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THE IMPACT OF BEHAVIOURAL BIASES ON TRADE RETURN, MODERATING ROLE OF FINANCIAL LITERACY AND LOCUS OF CONTROL.

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Abstract

The present study aims to examine the effect of behavioral biases like herding bias, mental accounting bias, overconfidence bias, loss aversion bias, anchoring bias and representativeness bias on the investment trade return of the investors with moderating role of financial literacy and locus of control. For testing the hypotheses, finding answers to the research questions and achieving research objectives the methodology of study consists of positivist philosophical stance, quantitative and deductive approach. The population of the study includes the stock market participants of KPK. The sample size consists of 600 respondents using Gpower. But the whole 600 questionnaires were not received back in good standing, only 353 respondents has been analyzed. The sampling techniques were stratified random sampling, the data was primary, collected through questionnaires (adopted) from investors. The analysis techniques for model fitness were factor loading and cross-loading, for assessing the construct validity and reliability Average Variance Extracted (AVE) and for composite reliability, the Cronbach's Alpha, for discriminant validity. The Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT) and for multicollinearity statistics Variance inflated factor (VIF). The descriptive statistics were used to answer the first research question, assess in achieving objective one and testing the first hypothesis. The structural model was used to answer the remaining research questions, achieving the rest of the objectives except the first one and testing the hypotheses. Findings of the research reveals that all investors incorporate all independent variables except herding behavior in their investment decision. Further there is a strong impact of mental accounting, overconfidence, loss aversion, anchoring and representativeness on the investment returns of investors and the financial literacy and locus of control moderate the association among variables. However, financial literacy doesn't impact between herding and trade return and locus of control negatively impacting between anchoring and trade return, loss aversion and trade return, and mental accounting and trade return. Based on result, it can be recommended that investors should increase financial literacy and locus of control as it would make their investment decision more accurate. Further, the government should devise proper measures for boosting financial literacy of investors for smooth and positive operation of the stock market to accelerate economic growth.

KeyWords:mental accounting, overconfidence, loss aversion, anchoring, herding representativeness, trade return, financial literacy, locus of control.

1. Introduction

Behavioral finance has served to make a lot of sense on the assumption that markets are perfect, and investors always make rational choices. In case of uncertainty and complexity, the rationality of decision-making professionals is subdued. In such situations, there is evidence that they employ heuristics to reduce the amount of effort needed in their decision making by using their experiences and other general known as guidelines for leaping towards decision making. (Alsabban S., & Alarfaj, 2020). This can lead to biased decisions as decision making is based on an illusion of the success and or the failure of a project. Learning these biases enables human beings to have informed reasons as to why people take specific financial decisions and their impact on the market. It focuses on how people use the money and how they manage their money in real life. This area of academic study helps in providing understanding why at some time people's behaviours regarding their money does not appear logical or why they might encounter consequences (Ingale & Paluri, R. A. 2022). Behavioral finance simply means getting inside the head of the investor and then trying to understand why he behaves in a certain way, with a lot of focus on the feelings which dictate this behavior (Rahoul et al 2022). According to researchers in behavioral finance everyone has their immutable tendencies or behavioral biases that occasionally prevent them from making rational decisions. These biases, therefore, can impact how individuals choose investment destinations and investor efficiency or effectiveness (Ahmad & Shah, 2020)

In other words, behavioral finance is the analysis of the drivers that control the behavior of shareholders and how these drivers affect and shape the markets (Ahmad, Ibrahim, and Tuyon, 2017). This field assists to explain why individuals makes certain decisions that can economically unreasonable, and how they can obtain the rationality. This basically sums up most investor's lack of understanding of some fundamental economic principles that provide for various abilities. Behavioral Finance is the study of the psychology and sociology behind those who work in the financial sector. It does not only bear upon personal choices but also has a collective effect on how markets operate (Hertwig and Pachur, 2019).

1.1 Research Problem

Efficient market hypothesis (EMH) postulates their prices already contain all the possible information which may lead to a rational decision, for example, stocks (Saud kousar et al. 2022). It has been suggested that there is no way to expect repeated results that are either above or below average. The current research notes that discrepancies in investment results are anchored in the psychological influences that shape investors' decision-making process. Such biases can result in wrong choices regarding investment and can be key to the development of an inefficient market. The major objective of this research is to examine the role of behavioral biases in the decision making of the individual investor with association of financial literacy and locus of control as a moderate variables.

1.2 Research Questions

1. What relation does herding have with individual investor trade return?
2. How does mental accounting affect the trade return of the individual investor?
3. Does loss aversion bias affect the individual investor trade return?
4. Does representativeness cause variations in individual investor trade return?
5. Is overconfidence affecting trader returns influence investor trade return?
6. Does anchoring affect individual investor trade return?
7. To what extent is financial literacy intermediate between herding bias and trade return?

8. Is financial literacy significantly correlated with trade return to act as a moderate variable between mental accountings?
9. Is there moderation effect of financial literacy between loss aversion bias and trade return?
10. Is there moderation effect of financial literacy between representativeness bias and trade return?
11. Is there any Moderation effect of financial literacy between overconfidence bias and trade return?
12. Does financial literacy moderate the anchoring bias – trade return relationship?
13. Does Locus of Control really have moderating effect between herding bias and trade return?
14. Is there a moderating role for locus of control between the effects of mental accounting bias and trade return?
15. Does LOC moderating effect exist between loss aversion bias and trade return?
16. To what extent do Locus of control variables offer a moderating relationship between representativeness bias and trade return?
17. Is locus of control a moderator of overconfidence bias and trade return?
18. Is locus of control a moderating variable between anchoring bias and trade return?

1.3 Research Objectives

1. To establish the use of herding effects in investment trade return positively or negatively.
2. Considering a related statistical finding on mental accounting, the next study aims to examine their influence on investment trade return.
3. To obtain statistical evidence of loss aversion on investment trade returns.
4. To establish the statistical effects of representativeness on investment trade return.
5. To obtain statistical results of overconfidence in the investment trade return.
6. To find out the statistical relation between anchoring on investment trade return.
7. To know the moderation results of the financial literacy between herding and between trade return.
8. Thus, to discover the moderation results of the financial literacy on the trade return and the mental accounting.
9. To accomplish the moderation results of financial literacy between loss aversion and trade return.
10. To get the moderation results of the financial literacy between representativeness and between trade return.
11. To test the moderation outcomes of the financial literacy on the overconfidence and trade return.
12. To identify the moderation results of financial literacy between anchoring and trade return.
13. To determine the moderation results of locus of control between herding and trade return
14. To identify the moderation role of locus of control between mental accounting and trade return.
15. To acquire the moderation results of locus of control between loss aversion and trade return.
16. To get the moderation results of the locus of control between representativeness and between trade return.
17. To identify the extent of the moderating role played by locus of control between overconfidence and trade return.
18. To prove the moderation results of locus of control between anchoring and trade return.

2. Literature Review

This chapter presents the theoretical support of the relevant theories to further elaborate the current study. Initially it will explain the choices of the investors under the uncertainty and unpredicted environment. Secondly there is discussion about the fundamental of behavior

finance, believe of the investors and also a brief discussion about prospect theory and heuristic theory.

2.1 The Choice under Uncertainty

The two consumption processes: consumer choice and utility maximization discussed above depend on several assumptions that include certainty of information. In these contexts, consumers make outcomes which are predictable and final. But in the real world nothing is this simple most of the time there is uncertainty, incomplete information or certain factors beyond the control of consumers are at play. This uncertainty can also be applied to investment field, where profit is not certain most of the time because of these Uncertainty (Zaheer, & Raza, 2017). Therefore, making choices under uncertainty eliminates the formation of structures of preference

It assists assess how an investor could possibly set up their investment choices. Looking at different portfolio investments separately, we can note that individuals seek to make the most out of different stocks depending on the returns expected from each.

2.3 Fundamentals of Behavioral Finance

It is quite clear that traditional finance has depended on caricature driving models in their formation process. However, more recent sociology views focusing on human economy since the 1950s, has raised some criticism in attempting to search for new approaches to understand the relationship between humans and the economy. This multidisciplinary group began devising strategies that paid attention to human rationality or the lack of it, they began formulating approaches that abandoned the received wisdom which stipulated that people are always rational actors.

Some earlier writers in what is known as the field of behavioral economics were Daniel Kahneman and Amos Tversky. Their work, especially at the end of the nineties, in fact built the base for this new approach. The theorist that is associated with these theories is Daniel Kahneman who was accorded the Nobel Prize in Behavioural Sciences in 2002. The Royal Swedish Academy of Sciences awarded him for his work in the areas of ‘‘introduction of psychological research, sociology and finance, particularly concerning people’s values, fallibility of judgments and decision-making in uncertain situations’’ (The Royal Swedish Academy of Sciences, 2002). Behavioural finance benefitted greatly from Kahneman and Tversky’s projects as they published articles trying to explain how human choices are controlled by behavioural patterns. In this rationale it is also noted that influence of other materials was established by their experiments. This field also received the input from Vernon Smith who also contributed in growth of experimental finance techniques. Smith had been awarded jointly the Nobel Prize for behavioural finance with Kahneman in 2002.

Experimental finance was useful in the subsequent ability to analyse how behavioral psychology influences the economic choices made by individuals. This should be emphasized: behavioral finance does not intend to compete with the conventional finance. Rather, it aims at contributing worthwhile information which can enrich classically financial models, using the consideration of propensity (The Royal Swedish Academy of Sciences, 2002). One of the first key contributions to behavioral finance was dividing it into two main areas: beliefs and preferences. Tversky and Kahneman explored beliefs in their 1974 work, "Judgment under Uncertainty: Heuristics and Biases." This area looks at how individuals make sense of the probability of future events in the course of making their decisions. In this approach they differ from the classical approach in which probabilities are assumed to be objective (Joyner & Jump, 2004, p.409).

As pointed by Shiller, though this effect was not well documented academically till 1990, since 1990, research started to be done on effect with lot of intensity. These studies have assisted in explaining events such as “dot com” crash and the financial crises.

Thereby, Shiller (2003) believes that behavioral effects of ordinary investors on stock markets cannot be fully offset by the intelligent funds’ hypothesis. Perhaps, it pays better for the smart

money to copy the trends instead of trying to beat them consistently. In any case, even when transaction costs may deny anyone the opportunity to gain from market anomalies, according to the Prospect Theory, such a person might make a wrong decision through wrong assessment of the cost.

Behavioral finance allows us to analyze the relationship between investors and markets through which they operate in the future. It explains various behavioral and market irregularities which rationality centered finance, cannot. Issues such as empirical regularities, things like anomalies empirical, limits to arbitrage, bounded rationality, and investor behavior are better explained by behavioral finance (Barberis & Thaler, 2003). The corresponding chapter of the further work will discuss how various biases influence rationality of investors.

2.4 Belief of investors

The behavioral factor that sits at the center of the behavioral finance is the violation of the efficiency hypothesis that is caused by the influence of the beliefs of the individuals on their economic choices. As traditional finance assumes that the probability of future events is given, Kahneman and Tversky point to the phrases that indicate beliefs or opinions such as "I believe that" "I think that". indicate otherwise. Intrinsic to such decisions, however, is that people often have to construct these probabilities themselves anyway, according to their subjective expectations. In some cases, people are able to make an expected value of different options to attempt to reach the greatest level of utility. But in real life one does not have this information at his/her fingertips. They use many instruments to approximate the likelihood of risky situations to create necessary decisions based on those predictions (Kahneman & Tversky, 1974). Behavioural finance has it that people use certain instruments in order to arrive at probability estimates, and what they get are definitely off and erratic (Fabozzi, F. J., Modigliani 2017).

The problem with forming subjective probabilities is in the sense that people attempt to estimate other quantities such as distance or the size (Fairchild, R. J. (2015). Human beings always use language in a heuristic way or rely on mental operations that allow them to do quick estimates. And while these shortcuts can be useful or even indispensable in the short run, they make people get things wrong, which results in making bad decisions. Many authors have described behavioral biases that might cause people to make wrong decisions. Kahneman and Tversky coined these biases in psychology in the first place and then used them in finance. They introduced three main biases: Wu and Zhang (2010) argued that three common heuristics namely representativeness, availability and anchoring were reviewed and established by Kahneman and Tversky (1974). Further, Barberis and Thaler (2003) expounded other bias such as overconfidence and optimism.

2.5 Behavioral Finance theories

Behavioral finance theory is a study that focuses on how people feel, think and act when in the financial dilemma concerning risks and returns. These psychological factors are grouped into cognitive bias as well as the emotional bias sections. Cognitive biases are realized when people commit errors while developing strategies for information acquisition, processing, and interpreting. These errors stem from poor information on decisions to be made, and hasty decisions which lead to bad decisions being made. Emotional biases are therefore the distortions in decision making stem from emotions (Pompian, 2012). Whenever decisions to invest are dictated by these psychological influences, the investor may be described as acting irrationally (Baker, 2017). Since biases can affect investment decisions, it becomes important to understand how such biases works so that investors can minimize its effects on their investment decisions. Currently the problem with behavioral finance research is one of theory, namely there is no consensus as to why individuals make these irrational financial decisions, what triggers them and what are the implications. But there are two theories which are prospect theory and heuristic

theory through which we can explain various aspects of psychology in financial domain (Ahmad, Ibrahim & Tuyon 2017).

2.6 Prospect Theory.

Kahneman and Tversky, who initially introduced the discipline of Behavioral Finance, presented a theory known as prospect theory in 1979 to the world. The very gases of this theory were even awarded a Nobel Prize to Daniel Kahneman in his later years. According to this theory, when people make decisions there are two initial stages, that is how options are presented (framing phase), and which option is better (evaluation phase). Although Prospect theory focuses on aspects such as regret aversion, loss aversion, and mental accounting they all have their contribution into how decisions are framed and made (De Meza, D., Irlenbusch, B., & Reyniers, D. 2019). This theory helps us explain one weird thing that occurs when we are attempting to resolve how much risky a certain position is in a case when we are not certain about how a specific scenario will turn out. The thinking here is that the sentiment is that although most of us refrain from risk taking particularly when things are good, we may be willing to take risks when we are in the red. It is usually like a light switch on when we feel like we are on the losing side we become ready to take risks. Another unique was that we pay much attention to the results that seem to be more certain; this was referred to as the certainty effect (Ahmad & Ab Alwarsi 2022).

2.7 Heuristics Theory

According to the concept in psychology, heuristic theory which is widely known as heuristics helps individuals make desirable choices and solve problems effectively. Heuristics are decisional heuristics or judgemental heuristics that assist individuals in making decision quickly without necessarily having to consider certain elements. These shortcuts are much beneficial when time is limited, or when the certain circumstance is very complicated. Hypothesis theory has it that people employ heuristics in decision making to minimalise losses in conditions of risk or uncertainties. These heuristics are general guidelines which decision makers use to operating in conditions where the rules are uncertain and complex (Ritter, 2017). They operate by reducing decision making on probabilities and other related concerns into easy heuristics (Kahneman & Tversky, 1974). Consequently, heuristics are broader principles which individuals use to solve problems in the context of challenging decisions (Brabazon, 2018). Through heuristics, investors and others are in a position to make a decision in the shortest time possible than if they had to go round processing all the information.

2.8 Investment Decision

An investment decision could be described as an action plan that a business firm employs when distributing its monetary resources, within the financial markets, in order to achieve the highest possible returns for its investors. This simply entails making right decisions on where to spend our money with the objective of earning the most returns (Gigerenzer, G., & Todd, P. M. 2016). Through diversification of investments and choosing appropriate and high return ventures the firm intends to provide the best returns to all people who invested in the company (Toma, F.M. 2017). For instance, a firm's investment might be in equities, or in corporate bonds, or in property, or any other financial security. Every kind of investment has its risks and reap benefits, so there is a need for the company to weigh the proportion of the risks and rewards for the investors' money (Medvec, V. H. 2018). The firm can therefore monitor the changes in the market and the financial field and make better decisions

2.9 Financial Literacy

The Organization of Economic Co-operation and Development (OECD) launched the topic of financial understanding in 2005. According to the OECD, financial literacy therefore refers to the consumer-investor perspective of financial products and concepts. It also involves their self-efficiency and capability to understand and observe financial prospect and threats, to decide and to know with whom to turn to and what actions to undertake in order to enhance his or her

financial position (Madi & Yousaf, 2018). In his understanding, (Ansar, R., Karim, M. R. A., Osman, Z., & Fahmi, M. S. 2019), financial literacy may be explained as the competency that allows a person to interpret financial data and make rightful decisions. (Alaaraj, H., & Bakri, A. 2020) also explain financial literacy in terms of having sufficient information in relation to basic financial concepts together with the ability to perform basic mathematics calculations. On the other hand, financially literate investors overcome those behavioral biases and are able to make rational investment decisions (Abdullah, H., & Tursoy, T. (2023).

According to Fazal, H. (2017) financial literacy may be defined as the extent to which a person can understand and implement financial knowledge. This entails that people possess the capability and assurance that they can use certain amount of financial information in order to come up with certain decisions. It also highlights the need of being in a position to be able to apply this knowledge in any real sense.

2.10 Locus of Control

Locus of control an aspect that seeks to explain how persons relate personal events to external forces (Robbins, 2016). For example, people possessing an internal locus of control genetic that their behaviors determine their life events. Externality is the other dimension of Locus of control where people believe that factors outside them, fate for instance has a greater say Antony, A., & Joseph, (2017).

Knowledge about an individual's locus of control might help one learn more about that person and his or her actions and choices. It even has an impact on how they tackle a problem, how they pursue a task or how they act or react when they succeed or fail. With the help of understanding of the concept of locus of control it is possible to be aware of one's own views and improve the decision making regarding the further life Anum, & Ameer (2017).

2.11 Behavioral Biases

Behavioral biases are defined as systematic mode of departure from rationality in judgments or decisions about particular behavior. These biases can appear throughout financial and investment decisions, and they can cause people to make choices that are less than rational and often, actually, not in their best interest. These are cognitive biases that stem from the structure of neuron circuits in the brain and that often can lead to mistakes. When these behavioral biases are identified by the investors, they can as well be controlled thus making investors make better decisions which are more beneficial to them (Barratt, C. L., & Yang, H. 2023).

2.11.1 Herding

Herding refers to the situation where people repeat what others are doing instead of undertaking their research. Such a tendency may be especially evident in financial markets. Caparrelli et al. (2017) opine that the herding effect, that is, the following of what others do by investors, is likely to occur when prices change. For instance, if many investors feel that a certain stock is worth buying hype develops, others begin to invest in it too making its price go up even if it should not. However, if many investors start selling the stocks, others also do the same until the price comes down. It can cause market bubbles that happen when prices are pushed to fantastic highs and crashes that result from steep prices drop (Arisanti, I., & Oktavendi, T. W 2020). This process leads to herding because people think that everyone who is in the group know something they don't know; this knowledge could be a result of fear of losing out on potential gains or the act of trying to avoid some losses. They noticed that understanding this phenomenon is important for investors to notice that they are now facing a situation when market movements are directed not by value, but by crowds (Areiqat, A. Y., Abu-Rumman et.al 2019)

2.11.2 Mental Accounting

Mental accounting is the way the human brain categorizes expenditures and receipts, how it plans and decides on spending, and how it appraises the results. It encompasses how people reason and make a judgment with regard to their financial dealings (Gupta et.al 2016). In other

words, this is the concept that puts people's financial life into various categories based on certain appearances. Why do investors allocate their portfolio in different mental accounts, which are managed separately, as long as the theory of mental accounting explains? This means that people classify all their income and eventually all they have into different parts mentally, regarding the part for spending and investment. If investors were not concerned with how each stock relates to the other that they hold in their portfolio, they would end up making very wrong decisions and be very Ineffective in their participation in the stock market. For instance, if the total market index is falling, then this indicates that the total stocks which the investors has are also going to decline. Further, the price change of one stock can affect others linked with those businesses based on consumer relations and products or some other factors.

Mental accouters, although making suboptimal decisions, very much weigh the costs and gains in their investment decisions. This approach makes them feel more secure as highlighted by McGraw-Hill in 2017.

2.11.3 Loss Aversion

When individuals focus more on equity loss than on profit, they are illustrating loss aversion (Metawa & Safa, 2019). This psychological influence shows that the hate of losing is stronger than the joy of gaining an equivalent amount at affecting people's level of happiness (Rauf, Khurshid & Afzal, 2018). Furthermore, it was evident that a loss after a win feels less bad than losing the expectations after several loses agreed by Barberis and Huang 2016. Lambkin (2017) stated that investors have certain stocks in their portfolio due to risk aversion influence in decision making. Riaz et al. (2019) also elaborated that risk aversion behavior is detrimental to an investor's decisions. Sarkar and Sahu (2018) added that perceived risk influences the behavior of investors in the stock market. Avoiding risks is part and parcel of managing the financial aspect of the business. Loss aversion bias points to the idea that generally; people's feelings of loss are felt even more seriously than gains (Haigh & List, 2017

2.11.4 Representativeness

Representativeness bias refers to a failure to use prior probability distribution by focusing on some limited information, for instance, the latest results or average outcomes for the short term (Yaowen et al., 2016). If stock market investors prefer to select the "hot" stock rather than the "cold" ones, it can be deemed as the representative bias. This is could cause over reactions in the market. For example, using current trend to invest in some stock, whereby investors will base their investment on the new current stock performance trend disregarding the long-term performance. Such a tendency makes investor dissociate themselves from fundamentals and make investment decisions based on short-term patterns instead of long. According to Shah and Mahmood (2018), this type of behavior results to overreactions in the market share. As Ritter (2017 explained, this concept can mean that individuals assign too much probability to the most recent events while ignoring average long-term results. Representativeness bias is typically followed by wrong thinking processes. For instance, an investor may buy shares in a company by observing its recent high performance and not taking into account past performance and or other rackets. That can lead to a lot of inefficient stock allocations due to the utilization of the most recent performance instead of accurate long-term evaluations (Parker, A. M., & Yoong, J. 2019).

2.11.5 Overconfidence

Overconfidence is defined as a situation where a person thinks that they can do a particular activity way better than they actually can. It often gives people a great and glorious confidence in their own abilities as well as in the information they possess. These maladies can arise in different forms including the following; Overconfidence in estimation could result in unrealistically tight confidence intervals and overconfidence in comparison, claiming to be better than the average individual (Renneboog & Tobler, 2017). This tendency to overestimate the capabilities certainly has ramifications. For instance, if in the working environment the

overconfident employees may decide to work on tasks or undertake projects that they cannot do well or at all since they are overconfident. Overconfidence in many a times leads to imprudent investment and financial decisions due to over estimation of control or understanding of an event. Overconfidence's positive effects are vital to know because they influence the way people make decisions. People can go around this bias by ensuring they establish feedback from other people, hoping not to rely on emotions to make decisions, and last, but not least, ensure people set realistic goals and expectations in job performance. Learning about overconfidence and its implications can help mitigate diverse issues in one's life, as well as in the sphere of career enhancement, as well as the financial management one (Huzaifa et.al 2018).

2.11.6 Anchoring

The first of the biases listed by Tversky and Kahneman in 1974 is the judgment bias known as the anchor. Yet it impinges on several large aspects of our lives like, decisions on the wage's bargains, material decisions, and judgment of fines or sentencing in criminal law, even our ability to empathize with others (Englich et al 2016). Among all, anchoring is considered to be one of the brightest and most investigated psychological prejudice (Shin & Park, 2018). Such a bias takes a substantial toll on the overall investment process and decisions made by investors (Wright & Anderson, 1989). Anchoring means one's reliance to the first given piece of information about something in decision making processes (Shin & Park, 2018; Ahmad & Shah, 2018; Singh, 2016). For instance, when investors attend to an initial stock price, they may also attend to second judgments based on that initial price even when situational information contradicts that price. This can lead towards wrong decisions with the help of anchoring effect as the initial reference influence their decision about the value and associated risk.

Figure – 2.1: Conceptual Framework

Moderate Variable

Behavior Biases
Independent Variables

DV

ho

DV

3. Research Methodology

3.1 Research Strategy

The research method is a way of defining before the research is conducted how the research is going to be undertaken by having into consideration the identified resource, the amount of time needed, the existing knowledge and the philosophical outlook. Based on these considerations, a researcher has a choice between quantitative and qualitative approach. The strategy applied in this study is quantitative since it forms the basic requirements of ontological objectivism epistemological positivism with regard to deductive research method (Collis and Hussey 2009; Bryman and Bell 2007). In order to obtain dependable, accurate and transportable measure, adequate sample size has been chosen. Furthermore, quantitative research enables analysis with the aid of statistical analysis tools as aided by the computer software

3.2 Population and Sample

The research gives emphasis on KPK individual investors who directly engage in trading either through the website or with the help of a mobile application. This ranges from the "stock market investors involved in financial securities through different brokers to those willing to engage in online Forex business in Khyber Pakhtunkhwa (KPK). Besides, stratified random sampling technique has been used.

3.3 Data Collection Method.

The primary data in this study is collected through structured and closed questionnaires from investors. There are two parts is each questionnaire. Section one surveys the investors for their demographic data, whereas Section two assesses self-reported behavioral biases for herding, mental accounting, loss aversion, representativeness, overconfidence, anchoring, financial literacy, locus of control, and trade returns. The questionnaires are filled using 5 point Likert scale having lowest end labeled as “strongly disagree” to the highest end having label “strongly agree”.,e a 5-point Likert scale, where 1 means "strongly disagree" and 5 means "strongly agree." All questionnaires are adapted from previous research, including Overconfidence from Antony & Joseph, 2017. Representativeness from Shikuku, 2014. Mental accounting from (Antony & Joseph, 2017). Loss aversion from (Mahmood et al., 2016). Herding from (Mahmoud et al., 2016). Trade return from Antony & Joseph, 2017. Anchoring from (Mahmood et al., 2016); financial literacy from Mahmood, Kouser, Abbas, & Saba, 2016; Shikuku, 2014, and locus of control from Furnham A 1986.

3.4 Measurement Model

In order to assess the validity of the outer model, discriminant validity, and convergent validity are used. To establish the convergent validity, the characteristic of factor loadings, average variance extracted (AVE), Cronbach alpha, and composite reliability (CR) which was proposed by Hair et al., (2014) has been applied.

3.5 Descriptive Statistics

The descriptive statistics have then been used to present mean minimum, maximum, median respondent personal information; variance and standard deviations.

3.6 Structural Model

In the subsequent sections, the structural model would be run and the hypotheses tested after the examination of the measurement model in PLS-based modeling strategy. To this end, the structural model was tested a 500-bootstrap-iteration analysis. The findings led to the validation or non-validation of the testicular hypotheses in relation to the research questions.

4. Data Analysis

4.1 The Measurement Model

To establish how financial literacy and locus of control affect behavior in investment and trade performance, this study adopts a two-stage estimation technique. This method is discussed elsewhere in this chapter as well. It persists that the two-step approach is better than the one-step approach as postulated by Hair, Black, Babin, Anderson, and Tatham (2017). The reason is that the two-step model guarantees that the constructions that are employed in a structural model are well-defined. This means that operating constructs used in the study are valid and reliable enhancing credibility of results. The measurement model demonstrates how the construct or the hidden (or latent) variable is operationalized by the indicators or other constructs. Mmore trustworthy results. The measurement model shows the relationship between the hidden (or latent) variable and its associated indicators or constructs. This model helps in checking if the constructs are distinct (discriminate validity) and if they are related to the latent variable in a meaningful way convergent validity (Bhale and HS.Bedi 2021) . On the other hand, the structural model explains the relationship between the dependent and independent latent variables. This model plays a major role in comprehending the general validity of the relationships under study, the nomological validity. Measurement model demonstrates how one latent variable influences the other in the arrangement of the study. When estimating the outer model, one is able to measures the constructs while the inner model helps the researcher in understanding the relationships between the constructs. To test the outer model, the study uses two key methods: The two that were checked included discriminant validity and convergent validity.

4.2 Factor loading and Cross Loading

The cross loading and the loading of all the factors are depicted in the table below. Measurement loading is synonymous with standardized coefficients and represent each factor to its latent variable link. Regarding Smart PLS software, the data are standardized and as a consequence, the loadings range from 0 to 1.

Table – 4.1: Factors Loading and Cross Loading

	ANCH	FL	HER	TR	LC	LSAVG		MACC	OCO	REP
ANCH 1		0.741	0.273	-0.324	0.419	0.416	0.437	0.413	0.321	0.423
ANCH 2		0.693	0.305	-0.334	0.394	0.381	0.462	0.489	0.369	0.462
FL1	0.356	0.788	-0.216	0.237	0.213	0.396	0.362	0.158	0.159	
FL2	0.405	0.905	-0.245	0.296	0.237	0.418	0.252	0.158	0.478	
FL3	0.278	0.785	-0.158	0.178	0.151	0.315	0.191	0.189	0.458	
FL4	-0.455	0.792	-0.53	-0.633	-0.418	-0.449	0.189	0.362	0.125	
FL5	-0.392	0.891	-0.53	-0.634	-0.305	-0.381	0.482	0.362	0.148	
HER1	-0.423	-0.194	0.872	-0.586	-0.343	-0.407	0.362	0.365	0.369	
HER2	0.548	0.288	0.713	0.365	0.428	0.575	0.197	0.492	0.258	
HER3	0.476	0.221	0.892	0.128	0.308	0.464	0.195	0.429	0.147	
HER4	0.389	0.181	0.896	0.586	0.316	0.461	0.142	0.423	0.159	
HER5	0.278	0.188	0.903	0.178	0.151	0.315	0.185	0.42	0.357	
HER6	0.113	0.289	0.946	0.172	0.141	0.356	0.185	0.32	0.489	
HER7	0.131	0.298	0.856	0.191	0.349	0.198	0.165	0.12	0.423	
TR1	0.345	0.148	-0.341	0.813	0.325	0.359	0.325	-0.362	0.321	
TR2	0.321	0.085	-0.242	0.945	0.389	0.331	0.365	0.398	0.568	
TR3	0.47	0.234	-0.394	0.903	-0.491	0.527	0.265	0.148	0.378	
LC1	0.381	0.196	-0.191	0.241	0.728	0.387	0.365	0.235	0.365	
LC2	0.418	0.201	-0.308	0.314	0.722	0.406	0.365	0.269	0.487	
LC3	0.547	0.394	-0.463	0.442	0.729	0.425	0.256	0.469	0.326	
LSAVG1		0.552	0.379	-0.373	0.341	0.48	0.844	0.256	0.223	0.487
LSAVG2		0.481	0.367	-0.348	0.475	0.469	0.803	0.369	0.498	0.236
LSAVG3		-0.423	-0.194	0.125	-0.486	-0.343	0.872	0.145	0.431	0.148
LSAVG4		0.548	0.288	0.393	0.829	0.428	0.879	0.368	0.254	0.482
LSAVG5		0.476	0.221	0.398	0.515	0.308	0.781	0.159	0.125	0.329
LSAVG6		0.389	0.181	0.426	0.762	0.316	0.892	0.365	0.542	0.429
MACC1		0.278	0.188	0.116	0.178	0.151	0.315	0.699	0.425	0.489
MACC2		0.113	0.289	0.115	0.172	0.141	0.356	0.789	0.425	0.489
MACC3		0.115	0.489	0.311	0.152	0.199	0.341	0.895	0.365	0.498
MACC4		0.194	0.369	0.398	0.177	0.318	0.327	0.739	0.125	0.369
MACC5		0.365	0.486	0.329	0.191	0.332	0.482	0.869	0.195	0.326
OCO1	0.125	0.289	-0.325	0.158	0.329	0.47	0.114	0.691	0.363	
OCO2	0.129	0.269	0.154	0.365	0.125	0.158	0.125	0.682	0.326	
OCO3	0.236	0.391	0.457	0.258	0.156	0.332	0.298	0.729	0.158	
OCO4	0.365	0.362	0.365	0.425	0.161	0.489	0.362	0.789	0.239	
OCO5	0.159	0.589	0.189	0.198	0.321	0.582	0.393	0.963	0.158	
OCO6	0.352	0.326	0.187	0.136	0.392	0.152	0.392	0.898	0.191	
REP1	0.159	0.489	0.189	0.198	0.321	0.382	0.393	0.152	0.891	
REP2	0.352	0.326	0.187	0.136	0.392	0.152	0.392	0.396	0.759	

ANCH=Anchoring bias, FL=Financial Literacy, HER=Herding bias, TR=Trade Return, LC=Locus of Control, LSAVG=Loss Aversion bias, MACC=Mental Accounting bias, OCO =Over Confidence bias, REP=Representativeness bias

From the above table, we can also recall that as it is described that all the loading scores of all factors are higher than 0.7 and two factors of over confidence and one of Anchoring factor. The result of the loading score of these three factors are 0.693, 0.691 and 0.682 are slightly lower than.7 or greater if rounded these factors becomes 0.7. Consequently, it has been found out that more than 50% of the variations of their corresponding latent variable are accounted for by these factors.

Table – 4.2: The Constructs Reliability and Validity of Measurement Model

Item	Factor loading	Cronbach's Alpha	Composite reliability (CR)	Average variance extracted (AVE)
Anchoring Bias		0.781	0.781	0.592
ANCH 1	0.741			
ANCH 2	0.693			
Financial Literacy		0.844	0.845	0.523
FL1	0.788			
FL2	0.905			
FL3	0.785			
FL4	0.792			
FL5	0.891			
Herding Bias	0.765	0.752	0.615	
HER1	0.872			
HER2	0.713			
HER3	0.892			
HER4	0.896			
HER5	0.903			
HER6	0.946			
HER7	0.856			
Trade Returns	0.826	0.826	0.621	
TR1	0.813			
TR2	0.945			
TR3	0.903			
Locus of Control		0.917	0.916	0.787
LC1	0.728			
LC2	0.722			
LC3	0.729			
Loss Aversion Bias		0.943	0.943	0.736
LSAVG1	0.844			
LSAVG2	0.803			
LSAVG3	0.872			
LSAVG4	0.879			
LSAVG5	0.781			
LSAVG6	0.892			
Mental Accounting Bias			0.728	0.714 0.631
MACC1	0.699			
MACC2	0.789			
MACC3	0.895			
MACC4	0.739			
MACC5	0.869			
Over Confidence Bias		0.892	0.827	0.584
OCO1	0.691			

OCO2	0.682		
OCO3	0.729		
OCO4	0.789		
OCO5	0.963		
OCO6	0.898		
Representativeness Bias	0.836	0.838	0.721
REP1	0.891		
REP2	0.759		

ANCH = Anchoring Bias, FL = Financial Literacy, HER = Herding bias, TR= Trade Return, LC= Locus of Control, LSAVG=Loss Aversion Bias,MACC=Mental Accounting Bias,OCC=Over confidence Bias,REP=Representativeness Bias

4.3 Construct Reliability and Validity

4.3.1 Cronbach's Alpha

Reliability is on the extent to which different items measure the same ''latent'' construct or variable. To check how reliable and valid a concept is, we can use three measures: Cronbach's alpha, composite reliability CR, and average variance extracted AVE. The three measures suggested are shown in the table above. As can be observed in the table, all the Cronbach's alpha values of the latent variables analyzed during the study are above 0.7. This high value indicates that the items regarding the variables really capture the specificities of the latent variables, thereby, the constructs are reliable according to Duri (2019).

4.3.2 Composite Reliability

Chin (1998) says that for reflective model, the idea of convergent validity is more appropriately assessed by the use of composite reliability. Cronbach's alpha can sometimes provide with excessively high or low estimates of reliability, and as a rule, the latter is observed. Due to this problem, any researcher that employs PLS (Partial Least Squares) often rely on the use of composite reliability to obtain a reliable estimate of the reliability of a scale. It was suggested that the acceptable value for composite reliability is 0.6 or above (Chin, 1998; Höck & Ringle, 2006). As seen from the table above, all the latent variables have composite reliability higher than 0.7. Overall, this repeated model indicates that the composite reliability achieved is equal to or more than 0.7 and the convergent validity is also met.

4.3.3 Average Variance Extracted (AVE)

Convergent validity and divergent validity are both checked through average variance extracted (AVE). According to Chin (1998) and Höck & Ringle (2006) the AVE value should be greater than 0.5 and should be greater than cross loadings of the items. This means that the items account for more than half of the variation in the hidden variables than the error variation. If the AVE value is less than 0.5, this will suggest that the factors explain less than 50% variation of the hidden variable and direct variance error value becomes more than the explained variance value. In such cases the convergent and divergent validity would be violated (Fornell & Larcker 1981).

Table – 4.3: Discriminant Validity: Fornell-Larcker Criterion

	ANCH	FL	HER	TR	LC	LSAVG	MACC	OCO	REP
ANCH	0.743								
FL	0.424	0.828							
HER	0.593	0.292	0.803						
TR	-0.492	-0.253	0.426	0.865					
LC	0.541	0.246	0.43	-0.414	0.725				
LSAVG		0.638	0.461	0.491	-0.479	0.565	0.828		
MACC	0.689	0.465	0.597	0.576	0.523	0.698	0.836		
OCO	-0.592	0.432	0.582	-0.532	0.411	0.522	0.362	0.897	

REP	0.546	0.293	0.623	0.653	0.621	0.653	0.623	0.689	0.789

ANCH = Anchoring Bias, FL = Financial Literacy, HER = Herding bias, TR= Trade Return, LC= Locus of Control, LSAVG=Loss Aversion Bias,MACC=Mental Accounting Bias,OCC=Over confidence Bias,REP=Representativeness Bias

On the assumption of average variance extracted results, the Fornell-Larcker criterion can ensure that each concept measured in the study is distinct from any other, having what is termed discriminant validity. The AVE square root indicates the extent to which the percentage of a latent variable's communality is due to its own items. The discriminant validity using Fornell-Larcker criterion is presented in the Table above with the ''value at the top of each column for respective latent variable. Below this value it is also possible to see correlation with other latent variables between these items. In order to establish discriminant validity, each item of the latent variable should have a greater correlation with its own reflected latent variable than it has correlations with other latent variables

Values in the main diagonal are greater than the values below it in the same column. This suggests that every single variable has a higher associations with its own corresponding LV than any other LV contained in the model. Therefore, we are confident in discriminant validity, as each of the concepts being measured is different from another.

Table – 4.4: Discriminant Validity: Heterotrait- Monotrait Ratio (HTMT)

	ANCH	FL	HER	TR	LC	LSAVG		MACC	OCO	REP
ANCH		0.576	0.623	0.632	0.598	0.639	0.911	0.326	0.699	
FL	0.625		0.556	0.256	0.569	0.561	0.653	0.591	0.585	
HER	0.725	0.562		0.365	0.489	0.326	0.532	0.847	0.744	
TR	0.838	0.398	0.659		0.365	0.456	0.751	0.698	0.756	
LC	0.303	0.698	0.458	0.656		0.819	0.698	0.781	0.429	
LSAVG		0.426	0.683	0.691	0.485	0.258		0.745	0.616	0.711
MACC	0.526	0.536	0.594	0.568	0.489	0.756		0.521	0.813	
OCO	0.815	0.781	0.599	0.659	0.562	0.653	0.235		0.598	
REP	0.598	0.711	0.617	0.644	0.491	0.652	0.422	0.627		

ANCH = Anchoring Bias, FL = Financial Literacy, HER = Herding bias, TR= Trade Return, LC= Locus of Control, LSAVG=Loss Aversion Bias,MACC=Mental Accounting Bias,OCC=Over confidence Bias,REP=Representativeness Bias

The HTMT is the ratio formed by heterotrait- heteromethod correlations of indicators across different construct divided by the average of the monotrait- heteromethod correlations of the indicators of the same construct. The HTMT ratio should be less than 1 as highlighted by Henseler, Ringle and Sarstedt (2015). According to Bagozzi, Yi, and Phillips (1991) as well as Henseler and his colleagues (2015), HTMT should not exceed 0.9, but Clark and Watson (1995) and Alarcón, Sánchez, and De Olavide (2015) indicate that it should not exceed 0.85.

In the table above, other than anchoring bias and mental accounting bias, all the HTMT ratios of the latent variables are below 0.85. This is quite nice for ascertaining discriminant validity as conclude by Bagozzi, Yi & Phillips (1991), Henseler et al. (2015), Clark, Watson (2020) & Alarcon, Sanchez, & Olavide, (2015).

4.4 Multicollinearity Statistics (VIF)

Table – 4.5: Outer VIF Values

S.No.	Factors	VIF	S.No.	Factors	VIF	S.No.	Factors	VIF
1	ANCH 1	1.46	13	HER6	1.368	27	MACC1	1.368
2	ANCH 2	1.266	14	HER7	1.392	28	MACC2	1.256

3	FL1	1.384	15	TR1	1.378	29	MACC3	1.652	
4	FL2	1.527	16	TR2	1.565	30	MACC4	1.452	
5	FL3	1.442	17	TR3	1.952	31	MACC5	2.023	
6	FL4	2.308	18	LC1	1.421	32	OCO1	1.321	
7	FL5	1.831	19	LC2	1.569	33	OCO2	1.523	
8	HER1	1.768	20	LC3	1.656	34	OCO3	2.059	
9	HER2	2.015	21	LSAVG1	1.518	35	OCO4	1.752	
10	HER3	2.047	22	LSAVG2	1.526	36	OCO5	1.369	
11	HER4	1.418	23	LSAVG3	1.371	37	OCO6	1.923	
12	HER5	1.553	24	LSAVG4	2.052	38	REP1	1.232	
			25	LSAVG5	1.637	39	REP2	1.123	
			26	LSAVG6	1.282				

Table – 4.6: Inner VIF Values

	ANCH	FL	HER	REP	LC	LSAVG	MACC	OCO	TR
ANCH								1.882	
FL								1.223	
HER								1.104	
REP								2.012	
LC								1.692	
LSAVG									1.121
MACC								1.928	
OCO								2.062	
TR								1.235	

ANCH = Anchoring Bias, FL = Financial Literacy, HER = Herding bias, TR= Trade Return, LC= Locus of Control, LSAVG=Loss Aversion Bias,MACC=Mental Accounting Bias,OCC=Over confidence Bias,REP=Representativeness Bias

4.5 Multicollinearity Statistics (VIF)

In the provided tables, the two tables are Table 4.7 and Table 4.8, and we found the VIF values for both the outer and inner models. The following two tables present VIF values for all the variables in this model. All the VIF values available in both the outer and the inner models are less than 3. This result provides evidence there is no multicollinearity issue in either the outer or inner model. Next to the VIF test shows that all the independent variables selected for the study are acceptable and since the VIF values are below 5, we can therefore continue with the analysis.

Table – 4.7: Descriptive Statistics

Variables	Obs	Mean	Std. Dev	Min	Max
ANCH	353	4.063267	1.027446	1	5
FL	353	3.158924	1.146405	1	5
HER	353	1.428706	0.944499	1	5
TR	353	3.786119	0.853597	1	5
LC	353	4.061236	1.136304	1	5
LSAVG	353	4.627842	1.174031	1	5
MACC	353	4.987625	1.825621	1	5
OCO	353	4.054232	1.125432	1	5
REP	353	4.032511	1.102321	1	5

All the variables were scaled on a Likert scale of 1-5, where 5 represented strongly agree and 1 represented strongly disagree. The above table shows that almost investors incorporate all the above biases in their investment decision except herding as the mean value is 1.42.

Table – 4.8: Structure Model

S. N0	Coefficient	Standard deviation (STDEV)	T statistics	P values
1 ANCH -> TR	0.192	0.046	4.173	0.01
ANCH*FL -> TR	0.199	0.046	4.326	0
ANCH*LC -> TR	-0.193	0.042	4.595	0.02
2 FL -> TR	0.182	0.045	4.044	0
3 HER -> TR	0.194	0.042	4.619	0
HER *FL-> TR	-0.143	0.024	5.958	0
HER*LC -> TR	0.181	0.041	4.414	0
4 LC -> TR	0.162	0.032	5.062	0
5 LSAVG -> TR	0.165	0.031	5.322	0
LSAVG *FL -> TR	0.152	0.032	4.75	0
LSAVG*LC -> TR	-0.172	0.031	5.548	0
6 MACC -> TR	0.193	0.04	4.825	0.02
MACC*FL -> TR	0.139	0.019	7.315	0
MACC*LC -> TR	-0.151	0.031	4.87	0.04
7 OCO -> TR	0.172	0.021	8.19	0
OCO*LC -> TR	0.121	0.031	4.033	0.02
OCO*FL -> TR	0.178	0.021	8.476	0
8 REP- -> TR	0.173	0.031	5.58	0
REP *FL- -> TR	0.142	0.023	6.173	0
REP *LC- -> TR	0.139	0.027	5.148	0
9 FL x LC -> TR	0.156	0.036	4.333	0

ANCH = Anchoring Bias, FL = Financial Literacy, HER = Herding bias, TR= Trade Return, LC= Locus of Control, LSAVG=Loss Aversion Bias, MACC=Mental Accounting Bias, OCC=Over confidence Bias, REP=Representativeness Bias

The above structure model shows a different correlation between different variables and correspondingly trade return. Table 4.9 presents a structural model with different variables in the first column of this table.

In simple terms, it can be concluded that all the variables described above and their interaction in the above table have positive effect on trade return as reflected by the coefficients, t statistics and p values. Out of the moderate variables, only some, when added alongside the independent variable, alter the coefficient values. However, the above-mentioned output results prove that it is unthinkable to defend these factors for affecting positively the trade return of the investors in the stock market.

5. Conclusion and Recommendations

5.1 Conclusion

The research question of this study was as follows: To what extent does financial literacy and locus of control mediate the relationship between behavioral biases and trade returns? This research therefore lies under Behavioral Finance which is an offshoot of mainstream Finance, but humor the shortcomings of the latter. Traditional finance theories, on the other hand, uses averred rationality while working under the context of aberrant rationality where investors are otherwise considered to be irrational as behaved by behavioral finance theories. For this, the study arrived at operational research questions, objectives, and hypotheses which guide the research. The result of the current study also stated that out of all the cognitive biases under test,

only four of the biases (anchoring, loss aversion, overconfidence and representativeness) significantly influence trade return of the investors while the herding and mental accounting do not. Besides this, one of the moderate variables of the current study is financial literacy which overall holds a significant and influential positive relationship between anchoring, loss aversion, mental accounting, overconfidence, and representativeness but no moderating relationship exists with herding and trade return. Likewise, another moderate variable, locus of control also has moderating effect with respect to herding, overconfidence, representativeness and non-moderating effect with respect toward anchoring, loss aversion and mental accounting. From the research findings of the current study, it shows that investors use almost all forms of behavioral biases when decision-making with regard to investment, but financial literacy and locus of control moderate their trading return. Besides this Financial literacy and Locus of control have changed their mind as they were thinking about anchoring, loss aversion, mental accounting, overconfidence, representativeness, herding are good for their investment decision, but the study shows that directly all the above-mentioned behavioral biases are not good for them. Hence from the evaluation of these results the research questions have been answered and the research objectives achieved. Therefore, this study finds that individual investors in KPK are prone to investment in biases but financial literacy and locus of control offers an efficient method of moderating or even excluding the impact of these behavioral bias on the investment decision of the investors in the stock market.

5.2 Recommendations

It is herein recommended that policymakers and capital markets regulators should increase awareness about and cooperation between management, administrators, and brokerage firms as well as investors. Based on the results obtained herein, it is felt that future research on trade return should also investigate on the effect of other behavioral biases such as framing effect, endowment effect, gambler's fallacy as well as the disposition effect. In addition, examination of the moderating factor in turn could shed some light on the effect of investors' emotional intelligence on the perceptions of control.

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