and telecom. Textile, pharmaceutical, and so on.

Table 1

Sr. No	Characteristics	Items	Percentage (%)
1	Age group	Below 30	45.5
		30 − 40 years	27.3
		41 − 50years	21.8
		51 or above	5.5
2	Education	basic HSC	1.8
		Hsc complete	5.5
		Bachelor	18.2
		Incomplete degree of Masters	10.9
		completed Masters	23.6
		Higher than Master	27.3
4	Experience	less than 5 years	76.4
		5 to 10 years	9.1
		more than 10 years	14.5
5	Professional field	financial institutions	7.3
		academic	38.2
		corporate (salaried)	7.3
		government officials	30.9
		Self-owned business	10.9
		General investors	5.5
6	Pre-Sector	financial institutions	41.8
		engineering	5.5
		power, oil, gas	10.9
		technology	5.5
		telecom	7.3

Investment i.e., mutual funds	16.4
pharmaceutical	5.5
textile	7.3

3.2 Descriptive Statistics

The descriptive statistics (mean and standard deviation) of this study have been presented in table 2. The mean statistics of all the factors fall from 2.9635 to 3.5729 and the standard deviation of all constructs lies from 0.59852 to 0.78220 which lies in the acceptable range. The results are correlated with previous studies. (Zaheer et al., 2017: Iqbal, 2008).

Table 2

Factors	Mean Statistics	Standard Deviation Statistics
Information Management	3.4771	0.66430
Portfolio Management	3.5729	0.73249
Trade Frequency	2.9635	0.78220
Representativeness	3.5854	0.59852
Overconfidence	3.3612	0.73047
Herding	3.2987	0.77735

3.3 Reliability and Normality Analysis

The Cronbach alpha of this study has been presented below in table 3. The coefficient of Cronbach's alpha represents the internal consistency of the data set. The results show that the value of Cronbach's alpha for all factors is greater than 0.5 as suggested by Briggs and Cheek (1986). Therefore, we can conclude that internal consistency exists as shown in table 2 and data can be used for further analysis.

Statements are tested to estimate the reliability of each factor by using Cronbach's Alpha. The empirical finding shows the value ($\alpha = 0.0930$) of information management that shows the consistency and reliability of data. Meanwhile, values for the rest of the others such as portfolio management (0.778), trade frequency (0.748), representativeness (0.912), overconfidence (0.870), and herding (0.836) are according to the criteria as explained by Hair, Bush, and Ortinau (2000) in literature. The Value of Cronbach's alpha is relatively sensitive to the number of items as mentioned in the scale. Briggs and Cheek (1986) recommend the minimum value of $\alpha = 0.5$ for short scales having a value of less than ten. The results are correlated with previous studies. (Zaheer et al., 2017: Iqbal, 2008).

Table 3

Factors	No. of Items	No. of Item Deleted	Cronbach Alpha
Information Management	7	-	0.930

Portfolio Management	5	1	0.778
Trade Frequency	3	-	0.748
Representativeness	6	-	0.912
Overconfidence	7	2	0.870
Herding	4	-	0.836

The normality Test tells the probability that the sample is extracted from a normal population. Several methods can be used to assess the normality of data. The researcher has used the Q-Q plot to fulfilling the purpose as suggested by (Field, 2005; Jullie Pallant, 2005; Soodhun, Khan, & Chutoo, 2014). Q-Q plots show the observed values as indicated by the line against the normally distributed data. In this study, the normality distribution of the variables is checked by skewness and kurtosis statistics (Elliott & Woodward, 2007). It is clear from the literature skewness and kurtosis values lie between -2 and +2 which indicates data is plausibly normal (MAIYAKI & Mokhtar, 2010). Following table 4 shows the skewness and kurtosis statistics. It is observed that the values of skewness and kurtosis lie between -2 and +2 for all variables.

Table 4

Factors	Skewness	Kurtosis
Information Management	-0.506	0.935
Portfolio Management	-1.157	1.962
Trade Frequency	-0.516	-0.760
Representativeness	-1.090	2.829
Overconfidence	-0.997	1.402
Herding	-0.459	0.825

Q-Q Plots

Normal Q-Q Plot of INF

Normal Q-Q Plot of PM

Normal Q-Q Plot of OCD

Normal Q-Q Plot of RP

Normal Q-Q Plot of HD
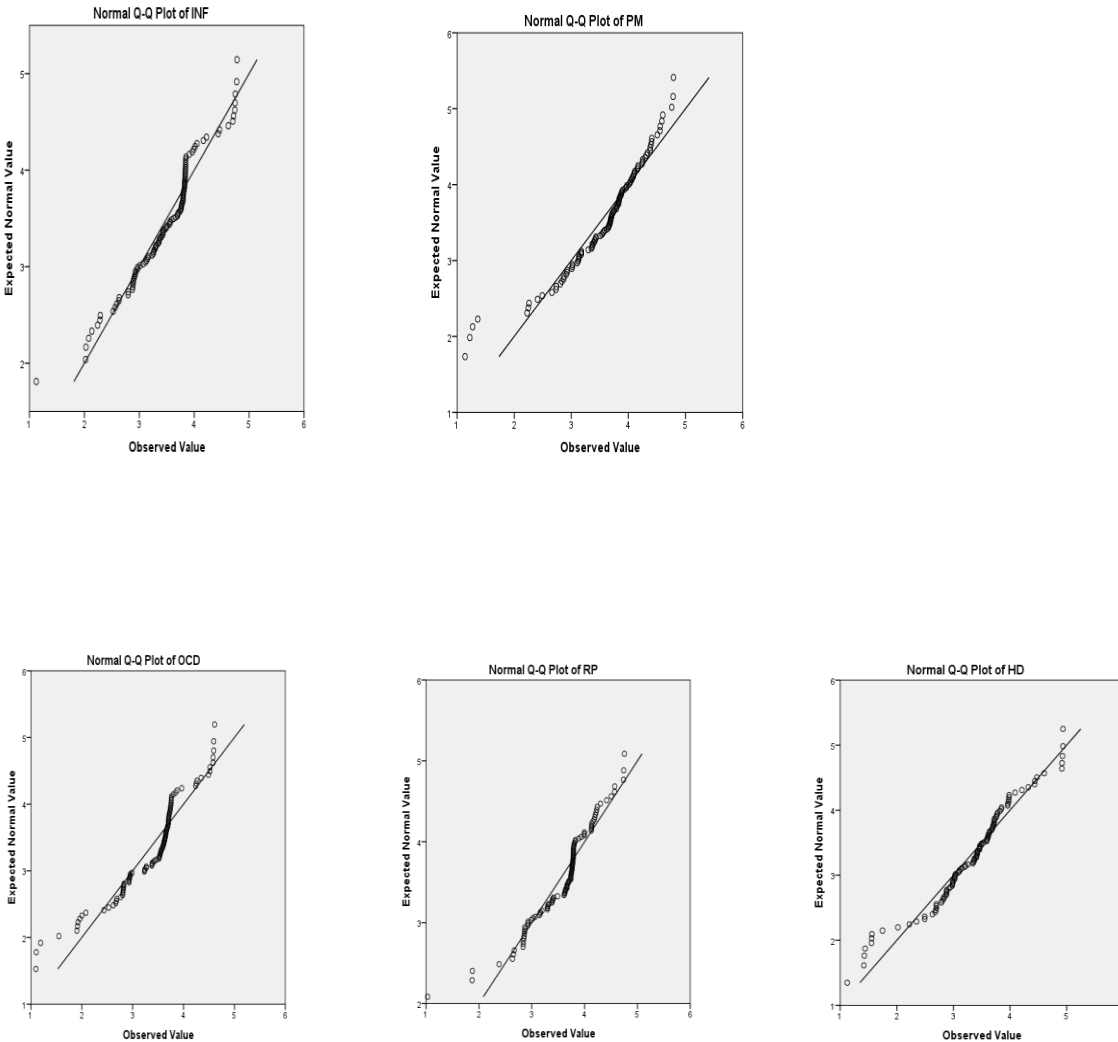
3.4   Correlation Analysis

The correlation matrix defines the strengths and directions of variables that entitles a linear relationship matrix. Furthermore, it investigates whether the explanatory variables are interlinked with each other. Table 5 statistics concludes the results of the correlation analysis. It represents the relationship between two variables as presented below. It comprises dependent variables (trade frequency), independent variables (information management and portfolio management), and moderating variables (representativeness bias, overconfidence bias, and herding behavior bias).

Table 5 summarizes the results that variables that r square = 1 diagonal side of the analysis show perfect correlation. The empirical finding of the correlation matrix indicates a positive and significant relationship between trade frequency with independent variables (portfolio management) and moderating variables (overconfidence bias and herding behavior bias) and also significant correlation exists between trade frequency and information management, trade frequency, and representativeness bias.

Table 5

Measures	Trade Frequency	Information Management	Portfolio Management	Representativeness	Overconfidence	Herding
Trade Frequency	—					
Information Management	0.239*	—				
Portfolio Management	0.229*	0.063**	—			
Representativeness	0.100	0.558**	-.123	—		
Overconfidence	0.154	0.063	0.435**	-0.014	—	
Herding	0.058**	0.033	0.239**	0.006	0.375**	—

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

3.5   Inferential Analysis

3.5.1   Factor Analysis

It is considered an appropriate method to reduce a large number of useful items into an appropriate number of variables. Accordingly, the factor analysis technique has enabled the conversion of 24 items into six factors that support the objective of the study. According to Julie Pallant (2007) to check the accuracy of data, we need to analyze two concerns critically. These are the sample size and the relationship among the items. It examines whether interrelated items and the sample size are appropriate for factor analysis. The literature discussed the two types of factor analysis.

  - ➢ Exploratory Factor Analysis (EFA)
  - ➢ Confirmatory Factor Analysis (CFA)

SPSS-25 and AMOS-24 are used for exploratory factor analysis and confirmatory factor analysis.

3.5.1.1   Exploratory Factor Analysis

Confirmatory Factor Analysis is used in this study. The validity of data is tested through EFA. It is used to screen the data and it is the requirement of CFA. EFA is conducted in SPSS-25 and maximum likelihood with Promax rotation is used. Before this, the normality test was conducted through skewness and kurtosis. The results of the normality test confirmed the normality of the data and the data is ready for further procedure.

Table 6

Pattern Matrix[a]

	Factor					
	1	2	3	4	5	6

INF7	.888					
INF5	.883					
INF2	.852					
INF4	.836					
INF6	.818					
INF3	.665					
INF1	.644					
RP3		.971				
RP2		.934				
RP4		.808				
RP5		.784				
RP6		.595				
RP1		.592				
OCD5			.888			
OCD6			.845			
OCD4			.791			
OCD2			.622			
OCD1			.553			
HD2				.847		
HD3				.801		
HD1				.766		
HD4				.535		
PM3					.939	
PM2					.632	
PM4					.617	
PM5					.501	
TF2						.863

TF3						.651
TF1						.613

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalization.[a]

a. Rotation converged in 6 iterations.

3.5.1.2   Confirmatory Factor Analysis

Confirmatory Factor Analysis is used to confirm the internal consistency of the factors. CFA is conducted through AMOS-24. A detailed description of confirmatory factor analysis follows. Table 7 shows the result of the confirmatory factor analysis, which depicts that model is fit for all dependent (trade frequency), independent (information source and portfolio management), and moderating variables (representativeness, overconfidence, and herding).

Model Fit Measures

Table 7 shows the fitness of the model. The values of all factors lie under the acceptable range. The values of chi-square/df. ratios are in the excellent range (1.375). The values of CFI, SRMR, RMSEA are 0.930, 0.074,0.059 respectively. The value of p-close is above 0.05 which indicates the model is fit. The threshold values are also given in the following table 7.
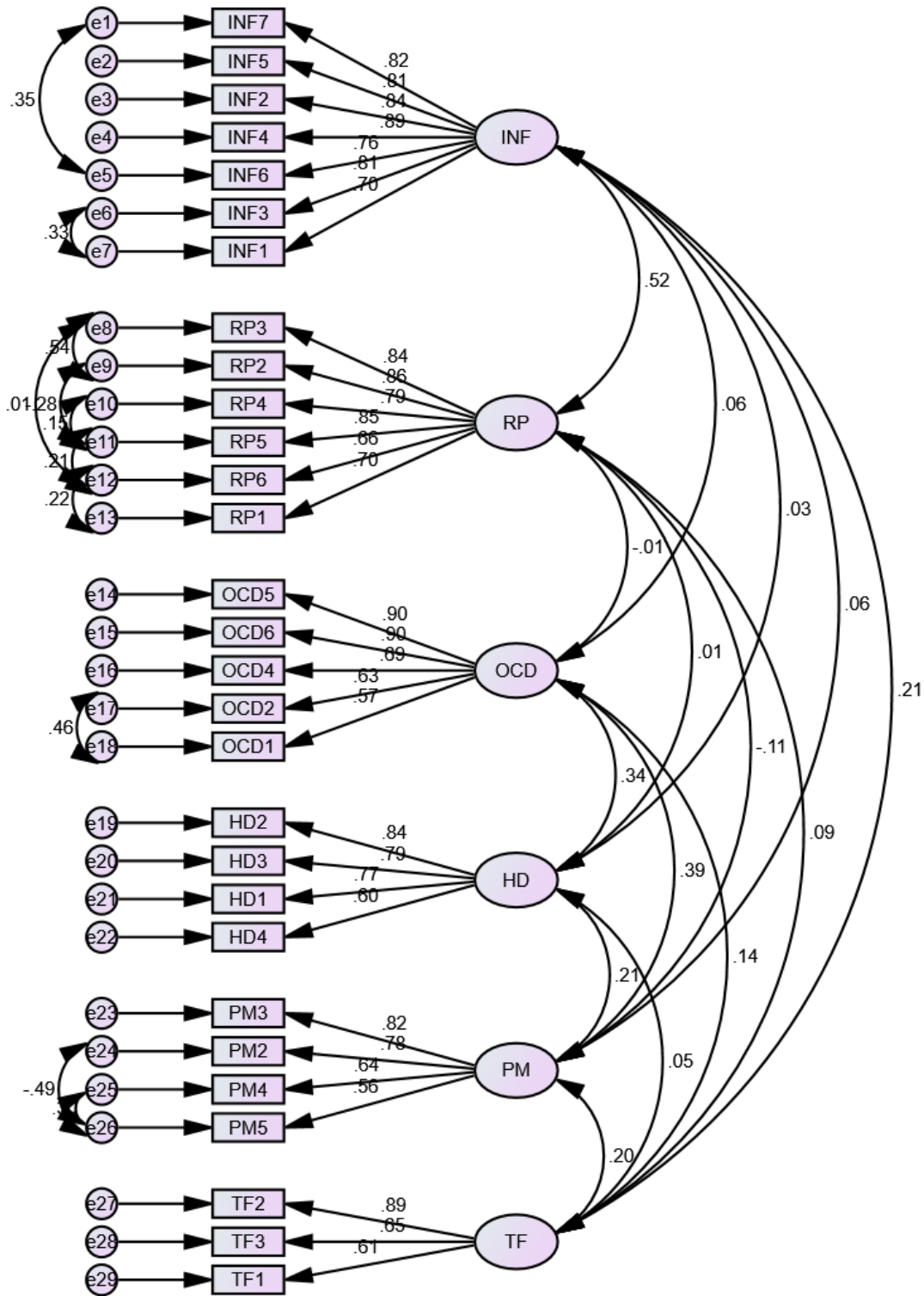
Table 7

Factors	Six Factors		
Measures	Estimates	Reference Values	Accept/Reject
CMIN	482.679	--	--
DF	351	--	--
CMIN/DF	1.375	from 1 to 3	Excellent
CFI	0.930	>0.95	Acceptable
SRMR	0.074	<0.08	Excellent
RMSEA	0.059	<0.06	Excellent
PClose	0.138	>0.05	Excellent

Table 8 describes the validity of the model. The values of AVE all factors are above 0.5 except PM. It shows the model is fit for further analysis.

Table 8

Factors	CR	AVE	MSV	MaxR(H)

|				
INF	0.929	0.651	0.269	0.935
RP	0.908	0.623	0.269	0.920
OCD	0.863	0.567	0.153	0.916
HD	0.841	0.573	0.114	0.860
PM	0.796	0.499	0.153	0.824
TF	0.765	0.528	0.046	0.836

3.6 Results of Regression Analysis

Linear Regression

Table 9 summarizes the results of linear regression. The regression coefficient (β) of the "INF" is 0.225 and the p-value is .0016 while the regression coefficient (β) of "PM" is 0.215 and the p-value is 0.021 highlighting the positive and strong impact on TF which indicates that one standard deviation increases in PM help to raise the TF by 21.5percent. Hypotheses 1 and hypotheses 2 both are accepted based on statistical analysis.

The adjusted R^2 (0.086) explains that the model has explained 8.6% variance in the dependent variable 'TF' and the overall model is a good fit because the p-value of F-statistics is significant (0.000).

Table 9

Predictors	Unstandardized Coefficients		Standardized Coefficients	t-statistics	P-values	Hypothesis Accept/Reject
	β	Std. error	β			
Constant	1.274	0.487		2.617	0.010	
INF	0.257	0.105	0.225	2.457	0.016	Accepted
PM	0.223	0.095	0.215	2.346	0.021	Accepted
Dependent Variable	"TF"					
R-Square	0.103					
Adjusted R-square	0.086					

Histogram — Dependent Variable: TF

Normal P-P Plot of Regression Standardized Residual — Dependent Variable: TF
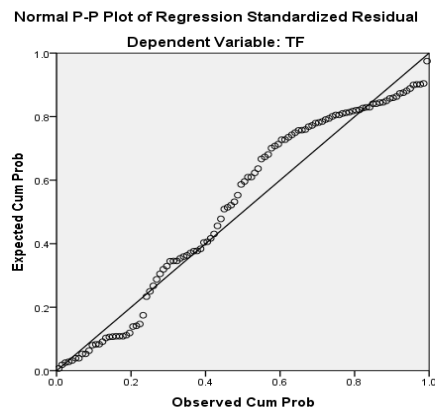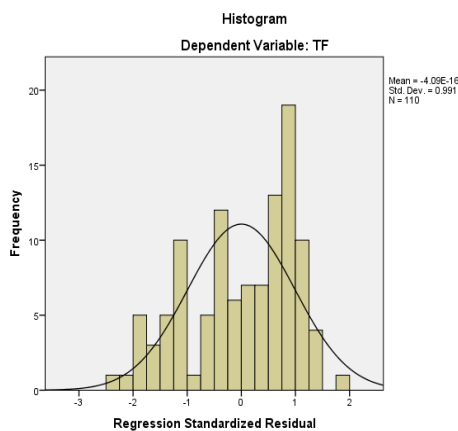
3.7 Results of Moderating Models

Table 10 summarized the results of moderating effect of behavioral biases (representativeness, overconfidence, and herding) on the dependent variable "Trade Frequency". Representativeness,

overconfidence, and herding behaviors are the behavioral biases used in this study as moderator variables. To test hypotheses 4, hypotheses 5, hypotheses 6, hypotheses 7, and hypotheses 8 which are the moderators' effect of behavioral biases on dependent and independent variables, model 1 is used process macro (Hayes, 2013). The values between LLCI and ULCI for hypothesis 3 are (-0.3437 and 0.2612) respectively, the regression coefficient is (-0.0413) and the p-value is 0.0892 which is >0.05, therefore hypothesis 3 is rejected. The values between LLCI and ULCI for hypothesis 4 are (-0.4806 and 0.3292) respectively, the regression coefficient is (-0.0757) and the p-value is 0.0509 which is <0.05, therefore hypothesis 4 is accepted. The values between LLCI and ULCI for hypothesis 5 are (-0.4405 and 0.2205) respectively, the regression coefficient is (-0.1100) and the p-value is 0.0308 which is <0.05, therefore hypothesis 5 is accepted. The values between LLCI and ULCI for hypothesis 6 are (-0.1225 and 0.3003) respectively, the regression coefficient is (-0.0889) and the p-value is 0.0768 which is >0.05, therefore hypothesis 6 is rejected. The values between LLCI and ULCI for hypothesis 7 are (-0.4155 and 0.1794) respectively, the regression coefficient is (-0.01180) and the p-value is 0.0670 which is >0.05, therefore hypothesis 7 is rejected. The values between LLCI and ULCI for hypothesis 8 are (-0.1548 and 0.4535) respectively, the regression coefficient is (0.1493) and the p-value is 0.0821 which is >0.05, therefore hypothesis 8 is rejected.

Table 10

Moderator Path	Effects	SE	LLCI	ULCI	P-Value	Hypotheses Accept/Reject
INF TF[a]	-0.0413	0.1526	-0.3437	0.2612	0.0892	Reject
PM TF[a]	-0.0757	0.2042	-0.4806	0.3292	0.0509	Accept
INF TF[b]	-0.1100	0.1667	-0.4405	0.2205	0.0308	Accept
PM TF[b]	0.0889	0.1067	-0.1225	0.3003	0.0768	Reject
INF TF[c]	-0.1180	0.1500	-0.4155	0.1794	0.0670	Reject
PM TF[c]	0.1493	0.1534	-0.1548	0.4535	0.0821	Reject

Moderators "[a] Representative bias (RP)"

Moderators "[b] Overconfidence bias (OCD)"

Moderators "[c] Herding (HD)"

Table 11

Model Summary						
Predictors Path	R	R-Square	MSE	F	df1	df2
INF TF[a]	0.2436	0.0593	0.5560	2.2281	3.0000	106.0000
PM TF[a]	0.2830	0.0801	0.5437	3.0762	3.0000	106.0000
INF TF[b]	0.2250	0.0650	0.5526	2.4571	3.0000	106.0000

PM	TF[b]	0.2653	0.0704	0.5494	2.6756	3.0000	106.0000
INF	TF[c]	0.2496	0.0623	0.5542	2.3476	3.0000	106.0000
PM	TF[c]	0.2470	0.0610	0.5550	2.2947	3.0000	106.0000

Moderators "[a] Representative bias (RP)"
Moderators "[b] Overconfidence bias (OCD)"
Moderators "[c] Herding (HD)"

4 Discussion

In concurrence with the result of the study, this study advocates the impact of information sources and portfolio management on the trade frequency of individual investors with moderating effects of behavioral biases----herding behavior, representativeness, and overconfidence bias. The results of this study revealed that information source and portfolio management both have a significant impact on the trade frequency of individual investors therefore, hypotheses 1 and hypotheses 2 both are accepted. The statistical analysis of the study shows that overconfidence bias, herding behavior, and representativeness do not moderate the relationship between information source and trade frequency, portfolio, and trade frequency, and information source, trade frequency, and portfolio management respectively. Behavioral biases----overconfidence bias moderated the relationship between portfolio management and trade frequency, and herding behavior moderates the relationship between information source and trade frequency. This study helps in understanding the moderating role of behavioral biases between information sources, portfolio management, and trade frequency of individual investors, especially in developing countries like Pakistan. The results of this study are supported by previous studies. Waqar et al., (2017); Kartini and Nahda (2021); Shukla (2020) their studies also concluded that behavioral biases influenced the decision-making of individual investors and these decisions lead to trade frequency. the investors' trading frequency is affected due to their poor or good decisions.

5 Conclusion

The objective of this study is to explore the impact of information sources and portfolio management on individual investors' trade frequency with moderating effect of behavioral biases at the Pakistan stock exchange. Information management and portfolio management influence investors' decisions and this leads to a change in trade frequency. Behavioral biases also moderate this relationship. Individual investors are the key player in the stock market. To achieve this objective, the researcher constructs the hypothesis which is based on existing literature, and then gathered the data of 110 individual investors of the Pakistan stock exchange through structured questionnaires. The researcher checked the reliability of data through Cronbach's alpha and confirmatory factor analysis. The normality of data was examined through skewness and kurtosis and Q-Q Plots. Descriptive and Regression analysis was also conducted.

There is different micro as well as macro factors which influence the trade frequency of individual investors. The stock market of Pakistan is complex and different from all over the world. The trading frequency of any investor can be influenced by their behaviors and decision-making process. To achieve the objective of this study, different hypotheses are developed based on previous literature. The findings of this study reveal that the first, second, fourth, and fifth hypotheses of the study are accepted. Information sources and portfolio management impact the trade frequency of individual investors. They have a highly positive significant impact on trade frequency. The finding also reveals that investors invest more when they have accurate information sources and they manage their portfolios in a better way. The findings of this study indicate the role of behavioral biases in the development of trade frequency of individual

investors. Furthermore, the representative bias and overconfidence bias which are used as a moderator in this study are strengthen the relationship between portfolio management and trade frequency, information management, and trade frequency. the findings of hypotheses fourth and fifth divulge that when investors manage their portfolios, they adopt representative bias and trade more. Similarly, when they possess information source they invest more, and their trade frequency increase because they are overconfident. The results of the study are consistent with previous studies (Zaheer et al., 2017).

5.1 Implications of the Study

This study will empower future researchers on the issues of behavioral finance especially behavioral biases, individual investors' behaviors, trade frequency, mechanism of their information source, and portfolio management. This study is useful for policymakers, managers, future researchers, and especially individual investors to manage better portfolios and avoid biases. This study is also useful for individual investors as the representative bias and overconfidence bias moderate the relationship between portfolio management and trade frequency, information source, and trade frequency respectively.

- ➢ They should avoid representative bias and overconfidence bias to make effective and realistic decisions.
- ➢ Analyze investment
- ➢ Make investments based on the advice of financial experts.

5.2 Limitations and Future Research Directions

The study has extended the scope of the existing literature but there are a few limitations as well. The study used a very small data set (110) respondents and cross-sectional data, same like only three behavioral biases are used in this study. Future researchers can include more behavioral biases in their research as well they can enhance their sample size as well as use longitudinal data. Future researchers can examine the moderator effect of demographic variables as these effects were not incorporated in this study. This study suggests future researchers compare the individual investors' trade frequency between developed and developing countries by adding more behavioral biases.

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