Role of overconfidence as mediator between anchoring heuristic and trade volume in Pakistan Stock Exchange

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A B S T R A C T

The purpose of this study is to investigate overconfidence as a mediator between anchoring heuristic and trading volume of Pakistan Stock Exchange (PSX). To measure the role of overconfidence as a mediator between anchoring heuristic and trading volume, a sample of daily trading data from January 1st, 2004 to December 31st, 2017 of 301 listed companies at PSX is collected. Overconfidence was measured through market volatility, the 52-week high price is used as a proxy to measure anchoring heuristic, and investors' investment decisions in PSX are measured through trading volume. Results of structural equation modeling revealed that market volatility plays a significant role between 52 weeks high price and trading volume at PSX. Results suggest that overconfident investors use 52 weeks high price to trade stocks in the market and affect the investors' investment decisions. This paper adds to the literature of behavioral finance concerning the role of overconfidence as a mediator between anchoring heuristic and investment decisions. The evidence documented in this paper is first known to measure the role of mediator between anchoring heuristic and investment decisions and it is the novelty of current study.

INTRODUCTION

Behavioral and psychological factors affect the decision making of individuals and these factors are emotions, cognitive biases, and mental shortcuts. The investors display these behavioral patterns in the stock markets while trading. Pakistani stock market is an emerging stock market with 559 listed companies in total of 35 sectors. Individual investors in Pakistan stock exchange are almost 60% which is a large number to represent an economy. There are 220,000 retail investors, 1886 foreign institutional investors and 883 domestic institutional investors in Pakistan. Retail investors are in large numbers, so they represent a significant portion of trading in the Pakistani stock market. So, the decision making of retail investors in stock exchange influences price level and trading volume.

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Other factors that affect investment decisions of investors include corporate profits, expected dividends, taxes, inflation rate, religious views and opinions, the affiliation of a specific political party, the opinion of family members and friends, financial literacy, financial position and situation of industries (Ahmad, 2017). All these factors are influenced by psychology and thinking patterns of investors. Investors perceive them according to their belief system and risk-taking attitudes. Psychology of investors impacts their decision making when they select portfolio and industries for investing purposes. Such behaviors influence price level and trade volume in the stock exchange. It is interesting to study the impact of behavioral heuristics and biases of investors in an emerging market like Pakistan where there are fewer information resources, people are not much financially literate and the financial markets are in developing phase (Sabir et al., 2019; Bashir et al., 2013). Results of the present study will interest readers and researchers of other developing markets and developed nations to see how the psychology of their investors is similar and where it differs.

For the present study, we have chosen anchoring heuristic and overconfidence bias to find out their impact on investment decisions of investors trading in Pakistan stock exchange. Anchoring heuristic and overconfidence are related as overconfident investors use anchors to make decisions (Kahneman et al., 1982). So, the impact of anchoring heuristic and overconfidence must be examined simultaneously on the investment decisions to get a more reliable and complete picture about the trading of investors. The main contribution of the present study is to fill the gap related to simultaneous testing of anchoring heuristic and overconfidence with investment decisions in the literature of behavioral finance. Current has introduced overconfidence bias as a mediator between anchoring heuristic and investment decisions which have not been done before to the best of authors' limited knowledge. After reviewing the literature of behavioral finance, it has been found that overconfidence, anchoring heuristic, and investment decisions are interlinked. They do not exist separately as stated by Kahneman et al., (1982); Kahneman and Tversky (1974); Baker and Nofsinger (2010). Behavioral heuristics help in spurring overconfidence and also affect their investment decisions. Direct links of these three variables are proved by many researchers (Kahenman et al., 1982; Kahneman & Tversky, 1974; Odean, 1999; Shiller, 2000; Statman et al., 2006; Glaser & Weber 2007; Grinblatt & Keloharju 2009; Li & Yu 2012; Daniel & Hirshleifer, 2015; Prosad et al., 2017). Few studies have shown the role of overconfidence as a mediator between different variables such as overconfidence has been tested as a mediator between confirmation bias and trading volume in a study conducted by (Park et al., 2010). In another study by Iqbal et al., (2015) overconfidence has been tested as a mediator between self-attribution bias and perceived market efficiency. Haixia (2018) conducted a study on the sentiment of investors and their investment behavior

which revealed that managerial overconfidence mediates their relationship significantly. Hence, it shows that overconfidence plays role of mediator between different biases. Therefore, we have introduced overconfidence bias as mediator between anchoring heuristic and investment decisions. It will be a contribution of the present study in the behavioral finance literature with respect to developing country like Pakistan. Tariq and Ullah (2013), Qadri and Shabbir (2014), Yasir (2015), Zia et al., (2017), Irshad et al., (2018) and Qasim et al., (2019) have conducted studies on behavioral biases and heuristics in Pakistan by utilizing primary data of individuals trading in Paksitan stock market. Second research gap is that the role of overconfidence as mediator has been tested by using secondary stock market data of Pakistan stock exchange and this is the novelty of present study.

LITERATURE REVIEW

It is found that anchoring heuristic, overconfidence, and investment decisions are interlinked, and anchoring heuristic and overconfidence are present simultaneously in the decision making of investors after reviewing extensive behavioral finance literature on these variables. According to Shah et al., (2018), anchoring heuristic and overconfidence influence the decision making of investors in the stock market and the efficiency of financial markets. Lee and Piqueira (2019) found that insider traders use the anchoring heuristics as they apply 52-weeks high price for trading for stocks in the market. Tan et al., (2019) explored the national culture of 21 countries and found that investors have different level of overconfidence bias in different countries. This behavior impacts their investment returns. Gupta et al., (2018) investigated the financial markets of China and India in pre and post global recession. They found that investors of both countries trade excessively during global recession and it effected their returns on investment. Anchoring heuristic is a psychological bias that occurs when investors give extreme importance to some values while making investment decisions. Anchoring influences the way people estimate and guess the chances to reach to the final decisions (Costa et al., 2017). People start making estimates by the anchor and make adjustments in it accordingly on the arrival of new information gathered and received by them (Kahenman et al., 1982). It is not a rational approach and contradicts the concept of market efficiency as different initial values resulted in different answers that are biased and incorrect (Fernandes et al., 2014).

Overconfidence plays the role of mediator between behavioral heuristics, biases, and investment decisions. A study conduct by Iqbal et al., (2015) examined the role of overconfidence as a mediator between self-attribution bias and perceived market efficiency. They found that overconfidence partially mediates the relationship between self-attribution bias and perceived market efficiency. Haixia (2018)

conducted a study on investors' sentiments and corporate investment behavior with managerial overconfidence as a mediator between them. Results showed that the role of managerial overconfidence partially mediated the relationship between investors' sentiments and corporate investment behavior.

Different researchers have used different reference points to measure anchoring heuristic and its impact on investment decision making. A study was conducted by Li and Yu (2012) on the attention of investor, use of anchoring bias and stock market predictability in NYSE/AMEX. In order to measure anchoring bias, they used two proxies. Firstly, they used Dow 52-weeks high price and secondly, high historical value as the anchor to find out about the anchoring bias in investors' decision making. Bhootra and Hur (2013) used 52-weeks high price as the anchor to find out the relationship between 52 weeks high price and momentum of stocks. Baker et al., (2012) studied the effect of 52 weeks high, the effect of past price on current price and weekly returns as a reference point in making decisions for mergers and acquisitions. Yu (2012) conducted a study on momentum strategies and the success of the investment. He used 52-weeks high, 52-week median, a 52-week low, half year high and two years high as the anchor in their study. Hao et al., (2016) used 52-weeks high stock price as the anchor to decide on the stock market. This anchor served as a reference point and produced momentum profit for investors of Taiwan. Kansal and Singh (2015) conducted a systematic literature review on the relationship between anchoring heuristic and investment decisions. They did a content analysis of reference points used as an anchor by investors in the stock markets from 2001-2015. They found that investors used chart patterns, moving averages, 52 weeks high, 52-weeks low, initial prices, current prices, and last day stock prices as the anchor in their investment decision making.

Overconfidence affects the level of trading activity in the stock market (Odean, 1998). High returns in the market cause investors to be overconfident, and they began trading more in the security with high returns (Glaser & Weber, 2007). Overconfidence leads investors towards the concept of irrationality that opposes the idea of market efficiency. Barber and Odean (2001) found overconfidence in the decision making of people and their irrational behavior in the stock market. Informed investors were found to be more overconfident, and their behavior affected their investment decisions. Different researchers have used different measures to find out about overconfidence bias in investors in the stock markets. Bruggemann et al., (2014) used linear VAR model to find out the relationship between stock returns and trading volume. Mohamed et al., (2017) conducted a study on the overconfidence behavior of investors in the Tunisian market. They used past market returns and current market turnover to measure

overconfidence bias. Glaser and Weber (2007) conducted a study on past returns and trading volume to find out about overconfidence in investors. Statman et al., (2006) also used past market returns to find out about market volatility due to the presence of overconfident investors. Bailey et al., (2011) conducted a study on portfolio turnover to find out about the overconfidence bias in the decision making of investors. Statman et al., (2006), Adel et al., (2013), Horne (2016) and Hsini (2015) used VAR, GARCH, EGARCH, market volatility, changes in trading volume, changes in market capitalization and standard deviation in monthly returns in their studies to find out about overconfidence bias in the decision making of investors in stock markets.

Anchoring heuristic and overconfidence affect the investment decision of investors in the stock market. Investment decisions are defined as the purchase and sale of financial assets to generate income or profit (Fabozzi, 2015). Investment decisions are taken by return and risk involved in security. Trading volume and market capitalization are used to make decisions about purchasing and selling of specific company's securities (Galariotis et al., 2015). Different research studies (Statman et al., 2006; Odean 1998; Glaser & Weber, 2007; Cueva et al., 2017; Gupta et al., 2018) have used trading volume to measure the investment decisions of investors in different settings.

The literature review shows that anchoring heuristic, overconfidence bias and investment decisions are inter-related. Above studies have shown the direct link of overconfidence and anchoring heuristic with investment decisions. Few researchers like Iqbal et al., (2015) and Haixia (2018) have investigated the role of overconfidence as mediator but there is no study that is showing the role of overconfidence as mediator between anchoring heuristic and investment decisions. Present study has tried to investigate this relationship and to fill this gap in behavioral finance. From the above discussion of literature on anchoring heuristic and overconfidence bias and investment decision, we have proposed the following model:
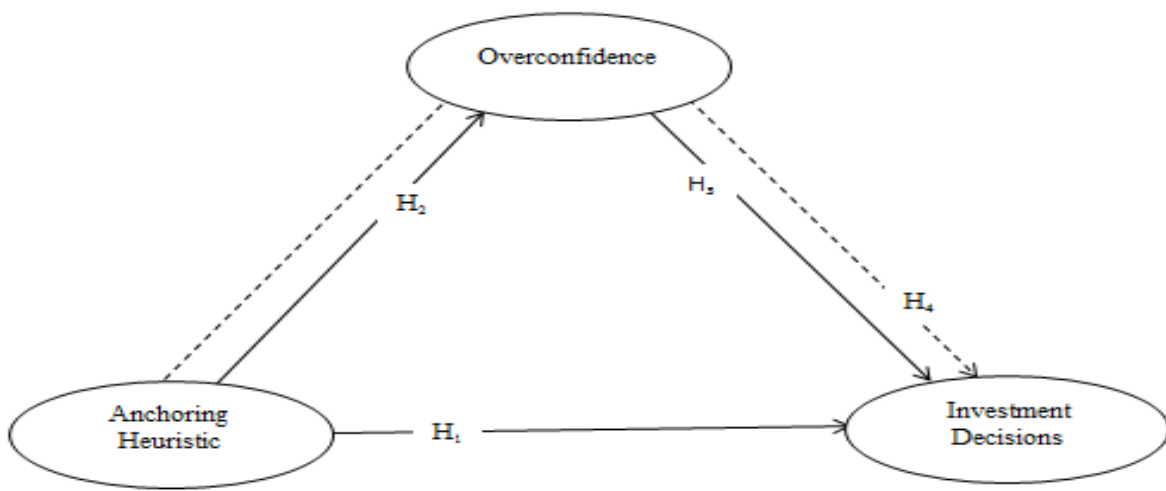
Figure 1: Theoretical Model

H₁: Anchoring heuristic positively affects the investment decisions of investors in the stock market.

H₂: Anchoring heuristic positively affects the overconfidence of the investors in the stock market.

H₃: Overconfidence bias positively affects the investment decisions of investors in the stock market.

H₄: Overconfidence ~~bias~~ positively mediates the relationship between anchoring heuristic and investment decisions of investors in the stock market.

METHODOLOGY

Data is collected from Pakistan stock exchange and website of the business recorder for the period of January 1st, 2004 to December 31st, 2017 for 301 listed companies. There is a total of 545 companies that are currently listed in Pakistan stock exchange (Pakistan stock exchange, 2019). Companies with zero variation were dropped from the sample as the purpose of the present study is to find out the changes in investment decisions because of behavioral biases. So out of 545 companies, 301 companies were selected for the present study that represents all the business and industrial sectors of Pakistan. Variables of the study were first calculated by applying different quantitative methodologies and then structural equation modeling was applied to find out the relationship between these variables and the role of mediation between anchoring heuristic and investment decisions.

For calculation of anchoring heuristic for the present study, 52-weeks high price is used as an anchor to make investment decisions in the stock market of Pakistan. These anchors are randomly generated in the

market and have been used as reference points. The ratio of every day's return is divided by the highest return of the year. With the increase in this ratio, the investment decision is likely to be positive. To measure the presence of anchoring heuristic on the 52-weeks basis, this study has used the methodology of (Li & Yu, 2012; Liao et al., 2013; Bhootra & Hur, 2013). To measure anchoring heuristic, following formulas has been used:

$$X_{(52w)} = \frac{P_t}{P_{yearly\ high}} \qquad (1)$$

P_t = daily prices in a year

$P\ yearly\ high$ = 52 weeks high price

To measure overconfidence bias, we have used the methodology of Statman et al. (2006). Volatility in daily returns has been measured using market data of KSE-100 index from January 1st, 2004 to December 31st, 2017. Volatility in returns shows the impact of the arrival of new information in the form of dividend announcement or earnings announcement. We have used the following formula:

$$\delta^2 m, t = \sum_{i=1}^{N_t} r_{i,t}^2 + 2 \sum_{i=1}^{N_{t-1}} r_{i,t} (r_i + 1_t) \qquad (2)$$

$\delta^2 m, t$ = Market volatility

$r_{i,t}$ = Market daily returns

Nt = Number of trading days

To measure the investment decisions, we have taken a differential log of daily trading volume following the methodologies of Adel et al. (2013) and Statman et al. (2006). If the value is positive, then investors will invest more and trade more; otherwise they will try to avoid the investment.

Data Analysis

A time series is said to be stationary when its mean, variance and auto-correlation are constant over time. It is the requirement of forecasting a series that it must be stationary after its mathematical transformation (Jentsch & Rao, 2015). Stationary series are easy to estimate as the statistical properties of data remains same in future as these were in past. Time series must be stationary to get significant and meaningful

results related to mean, variance and correlation. Future estimation is only possible when data series is stationary (Chatfield, 2003). If series is not stationery, then sample mean, and variance will increase when data will be increased, and this will miscalculate the mean and variance for future time periods. There is another point that if mean and variance are not well defined and estimated then there will be problems with correlation results (Horvath et al., 2014). For all these reasons, data must be stationary for finding out reliable results.

To find out the relationship among three variables of present study, first stationarity of data was checked by applying Augmented Dicky-Fuller test (ADF), Phillips–Perron test (PP) and Kwiatkowski–Phillips–Schmidt–Shin tests (KPSS). Augmented Dicky-Fuller test (ADF) investigates the presence of unit root in the data series. ADF is a negative statistic and when the value is more negative then null hypothesis is strongly rejected that there is unit root in time series data. When null hypothesis is accepted it means time series has a unit root and data is nonstationary (Dash, 2017). This type of data series is affected by some trends, seasonal effects and business cycles. When null hypothesis is rejected then it means that time series does not have unit root and it is stationary (Cavaliere et al., 2015). When p value is greater than 5% level of significance it means that null hypothesis is accepted, and data is non-stationary. When p value is less than 5% level of significance it means that null hypothesis is rejected, and data is stationary and fit for estimation.

Phillips–Perron test (PP) is based on augmented Dicky-Fuller test and it also tests the null hypothesis to find out about the stationarity of the time series. It also tests unit root by testing null hypothesis on 1%, 5% and 10% level of significance (Del Barrio Castro et al., 2015). Higher negative values at p values less than 5% suggests that data is stationary. Here p value less than 5% favors the time series for estimation as it is not time dependent and does not include trends in it. P value greater than 5% will accept the unit root in time series (Mishra & Smyth, 2014).

Kwiatkowski–Phillips–Schmidt–Shin tests (KPSS) are used to find the acceptance of null hypothesis as it assumes that time series is stationary. In this test, alternative hypothesis states that data has unit root (Paparoditis & Politis, 2018). It is based on linear regression and tests the data series into three parts:

$x_t = r_t + \beta_t + \varepsilon_t$

r_t = random walk

β_t = non-random trends

ε_t= stationary error

Table 1 shows the test results for stationarity of data. Augmented Dicky-Fuller test (ADF) investigates the presence of unit root in the data series. ADF is a negative statistic and when the value is more negative then null hypothesis is strongly rejected that there is unit root in time series data. Phillips–Perron test (PP) is based on augmented Dicky-Fuller test and it also tests the null hypothesis to find out about the stationarity of the time series. Higher negative values at p values less than 5% suggests that data is stationary. Kwiatkowski–Phillips–Schmidt–Shin tests (KPSS) are used to find the acceptance of null hypothesis as it assumes that time series is stationary. In this test, alternative hypothesis states that data has unit root (Paparoditis & Politis, 2018). All the series were examined at 1%, 5%, and 10% level of significance and the null hypothesis was rejected in case of ADF and PP tests, and it was accepted in case of KPSS tests. For ADF and PP the null hypothesis states that data is

Table 1: Tests for Stationarity of data

Variables	ADF	PP	KPSS
Anchoring	-27.06380*	-280.3278*	0.227596**
Overconfidence	-32.67230***	-150.4879***	0.200979***
Investment Decisions	-28.34136*	-207.7255*	0.299962*

Data is stationarity at 1%, 5% and 10% level of significance

After checking the stationarity of data series, structural equation modeling is applied for further analysis. Estimation of the model was done through the derivation of the measurement model and structural model. In the measurement model, discriminant validity was used, and in the structural model, model fit, path coefficients and bootstrapping were used to find out about the direct and indirect effect of variables on each other.

Discriminant validity was measured through Fornell-Larcker criterion, Cross Loadings and Heterotrait-Monotrait Ratio (HTMT) for partial least square (PLS) modeling. Table 2 shows the results for Fornell-Lacker criterion. According to Fornell-Larcker criterion, discriminant validity can be established by using looking at the diagonal cell values. If the values on diagonal are higher than the values below them (off diagonal), then discriminant validity is established. It can be noted from the values in Table 2 that all the values on diagonal are higher than off-diagonal values which shows that discriminant validity is established for variables of current study.

Table 2: Fornell-Lacker criterion

	Anchoring	Overconfidence	Investment Decisions
Anchoring	1.000		
Overconfidence	-0.010	1.000	
Investment Decisions	0.006	0.018	1.000

From Table 3 cross loadings for current study can be observed. Cross loadings analyze the loadings of constructs on another construct. It also examines that how much strongly these construct load on one and another. It shows correlation of one latent variable with another latent variable of the study. Values in Table 3 show the cross loadings of all variables on one and another and all loadings show the presence of discriminant validity for current study.

Table 3: Cross Loadings

	Anchoring	Overconfidence	Investment Decisions
Anchoring	1.000	-0.010	0.006
Overconfidence	-0.010	1.000	0.018
Investment Decisions	0.006	0.018	1.000

Table 4 shows the third measure of discriminant validity to analyze correlation among variables of the study. It is relatively new method for finding out discriminant validity in structural equation modeling. The interpretation of HTMT Table is simple which is based on cut-off value for HTMT. According to Henseler et al., (2016) stated that the cut-off values of HTMT is 0.85 and 0.90 respectively. If the derived values of HTMT Table are less than the cut-off values of HTMT, then discriminant validity is established. Higher values than these thresholds show the lack of discriminant validity. The Table 5.21 shows that all values are less than the cut-off values of 0.85 and 0.90. This establishes the discriminant validity for current study.

Table 4 Heterotrait-Monotrait Ratio

	Anchoring	Overconfidence	Investment Decisions
Anchoring			
Overconfidence	0.010		
Investment Decisions	0.006	0.018	

From the above results discriminant validity has been established for the present study. After establishing discriminant validity, we have measured the structural model.

Structural model

It includes R-squared, model fit, path coefficients and bootstrapping to find out significance among variables and role of mediation.

Model Fit

Model fit includes measures of Standardized Root Mean Square Residual (SRMR), Normed Fit Indexed (NFI) that are based on the value of Chi-square ($\chi2$). Table 5 shows the model fit for current study. According to Henseler et al., (2015) a value of "0" of SRMR shows the best model fit and generally value less than 0.08 is acceptable. For NFI, a value of 0.90 is acceptable, and when the model is close to 1, then it is perfect (Hair et al., 2014). Chi-squared and R-squared are acceptable at a 5% level of significance. All these values are according to these quality criteria, so our model is fine and statistically fit and it is shown in Table 5.

Table 5: Model Fit

Model Fit Measures	Model Values
SRMR	0.007
Chi-Square	32.843
NFI	0.994
R^2	0.071

After determining the model fit, mediation analysis was performed to see the significance of the proposed model.

Mediation Analysis

The present study has used overconfidence as a mediator between anchoring heuristic and investment decisions. Results are shown by total effect, direct and indirect effect to measure the significance of mediation between variables.

Total effect models are used in mediation analysis (Bolin, 2013). Both direct and indirect effect is calculated (ć +ab). Indirect effect and its statistical significance show the importance of mediator in the study. The indirect effect is calculated by subtracting direct effect from total effect (Hayes, 2018). The total effect, indirect effect, path coefficients, and bootstrap results were calculated to find out the significant role of mediator between anchoring and investment decisions and results are shown in Table 6:

Table 6: Total Effect for Anchoring heuristic

	Path Coefficients	Standard Deviation	T Statistics	P Values
Anchoring Heuristic -> Overconfidence	-0.010	0.002	5.810	0.000
Overconfidence -> Investment Decisions	0.018	0.006	3.111	0.002
Anchoring Heuristic-> Investment Decisions	0.007	0.002	2.982	0.003
*Anchoring -> overconfidence -> Investment Decisions	0.00019	0.00007	2.7076	0.0071

*Mediation Analysis

From these results, it is quite visible that all path coefficients are statistically significant at 5% level of significance. T-values are higher than 1.90 cut-off value which shows that these behavioral biases have affected the Pakistani stock market significantly during January 1st, 2004 to December 31st, 2017.

The link between anchoring heuristic and overconfidence shows the importance of their relationship. The path coefficient of anchoring heuristic for overconfidence bias shows the negative and statistically significant value at 5% level of significance. The behaviors of overconfident investors negatively affected them when they used 52-weeks high value as a reference price, without considering other alternatives available to them. It generates evidence that anchoring heuristic helps in spurring overconfidence bias and they co-exist as overconfident investors rely on their private information. They

think they have all the necessary information needed about the trading of stocks in the stock market. They overconfidently estimate the use of 52-weeks high price as a reference point. The results of the present study have proven the relationship between overconfidence bias and anchoring heuristic for Pakistani investors and Pakistani stock market.

Table 6 shows the significant role of overconfidence bias as a mediator between anchoring heuristic and investment decisions, and it is found to be positive and statistically significant. It shows that overconfidence partially mediates the relationship between anchoring heuristic and investment decisions. Figure 2 shows the role of mediator between anchoring heuristic and investment decisions:
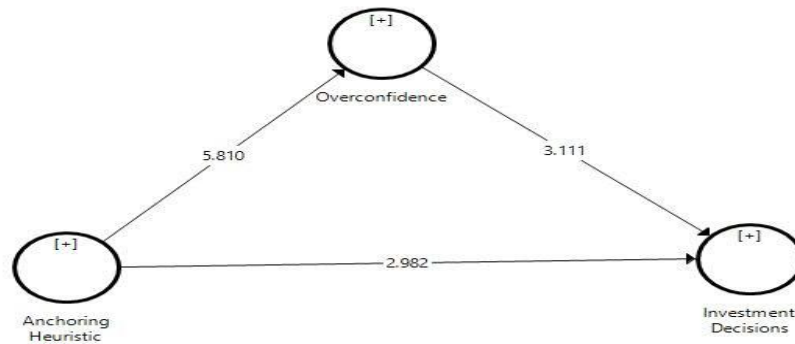

Figure 2: Mediation between Anchoring Heuristic and Investment Decisions

Looking at the results of anchoring heuristic with investment decisions, it can be concluded that investors have relied on 52 weeks high price as the anchor for making investment decisions and the stock market was affected by the overconfident behavior of the investors trading in it. They got good results for being overconfident, and it paid them off in positive returns. We can say that when new information arrives in the stock market, then use of reference price by overconfident investors brings positive results for them. The market becomes volatile in the presence of overconfident investors and use of 52 weeks high price for decision making. Summary of hypotheses is given in Table 7:

Table 7: Summary of Hypotheses

Hypothesis	Impact	P-value	Hypothesis supported
H1	Anchoring heuristic positively affects investment decisions.	0.003	Yes
H2	Anchoring heuristic positively affects overconfidence bias.	0.000	Yes
H3	Overconfidence bias positively affects investment decisions.	0.002	Yes
H4	Overconfidence bias partially mediates between the relationship between anchoring heuristic and investment decisions.	0.007	Yes

*Note. *p < 0.05*

DISCUSSION OF RESULTS

The results of the present study of the impact of anchoring heuristic on the investment decision making are supported by (Sabir et al., 2019; Subash, 2012; Shankar & Dhankar 2015; Chandra & Kumar, 2011; Chen et al., 2007). The results of the impact of overconfidence on investment decision are supported by studies conducted by (Alrabadi et al., 2018; Prosad et al., 2017; Odean, 1998; Subash, 2012; Daniel & Hirshleifer, 2015). The results of the link between anchoring heuristic and overconfidence are supported by the research studies conducted by (Demir, 2017; Baker & Nofsinger, 2010; Chari et al., 2017). Dhankar & Devesh., (2019), Baker et al., (2019), Jain et al., (2019), Khan et al., (2019), Madaan and Singh (2019) and Murhadi (2018) have proved the link between behavioral heuristics, overconfidence and investment decision. They also found the overconfidence partially mediates between the behavioral biases and investment decisions.

So anchoring heuristic, overconfidence, and investment decisions are related as proven by results of the present study. Pakistani stock market has shown the tendency to be affected by behavioral heuristics and biases from 1st January 2004 to 31st December 2017. The reasons for these results and evidence are the Pakistani stock market is a developing market and investors trading in it are not financially literate (Sabir et al., 2019; Munir et al., 2018). They live in collective culture, and they are affected by the behaviors and suggestions of family and close friends. They try to follow the investment behaviors and strategies of their family members and friends and affected by their external environment (Yousaf et al., 2018; Bashir et al., 2013). Pakistani investors avoid risk and focus on short term returns (Khan, 2014). So, it can be concluded that behavioral biases affect them and their decision making.

CONCLUSION

Results of this study have shown the presence of heuristics and biases in the investment decisions of investors. The role of overconfidence as mediator is also proved significant between anchoring heuristic and investment decisions. It has been proved that the Pakistani stock market is affected by behavioral heuristics and biases. Present study has a broader scope for the future researcher, academicians, and policymakers. Future researchers and academicians can form new links between behavioral heuristics and investment decisions by introducing mediator and moderator. New theories can be developed by introducing these new links. Policy makers like securities exchange commission can use the results of present study to guide the investors about the impact of anchoring heuristic and overconfidence on their investment decisions by arranging workshops and training sessions for them. Results are interesting for investors, academicians, and researchers of other emerging markets like Pakistan. This study has given a new perspective to think about the relationship of behavioral heuristics and biases by introducing the role of overconfidence as mediator which is a contribution to the literature of behavioral finance. Academicians can utilize the results of this study to find out how other behavioral factors are linked and worked simultaneously in a single model. Policymakers like securities exchange commission can train investors on proper utilization of the behavioral biases to get positive returns on their investment.

For future researchers, they can use mix methods to find out the reliability and generalizability of the results of the same model in other developing and Asian countries. Primary data along with secondary data will give a comparison on the national and international level. Mix method will cover both individual responses as well as market responses.

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