IRSTI 06.73.21 https://doi.org/10.26577/be.2020.v132.i2.07

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THE INFLUENCE OF BEHAVIORAL FINANCE ON THE DECISION OF INVESTORS: EMPIRICAL INVESTIGATION FROM PAKISTAN STOCK EXCHANGE

A high rate of return on the investment is crucially dependent on rational investment decision making because rational investment decision ensures the successful return of an investment, especially in stocks. Investment decision making is affected by many factors; most of them are related to psychological and behavioural. Since it is difficult to make rational decisions about investment, researchers are trying to discover the factors that influence the investor's behaviour about decision making. For the rational estimation of success rate in stocks, investors have tried many traditional methods but reached on unsatisfactory results. However, Behavioral Finance has addressed this issue and discovered the most crucial factors that may affect the investment decision making. Thus, this study aims to evaluate the influence of the factors of behavioural finance that affect decision making in the stock exchange. Three factors have been selected and used to gauge the impact on investment decision making. These factors include; overconfidence bias, representativeness bias, and availability bias. A structured close-ended questionnaire has been used to collect the data, and data was collected from 211 respondents who are investors on Karachi stock exchange. To analyze the collected data, multiple linear regression (MLR) model has been used. The result of this study shows that all three independent variables have a significant impact on investment decision making. Moreover, the relationship is positive between the independent and dependent variables. Therefore, it can be concluded that the null hypothesis is rejected. This study will assist investors to make decisions rationally in the stock market.

Key words: Behavioral Finance, Overconfidence Bias, Representativeness Bias, Availability Bias.

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Мінез-құлыққа негізделген қаржыландырудың инвесторлар шешіміне әсері: Пәкістан қор биржасындағы эмпирикалық зерттеу

Инвестициядан түсетін кірістің жоғары қарқыны ұтымды инвестициялық шешімге байланысты болады, өйткені ұтымды инвестициялық шешім инвестициялардың, әсіресе акциялардың табысты болуын қамтамасыз етеді. Инвестициялық шешімдерге көптеген факторлар әсер етеді; олардың көпшілігі психологиялық және мінез-құлыққа байланысты. Инвестициялар туралы ұтымды шешім қабылдау қиын болғандықтан, авторлар шешім қабылдауға байланысты инвестордың мінез-құлқына әсер ететін факторларды анықтауға тырысады. Акциялардың табыстылығын ұтымды бағалау үшін инвесторлар көптеген дәстүрлі әдістерді қолданады, бірақ қанағаттанарлықсыз нәтижелерге қол жеткізеді. Алайда, мінез-құлыққа негізделген қаржыландыру бұл мәселені шешіп, инвестициялық шешімге әсер етуі мүмкін маңызды факторларды тапты. Осылайша, зерттеу қор биржасында шешім қабылдауға әсер ететін мінез-құлыққа негізделген қаржыландыру факторларының әсерін бағалауға бағытталған. Инвестициялық шешім қабылдауға әсер етуді бағалау үшін үш фактор таңдалды және пайдаланылды. Бұл факторларға мыналар жатады: біржақтылық, өкілдік және қол жетімділік. Деректерді жинау үшін жабық сауалнама жүргізілді және Карачи қор биржасында инвестор болып табылатын 211 респонденттен деректер алынды. Жиналған мәліметтерді талдау үшін көп сызықты регрессия (MLR) моделі қолданылды. Осы зерттеудің нәтижесінде барлық үш тәуелсіз айнымалы инвестициялық шешімдер қабылдауға айтарлықтай әсер ететіндігі анықталды. Сонымен қатар, тәуелсіз және тәуелді айнымалылар арасындағы байланыс оң. Демек, нөлдік гипотеза қабылданбайды деген қорытынды жасауға болады. Бұл зерттеу инвесторларға қор нарығында ұтымды шешім қабылдауға көмектеседі.

Түйін сөздер: мінез-құлыққа негізделген қаржыландыру, біржақтылық, өкілдік, қол жетімділік.

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Влияние поведенческих финансов на решение инвесторов: эмпирическое исследование с Пакистанской фондовой биржи

Высокая норма прибыли на инвестиции в решающей степени зависит от рационального принятия инвестиционного решения, потому что рациональное инвестиционное решение обеспечивает успешный возврат инвестиций, особенно в акциях. На принятие инвестиционных решений влияет множество факторов; большинство из них связаны с психологическими и поведенческими. Поскольку принимать рациональные решения об инвестициях сложно, авторы пытаются выявить факторы, влияющие на поведение инвестора в отношении принятия решений. Для рациональной оценки успешности акций инвесторы испробовали множество традиционных методов, но достигли неудовлетворительных результатов. Тем не менее, поведенческие финансы решили эту проблему и обнаружили наиболее важные факторы, которые могут повлиять на принятие инвестиционного решения. Таким образом, данное исследование направлено на оценку влияния факторов поведенческого финансирования, которые влияют на принятие решений на фондовой бирже. Три фактора были выбраны и использованы для оценки влияния на принятие инвестиционных решений: предвзятость, представительность и доступность. Для сбора данных использовалась структурированная закрытая анкета, и данные были получены от 211 респондентов, которые являются инвесторами на фондовой бирже Карачи. Для анализа собранных данных использовалась модель множественной линейной регрессии (MLR). Результат этого исследования показывает, что все три независимые переменные оказывают существенное влияние на принятие инвестиционных решений. Более того, связь между независимыми и зависимыми переменными является положительной. Следовательно, можно сделать вывод, что нулевая гипотеза отвергается. Это исследование поможет инвесторам рационально принимать решения на фондовом рынке.

Ключевые слова: поведенческие финансы, предвзятость, представительность, доступность.

1 Introduction

1.1 Background of the Study

A financial market is very volatile; the unpredictability and uncertainty cause high fluctuation in the turnover. Investors do not receive the desired outcomes because investors are human beings, and their behaviour has been questioned since long (Yüksel, S., & Temizel, E. N. 2020). The apparent reason behind this fluctuation is the fallibility of financial measuring tools and standards such as CAMP, APT, or portfolio theory (Zahera & Bansal, 2018). Investors rely on these tools to create rationality in their decisions. However, these tools and standards are unable to provide the certainty of correct decision making that leads to profit maximization. This happens because investors being human cannot be rational all the time. The irrationality factor hinders their decision making. Reason for irrational decisions is psychological and social factors (Francisco, D. S. B. 2020). Cognitive and emotional factors influence the decision-making process too. All these phenomena are explained by the new emergent field within Finance, which is called "Behavioral Finance" (Bakara & Yia , 2016). This is the study of investment decision psychology. The emotions and biases of investors affect the decision making of the investment. BF defines these biases and reasons for investment that traditional tools are unable to explain. Birău (2012), defines this phenomenon as the inefficiency of markets that mainly deals with finance from the perspective of cognitive psychological point of view.

While on the other hand, classical financial theories have not been providing alternatives for rational decision making; the psychological factors affect decision making (Alsabban, S., & Alarfaj, O. 2020). A rule of thumb cannot be developed for investment decision making. Many biases influence investment decision making. The list is exhaustive; the most discussed factors are taken for this study. It includes; overconfidence, representativeness, and availability. The overconfidence may influence the investors because they feel they have enough knowledge and experience to evaluate a new investment. Representativeness bias is when an investor starts linking the past events to conclude a decision for present or future investment. Lastly, the availability factor influences investment decision making when an investor relies on readily available information.

Therefore, to understand the nature of investment decision making, it is necessary to analyze the investor's behaviour towards investment decision.

It is crucial to discover how an investor behaves in certain situations that cause the decision making irrational and create a high level of uncertainty. This is the stage when BF provides the solution for rational decision making because it defines the phenomenon from the perspective of cognitive and emotional behaviour. Birau (2011) elaborates that there are most complex and challenging scenarios where traditional finance theory cannot provide solutions for rational investment decisions. Rasheed (2018) has emphasized the importance of stock exchange and stated that it is the source of economic development and source of finance for the companies dealing in businesses. Investors, including international investors, tend to deal in the less risky stock exchange. Therefore, it is essential to figure out the factors that are influencing the behaviour of investment decision making dealing on Karachi Stock exchange.

1.2 Objective

The aim is to discover the influence of behavioural finance on investment decision making (IDM). The specific objectives are the following:

To discover the influence of overconfidence on IDM

To measure the influence of availability bias factor on IDM

To discover the impact of representativeness bias on IDM

1.3 Scope

This study is significant for those individual investors who invest in stock markets. This study will help them recognize the influential factors of BF that may lead them to make irrational decisions in the stock exchange. Besides, this will help investors to make their decisions better to maximize the profit.

1.4 Statement of the Problem and Research Questions

Research has proved that around all over the world, investment decision making is done in millions every minute (Kimeu, 2016). Many behavioural factors are influencing investment decision making all over the world. One of the most critical factors that are the cause of irrational decision is a psychological factor; within the psychological factor, there is a cognitive factor that mainly deals with investor's behaviour towards any decision making and particularly in investment decision making. In Pakistan, the amount of research work done on this topic is less. Moreover, if the decisions taken for investment are based on investor's behaviour, the profit maximization may be highly volatile and uncertain. Therefore, to address this issue, there is a need to fill this gap to understand the behaviour of an investor related to investment decisions on Karachi Stock Exchange.

Does behavioural finance influence investment decision making?

Is overconfidence as a factor impacts decision making of investment?

Is the availability bias factor affects the investment decision making?

Is representativeness bias affect the decision making of investment?

2 Literature review

2.1 Review of the Literature

Research work on the phenomenon of investment decision making is not new in the finance field. Investors from the past 300 years (Saleem, Usman, Haq, & Ahmed, 2018) are struggling hard to gauge the parameters on which a rational decision could be made. Decision and behaviour are characteristic phenomena of the investment decision process. Investor's decision is dependent on his/her prior experience and reaction that he/she already has encountered.

Investment decision making is based on two schools of thoughts; Descriptive and Normative. The descriptive theory explains how investors make decisions about an investment; on the other hand, the normative theory focuses on how an investor should make choices among various alternatives. However, rational decision making cannot take place when human behaviour is involved (Kengatharan & Kengatharan , 2014). Psychology has defined the investment decision-making process as irrational phenomena because investors make decisions on the grounds of their previous experience and future valuation of profit maximization. BF is the field that studies the psychological and emotional behaviour of an investor and why they make errors while making any investment (Hilton, 2001).

BF stems under the paradigm of finance and economics to adhere to the psychological and cognitive behaviour for investment decision making. It explores the psychological factors that are involved in affecting investment decision making irrationally (Thakur , 2017).

The BF theory works with psychology to discover the idea of how investors' behaviour is affected by emotions and cognitive errors (Kengatharan 2014). The prior research work shows that BF is originated from cognitive psychology. This can be defined as the study, which is based on learning about human behaviour that influences reasoning, thinking, and decision-making skills. Gitman and Joehnk (2008) describe that a study on BF discovered that

investors' decisions are influenced by a number of different views, perceptions, and priorities. Bakara & Yia (2016) explain that the beliefs, perceptions, and biases are the reasons of causing investors' overreaction about some phenomena related to financial information and decisions that may lead to irrational decision making and risk-taking. The heuristic theory works under the domain of BF, which is known as "rules of thumb" (Fromlet, 2001). This theory is applied in complex and volatile scenarios, where decision making is difficult and critical (Shefrin, 2000). Heuristics presents criteria for evaluation to make decision making more straightforward and more comfortable.

Furthermore, the optimal solution is acquired by heuristics. Kengatharan (2014) identified that Kahneman and Tversky introduced the availability bias in 1974. After that, Waweru et al. (2008) also included the overconfidence phenomenon into a heuristic. Similarly, other numerous factors influence investment decision making; some of them are defined in the upcoming parts of this study.

Moreover, Ritter (2013) discussed this phenomenon in great detail. According to him, with the help of psychology theory, it will be easier to deduct the actual reasons behind the irrational decision making of investors.

Kliger and Kudryavtsev (2010) distributed BF into two dependent variables and called it the building blocks of BF. One of them is cognitive psychology while on the other hand, it is arbitrage. Cognitive psychology is concerned with the implicated errors that an investor may encounter while making investment decision making. On the other hand, arbitrage predicts the most suitable way of an investment in the market. Following are some of the factors that are related to cognitive psychology.

One of the most influential variables in cognitive psychology is heuristics. As mentioned above, this is the method of converting a difficult problem with a simple one and providing the solution (Kahneman, 2003). In most of the unfavourable and volatile circumstances, heuristics is the guideline for investors (Chaiken, 1987). Investors usually depend on heuristics in most uncertain situations because they feel a "rule of thumb" will help them to escape the critical situation. They believe that by use of this, they can reduce the chances of risks and predict the outcomes (Raines and Leathers, 2011). For instance, investors may feel that their decisions are sensible and rational when they see the acquisition coming (Schijven and Hitt, 2012). Furthermore, it encourages investors to overestimate the probability of investment into new projects and end up with high risks (Wickham, 2003). Some of the biases are being discussed in the following such as; overconfidence bias, representativeness bias, and availability bias.

2.1.1 Investment Decision Making:

The phenomenon to put some money in the particular project, stock or anything to get the profit out of it or maximizing the profit is considered as the investment. The investment needs a clear vision and accurate estimation for maximum success. Being an investor, the objective is to maximize profit. To obtain this objective, it is considered that rational decision making is critical in investment decision making. Merton (1987), suggested that rational decision making is a dependent variable on the independent variable of knowledge. Moreover, both have a positive relationship. If an investor has a high level of knowledgeable about the financial markets, the decision about the investment can be rational. The argument arises when the traditional theorists argue that being an investor, there is always a rational decision about the investment. However, this phenomenon is different in economic life. Investors do get affected by the psychological factors in decision making about the investment along with the behavioural factors. In recent past years, researchers are trying to figure out the factors that are affecting the financial decisions. As a result, they have come up with the findings that human nature is prone to be affected by the factors that are natural to them in day to day life. BF is the field that addresses both the things together. It uses human nature or psychology, together with financial factors. Consequently, decision making is affected by psychological and behavioural factors.

2.1.2 Behavioral Finance:

Olsen (1998), defined BF as a tool to comprehend financial markets' psychology and implications. It is a systematic instrument to predict the decision-making outcome. Belsky (1999), referred to BF, is a study of psychological and cognitive aspects of financial markets. It is the study to discover the reasons behind illogical and irrational decisions about investments. However, on the other hand, Shefrin (2001), interpreted BF as the study of psychology to understand financial behaviours. Precisely, BF can be defined as the study about the investment that is dependent on the emotions and feelings of investors rather than on practical and rational approach. On the other hand, focused on the nature of the market, the change in the market and the trend of profit and loss dependent on the behavioural aspect not on the systematic pattern of the market. He further described it as the function to

understand and answer the questions that traditional theories cannot, but BF has answered and provided the most rational decision-making techniques.

2.1.3 Overconfidence Bias:

The bias that affects investor in decision making is overconfidence. De Bondt and Thaler (1995) define overconfidence as the overestimation of the success rate based on their skills and knowledge. The ability and knowledge are the two things; usually, investors are overconfident about (Chaudhary, 2013; Shiller, 1998). Investors overestimate their abilities and knowledge by ignoring the possible negative outcome and trust their talents (Johnsson et al., 2002). That means an investor is more likely to face higher risk if that investor has overconfidence within himself/herself. March 1987 elaborates this idea by stating that overestimation about success rate is done when investors consider themselves as an expert. Moreover, this factor affects when investment makings are frequented and excessive (Evans, 2006). Moreover, it is indicated that overconfidence is one of the reasons investors prefer those companies that are less diversified.

2.1.4 Representativeness Bias:

Representativeness affects decision making, like the factor of the above two mentioned. This means that investors decide on the bases of a recent incident that may have influenced them positively or negatively without any further investigation (Bondt, 1998). Pompian (2012) further explains that this bias occurs when an investor decides the present on the bases of experiences that are related to the past. Shafran (2009) further elaborates it by stating that investors combine two events irrationally and make decisions. Prior research work indicates that investors categorize their experiences on the bases of their experience success rate even if the scenario is new for them (Athur, 2014).

2.1.5 Availability Bias:

The final determinant for this study is availability bias. This works under cognitive theory and is considered as a shortcut to make decisions about investment by utilizing readily and accessible knowledge to go for better options (Kimeu, 2016). It is considered as an essential tool to gauge the probability and frequency. It is called a rule of thumb which is already present in investors mind whenever the situation of decision making occurs the mind starts connecting the past events to formulate a conclusion. Therefore, the decision was taken, which is affected by prior experiences may result in a biased decision. Avgouleas (2009) defined in simpler words stating availability as the accessibility of knowledge.

2.2 Prior Studies:

Rasheed, (2018) researched to discover the cognitive factors accurately; representativeness and availability in the process of decision making by investors and to observe the effect of locus of control on the subjects. The study was based on quantitative analysis with the data collection tool: a questionnaire with the structured questions and 227 participants from the different cities of Pakistan. The model used for this study was a structured equation model with linear regression. The findings show that the said factors affect decision making.

Kliger (2010) focused on an essential factor availability bias that is usually an impactful cause of irrational decision making. He analyzed the availability on the bases of risk and dub outcome. The study discovered that when there are positive changes in the stock price, the decision is more irrational because the available information is the base for next decision making.

Seppälä (2009) conducted the study to rule out the impact of three psychological biases that may hinder the investment decision-making advisors. The study incorporated the most critical factor overconfidence, the most debatable factor hindsight, and most research factor self-attribution. The study figured out that advisors of investment are affected by the hindsight factor. Moreover, those investors who are experienced are more likely to be affected by self-attribution factor. Finally, most experienced investors are more confident about their decisions.

Bhandari (2008) indicated that cognitive biases are present in investors at the time of investment decision making. This study was conducted on 119 participants to prove that if the decisions are taken effectively, the biases can be reduced by the right amount of ration and decisions can be taken rationally too. Moreover, such rational decisions are more useful for higher profit maximization.

Chen (2008) argued that even in trading, the investment decision is taken irrationally in China. The data was collected from a brokerage house for analysis. He analyzed that investors like to sell stocks with high prices and hold stocks at low prices. Moreover, unlike other investors, traders are overconfidence because of their frequent selling and buying in the trade market. Finally, he discovered that the previous profit or loss affects future trading decisions.

Chandra (2008) discussed the relationship between psychological factors and investment decisions affected by risk. This study collected the secondary data available online; research work was done that is published by researches, and data present

on finances. He found out that rational decision making may not be achieved entirely by traditional finance theory. The decisions are usually affected by the fear of loss, mental accounting, anchoring, and other factors that are involved in risk.

Chira (2008) examined the elements dealing with the individual behaviour of an investor and their impact on investment decision making. This study was conducted on the business students, and data was collected with the help of a questionnaire. The significant variables for the analyses were loss aversion, overconfidence, and sunk cost. This study was limited to the students only; therefore, results may not be authentic.

Saleem et al. (2018) conducted a study on PSE and included 150 respondents in the study. A structured questionnaire collected the data. The study focused on the rationality of the decision making related to the investment. This study included demographic factors as well as behavioural factors such as; overconfidence, herding, the illusion of control, herding, self-attribution, and disposition. The data was collected from Islamabad and Lahore to gauge the relationship between the dependent and independent variables. SEM technique was used to assess the relationship. The results summed up that behavioural factors influence investment decision making. Moreover, demographical factors have a negative but significant relationship. However, behavioural biases have a positive and significant impact on the dependent variable.

Birau (2012) presented his study about capital market investment and decision making. He argued that the decisions are affected by the psychological factors that are part of behavioural finance as well. Moreover, he indicated that classical finance theories for the evaluation of investments are not enough for investment decision making. Instead, they are affected by other psychological factors, such as herding, disposition. Risk-averse etc. the findings of the study concluded that the classical models to gauge the rational decisions are not enough. Other factors may influence investment decision making. This proves that behavioural finance has become most important in the field of research because of its significant impact on decision making.

Chaudhary (2013) conducted research work to assess the influence of BF in investment decision making. He argued that investors get influenced by BF factors easily. He added the most critical factors in the study to assess the impact of these factors with the context of investment.

Kaheneman (1979) developed the model named prospect theory to gauge the behavioural biases in investment decision making. He argued that many factors affect decision making by investors other than economic factors. He suggested that to gauge the value of the decision should be assigned to profit and loss or gain and loss, not to the probabilities of the assets.

Kimeu (2016) distinguished between the two methods of evaluating the decision making about investment in the stocks. The two methods were traditional or classical method, and the other was BF theory. He suggested that for the traditional or classical theory, one needs to have the proper understanding of mathematical formulas to gauge the rational investment decision in the stock. Investors may lack in this systematic and mathematical way to gauge the profitable stocks. While on the other hand, he suggested that BF theory is the easiest way for any investor to gauge the investment decisions that are supposed to be rational. He included few factors from heuristics, herding, and prospect factors to make the decisions about investment in stocks more rationally and systematically. He used the close-ended questionnaire as a data collection tool. He included 80 responses as the sample size of his study. He used descriptive analysis, inferential analysis, regression to find out the results that if the decisions are affected by BF factors of not. The findings show that BF factors do impact decision making in stocks.

Athur (2013) enlightened the importance of BF theory. He emphasized that with the traditional or classical theory for the evaluation of stock does not represent the full picture of success. Few factors do affect the decision-making process and lead to the failure of successful decision making. He emphasized that because of the incompetency of traditional evaluation models for the stocks, the anomalies have been evolved frequently. Anomalies mean the underpricing of the stocks and overpricing of the stocks.

Moreover, he indicated the need for the development of the BF theory. He added most of the factors of BF in his study and gauged the impact of those factors on investment decision making. The findings suggest that there is a positive and significant relationship between the dependent and independent variables. Representativeness bias, herding, cognitive dissonance, and hindsight factors were included in the study, and they all implied the positive and significant influence on investment decision making. However, he did mention a few factors that do not have a significant influence on the investment decision making such as; self-attribution, over-optimism, and regret aversion.

Bakar (2016) conducted a study on the Malaysian stock exchange to assess the impact of BF factors on investment decision making. He emphasized the significant impact of BF on investors. Moreover, he suggested those decisions that are made irrationally turn out with high profits and the impact of this on profit is better than the decisions taken irrationally. He used the questionnaire as the data collection tool. The sample size he used for the study was 200 respondents. He mainly focused on all age groups, 18-60 years old people. Not only this, but he also concluded that his findings are similar to the findings of other researchers. He concluded that the impact of BF is positively and significantly related to irrational decision making. He gauged the result by using MLR equation model. The focused on the phenomena if the level of irrational decision making is increased, the efficiency of the market can also be improved.

Kengatharan (2016) conducted the study on Colombo stock exchange to rule out the impact of BF on decision making about investment on the stock exchange. The purpose of this study was to see if the people of Sri Lanka perform irrationally or not. He too emphasized the importance of BF as the effective way to make decision irrationally. He used the regression model to analyze the data and interpret the results. The findings of this study indicated that the independent variables affect the decision variable moderately. That means herding behaviour, heuristic behaviour, and other BF factors affect investment decisions moderately. If these factors are considered at the time of decision making, the ratio of an irrational decision can be minimized.

Shafran (2007) experimented with different scenarios and situations and gauged the relationship between BF factors and decision making. The finding concluded that people perform differently in the traditional method of evaluation of stocks. They consider future prices by predicting through a systematic model. While on the other hand, people make decisions based on past performances. The findings of the experiment concluded that investors tend to keep the winning stocks for a long time while they tend to sell the stocks that do not have chances to become winning stocks. Moreover, the study indicated that investors pay more attention to the most available information to assess the stock and take the decision on the recent past about the stocks.

Kisaka (2015) critiqued the traditional method such as CAMP for not evaluating the proper estimates to gauge the future value of stocks and paid more attention to the newly emerging theory BF to make decisions irrationally. He conducted his research in Kenya NSE to assess the relationship between the variables. He used the regression model to analyze the data. The data was collected through the structured questionnaire within two months. He found out that a few BF factors affect investment decision making significantly. These factors include loss aversion and overconfidence. He suggested that if an investor pays attention to these biases, he or she can make the decisions about investment more irrationally.

Thakur (2017) researched with 50 respondents to gauge the association between BF factors and investment decision making. The study used ANOVA to analyze the data and for the results. The study included overconfidence, representativeness, availability, loss aversion and few more biases to check their impact on rational decision making. He concluded that FB factors have an impact that is significant and positively associated with decision making. However, he indicated that few factors are there that do not affect the decision of the investors in a more significant manner. Moreover, few have a moderate impact on decision making.

Tekce et al. (2012), examined the factors of BF on the decision-makers who mainly invest in Turkish stock exchange. They thoroughly examined the factors that may affect decision making and included the most debatable factors in their study. They incorporated disposition effect, overconfidence, familiarity bias, and representativeness bias. They gauged the effect of these factors on the dependent variable performance return. This study aims to evaluate demographic changes concerning investment decision making. They collected the data with the help of a close-ended questionnaire. The findings of the research study show that overconfidence and familiarity biases have a strong correlation. The study concluded that BF factors have a significant and positive impact on investment decision making.

Zahera (2018) presented a systematic review of the BF factors and their influence on decision making. She used the research papers to analyze the data for the study. She analyzed papers on the BF since 1979 to 2016. After a thorough study of literature, she concluded that human emotions are affected by the BF factors and an investor being a human cannot avoid the biases. Somehow, at some point in time, directly or indirectly, these factors affect the investors while making decisions rationally. It is a bit difficult to avoid all biases and make decisions about investments. She explained the relationship between BF factors and investment

decision making. The findings of this research paper were that investors are affected by BF factors significantly. However, the relationship could be positive or negative, but there is a significant association between the two variables.

Cherono et al. (2018), conducted the study on Kenya stock market. The study aims to evaluate the impact of herding behaviour on investment decision making. The study used a quantitative approach, and it used secondary data. The data was collected from the listed companies in the Nairobi market. The sample size of this study is 48 companies. The data was collected from 2004 to 2016. For the analysis panel regression model is used. The findings of the research paper indicate that investment decision making and herding bias have a positive relationship. Herding bias has a significant impact on investment decision making. Therefore, the null hypothesis is rejected, and the alternative hypothesis is retained. This study shows that there is a positive and significant relationship between the dependent and independent variables.

However, Babajide (2012) presented his work conducted on the Nigerian Security Market (NSM) concerning BF. He incorporated 300 responses in his study. The data was collected with the help of a structured questionnaire. This study has two aims. First, one finds out if the BF factors exist in NSM or not. Second, if these BF factors have any significant impact on NSM, he used Pearson with the help of SPSS. Pearson was used to figuring out the coefficient correlation between the dependent and independent variables. The findings of this research study prove that BF biases do exist in the market; however, there is a negative relationship between the two variables because the beta is negative, which shows the inverse relationship. That means there is no effect of BF on NSM.

Luu (2013), came up with the findings of the impact of BF on Vietnam and concluded that there is a moderate impact of BF on the stock market. For this study, he took help from the well-structured and close-ended questionnaire based on 188 respondents. The study used five factors for the study to evaluate the influence of BF on the Vietnam stock market. The five factors that he included in the study are; overconfidence, herding, prospect, anchoring, and market. The findings of the research show that there is a moderate impact of BF factors on the market. Which means investor's behaviour is affected but in moderation.

2.3 Conceptual Framework

Based on the above studies, this study aims to discover the relationship between investment decision making and factors affecting the decisions of investors who mainly trade on the stock exchange of Karachi. This framework is adapted from Kisaka (2015).

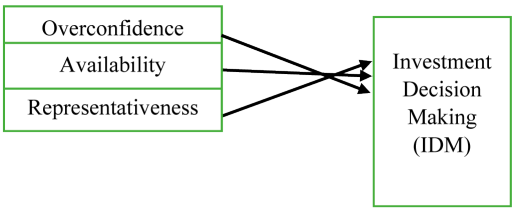

Figure 1– Relationship between investment decision making and factors affecting the decisions of investors
Source: Kisaka, 2015

2.4 Research Hypotheses

This study aims to test the following hypotheses:

H_1: Overconfidence bias does not affect the investor significantly to make decisions irrationally.

H_2: Availability bias does not affect the investors significantly to make decisions irrationally.

H_3: Representativeness bias does not affect the investors significantly to make decisions irrationally.

3 Methodology

3.1 Data

Primary data has been collected from individual investors who invest in stock exchange Karachi to figure out the impact of overconfidence, representativeness bias, and availability bias on investor's investment decision making. The questionnaire has been developed to collect data, and convenient sampling has been used to collect the data from investors. 350 questionnaires were circulated. Out of 350 questionnaires, 211completely filled questionnaires are being considered for this research study after eliminating uncompleted and partially filled questionnaires.

3.2 Data Collection Tool

A well-structured questionnaire has been adopted for the study. It has four variables to gauge

the relationship between investment decision making and biases that affect decision making. The questionnaire includes; overconfidence bias, representativeness bias, availability bias, and investment decision making. There are three parts of the questionnaire. First part is about demographic questions related to the age, gender, education, and experience of investment on the stock exchange of Karachi. Part two consists of the questions gauging the three independent variables and the third part are related to the dependent variable. Part two and three of the questionnaire is based on the 5-Likert scale in which one is least agree to five being most agreement. In part two, question number one to eight is related to the overconfidence bias. In which question number one to 5 are adopted from the study of Alrabadi (2011) and question 6 to 8 are adopted from the study of Prosad (2015). Question number 9 to 16 are related to representativeness bias. Question number 9 and 10 are adopted from the study of Waweru (2008), question number 11 to 13 are adopted from the study of Sarwar (2014), and question number 14 to 18 are adopted from Phuoc Loung (2011). Availability bias has questions from 17 to 23. Question number 17 to 19 are adopted from the study of Kudryavtsev (2013), question number 20 has been adopted from the study of Waweru (2008), and question number 21 to 23 are adopted from the study of Phuoc Loung (2011). Finally, the dependent variable decision making about investment in the third part of the questionnaire has eight questions. All questions are adopted from the study of Scott (1995).

3.3 Variables

The dependent variable of this research paper is the investor's decision making about the stocks of Karachi stock exchange. However, the independent variables are factors affecting the decision-making process. These factors are overconfidence, representativeness bias, and availability bias.

3.4 Inclusion Criteria

Nonprobability sampling technique 'convenience' is used to collect data. Reasons for selecting this technique is time-saving and less expensive nature of this technique (Bryman & Bell, 2015). For the data analysis, Multi Linear Regression is used. MLR is used when a research study has more than two variables. This study has one dependent variable and three independent variables.

3.5 Sample and Sampling Techniques

The population is every individual who invests in the stock market of Pakistan. The target population is all investors who invest in Karachi Stock Exchange. The sample size is 211 individual investors. Nonprobability sampling technique convenience is used to collect data.

3.6 Statistical Model

This study has adopted Multiple Linear Regression (MLR) to calculate the linear regression to gauge the impact of an independent variable on the dependent variable. MLR is used when there are two or more than two independent variables and one dependent variable.

$$Y = \beta_0 + \beta_1 X_{OCB} + \beta_2 X_{RB} + \beta_3 X_{AB} + \varepsilon i$$

Where Y = IDM

β_0 = constant

β_1, β_2, β_3 = Regression coefficients

X_{OCB} = Overconfidence Bias

X_{AB} = Availability Bias

X_{RB} = Representativeness Bias

4 Result and Discussion

Multiple linear regression analysis is used to gauge the impact of overconfidence bias, availability bias, and representativeness bias on investor decision making. Multiple linear regression MLR is used when there are two or more than two independent variables and one dependent variable (Srivastava and Rego 2012). Moreover, ANOVA and descriptive statistics are used for the analysis. Furthermore, frequencies and descriptive have been used for demographics.

4.1 Demographic Statistics

The tables below represent the socio-economic characteristics of respondents.

According to the demographic statistics chart above, 80.1% of the respondents are male, and 19.9% are females. Moreover, 10% of the respondents are in the age bracket of 18-25, 39.8% respondents are the age of 26-35, 39.35 are aged between 36-45 years, 8.5% respondents are aged 46-55 years, and 2.4% respondents are above 55 years of their age. Furthermore, 6.2% of the respondents have a high school education, 3.8% of investors have diploma education, 55.9% of investors are graduates, and 34.1% of investors are postgraduates. The statistics of investment experience level in the stock exchange of the respondents is as follows: 44.5% of the investors are investing in the stock exchange since less than a year, 27% investors have experience of 1-5 years, 24.2% investors have experience of 6-10 years, and 4.3% of investors have experience of 11-15years.

Table 1 – Socio-economic characteristics of respondents

Demographic Variable	Investors' Grouping	Frequency	Percentage
Gender	Male	169	80.1
	Female	42	19.9
Age	18-25years	21	10.0
	26-35 years	84	39.8
	36-45	83	39.3
	46-55 years	18	8.5
	Over 55 years	5	2.4
Education Level	High School	13	6.2
	Diploma	8	3.8
	Graduate	118	55.9
	Post Graduate	72	34.1
Experience	Less than a year	94	44.5
	1-5 years	57	27
	6-10 years	51	24.2
	11-15 years	9	4.3
	More than 15 years	0	0

4.2 Descriptive Analysis

4.2.1 Reliability of the scale

To check the reliability of the data collection tool, i.e. questionnaire, Cronbach Alpha has been used for all four variables. The Cronbach Alpha measures the reliability of variables. If the result of this measure is 0.6 or greater, the tool is considered reliable (Sekaran and Bougie, 2012). In the tables below, it can be observed that Cronbach alpha's values are above 0.6 for all the variables. Overconfidence has 0.958 value; availability has 0.850 value; representativeness has 0.956 value; and decision making variable has 0.930 value.

Table 2 – Cronbach Alpha

Variables	Cronbach Alpha	Number of Items
Overconfidence Bias	0.958	8
Representativeness Bias	0.956	8
Availability Bias	0.850	7
Decision Making	0.930	8

4.2.2 Descriptive Statistics

In the descriptive analysis, the values of mean and standard deviation were estimated. Mean is calculated to estimate the average value and standard deviation is calculated to estimate the variation in variables. The descriptive statistics indicate that the average value of overconfidence is 3.34, representativeness bias is 3.57, availability bias is 3.14, and investment decision making is 3.42 on the scale of 1 to 5. All values are above 3, which

shows the significance of the variables. The standard deviation also is not too big. It varies from 0.85 to 1.0, which again is the desired value. This shows there is not much variation in the responses.

Table 3 – Descriptive Statistics

	N	Mean	Std. Deviation
Over Confidence	211	3.3477	1.03983
Representativeness Bias	211	3.5705	1.01257
Availability Bias	211	3.1476	.81666
Decision Making	211	3.4277	.85554
Valid N (listwise)	211		

4.3 Inferential Analysis

4.3.1 Correlation Analysis

To identify the correlation between the variables, the correlation analysis was conducted. The table below shows the significant relationship between variables. There is a significant positive relationship between overconfidence bias and representativeness bias, availability bias, and investment decision making as all the values of significance are below 0.05.

Table 4 – Relationship between variables

Correlations					
		Over Confidence	Representativeness Bias	Availability Bias	Investment Decision Making
Over Confidence	Pearson Correlation	1	.816**	.341**	.771**
	Sig. (2-tailed)		.000	.000	.000
	N	211	211	211	211
Representativeness Bias	Pearson Correlation	.816**	1	.501**	.836**
	Sig. (2-tailed)	.000		.000	.000
	N	211	211	211	211
Availability Bias	Pearson Correlation	.341**	.501**	1	.622**
	Sig. (2-tailed)	.000	.000		.000
	N	211	211	211	211
Decision Making	Pearson Correlation	.771**	.836**	.622**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	211	211	211	211
**. Correlation is significant at the 0.01 level (2-tailed).					

4.3.2 Regression Analysis

Table 5 – Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.889[a]	.790	.787	.39520
a. Predictors: (Constant), Availability Bias, Over Confidence, Representativeness Bias				

In the above table of model summary, coefficient of correlation R has the value of 0.889 which means there is a strong correlation between dependent variable decision making and three independent variables. R squares show how much change can occur in the dependent variable from the independent variables. The R square value of this study is 0.790, which means 79% change in the investment decision making is due to overconfidence, availability bias, and representativeness bias. This means 21% are the other variables that are not included in this study that influence the investment decision making. Therefore, it can be concluded that this model which includes three independent variables are sufficient to gauge the impact of behavioural finance on investment decision making and is a good fit for the study. However, the acceptable value of R square changes according to the area of study (Silva et al. 2014). Therefore, it is advisable to study the literature thoroughly about the study. The study by Lim (2012) has an R square value of 0.696 and the study from Qadri and Shabbir (2014) has an R square value of 0.755. This implies that the R square for this study is within the range as per other similar studies in different contexts. Adjusted R square is 0.787, which means the independent variables explain 78.7 % of the variance in the dependent variable. Hence, this model is reliable to predict the results for this study.

Table 6 – Anova

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	121.380	3	40.460	259.055	.000[b]
	Residual	32.330	207	.156		
	Total	153.710	210			
a. Dependent Variable: Investment Decision Making						
b. Predictors: (Constant), Availability Bias, Over Confidence, Representativeness Bias						

Table of Anova represents if the model is significant or not for the study. The value of F is the most important value to evaluate if the model is fit for the study or not. If the value of F for any model is more than 4, that indicates the goodness of fit. The F value of this model is 259.055. Therefore, it is concluded that the model is a good fit for the study. After the F value, the Sig value is evaluated. If it is less than 1%, it means the model is significant. Here in this model, the sig value is 0.000, which is less than 0.01 or 1%. Hence it is proved that the model is significant for the study.

Table 7 – Impact of variables

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.271	.122		2.218	.028		
	Over Confidence	.269	.046	.327	5.876	.000	.328	3.046
	Representativeness Bias	.354	.051	.419	6.926	.000	.278	3.597
	Availability Bias	.315	.039	.301	8.095	.000	.735	1.361
a. Dependent Variable: Investment Decision Making								

The table above shows that all three independent variables; overconfidence, representativeness bias, and availability bias have a significant impact on dependent variable investment decision making because all three independent variables have t-value greater than two which is the standardized cut off for the t-value. Overconfidence has t-value of 5.876; representativeness bias has t-value of 6.926, and availability bias has 8.095 t-value. Moreover, the Sig values for three independent variables are below 0.05 or 5%. Furthermore, overconfidence has a coefficient value of 0.269, which represents that if there is one per cent increase in the independent variable, the dependent variable will be increased by 26.9 per cent. This means, investors will become more overconfident, and investment decision would be irrational. Secondly, representativeness bias has a coefficient of 0.354 which means if there is one per cent increase in representativeness bias, investment decision making will be irrational by 35.5%. Finally, availability bias has a coefficient of 0.3155. This represents that if an investor is affected by availability bias by 1 per cent, the investment decision making will be irrational by 31.55%. Furthermore, there is no multicollinearity in between overconfidence, representativeness bias, and availability bias because all independent variables have Variance Inflationary Factor (VIF) values less than five that is a benchmark for it. Overconfidence has VIF 3.046; representativeness bias has VIF 3.597, and availability bias has VIF 1.361. There is no issue of multicollinearity. Therefore, based on t-values, Sig values and impact percentage of three independent variables, it can be concluded that overconfidence, representativeness bias, and availability bias have a positive and significant impact on the dependent variable investment decision making. Consequently, based on the results, the null hypothesis that stated there is no significant impact of overconfidence, representativeness bias, and availability bias on investment decision making is rejected. The following would be the regression equation:

Investment Decision Making = 0.271+0.269Overconfidence+0.354Representativeness bias+0.315Availibility bias + Ɛi

4.4 Hypotheses Assessment Summary

Table 8 – Hypotheses

No.	Hypotheses	Result
1	Overconfidence bias does not affect the investor significantly to make decisions irrationally.	Rejected
2	Availability bias does not affect the investors significantly to make decisions irrationally.	Rejected
3	Representativeness bias does not affect the investors significantly to make decisions irrationally.	Rejected

According to the result of the regression test, it is concluded that the above three hypotheses have been rejected because the Sig value of every hypothesis is below 0.05, and the beta is positive. Hence, it is proved that overconfidence, availability bias, and representativeness bias do affect positively and significantly the investor to make the investment decision irrationally.

4.5 Discussion

The purpose of this research was to estimate the impact of behavioural finance on investment decision making. Through this study, it was assessed that either the decision are influenced by the biases such as overconfidence, representativeness bias, and availability bias. The reason was to help the investors to make investment decisions more rationally and get the maximum profit out of it. The data was collected through convenience sampling. The close-ended questionnaire was used to collect the data. Investors do get influenced by the knowledge and experience they have. They depend on their skills and assumptions based on experience and knowledge rather than considering systematic and scientific tools to predict the outcome.

Moreover, investors are prone to the most available information about the stocks. They consider the readily available information quickly. They think that the current information can help them out to predict the outcome. Finally, investors pay more attention to the company's management, past performance, and gains or losses. They base their decision on the recent past incidents rather than looking at or predicting the probable future outcomes, and these outcomes are not based on the past performances because every stock has different phenomenon and require different factors to be evaluated. It means if there is an increase in investment decision making, there are chances that

the behavioural finance factors will affect investors by 79% to make decision irrationally because the dependent and independent variables have a significant positive relationship.

Overconfidence has a significant positive impact on investment decision making that indicates that investors' decisions about investment in stock exchange are likely influenced by overconfidence bias. They think that the decisions they make are correct. The decisions are taken by investors always earn them gains and profits. Their competency level as an investor is higher than other people. Qadri and Shabbir (2013) have a similar outcome of the overconfidence impact on investment decision making on Islamabad Stock Exchange. They concluded that overconfidence has a positive and significant impact on investment decision making.

Moreover, Lim (2012) also have similar results and concluded that overconfidence has a positive and significant impact on investment decision making in the Malaysian share market. Furthermore, Bashir (2014) concluded that overconfidence has a positive and significant impact on investment decision making. However, the result of this study is not parallel with the findings of Arif (2014). He concluded that though overconfidence has a significant impact on investment decision making, the dependent and independent variables have a negative relationship. The same result was presented by Kengatharan (2014); he concluded that there is a negative relationship between the two variables, but the independent variable has a significant impact on the dependent variable. Conclusively, it is stated that investment decision will be affected by one unit in increase if there is one unit increase in overconfidence bias.

Availability bias has a positive and significant impact on investment decision making about investment on Karachi stock exchange. This shows that investors decide on investment based on readily available information. The current price of stocks is the base of predicting future prices of the stocks. Moreover, the decision about investment is mainly based on the information provided by investors' close friends, relatives, and news from the stock exchange. This finding is similar to the finding of Nofsingera and Thu Ha (2011) as well. He concluded that there is a significant impact of availability bias on investment decision making. Moreover, Qureshi (2012) also have similar findings with a significant positive relationship between the two variables. Furthermore, Bakar and Yi (2016) concluded that availability bias has a very significant and positive impact on investment decision making of stocks available Malaysian stock exchange.

Representativeness bias has a highly significant impact on investment decision making and has a positive impact on investment decision making. This means investors on Karachi stock exchange decide on the bases of a recent incident that influence them positively or negatively without any further investigation. Moreover, the investors decide the present on the bases of experiences that are related to the past. Furthermore, prior research work indicates that investors categorize their experiences on the bases of their experience success rate even if the scenario is new for them. The findings of this study are parallel to the findings of Rasheed (2018). He concluded that there is a significant and positive impact of representativeness bias on investment decision making.

Moreover, the findings of this study are similar to the findings of Waweru (2008) as well. The findings concluded that investment decision making about stocks at Nairobi stock exchange is affected by representativeness bias significantly and positively. Hence, if there is an increase in this bias by one unit, it will affect investors to make decisions irrationally by one unit.

Overall, the findings of this research are similar to the findings of Qadri and Shabbir (2013), Lim (2012), and Bashir (2014). The findings of the overconfidence are similar to this study. They concluded that there is a positive and significant impact of overconfidence on investment decision making. Moreover, the findings from Nofsingera and Thu Ha (2011) and Bakar and Yi (2016) are similar to the findings of this study for availability bias. Lastly, Waweru (2008) and Rasheed (2018) have concluded that there is a positive and significant impact of representativeness bias on investment decision making.

However, the findings of the study from Arif (2014) and Kengatharan (2014) are not similar to the findings of this study. They concluded that behavioural finance factors do have some significant impact on investment decision making, but the relation is negative.

5 Conclusion, limitation & recommendation

5.1 Conclusion

The null hypothesis of this study has been rejected and alternative retained because according to the data analysis and findings it can be concluded that there is a significant and positive impact of independent variables; overconfidence, representativeness bias, and availability bias on the dependent variable: investment decision making. Investors are irrational while deciding on investment in a stock exchange.

Considering the findings of this study, investors can make their investment decisions more rationally.

5.2 Limitations

This study mainly focused only on Karachi stock exchange due to time constraints and contacting investors. This means this study is limited to gauge the ideas and perceptions about the investment decision making of only one region. People from different regions may have different opinions about investment decision making. The other limitation is that the researchers have different investors shared their views and ideas dependent on the mood, availability, time, and other socio and psychological factors. The views and opinions may differ in different context and time. Therefore, the findings of this study are not subjected to these participants' true feelings.

5.3 Recommendations

This research study has included only three factors of behavioural finance that affect investment decision making. Recommendations for the future research studies on this topic are: consider adding the other behavioural finance factors that are missing in this study because other factors like herding, conservatism, loss averse, and risk perception may also some impact on investment decision making. Moreover, this study only focused on the opinions of investors and gauged it regardless of gender, age, experience, or education. The effect of these demographics can be gauged to see the impact. It would be beneficial to estimate the ideas and opinions of females and males separately. Furthermore, the sample size can be improvised. It is recommended to incorporate the investors all over Pakistan to see if the results or find remain the same or not. Not only this, but the comparison could also be made between Pakistani investors and investors from developed countries. This will help to improve the decisions about investment locally and making the decisions rationally.

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