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Effect of behavioural factors on the investment risk profile of investment schemes members in Nairobi County.

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EFFECT OF BEHAVIOURAL FACTORS ON THE INVESTMENT RISK PROFILE OF INVESTMENT SCHEMES MEMBERS IN NAIROBI COUNTY

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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Approval

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ABSTRACT

Studies conducted in behavioral finance science provide diverging and inconclusive results with respect to how behavioral biases blur investment decision making. Additionally, behavioral science studies have provided differing results compared to arguments of traditional finance theories, which suggest that investors are rational and make investment decisions after keen analysis of all available information. Behavioral finance suggests that investment decisions are greatly affected by irrational, emotional and psychological factors. It is against this background that the current study was premised to examine the effect of psychological biases and heuristics on the investment risk profile of members of investment schemes in Kenya. The study sought to respond to the following objectives: to assess the effect of heuristics on the investment risk profile of investment group (chama) members in Nairobi County and to examine the effect of psychological biases on the investment risk profile of investment group (chama) members in Nairobi County. The study was guided by behavioral finance theory and employed an explanatory research design. The study targeted all the 121 registered Chamas in Nairobi (Kenya Association of Investment Groups (KAIG) database). The study targeted three employees drawn from each of the chamas. The data analysis phase applied both descriptive and ordinal regression analysis. The survey was able to obtain an 81% response rate with only 19% of the considered sample respondents not able to present their questionnaires within the provided timeframe. Findings pointed out that most of the groups 48% had 11-30 members, 29% had 31-60 members with 18% having less than 10 members. The correlation results revealed that there was a weak positive and significant association between psychological biases, demographic factors and the investment risk profile of investment groups in Nairobi County. The correlation tests also revealed a strong positive and significant association between heuristic biases and the investment risk profile of investment groups in Nairobi County. Based on the study's first objective, the study concluded that psychological biases and heuristic biases have a positive and significant effect on investment risk profile of investment groups in Nairobi County. Finally, the study concluded that demographic factors had an insignificant control effect on the investment risk profile of investment groups. The study recommended for oversight and supervision of investment groups to ensure that they comply with relevant laws and regulations. This can help to protect investors and promote a fair and transparent investment environment. Further individual groups should also establish a rigorous investment appraisal process that incorporates multiple perspectives and considers all relevant factors. The study also recommends that Chamas adopt a diversified investment strategy across different asset classes and industries to mitigate the risk of loss associated with concentration risk. This can help to minimize the impact of any single investment's performance on their overall portfolio.

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DEDICATION

I dedicate this Dissertation to God Almighty, my pillar and source of inspiration, wisdom, knowledge and understanding. To Him I give all praise and glory. This work is also dedicated to my husband, Jacob, who has tirelessly stood by me and offered all the support I needed as I pursued my MBA program. To my children Leann, Israel and Bella who have been affected in every way possible by this quest, thank you. My love for you all can never be quantified. God bless you.

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ABBREVIATIONS AND ACRONYMS

CBK	Central Bank of Kenya
CMA	Capital Markets Authority
DTM	Deposit Taking Microfinance
EVA	Economic Value Added
GoK	Government of Kenya
MFI	Microfinance Institutions
NPV	Net Present Value
ROA	Return on Assets
SACCO	Savings And Credit Cooperative Organizations

DEFINITION OF TERMS

Heuristic factors: Mental shortcuts that permit people to make judgments quickly and efficiently, (Tversky and Kahneman, 1974). Heuristic biases include anchoring and adjustment, representativeness, and availability.

Psychological biases: Subjective behavioral attributes that lead to unexpected decision biases. It refers to a predisposition to views that inhibits objective thinking, (Osmond *et al.,* 2013). Examples of psychological biases include confirmation bias, information bias, status quo bias, and oversimplification bias.

Investment risk profile: Individual preferences in making investment decisions in both long-term and short-term decisions, (Jagullice, 2013). Investment risk profile is guided by factors such as risk-seeking behavior, risk-avoidance behavior, and risk-neutral behavior.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Muia et al., (2018) notes that today, the force of globalization, rapid advancement in information and communication technology, and increased competition, has necessitated a paradigm shift within the investment world. Information technologies are shaping investor's perceptions of what to invest in and as such, investment managers are looking into the factors that affect investment decisions (Aduda, Oduor, & Onwonga, 2017). Farooq and Sajid (2015) affirm that the study of investment decisions lies within behavioral finance which uses psychology in understanding how investors determine the intrinsic value of their investments. The behavioral finance theories posit that investors use their psychological knowledge when making investment decisions as opposed to logic and critical analysis of available data (Karmacharya, Chapagain, Dhungana, & Singh, 2022; Onyuma, 2020; Pokharel, 2020).

The last decade has seen increased recognition of investment schemes as economic development tools. This recognition has grown with the dramatic transformation of the securities market where more people are investing in stocks, an activity which was once the province of a privileged elite (Onyuma, 2020). These schemes are based on a traditional European model that was founded in Texas in 1898. Muia et al., (2018) explains that the concept has become popular in Africa which is characterized by a culture of resource pooling. Investment groups permeate the continent and have different compositions and names. In South Africa, they are known as *stokvel*, *tontine* in several French-speaking countries, *susu* in Ghana and *Chama* in Kenya. While there are no definitive statistics available on participation in savings groups, Gash, et al. (2017) and the SEEP

Network (2018) estimate that a third of the sub-Saharan Africa population participates in informal savings groups.

Group membership in Kenya increased significantly with the transformations in Kenya's financial sector between 2003 and 2018, as well as the clustering of microenterprises in urban centers, social networks and the recognition that these groups are viable vehicles for poverty alleviation, and empowerment of women and the youth (Oino, Auya, & Luvega, 2018). Investment groups have grown in sophistication and scope and transformed their operations to focus on offering savings, credit and investment services as formal financial institutions adopt similar models (Onyuma, 2020). Kinyanjui (2014) adds that Chamas in Nairobi are composed of individuals from different backgrounds, professions, income and gender. The prevalence of investment groups has prompted research examining the factors influencing investment decisions.

In the United States, for instance, Hibbert, Lawrence and Prakash (2018) were of the opinion that while past experience has a significant influence, women are generally more risk averse than men and will avoid uncertain markets. In China, Lan, Xiong, He and Ma (2018) demonstrated a strong correlation between demographic varibales and individual investment decision behaviors, with experience and income being key predictors of investment decision. In Nepal, Karmacharya, Chapagain, Dhungana and Singh (2022) revealed a significant influence of market information and individual sentiments on decisions to invest in the stock market. Overconfidence had negative effects while anchoring positively influences investment decisions.

On the other hand, according to Nigeria's Ogunlusi and Obademi (2021), highly heuristic individuals are less likely to invest in Nigerian stocks. Muia et al. (2018) concluded that the contemporary group investor pays little attention to well analyzed and processed financial information but is highly influenced by other people in similar positions, adding that psychological

factors such as confidence, representativeness, availability bias, and gamblers fallacy all influence investment decisions. However, according to Alquraan et al. (2016), heuristics such as herding have no influence on investment decisions in the Saudi market. Similarly, Pokharel (2020) also found no link between heuristics, herding and prospect (loss aversion, regret aversion, and mental accounting) and investment performance. This begs the question, which behavioral characteristics actually influence the peoples' investment decisions? And do they vary at different life stages?

The Financial Sector Deepening report (2018) confirms that the country has more than 300,000 *chamas* which hold up to KES 300 billion (US$3.4) billion in assets, with 41 percent of Kenyans having used *chama* services (FSD, 2018). *Chamas* propose value to their members through the purchase of assets, exchange of business ideas and funds mobilization (Kirui & Onyuma, 2019). However, while chamas manage members' money, there are no formal regulations directing chama registration and activities meaning that each *chama* has its own checks and balances (Kirui & Onyuma, 2019). Cytonn (2023) reports that lack of formal rules leaves investment decisions in the hands of members who mostly lack the requisite financial knowledge and can make incorrect financial decisions, resulting in disgruntled members or closure of the groups. The report affirms that most chamas collapse within two years of existence due to lack of a clear investment objectives, poor investment decisions and lack of commitment (Cytonn, 2023).

Chama members, just like other investors need to make logical investment decisions. Nonetheless, most chama members are faced with the challenge of interpreting financial data and the dynamics involved in assessing risk and return (Muia et al., 2018). As such, the majority of them are pushed to rely on consultancy services offered by investment companies and brokers who provide financial analysis tools that members may not necessarily find pertinent to their investment decisions (Mwangi, 2011). To increase their productivity, it is important to understand the

psychological factors that influence investment decisions (Berrou & Combarnous, 2017). This background informed the basis of the current study.

1.1.1 Psychological Biases

Behavioral factors or determinants refer to the psychological characteristics that inform decision-making process. Osmond *et al.,* (2013) perceives individual behavioral determinants in terms of psychological biases that investors consider in the process of making investment-related decisions.

Literature further indicates that with regards to investment, rational thinking can generate irrational decisions in light of misunderstood and misperceived context of information. Additionally, scholars and researchers relate behavioral biases to misrepresentation of information (Jagullice, 2013; Onyango, 2018; Kinyanjui, 2012). They maintain that biases cause people to discount information or generate too strong an attachment to an idea. Overall, literature suggests that behavioral biases cause an inability to recognize an opportunity. The scholars further note that individual behavioral factors are composed of both cognitive and emotional factors. Some of the emotional factors the scholars note include mental accounting, loss and regret, endowment, and herding behavior (Asingwa, 2013). On the other hand, they indicate cognitive factors include gamblers fallacy, hindsight, and overconfidence. Over time, literature uses individual behavioral factors to explain irrational investment behaviors (Athur, 2014).

Previous studies have noted several fundamental psychological biases, namely, confirmation bias, information bias, risk aversion, status quo bias, and oversimplification bias. Confirmation bias refers to the tendency of investors valuing confirmatory evidence and disregarding or mistrusting evidence that do not confirm to their expectations (Athur, 2014). Information bias refers to the tendency to consider or evaluate information even when it is not useful in evaluating the question at hand. Loss aversion is the tendency of investors strongly prefer avoiding losses than obtaining

gains. Oversimplification bias refers to investors seeking clear and simple explanations when confronted with complex queries (Jagongo & Mutswenje, 2014). Status quo bias refers to a subject preference to specific investment choices. Status quo makes investors have default options for specific choices.

Literature on psychology science has expanded over the past decade as scholars and researcher make efforts to understand the extent to which behavioral biases impact investment decision making. Existing literature on human psychology and behavior draws our attention to the proposition that investors are subject to significant limitations in their cognitive processes. It suggests that people tend to develop behavioral biases that influence decision making significantly. Azouzi and Jarboui (2012) posits that individual reasons are cognitive shortcuts that influence the position, making non-optimal and irrational terms of traditional financial theories. It is against this background that the current study sought to investigate the role psychological bias plays in investment decision making.

A study conducted by Islamoglu, Apan, & Ayvali (2015) demonstrated that, in most situations, behavioral finance can explain more accurately than financial finance paradigm the behavior of investors. Nonetheless, available literature does not satisfactorily respond to several questions raised in this field of study (Jagongo & Mutswenje, 2014). For instance, literature has failed to convincingly respond to this question: when do people become excessively pessimistic and optimistic? How do people construct their portfolios? What consequences does optimistic and pessimistic behavior have on the financial markets? It implies that our understanding of behavioral finance is not adequate. Therefore, the current study intends to contribute to the growing body of knowledge regarding financial behavior (Jagullice, 2013).

1.1.2 Heuristics

Typically, we gather and assess the evidence that guides us in rational decision making. However, we sometimes do not have the time to gather all the needed evidence. Sometimes, we are not in a position to assess all the available evidence. Therefore, in instances where we are pressed for quick decisions, we work with the available information. In such cases, we use reasoning shortcuts, which scholars refer to as inferential heuristics. Literature suggests that heuristics play part in investment decision making.

Researchers Daniel Kahneman and Amos Tversky identified three key heuristics, namely, anchoring and adjustment, representativeness, and availability. Anchoring and adjustment heuristics allows investors to make subjective estimation of numbers by starting at an initial value and making positive or negative adjustments (Islamoglu et al., 2015). Note that different initial values generate different estimates. Representativeness heuristics allows investors to judge the possibility of an object to belong in a general class based on the similarity between the object and numbers in the class (Kinyanjui, 2012). Availability heuristics makes investors weigh the possibility of an event occurring based on how easily the event can be brought to mind.

To date, researchers provide inconclusive evidence regarding the influence of heuristic biases on investment decisions. While part of scholars and researchers argue that heuristics play an important role in helping investors make sense of real-world challenges (Islamoglu et al., 2015; Jagullice, 2013), others maintain that heuristics leads to systematic errors that generate inappropriate outcomes (Kangatharan et al, 2014; Onyango, 2018; Kinyanjui, 2012). Asingwa (2013) notes that the systematic errors caused by cognitive biases are characterized into three namely, anchoring, adjustment and representative heuristic. The scholar further explains that heuristic biases have

been used widely by investors to speed up investment decision making process as compared to rational decision making, which requires detailed analysis of all available information.

1.1.3 Investment Risk Profile

Investor risk profiling is a fundamental component in private wealth management. Theoretically, failure to properly understand knowledge of the investor's goals, liquidity needs, time horizon and risk aversion makes it impossible to build an efficient investment or effectively recommend suitable investment (Islamoglu et al., 2015). Traditional finance uses the concept of modern portfolio theory, capital asset pricing model (CAPM), and classical decision-making to define an investor's risk profile. It is generally observed that investors are inherently risk averse. Investors take additionally risk only if there is a hope of anticipated higher returns sufficient to compensate the risk (Jagullice, 2013).

While current literature has significant studies concerning investment risk profiles in capital and money market, there is deficiency of literature with regards to investment risk profile in the context of Chamas or informal investment schemes (Kangatharan et al, 2014; Onyango, 2018). That notwithstanding, it is undoubtedly imperative to understand the literature on risk-seeking, risk-avoidance, and risk-neutral behavior of investors in the context of the Chamas in Kenya. Therefore, the current study sought to contribute to the growing body of knowledge in an effort to make researchers, scholars, and practitioners in the investment sector understand investment from the perspective of Chama members.

According to Athur (2014), individuals or institutions invest in anticipation for profits or returns for the risk of putting their money in a certain project. Thus, scholars define investment as an increase in capital stock that includes material used in the production process for valuable products

that can be purchased by customers (Mwangi, 2011). Investment occurs when money is used to purchase a commodity of value in anticipation for better returns in a future date (Kadariya, 2015).

The majority of studies investigating the relationship between behavioral biases and investment risk profile have focused on the stock market. For instance, Nofsingera & Varmab (2013) explains that stock markets have witnessed varying degrees of behavioral biases on their stock markets. Other studies on numerous stock exchange markets in the United States of America indicate that the stock markets have not depicted deposition effect over the years because stock prices unpredictably rise and fall (Islamoglu et al., 2015; Jagullice, 2013). Nonetheless, Jagullice (2013) observed that strong behavioral impact has been witnessed on investor stock repurchase decisions at the New York stock exchange. However, Nofsingera & Varmab (2013) explains that it has become challenging to measure the behavioral disposition effect.

1.1.4 Investment Groups (Chamas) in Kenya

Chama is an informal name in Kenya referring to an informal cooperative society used in pooling of resources either for personal engagement or making investment savings. According to the Capital Markets Authority (2012), Chamas have become financial machines that have initiated many projects ranging from simple to multi-million-shilling projects. Some Chamas have morphed into savings and credit cooperative organizations (SACCOs) and grown to control multi-billion savings and investments (Oino et al., 2014).

In Kenya, Chamas were originally perceived as an all-women institution and were designed to be rotating savings and credit associations. However, over the years, Chamas have grown in composition and sophistication to encompass men and it is a phenomenon that cuts across social status, gender, and age (Kibue, 2013). Chama could meet occasionally to contribute a fixed amount of money and the total amount was given to an individual to spend as he/she preferred (Muia et

al., 2018). Over the years, Chamas have evolved to more than mere rotating savings and credit associations. Today, Chamas are investment groups where members pool financial resources fundamentally to create wealth (Mwangi, 2011).

1.2 Statement of the Problem

While traditional theories of finance argue that investors act rationally, emerging literature on investor behavior argue that investors are influenced by more than financial data. In fact, there is a growing body of literature that supports a significant association between emotions and heuristic-driven biases which cloud investor's judgement and investment decisions, meaning that more often than not, investors will behave irrationally (Kimeu, et al, 2018). Hibbert, et al,. (2018) opine that investors can be influenced by others, can have an extreme reaction to market price changes or be influenced by overconfidence. Moreover, an individual's age and gender have significant impacts on their appetite and tolerance for risk (Baruah & Parikh, 2018). These factors become compounded in groups where Parveen and Siddiqui (2017) opine that groups with a high number of members with a background in finance are more profitable. However, according to Kirui and Onyuma (2019) such groups can suffer from overconfidence bias and make wrong investment decisions. Bad investment decisions pronounce the dissolution of most investment groups.

Existing literature does not satisfactorily respond to several questions raised in this field of study (Jagongo & Mutswenje, 2014; Kengatharan, 2014). Evidence from Pakistan points to the influence of heuristics (representativeness, over confidence and gambler's fallacy) on the investment performance (Aziz & Khan, 2016), while according to Hunjra, Qureshi and Riaz (2016), the propensity of the risk, the framing of problem, asymmetry of information and perception of risk are the main determinants of investment decision-making. On the other hand, while Indian women and people working in agricultural sector may have the least exposure to equity investments, the

investment's rate of return, its safety and capital appreciation are the main determinants (Swamynathan, 2017).

Regionally, South Africa's Dickason and Ferreira (2018) indicated that personality factors have significant effects on investment decisions with mental accounting and loss aversion being the characteristics of investors with low-risk tolerance. In Uganda, Kinatta, et al., (2021) researched on the effect of cognitive and intuitive attributes and observed a significant association between framing variation, cognitive heuristics and mental accounting and the quality of investment decisions; mental accounting and herding behavior had negative effects. However, according to Njeru and Matanda (2023), herding, representativeness and anchoring have positive effect on investment decisions while overconfidence negatively affects the investment decisions of retail investors. Furthermore, Naomi, Kiprop and Tanui (2018) observe that herding does not significantly influence the investment decisions farmers in Kenya.

Chama's are collective investment schemes whereby each member claims the right to choose the group's investment (Icharia, 2014). However, evidence shows that investors behave in irrational ways and often don't rely on official financial data to guide their decision-making. Given the chama concept is gaining popularity and being included in official finance instruments, a better understanding of members' investment decisions, especially when presented with minimal financial data is crucial for gaining insights into the factors that influence investment decisions and how these in turn affect group investment outcomes. This information can provide important information that can help direct future investors. This study seeks to examine these factors through analysis of the behavioral factors that influence investment risk profile of investment group members in Kenya.

1.3 Objectives of the Study

1.3.1 General Objectives

The general objective of the current study is to investigate the behavioral related determinants affecting investment risk profile of members of investment groups (Chamas) in Nairobi County.

1.3.2 Specific Objectives

i. To assess the investment risk profile of investment groups (chamas) members in Nairobi County.
ii. To assess the effect of heuristics on the investment risk profile of investment groups (chamas) members in Nairobi County.
iii. To examine the effect of psychological biases on the investment risk profile of investment groups (chamas) members in Nairobi County.

1.4 Research Questions

i. What is the investment risk profile of investment group (chama) members in Nairobi County?
ii. Does heuristics affect the investment risk profile of investment group (chama) members in Nairobi County?
iii. How do psychological biases affect the investment risk profile of investment group (chama) members in Nairobi County?

1.5 Scope of the Study

The current study focused on examining behavioral related determinants affecting investment decisions/behavior of members of Chamas in Nairobi Kenya. The study targeted all the 121 registered Chamas (Kenya Association of Investment Groups (KAIG) database) in Nairobi. Three

respondents were randomly sampled from each Chama. Therefore, the target population was composed of 363 respondents. The research utilized quantitative data collected using structured questionnaires which was developed in line with the objectives of the survey.

1.6 Significance of the Study

1.6.1 To Policy makers

When formulating policies, decision-makers will be able to create better ones that mitigate the detrimental consequences of the behavioral components revealed in this study. As a result, the measures they propose would boost investment in unofficial investment organizations, leading to expansion of the economy as a whole. The research results will also present more empirical evidence on how behavioral related determinants can be utilized across other industries to improve the risk position.

1.6.2 To Chama members and management

Despite the fact that their characteristics and those of their investment groups are significantly different, studies have for a long-time overlooked Chama members in Kenya. The knowledge gathered from this study was important to them. The study will also highlight the gaps in the current investment risk profiles of chama members, thus providing the management teams with more practical tools to improve their schemes.

1.6.3 To Academia

By enhancing the body of knowledge already available on how behavioral variables influence individual investing decisions, this research will add to the body of knowledge in the field of finance. The investigation of the connection between investment decisions and cultural, demographic, social, and behavioral characteristics will also contribute to the discipline of

financial economics. The analysis will reveal any research gaps and, as a result, open new directions for future investigation. This study will act as a springboard for academics and researchers who wish to undertake future studies in the field of behavioral finance since it indicates the areas that require additional exploration.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed literature related to behavioral science with respect to investment decision making. The chapter starts with interrogating the behavioral factors that are likely to affect the decision-making process of investors in informal investment groups. Thereafter, the chapter discussed the theoretical foundation, conceptual framework, empirical review, and research gaps.

2.2 Theoretical Review

This section discusses theories relevant to the study. The goal of the theoretical review is to identify key theories, understand their underlying assumptions and key concepts, and examine how they have been applied in the current and previous research. The review also helps to provide a theoretical framework for the researcher's own study and to identify gaps in the existing literature that the researcher's study can address. (Mweu and Omwenga, 2017).

2.2.1 Behavioral Finance Theory

The current study was anchored on behavioral finance theory. Behavioral finance originated from the work of psychologists Amos Tversky and Kahneman Daniel and economist Robert Shriller in the 1970s and 1980s. In 1985, De Bondt and Thaler published the first proposition of the theory. Behavioral finance theory proposes that financial decisions are not guided by strict rational thinking. The proponents argue that financial decisions are always guided by deep-seeded, pervasive, subconscious biases and heuristics. The De Bondt and Thaler (1985) propositions triggered a chain of empirical studies. Study results started unveiling weaknesses of the efficient market hypothesis (EMH), which proposed that stock markets move in a rational and predictable way. Since then, finance studies on behavioral science suggest EMH does not hold up under

scrutiny. The studies suggest that markets are full of inefficiencies occasioned by investors' irrational thinking about risk and prices.

Nonetheless, behavioral finance theory has come under scrutiny over the recent past and criticisms are emerging. The theory is criticized on the basis that it lacks originality (Ogunba & Oloyede, 2014). Critics observe that behavioral finance theory is simply a critique of traditional finance theory. They further argue that the proponents do a good job disproving the traditional finance theory, but they fail to provide alternatives. Kadariya (2015) notes that behavioral finance theory lacks new propositions, and it provides nothing that can be tested empirically. However, despite its weaknesses, the theory is still important when seeking to explain how psychology influences decision-making in the case of investors and has been key to explaining the anomalies of traditional finance theory.

The theory has been previously used in examining investment behavior of Chinese security investors (Zhang & Zheng, 2015), investors at the Ammani Stock exchange (Areiqat, Abu-Rumman, Al-Alani, & Alhorani, 2019) and in explaining the financial behavior and growth of women groups in Kenya (Gichuhi & Mwangi, 2021). In these studies, the theory has been utilized in identifying the psychological biases that influence investors to make either rational or irrational decisions when planning to save, invest, spend, or borrow money. The biases identified by the theory include mental accounting errors, loss aversion, and herd behavior (Kinatta, et al., 2021). This theory will enable the research to better understand psychological biases and how they influence biased decisions as this can help in the design of programs that can be used to train group members on how to avoid the common biases that influence poor investment decisions.

2.2.2 Moral Hazard Theory

The idea of moral hazard was observed by Adam Smith, the father of modern economics, in 1759. The idea was theorized and developed by J.M. Keynes and F. A. Hayek in the 1900s. The moral hazard theory is an economic concept that refers to the situation where one party can take risks because it does not have to bear the full consequences of those risks. This occurs when one party (such as a financial institution) can transfer some or all the risk to another party (such as a government or taxpayers). Economists such as Kenneth Arrow and Jean Tirole, further formalized the concept and introduced it in the economic field. They showed how moral hazard could be a problem in situations where one party has more information about a situation than another party and how this information asymmetry could lead to suboptimal outcomes.

One of the most well-known examples of moral hazard is the financial industry, where banks and other financial institutions can take on more risk than they would otherwise because they know that if things go wrong, they will be bailed out by the government. This creates an environment where banks can engage in risky behavior without worrying about the potential consequences, because they know that if their risky bets do not pay off, someone else will bear the cost. This can also apply in the field of investment schemes since several people invest in a common goal and someone else can bear the cost in case of consequences of taking risks.

This theory has however been criticized by several authors including Akbar, (2016) who noted that the theory assumes rational actors, but in reality, people's behavior is often irrational and driven by emotions or biases, which can lead to outcomes that deviate from the predictions of the moral hazard theory. According to Weber (2017), The theory further assumes that individuals and organizations are fully aware of the risks they are taking and the potential consequences, but in reality, this may not always be the case.

The theory of moral hazard helps to explain why certain types of intervention or regulation may lead to more risky behavior by the entities being protected. This can be mitigated by having a strict regulatory environment that holds individuals accountable for their risky behavior and incentivize them to be more cautious. This theory was important to the study to explain the different investment risk profiles of chama members and why some chama members are riskier than others.

2.3.3 Heuristic Theory

Heuristics refer to the rule of thumbs which people often use subconsciously in decision-making. They are those mental shortcuts learned through different experiences that inform current decisions and inform how investors make choices and solve emerging challenges when they have incomplete information. These choices are also important when time and information are both constrained. The theory was postulated by Tversky and Kahneman (1974) who identified three heuristics which most individual investors utilize when making important decisions. These were anchoring, availability and representativeness. Waweru et al. (2008) advanced the theory recently and included overconfidence and gambler's fallacy as the other heuristics that influence decision-making. However, while these heuristics influence decision-making, they can be sources of bias when circumstances change, and the decision maker has no idea. Samsuria, Ismiyantib and Narsa (2019) affirm that heuristics are some of the main sources of sub-optimal investment decisions such as selling off profitable assets or holding on to loss-making investments.

Overconfidence is a heuristic that arises when an investor is too confident about their knowledge, skill and competencies and makes overzealous investments (Jain, Walia, & Gupta, 2020). According to the researchers, overconfident investors tend to believe more in their information than others and will seek to influence others with their beliefs. Representativeness is a rule of thumb that relies on familiarity when making financial decisions (Busenitz & Barney, 1994).

Representativeness assumes that when faced with minimal information, decisions are made solely on experience which may make the investor overreact, purchase hotly contested deals or avoid stocks with lower performance in the recent past (Mushinada, 2020). Anchoring, on the other hand, refers to the inclination towards particular chunks of information when making investment decisions, meaning that investors with this kind of bias will judge an investment based on some information which they use as a point of reference (Shukla & and Katiyar, 2020). The last bias is the availability bias which entails the reliance on easily available information when making investment decisions, as opposed to complete analysis of available alternatives. This theory asserts that these biases push investors to make irrational investment decisions due to limited time/availability of information.

While this theory asserts that biases are the reasons for irrational decision-making, it fails to account for situations where the investor is not limited by the identified biases. However, this theory was appropriate in this study as it sought to understand how investors with limited financial knowledge, skills and information make investment decisions. Evidence from Mushinada (2020) pointed to significant influences of human experience and intuition on investment decision making while according to Shukla et al. (2020), available information, historical performances, expectations and past experiences influence investors' decisions. This theory will anchor the Heuristics variable in the study.

2.3 Empirical Review of Literature

Behavioral finance has drawn interest of several researchers both globally and locally, from which interesting insights have been established concerning individual behavioral factors and decision making as discussed in this section (Kamau, Kamau, & Muhia, 2015).

2.3.1 Psychological Biases and Investment risk profile

Kangatharan et al, (2014) studied how performance and investment decisions affects behavioral factors, for Colombo Stock Exchange with the study using a sample of 128 investors. The investigation employed a cross-sectional design to establish a trend of stock market investors. The study used questionnaires administered to investors to collect data. The data was analyzed, and a conclusion was arrived at, that investment decisions were made because of herding heuristics, and prospect and market factors. While the Kangatharan et al, (2014) investigated behavioral factors affecting investment decisions, the cross-sectional research design used failed to provide an ideal framework for generalization and its variables were too broad and wide. It is for this reason that the current study sought to examine two variables, namely heuristics and psychological bias, and their relationship to investor risk profile.

Elsewhere, Antony (2017) studied the effect of psychological factors on real estate development in Nairobi. Descriptive statistic method was used in the research, with a sample of 40 institutional real-estateinvestors. The investigation concluded that psychological factors such as too much confidence, frame dependence, representativeness, mental accounting, and herd behavior are major contributors in making investment decisions. Onyango (2018) used a sample of 40 Nairobi real estate investors to investigate how real-estate performance is affected by behavioral factors. The investigation adopted a correlational research design and data was collected using survey questionnaires. The findings showed a high correlation between behavioral factors and growth of real-estate; and that 73.3% of real-estate performance is predicted by behavioral factors. The studies conducted by Antony (2017) and Onyango (2018) investigated the real estate industry. The current study sought to expound on the findings within the real estate sector to the informal groups investments in Kenya.

In another study, Chami (2017) looked at how factors of behavior affect choices of investment among Nairobi's retail investors. The study concentrated on determining the behavioral factors and linked the identified behavioral factors to investment decisions. The study adopted a causal research design. 86 responses were received out of a sample of 98 respondents. The results revealed that education played a key role in choosing investments. The study established that market fundamentals largely helped investors to make investment decisions. The findings provided by Chami (2017) needs to be reviewed in the context of informal investment groups. It is for this reason that the current study examined how these findings reflect on the Kenyan informal investment groups.

Researchers Annamalah, et al. (2019) conducted an experimental study to evaluate the factors that influence Malaysian investors' choice of unit trusts. 250 individual investors participated in the study, which used descriptive statistics to examine four factors: risk-taking tendencies, investment gains, knowledge, and financial situation. The study's conclusions showed that information accessibility, followed by risk-taking and financial situation, had the most impact on an investor's behavior. They also concluded that there was no statistical relationship between investor investment behavior and investment return and revenue. These findings will be extended to group members in small scale unregistered groups.

2.3.2 Heuristics and Investment risk profile

Iroham, Ogunba and Oloyede, (2014) studied how principal heuristics influences accuracy of property valuation in Nigeria. Descriptive design study was employed to carry out the study in which the researcher administered cross-sectional questionnaires to 159 Estates Surveying and Valuation firms in Lagos, Metropolis. The study also administered other questionnaires in Abuja and Port Harcourt, which were 29 and 30 questionnaires respectively. The T-test of 95%

confidence value was used to ensure the accuracy and reliability of the values of the study. The study concluded that heuristic behaviors though representative, are not accurate as compared to current market information. The Iroham et al., (2019) study focused on the real estate industry and there is, therefore, a need to assess whether these findings apply to other industries. The current study sought to fill this research gap by assessing the Kenyan informal group investments.

Similarly, Lowie, Hall and Cloete (2016) investigated the relationship between heuristic bias and decisions in property investment in the investment sector in South Africa. The study employed survey-based design and the target population was all the listed property fund managers in Johannesburg securities exchange. Results suggested existence of modification and anchoring bias in decision making. Results further indicated that fund managers failed to react to new information due to social-political environment in South Africa. The investment environment in South Africa and Kenya are not similar. Therefore, the findings of Lowie et al. (2016) may not be applicable in the Kenyan context. Thus, there is a need of conducting a similar study in Kenya.

Additionally, Glaser and Weber (2013) carried out an empirical evaluation of Overconfidence and Trading decisions. By linking individual overconfidence scores with various metrics of individual investors' trading volume, they directly evaluated this idea (number of trades, turnover). About 3000 online broker investors were requested to participate in the study by responding to an online survey that was made to gauge different aspects of overconfidence. The measurements of trading volume were produced using the transactions of the 215 individual investors that answered to the survey. The study discovered that those individuals who believed their performance or investment talents were above average frequently traded at substantially bigger volumes. They said that the "differences of opinion" explanation of high levels of trade volume is psychologically supported by the findings, which they presented. Additionally, their approach to empirically testing

behavioral finance models, which involves correlating economic and psychological variables and combining field data with psychometric measures of bias in judgment, such as overconfidence scores, appears to be a promising way to learn more about the psychological processes that influence economic behavior.

2.3.3 Demographics and Investment Risk Profile

Riessen and Ruenzi (2017) sought to find out the effect of gender diversity in a management team on investments risk profile. When examining mutual funds in the United States of America, the study found that gender diversity in the leadership team had a detrimental effect on the risk profile of investments. The study also found that management teams with a male prevalence saw more portfolio return variability and less consistency. The study also showed that male-dominated management teams had higher overconfidence in their trading strategy than female-dominated management teams, trading stock up to 45% more than female-dominated management teams. Male-dominated management teams executed more deals because they were overconfident, but these trades had poorer returns after transaction costs were considered. This study focused on mutual funds in the United States while the current study focused on Chamas in Kenya.

However, Atkinson, Baird, and Frye (2013) in their study of the impact of gender composition on investment portfolio performance of mutual funds. When comparing mutual funds that primarily consist of fixed-income assets, the study indicated that the gender mix of the management team wasn't a major indicator of investment portfolio performance. The study also showed that there is no appreciable difference between the returns produced by management teams with a male prominence and those with a female predominance in mutual funds. The study was focused on investment portfolio performance of mutual funds while the current study examined the investment risk profiles.

In another research, Gebeyehu (2012) investigated the main behavioral causes of the informal groups' loan default issue in Ethiopia. The study examined the behavioral factors that influence borrowers' loan repayment status. The findings of the estimation using the two-bit model showed that other sources of income, education, and investing experience were the factors that impacted the loan performance of the projects. Education and investment experience were determined to have a negative effect on the group's risk profile. The study determined that more educated and experienced investors may be more comfortable with risk, as they have a better understanding of how different types of investments work and how markets can fluctuate. In contrast, less educated and experienced investors may be more cautious and prefer more conservative investments. This study investigated default while the current study explored investment decisions.

Ojiako, Idowu, and Ogbukwa (2014), on the other hand, used data from a few chosen cooperative members in the Yewa region of Ogun State, Nigeria, to analyze the investment performances of smallholder enterprises as well as their determinants. The identification of 110 respondents for whom data was gathered using a structured questionnaire was done utilizing a multistage random sampling procedure. The study revealed that only 74.0% of all investments had a positive performance and a negative association was found between age and investment performance, concluding that younger investors had better investment performance rates. The study further determined that younger investors, who have a longer time horizon until retirement, may be more willing to take on more risk in exchange for the potential for higher returns. Conversely, older investors, who are closer to retirement and may have less time to recover from market downturns, may be more risk-averse and prefer more conservative investments.

Finally, Kerga and Asefa (2018) conducted a study on the moderating effect of income on an investor's risk profile in Kenya. The study revealed a significant relationship between income and

an investors risk profile. The study found out that investors with higher incomes may be more willing to take on more risk because they have more resources to fall back on if their investments lose value. However, lower-income investors may be more risk-averse, as they may not be able to afford to lose money on investments. This study included psychological biases and heuristics in analysis to expound these findings.

2.4 Summary of Literature and Research Gaps

Behavioral factors involve the conduct of financial practitioners being influenced by psychology (Kinyanjui, 2012). The literature review gives us insights on behavioral biases and information processing errors that influence individual investors' decisions. The literature review has discussed biases such as representativeness, belief perseverance, anchoring bias, overconfidence, and herd behavior. Furthermore, it has discussed notions of the theory of prospect, aversion of regret, mental accounting, and aversion of loss. From the literature review, it can be concluded that emotions and cognitive biases influence decision making in investments. As argued by Glaeser (2013), "Buyers do not seem rational, but thoughtfully partial investors working with simple heuristic simulations instead of an all-inclusive overall equilibrium outline." The study of the empirical literature shows how extensively research has been done on investor risk profiles and how they connect to behaviorally related causes. However, the study outlines the numerous research gaps that arose from the varied study setting and methodology used in the table below.

Table 2.1 Summary of research gaps

Author & Year	Focus of the study	Findings	Research gaps	How the gap will be filled
Kangatharan al et (2014)	Investigated how performance and investment decisions affects behavioral	Investment decisions were made as a result of herding heuristics, and prospect and market factors	The variables in the employed cross-sectional study methodology were too broad and varied	These findings were extended to the Kenyan investment market and adopted a descriptive study

	factors, for Colombo Stock Exchange		to offer an optimal foundation for generalization.	
Antony (2017)	The effect of psychological factors on real estate development in Nairobi.	The results showed a high correlation between behavioral factors and growth of real-estate	The research findings focused on real estate sector. Thus, the findings may not be applicable to informal investment groups in Kenya	These findings were centered to investment groups which have a unique set of investors with limited financial knowledge
Obong'o, Nyakundi and Vitali (2016)	Investigated how behavioral factors influence performance of the real estate sector in Kisii.	Results of the study showed that behavioral factors are positively correlated to the ability of real estate entities to perform.	Failed to convincingly respond to these questions: when do people become excessively pessimistic and optimistic	This study added demographic factors to make these findings clearer.
Annamalah, et al. (2019)	Studied the following four factors' influencing Malaysian investors' choice of unit trusts - risk-taking tendencies, investment gains, knowledge, and financial situation.	Findings indicated that information accessibility, followed by risk-taking and financial situation, had the most impact on an investor's behavior. In addition, there was no statistical relationship between investor investment behavior and investment return and revenue.	There is need to assess these findings against the context of Kenyan Informal investment groups.	This gap was filled through an analysis of Kenyan investor's investment profiles
Iroham, Ogunba and Oloyede (2014)	Studied how principal heuristics influences accuracy of property valuation in Nigeria.	The study concluded that heuristic behaviors though representative, are not accurate as compared to current market information.	The Iroham et al., (2019) study focused on the real estate industry and there is therefore a need to assess whether these findings apply to the Kenyan informal group investments.	This study focused on investment groups to fill this gap
Lowie, Hall and Cloete (2016)	Studied the relationship between heuristic bias and property investment decisions in the investment sector in	The findings indicated existence of anchoring and modification bias in decision making. In addition, fund managers did not react	As the investment environment in South Africa and Kenya are not similar, these findings may not	This study sourced data on Kenyan investors

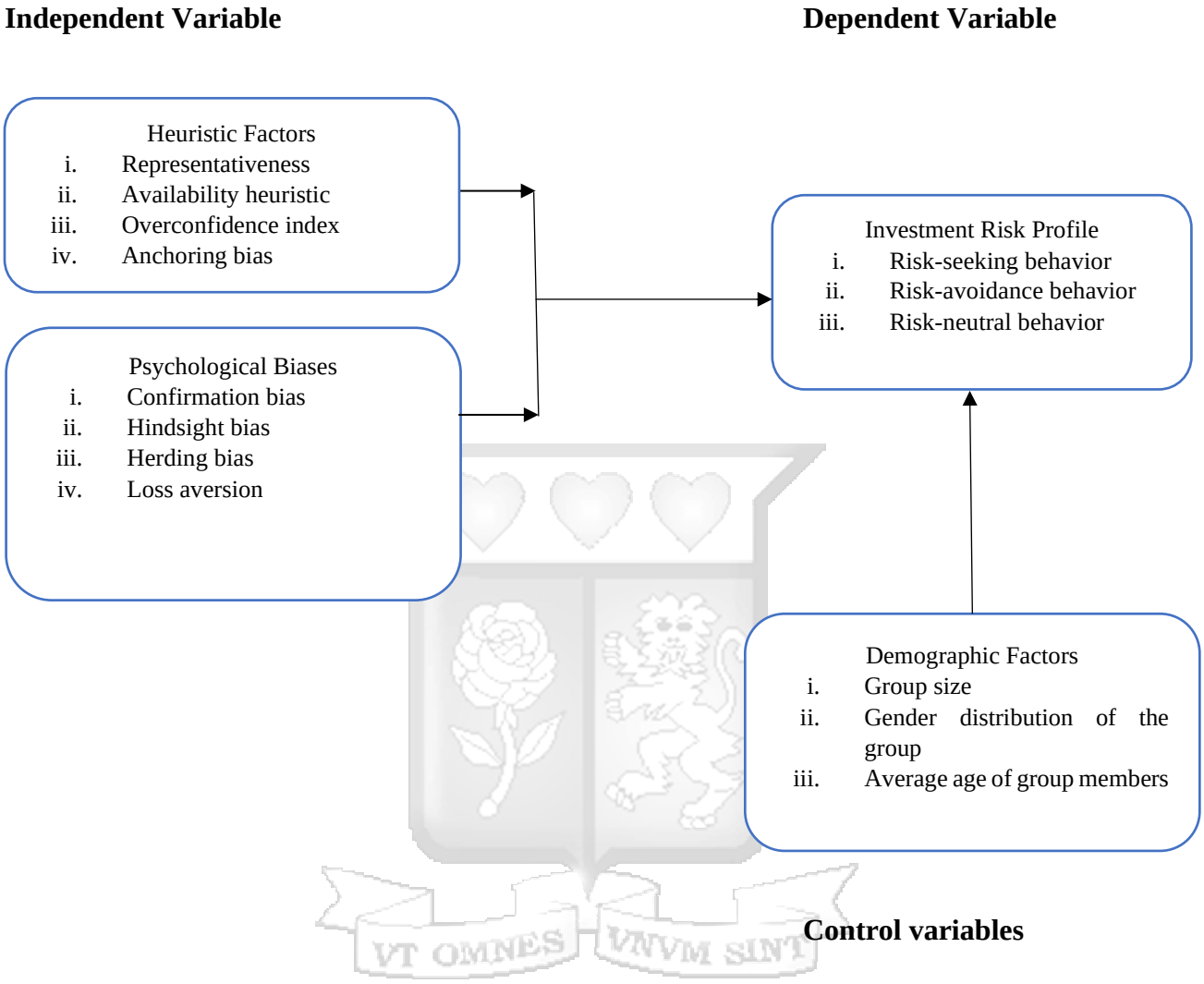
	South Africa	to new information as a result of the socio-political environment in South Africa.	be applicable in Kenya.	
Riessen and Ruenzi (2017)	Studied the effect of gender diversity in a management team on investments risk profile.	Findings revealed that gender diversity in the leadership team had a detrimental effect on the risk profile of investments. Further, management teams with male prevalence exhibited more portfolio return variability and less consistency. Male dominated management teams had higher overconfidence in their trading strategy than female-dominated management teams, trading stock up to 45% more than female-dominated management teams	This study focused on mutual funds in the United States. There will be need to review if these findings apply in the Kenyan context of Chamas.	This study explored more than the investor's gender and expounded to income and age as well as education status
Atkinson, Baird and Frye (2013	Investigated impact of gender composition on investment portfolio performance of mutual funds.	Findings indicated that when comparing mutual funds that primarily consist of fixed-income assets, the gender mix of the management team wasn't a major indicator of investment portfolio performance. In addition, there was no appreciable difference between the returns produced by management teams with a male prominence and those with a female predominance in mutual funds.	The study was focused on investment portfolio performance of mutual funds but did not look into the investment risk profiles.	This study specified the investment risk profile of the chama members
Ojiako, Idowu, and Ogbukwa (2014)	Studied investment performances of smallholder	The study revealed that only 74.0% of all investments had a	The study focused on small holder enterprises in	This study examined the Kenyan informal

	enterprises as well as their determinants	positive performance and a negative association was found between age and investment performance, concluding that younger investors had better investment performance rates. Further younger investors were more willing to take on more risk in exchange for the potential for higher returns.	Nigeria. There is need to see if these findings are applicable in the Kenyan informal schemes' context.	investment market to fill this gap
Kerga and Asefa (2018)	Studied the moderating effect of income on an investor's risk profile in Kenya.	Findings indicated significant relationship between income and an investor's risk profile where investors with higher incomes were more willing to take on more risks as they had more resources to fall back on.	There is need to review how applicable these findings are in the informal context Kenyan informal investment schemes.	This study explored other factors apart from the income of the investor such as gender and age to enhance these findings

2.6 Conceptual Framework

Kothari (2004), highlights that a conceptual framework is a way to organize and present the relationships among variables, concepts, and theories that are relevant to the study. Saunders et al., (2012) further posits that it serves as a guide for the researcher, helping to define the problem, identify the research questions, and outline the methods that were used to collect and analyze data. The conceptual framework below depicts the relationship between the independent variables, the independent variables and the control variable. This study hypothesizes that heuristic and psychological biases together should influence the investment risk profile of group members belonging to investment groups. The framework also contends that factors unique to each group such as the average age of the members, their gender and group size moderate the relationship between the variables under analysis.

Figure 2.1 Conceptual Framework



2.5.1 Operationalization of the Variables

Table 2.2 Operationalization of Research Variables

Variable	Measures	Literature	Research Instrument
Heuristic factors	• Anchoring bias • Representativeness • Availability heuristic • Overconfidence index	Iroham, Ogunba and Oloyede (2014); Iroham et al., (2019); and Lowie, Hall and Cloete (2016).	Ordinal Scale (Likert scale)
Psychological biases	• Confirmation bias • Hindsight bias • Herding bias • Loss aversion	Kangatharan et al, (2014); Antony (2017); Onyango (2018); and Chami, 2017.	Ordinal Scale (Likert scale)
Demographic Factors	• Group size • Gender distribution of the group • Average age of group members	Riessen and Ruenzi (2017); Ojiako, Idowu and Ogbukwa (2014). Kerga and Asefa (2018)	Ordinal Scale (Likert scale)
Investment risk profile	• Risk-seeking behavior • Risk-avoidance behavior • Risk-neutral behavior	Kimeu, C. N. (2016); Muthama, M.K. (2011); Raines, J.P., Leathers, C.G. (2011); Winchester et al. (2011).	Ordinal Scale (Likert scale)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Chapter three looks into the methodology preferred by the researcher to guide the study to responding to the study objectives. Key methodology components discussed include research design and philosophy, target population, sample size and sampling design, data collection, and data analysis and presentation, and logistical and ethical considerations.

3.2 Research Philosophy

According to Kinyanjui (2012) research philosophy refers to a belief regarding the way data about research variables was collected, analyzed, and used. The scholar further notes that traditional science has identified two types of research philosophies, namely, positivist and interpretivist. Positivist perspective observes that reality can be observed and described objectively without interfering with the phenomena under study. Interpretivist philosophy, on the other hand, argues that a phenomenon can only be understood through a subjective interpretation through interventions. In this regard, positivist is the ideal philosophy for the current study because the population was investigated objectively without interference and quantitative approaches were incorporated in the course of the research. This study sought to determine if behavioral related determinants influence the investment risk profile of chamas in Kenya. Thus, adopting a positivism philosophy was key in drawing relationships between the variables and generalize the results to a larger population.

3.3 Research Design

Research design is the plan or strategy for conducting research, including the methods and

procedures that was used to collect and analyze data (Kombo & Tromp, 2006). The research design provides a structure for the study and guides all aspects of the research process. Explanatory research design was adopted for this study. Kombo & Tromp (2006) view explanatory research design as a type of research design that is used to explain or understand the relationships between variables. The goal of explanatory research is to determine the cause of a particular phenomenon and to identify the factors that influence it. Explanatory research design was used to establish cause-and-effect relationships, making it a great approach to understand the underlying mechanisms, factors and causes of a phenomenon under investigation in this study (Kothari, 2004).

3.4 Target Population

A population is the whole list or number of people, animals, items, or events on which the research is done, and the researcher has interest in (Patten & Newhart, 2017). The population is made up of group of similar events, individuals, or items. Research work that has the right population and sample size used, made the research findings believable. The list of all registered investment groups or Chamas was retrieved from the Kenya Association of Investment Groups (KAIG) database. KAIG database indicates that there are a total of 121 registered investment groups in Nairobi County (Appendix II). This study targeted 3 group officials from each of the investment group: chairman, secretary, and treasurer. The participants were selected due to their leadership roles which provides them with necessary information on how various psychological biases and heuristics have impacted the investment risk profile of their groups. The unit of observation was 363 respondents.

3.5 Sample Size and Sampling Frame

Kombo and Tromp (2006) explains that sampling frame is the list of all population units derived

from the sample population. The KAIG database indicates that there are total of 121 registered investment groups in Nairobi County. Therefore, the 121 groups represented the target population for the study. The researcher applied random sampling in selecting the participants for the survey. The sample frame for the survey was363 respondents drawn from Chairpersons, Secretary and Treasurer from each of the investment group. The final sample was determined using the formula below.

$$n = \frac{N}{1 + N\,(e)^{2}}$$

where, n is the sample size, N is the total population, and e is the level of precision.

Thus; $n = \frac{363}{1+363\,(.05\,x\,.05)}$ = 190 respondents

Table 3.1 Sample Distribution

Category	**Sample Apportionment**
Chairman	190/3 = 64
Secretary	190/3 = 63
Treasurer	190/3 = 63
Total Sample Respondents	**190**

3.6 Data Collection Instruments

Primary data that was gathered utilizing questionnaires that are structured. Questionnaires was regarded as suitable since they offer a comparatively easy and straightforward method of doing the research. Since they allow respondents to express many of their perspectives on the study topic, questionnaires are also perceived to be excellent data gathering tools (Cooper & Schindler, 2011). Use of primary data gave the investigator freedom and control on the manner information

collection is done and the freedom to focus on specific behavioral factors in line with needed information on the sampled Chamas. The researcher has a full and precise knowledge and understanding of matters that relate to factors of behavior pertaining to making of decision regarding investments.

3.7 Data Collection Procedures

Following a preliminary set of instructions, the responders were given the whole questionnaire to fill. Participants were asked to provide informed consent and indicate whether they were available and willing to provide more information as needed. To enhance the convenience of the data gathering procedure, the research employed a drop and pick approach. Prior to executing sizable research aimed at enhancing the latter's quality and efficiency, a pilot test which is a trial test intended to assess logistics (reliability and validity of specific outcomes) and gather information, was conducted. 10% of the sample responders were expected to take part in the pilot test (Kumar, 2012).

3.7.1 Reliability of the Research Instruments

Saunders *et al,* (2012) views reliability of data collection instruments as referring to the consistency of the results obtained using a particular instrument over time, or when used by different researchers or in different settings. Reliability is an important characteristic of any data collection instrument, as it helps to ensure that the results obtained from the instrument are accurate and trustworthy. The study adopted the Cronbach alpha in testing for the reliability of the survey instrument. The Cronbach alpha tests were applied to check for reliability according to Kombo and Tromp (2006), is a measure of the consistency of an instrument over time. The findings showed the Cronbach Alpha score were psychological biases ($\alpha = .851$); heuristic biases ($\alpha = .745$) and investment risk profile ($\alpha = .910$) indicating the adaptability of the instrument for the main survey.

3.7.2 Validity of Research Instruments

According to Borg and Gall (2013), Validity of data collection instruments refers to the extent to which the instrument measures what it is intended to measure. Validity is an important characteristic of any data collection instrument, as it helps to ensure that the results obtained from the instrument are meaningful and relevant. The study adopted the content validity to determine validity of the research instruments. Content validity refers to the extent to which an instrument covers all aspects of a construct. It is achieved by evaluating if the items of the instrument represent the domain it wants to measure. (Sekaran, 2010).

3.8 Data Analysis and Presentation

During this stage of the study, charts, graphs, and tables based on previously coded percentages and figures was used as descriptive statistical tools. The evaluation of all questionnaires and interview transcripts was the preliminary step in this procedure. To guarantee accuracy and consistency, the data was amended after it has been sorted. After that, statistical software like Microsoft Excel and the Statistical Package for the Social Sciences (SPSS) was used to examine the quantitative data. The tools were used to calculate variance, frequency count, mean, and other statistics. Finally, the study' findings was presented in tables, charts, and graphs.

Multiple regression analysis and correlation was used in inferential statistics to calculate the degree of relationship between the study variables. The Spearman rank correlation analysis yields the first set of inferential findings, which explain the type and strength of the link between pairs of variables by generating correlation coefficients and their associated significance (p-values). Multiple ordinal regression analysis was used for the second set of inferential statistics to estimate the magnitude of the behaviour related determinants on investment risk profile of chamas in Kenya. The regression equation was as follows.

$$IRP = \beta 0 + \beta 1X1 + \beta 2X2 + \beta \sum controls + \mathcal{E} \ldots\ldots\ldots\ldots (1)$$

Where:

IRP = investment risk profile

X_1 = psychological biases

X_2 = Heuristics

Controls= demographic characteristics of chama members in Nairobi County

β_0 Is the regression constant for the y-intercept

γ Denotes investment risk profile

β_1, β_2, and $\beta_\sum$ Are regression coefficients

ε was the error term.

3.9 Diagnostic Tests

Diagnostic tests refer to a set of procedures that are used to evaluate the assumptions and properties of statistical models. The main purpose of these tests is to detect and diagnose any problems or issues with a model that may affect the validity of the results derived from the model (Cooper & Schindler, 2012). The research conducted collinearity tests, autocorrelation, heteroscedasticity and normality tests.

3.9.1 Multicollinearity Tests

Kumar (2012) characterized multi-collinearity as a statistical phenomenon that occurs when two or more predictor variables in a regression model are highly correlated with each other. This can be problematic because it can make it difficult to determine the unique effect of each predictor variable on the response variable and can also lead to unstable or unreliable parameter estimates.

VIF was the multicollinearity test employed in this study. According to Field (2009), Variance Inflation Factor (VIF) calculates the ratio of the variance of a regression coefficient to the variance of that coefficient in a model with one predictor variable. A VIF value greater than 1 indicates that the predictor variable is correlated with one or more other predictor variables.

3.9.2 Normality Tests

Normality tests are statistical procedures used to determine whether a sample of data is likely to have come from a population that is normally distributed. Normality is an important assumption of many statistical methods, particularly parametric methods, as it allows for the use of certain statistical techniques that rely on the normal distribution (Cooper & Schindler, 2012). The study employed the normality p-p plot to check if t the sample came from a normal distribution (Kumar, 2012).

3.9.3 Autocorrelation Test

An autocorrelation test is a statistical method used to determine whether there is a significant correlation between the values of a time series and the lagged values of the same series (Kumar, 2012). In other words, it tests whether a time series is positively or negatively correlated with itself at different lags. According to Kothari (2014), it is used to determine the presence of serial dependence in a time series. The study employed the Durbin-Watson test.

3.9.4 Heteroscedasticity

Heteroscedasticity refers to the presence of non-constant variance in a dataset, and a heteroscedasticity test is a statistical test used to detect whether the variance of a variable, often the residuals from a regression model, is dependent on the value of an independent variable (Cooper & Schindler, 2012). Heteroscedasticity can be problematic because it can lead to invalid conclusions about the significance of coefficients in regression models and can also affect the

calculated standard errors of the coefficients. If the assumption of homoscedasticity is violated then the standard error was incorrect, and then inference such as t-test, Confidence intervals would be incorrect too. The study adopted the Breusch-Pagan test which tests the null hypothesis that error variances are homoscedastic.

3.10 Ethical Consideration

The researcher observed all the necessary research ethics. First, before data collection, the researcher sought the consent of all participants. No one was coerced to participate in the study's data collection phase. The researcher commenced with seeking research permission from Strathmore and the National Commission for Science, Technology, and Innovation. On the same note, the researcher sought the consent of research respondents before administering questionnaires or interviews. Second, the researcher ensured that the identity of the participants was not disclosed. Anonymity and confidentiality are always important in any study.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 Introduction

The results obtained from the analysis of the collected research data are presented in this chapter of the research. The study applied quantitative analysis techniques and the findings are presented in the following outline: the response rate, the profile of the investment groups, the descriptive results, diagnostic tests, correlation analysis and finally the regression findings.

4.2 Response Rate

This study was interested in collecting research data from a sample of 121 investment groups (chamas) registered with Kenya Association of Investment Groups within Nairobi County. From the individual groups the study presented questionnaires to the top three officials from each group. The collected research questionnaires were cleaned and checked for completeness and a final tally of 153 questionnaires representing 81% response rate with only 19% of the considered sample respondents not able to present their questionnaires within the provided timeframe. Kombo and Tromp (2006) have opined that over 60% responses for quantitative research are considered good representation of the overall sample thus can be used for analysis.

4.3 Profile of the Investment Groups

This section presents the demographic profile of the various investment groups considered and the various categories based on the study questionnaire are applied to demonstrate the findings.

Table 4.1 Profile of Investment Groups

		Frequency	Percent
Gender	Male	81	52.9
	Female	72	47.1
	Total	153	100.0
		Frequency	**Percent**
Age	18-25 years	44	28.8
	26-35 years	72	47.1
	36-45 years	34	22.2
	Over 46 years	3	2.0
	Total	153	100.0
		Frequency	Percent
Education	O-level	12	7.8
	Certificate	47	30.7
	Diploma	72	47.1
	Bachelors	22	14.4
	Total	153	100.0
		Frequency	Percent
Chama membership	Less than one year	26	17.0
	1-5 years	57	37.3
	6-10 years	63	41.2
	Over 10 years	7	4.6
	Total	153	100.0
		Frequency	**Percent**
Members	Below ten members	28	18.3
	11-30 members	74	48.4
	31-60 members	44	28.8
	Over 60 members	7	4.6
	Total	153	100.0

The research sought to determine the gender variation among the officials drawn from each of the groups in Nairobi County and analysis is presented in Table 4.1. The findings above showed that the majority of the officials' 53% (n = 81) were male officials with 47% (n = 72) were female respondents indicating minor skewness in the representation of group officials by genders. The

analysis revealed that 47% of the participants were between 26-35 years of age, 29% were of the age 18-25 years with 22% of the respondents being of the ages 36-45 years. The findings showed the groups were highly populated by youthful members which is key to enhancing their capacity to participate in income-generating/investment opportunities. The level of participants education was also of interest to the survey and findings showed that most of the officials' 47% had a college diploma, 31% a certificate education and 14% a bachelors degree. These findings implied there was high education attainment among officials as shown by the post-secondary certification which is key to having requisite knowledge to learn the groups.

The research sought to establish how long the investment groups have been registered and analysis revealed that most of the chamas; 41% have been in existence for 6-10 years, 37% for 1-5 years and only 17% were newly registered for less than a year. The results showed the groups have been in operation for lengthy period which ensured the official have vast experience within the industry and can provide relevant information required in this research. The size of the chamas was viewed as a key factor and the respondents were queried on the same with results shown in Table 4.1 and findings pointed out that most of the groups 48% had 11-30 members, 29% had 31-60 members with 18% having less than 10 members. This showed that majority of the groups had over 10 members which signifies increased attraction of the group to the community. Further, larger groups have higher financial capacity to be involved in more investments hence can provide information on how biases impact their investment risk profile.

4.4 Descriptive Analysis

The study sought to determine the respondents' views on the various biases and investment risk profile within groups in Nairobi County. A Likert scale of 1 – 5 was used such that 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree. The study applied descriptive tests such as means and standard deviation in presenting the summary of the research responses.

4.4.1 Psychological Biases

The analysis of the psychological biases and how they influence investment profile is presented in the table below.

Table 4.2 Psychological Biases Analysis

	N	Median	Mean	Std. Deviation
You become more cautious in taking risks after a loss than before	153	4.00	3.6405	.92206
You become more of a risk taker than usual after a gain	153	4.00	3.4183	1.00403
You regret more about holding a losing investment for too long than about selling winning investment too soon	153	4.00	3.5294	.96012
You avoid selling investments that have decreased in value and readily sell those that have increased in value	153	4.00	3.4575	1.05747
You tend to mentally treat each element of your investment portfolio separately	153	4.00	3.6928	.99526

The findings showed respondents agreed they tend to mentally treat each element of the investment portfolio separately (mean = 3.692, dev = .995). The officials agreed (mean = 3.640, dev = .922) the group have become more cautious in taking risks after a loss than before. A mean value of 3.529 indicated agreement among respondents they regret more about holding a losing investment for too long than about selling winning investment too soon. The results demonstrated neutrality that the groups have become more of a risk taker than usual after a gain (mean = 3.418, dev = 1.004).

4.4.2 Heuristic Biases

The participants were also presented with statements on how heuristic biases influence investment risk profile and analysis is shown below.

Table 4.3 Heuristic Biases Analysis

	N	Median	Mean	Std. Deviation
You are generally able to predict the end of good or poor market returns	153	3.00	3.3464	1.05332
You are able to predict the change in investment in the future based on recent prices in the market	153	3.00	3.3268	1.04397
You trust that your skills and knowledge of the investment returns	153	4.00	3.7124	.84817
You trust that your skills and knowledge of the investment market can help you outperform the market	153	4.00	3.5686	.93023
You rely on your previous experiences in the market for your next investment	153	4.00	3.7320	.84298
You tend to give more attention to specific investment and make your judgement based on the information easily recalled	153	4.00	3.6275	.84201
You believe that recent good streaks of an investment will have influence on current performance	153	3.00	3.3725	.98597
You believe that recent bad streaks of an investment will have influence on current performance	153	3.00	3.2222	.98823

Participants were in agreement that they rely on their previous experiences in the market for your next investment (mean = 3.732, dev = .842). Results indicate agreement (mean = 3.712, dev = .848) the officials trust their skills and knowledge of the investment returns. The official further agreed that they tend to give more attention to specific investment and make their judgement based on the information easily recalled (mean = 3.627, dev = .842). Further analysis revealed neutral agreement the respondents believe that recent good streaks of an investment have influence on current performance (mean = 3.372, dev = .985). The mean of 3.222 showed moderate agreement the groups believe that recent bad streaks of an investment will have influence on current performance.

4.4.3 Investment Risk Profile

The study dependent variable presented the officials with various statements on the investment risk profile of the groups and results are presented in Table 4.6 below.

Table 4.4 Investment Risk Profile Analysis

	N	Median	Mean	Std. Deviation
You would be willing to risk a percentage of your income/savings in order to get a good return on investment	153	4.00	3.7386	.87186
To achieve high returns, it is necessary to choose high-risk investments	153	4.00	3.6209	1.03241
Even if you experienced significant loss in investment, you would not be put off in undertaking risky investments	153	4.00	3.4248	.91546
You consider risk as an important criterion when making an investment decision	153	4.00	3.7582	.90340
You rely on information gathered from friends, family and colleagues in selection of an investment	153	4.00	3.3595	1.01705
You make fundamental analysis on all available information about an investment before selection	153	4.00	3.6863	.83090
Based on your previous investment selection, you frequently invest	153	4.00	3.6275	.81823

There was agreement among respondents they consider risk as an important criterion when making an investment decision (mean = 3.758, dev = .903). Participants agreed (mean = 3.738, dev = .871) they would be willing to risk a percentage of their income/savings in order to get a good return on investment. The results showed agreement the groups do consider achieving high returns, if it is necessary to choose high-risk investments (mean = 3.620, dev = 1.032). Results indicated moderate agreement the groups rely on information gathered from friends, family and colleagues in selection of an investment (mean = 3.359, dev = 1.017). The officials revealed neutrality on whether if they experienced significant loss in investment, they would not be put off in undertaking risky investments (mean = 3.424).

4.5 Diagnostic Tests

The quantitative analysis of the research data was focused on applying regression analysis which requires certain conditions to be met to ensure the data meets the threshold for adoption of the technique. The study conducted four main diagnostic tests and findings are shown in this section.

4.5.1 Autocorrelation Test

The aim of the test according to Kothari (2014), it is used to determine the presence of serial dependence in a time series. The study employed the Durbin-Watson test and results are shown in Table 4.7

Table 4.5 Autocorrelation Results

Model	Durbin-Watson
1	1.752

a. Predictors: (Constant), Over 61 members, Heuristic Bias, Diploma, 36-45 years, Female, Less than one, 11-30 members, O-Level, Over ten, 18-25 years, One to five, Psychological Bias, Bachelors, Over 46 years, Below 10

b. Dependent Variable: Investment Risk Profile

The findings above showed the regression model summary resulted in a Durbin-Watson test statistic of 1.752 which falls within the threshold of 1.5-2.5. This implied there was no presence of autocorrelation violations within the model thus estimation can be conducted using the analysis.

4.5.2 Multicollinearity Test

Collinearity can be problematic because it can make it difficult to determine the unique effect of each predictor variable on the response variable, and can also lead to unstable or unreliable parameter estimates. This study utilized both VIF and Tolerance Values in testing for multicollinearity as shown in Table 4.8 below.

Table 4.6 Collinearity Results

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Psychological Bias	.706	1.416
	Heuristic Bias	.720	1.390
	Female	.908	1.102
	18-25 years	.715	1.399
	36-45 years	.735	1.360
	Over 46 years	.657	1.523
	O-Level	.711	1.407
	Diploma	.599	1.669
	Bachelors	.631	1.584
	Less than one years	.634	1.577
	One to five years	.725	1.379
	Over ten years	.691	1.447
	Below 10 members	.508	1.968
	11-30 members	.573	1.744
	Over 61 members	.707	1.415

a. Dependent Variable: Investment Risk Profile

The findings above showed that all the predictor variables considered in the survey had variance inflation factor (VIF) values that were below 10 which is an indicator there are no collinearity violations within the variables. Further, the tolerance values of predictors were above 0.1 which further confirmed there was no multicollinearity issue.

4.5.3 Heteroscedasticity Test

Heteroscedasticity can be problematic because it can lead to invalid conclusions about the significance of coefficients in regression models and can also affect the calculated standard errors of the coefficients. The findings of the Breusch Pagan tests are shown in the Table 4.9

Table 4.7 Heteroscedasticity Results

Null Hypothesis	Chi-Square	Sig
Constant Variance	18.125	0.287

From the findings it was revealed that there that testing for the null hypothesis at 5% level of significance the chi-sq. = 18.125 with Sig = 0.287 implying there was uniform across the error term thus no heteroskedasticity problem.

4.5.4 Normality Tests

The study also conducted normality tests using the Normal P-P plot on the residuals of the regression model and findings showed the observations fitted within the normality line thus indicating the data was from a normally distributed set as shown in Figure 4.4

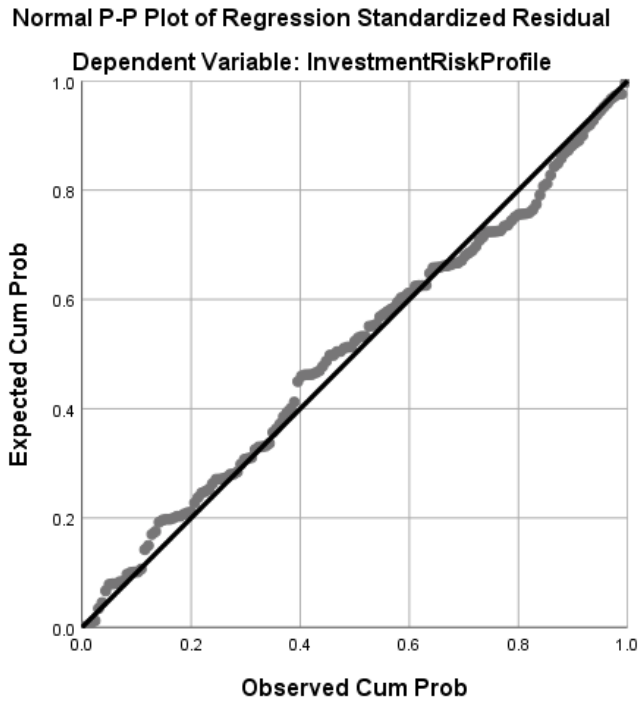


Figure 4.1 Normality P-P Plot

4.6 Correlation Analysis

Pearson correlation tests was applied to determine the direction and significance of the relation between the study variables and results are shown in Table 4.10 below.

Table 4.8 Pearson Correlation Results

		Investment Risk Profile	Psychological Bias	Heuristic Bias	Male	Female	18-25 years	26-35 years	36-45 years	Over 46 years	O-Level	Certificate	Diploma	Bachelors	Less than one	One to five	Six to ten	Over ten	Below 10	11-30 members	31-60 members	Over 61 members
Investment Risk Profile	Pearson Correlation	1	.366**	.572**	.175*	-.175*	.007	-.002	-.022	.052	-.093	-.005	.054	.002	.031	.092	-.125	.026	.016	.060	-.045	-.077
	Sig. (2-tailed)		.000	.000	.031	.031	.930	.978	.783	.523	.254	.948	.509	.985	.704	.257	.123	.753	.840	.458	.580	.342
	N	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153

The first objective focused on establishing effect of psychological biases on the investment risk profile of investment groups. The findings showed N (153), r = .366**, .000<.05 revealed there was a weak positive and significant association between psychological biases and the investment risk profile of investment groups in Nairobi County. The second objective reviewed the effect of heuristic biases on the investment risk profile of investment groups. The correlation tests indicated N (153), r = .572**, .000<.05 revealed there was a strong positive and significant association between heuristic biases and the investment risk profile of investment groups in Nairobi County.

The third objective sought to establish the effect of demographic factors on the investment risk profile of investment groups. The analysis showed that presence of male officials; N (153), r = .175*, .031<.05 had a weak positive, while presence of women also had a weak negative r = -.175*, .031<.05 and significant association with the investment risk profile of investment groups in Nairobi County. Further analysis revealed other characteristics such as education level, group size and length of membership had insignificant association with investment risk profile of investment groups in Nairobi County.

4.7 Regression Analysis

The research adopted both ordinal linear regression analysis to establish the magnitude of effect between independent variables and dependent variable.

4.7.1 Regression Psychological Biases and Investment Risk Profile

The first regression model was conducted, and summary results are shown in the Table 4.11 below.

Table 4.9 Regression Summary Psychological Biases and Investment Risk Profile

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	326.420			
Final	304.644	21.776	1	.000

Link function: Logit.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	245.416	255	.655
Deviance	156.388	255	1.000

Link function: Logit.

Parameter Estimates

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Location	Psychological Bias	.233	.049	22.527	1	.000	.137	.329

Link function: Logit.

The findings above on the -2 Log-Likelihood (-2LL) with the intercept only considered yielded 326.420, while the independent variables considered the -2LL were .000. The difference in the chi-square statistic (= 21.776) is statistically significant since the Sig =.000<.05. The research thus held there was a statistically significant relationship between psychological biases and the investment risk profile of investment groups (chamas) members in Nairobi County. The Goodness of fit tests that show the consistency levels between the observed data and the fitted model. The test's null hypothesis is that the observed data is consistent with the estimated values in the model

fitted. From the above results, the study was able to accept the null hypothesis and affirmed that the observed data was consistent with the estimated values in the model since the Sig-values 1.000>.05.

Findings revealed that location parameter for psychological biases had positive (X_1 = .233, Wald = 22.527, Sig = .000<.05), indicating that psychological biases increase the likelihood of higher values in the investment risk profile among investment groups. Thus, it's' concluded that psychological biases have significant and positive predictive power on the investment risk profile.

4.7.2 Regression Heuristic Bias and Investment Risk Profile

The second ordinal regression tests focused on establishing the magnitude of relationship between heuristic biases and investment risk profile and findings are shown in Table 4.12

Table 4.10 Regression Summary Heuristic Biases and Investment Risk Profile

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	390.182			
Final	326.780	63.402	1	.000

Link function: Logit.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	215.321	303	1.000
Deviance	177.131	303	1.000

Link function: Logit.

Parameter Estimates

	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Location Heuristic Bias	.309	.041	57.127	1	.000	.229	.390

Link function: Logit.

The findings above on the -2 Log-Likelihood (-2LL) with the intercept only considered yielded 390.182, while the independent variables considered the -2LL were .000. The difference in the chi-square statistic (= 63.402) is statistically significant since the Sig =.000<.05. The research thus held there was a statistically significant relationship between heuristics biases and the investment risk profile of investment groups (chamas) members in Nairobi County. The Goodness of fit tests that show the consistency levels between the observed data and the fitted model. The test's null hypothesis is that the observed data is consistent with the estimated values in the model fitted. From the above results, the study was able to accept the null hypothesis and affirmed that the observed data was consistent with the estimated values in the model since the Sig-values 1.000>.05.

Findings revealed that location parameter for heuristic biases had positive (X_2 = .309, Wald = 57.127, Sig = .000<.05), indicating that heuristic biases increase the likelihood of higher values in the investment risk profile among investment groups. Thus, it's' concluded that heuristic biases have significant and positive predictive power on the investment risk profile.

4.8 Overall Regression Model

The research utilized an ordinal regression to estimate the magnitude of effect of behavioral related determinants on the investment risk profile of members of investment groups/Chamas in Nairobi County. The results are presented in Table 4.14

Table 4.11 Model-Fitting Information for Behavioral-Related Determinants and Investment Risk Profile

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	752.583			
Final	677.055	75.528	15	.000

Link function: Logit.

The overall model fitting results of the PLUM regression in Table 4.14 compared the results generated from the Complementary Log-log function. The findings showed that the -2 Log-Likelihood (-2LL) with the intercept only considered yielded 752.583, while the independent variables considered the -2LL were .000. The difference in the chi-square statistic (75.528) is

statistically significant since the Sig =.000<.05. Thus, the study held a significant relationship between behavioral-related determinants (psychological biases, heuristic biases and demographic factors) and the investment risk profile of the chama.

Table 4.12 Goodness of Fit Test for Behavioral-Related Determinants and Investment Risk Profile

	Goodness-of-Fit		
	Chi-Square	df	Sig.
Pearson	2308.715	2305	.474
Deviance	675.669	2305	1.000

Link function: Logit.

Table 4.15 showed the results of the Goodness of fit tests that show the consistency levels between the observed data and the fitted model. The test's null hypothesis is that the observed data is consistent with the estimated values in the model fitted. From the above results, the study was able to accept the null hypothesis and affirmed that the observed data was consistent with the estimated values in the model since the Sig-values 1.000>.05. Thus, signifying a statistically significant relationship between the predictor variables and the investment risk profile of chamas.

Table 4.13 Parameter Estimates for Behavioral-Related Determinants and Investment Risk Profile

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Location	Male	.401	.300	1.790	1	.181	-.186	.988
	18-25 years	-2.355	1.298	3.295	1	.070	-4.899	.188
	26-35 years	-2.068	1.274	2.633	1	.105	-4.566	.430
	36-45 years	-2.086	1.262	2.734	1	.098	-4.559	.387
	O-level	1.104	.722	2.336	1	.126	-.312	2.519
	Certificate	.818	.512	2.550	1	.110	-.186	1.822
	Diploma	.813	.455	3.199	1	.074	-.078	1.704
	Less than one year	.469	.906	.268	1	.605	-1.307	2.246
	1-5 years	.700	.832	.707	1	.400	-.931	2.331
	6-10 years	.471	.817	.332	1	.564	-1.130	2.072
	Below ten	.784	.885	.785	1	.376	-.950	2.518
	11-30 members	1.153	.827	1.946	1	.163	-.467	2.773
	31-60 members	.967	.808	1.432	1	.231	-.617	2.552
	Psychological Bias	.099	.056	4.172	1	.025	-.010	.208
	Heuristic Bias	.296	.046	41.640	1	.000	.206	.386

Link function: Logit.

a. This parameter is set to zero because it is redundant.

The study further analyzed the parameter of the research estimates, which showed the significance of the predictor variables. These are interpreted below.

To assess the effect of heuristics on the investment risk profile of investment groups (chamas) members in Nairobi County.

The results for the first objective showed β_1 = .296, Wald = 41.640 sig = .000. The findings revealed a positive and significant effect of the variable which confirmed that changing heuristic biases by a unit will lead to improvement in investment risk profile by a factor of .296

To examine the effect of psychological biases on the investment risk profile of investment groups (chamas) members in Nairobi County.

The coefficient for the second objective showed β_2 = .099, Wald = 4.172, sig = .025. The findings revealed a positive and significant effect of the variable which confirmed that changing psychological biases by a unit will lead to improvement in investment risk profile by a factor of .099

To assess the control effect of demographics on the investment risk profile of investment groups (chamas) members in Nairobi County.

The regression coefficients revealed that demographic factors clustered under; gender of officials, age of officials, size of the group, education level of officials and years of group membership all had an insignificant effect on the investment risk profile of investment groups (Sig values > .05).

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The research's fifth chapter included a summary of the analysis and a discussion of the findings in light of the empirical literature. The study's findings, conclusions, and suggested areas for additional research were all discussed in the chapter.

5.2 Summary

Studies conducted in behavioral finance science provide diverging and inconclusive results with respect to how behavioral biases blur investment decision making. Behavioral finance suggests that investment decisions are greatly affected by irrational emotional and psychological factors. It is against this background that the current study was premised to examine the effect of psychological biases and heuristics on the investment risk profile of members of investment schemes in Kenya. The study sought to respond to the following objectives: to assess the effect of heuristics on the investment risk profile of investment group (chama) members in Nairobi County and to examine the effect of psychological biases on the investment risk profile of investment group (chama) members in Nairobi County. The study was guided by behavioral finance theory and employed an explanatory research design. The study targeted all the 121 registered Chamas in Nairobi (Kenya Association of Investment Groups (KAIG) database). The study targeted three employees drawn from each of the chama. The data analysis phase applied both descriptive and ordinal regression analysis.

The correlation results revealed that there was a weak positive and significant association between psychological biases, demographic factors and the investment risk profile of investment groups in Nairobi County. The correlation tests also revealed a strong positive and significant association between heuristic biases and the investment risk profile of investment groups in Nairobi County. The regression analysis revealed that investment risk profile of the chamas can be predicted by the behavioral-related determinants (psychological biases, heuristic biases and demographic factors). The regression analysis further showed that psychological biases and heuristic biases had a positive and significant effect on investment risk profile of investment groups in Nairobi County while

demographic factors revealed an insignificant effect on investment risk profile of investment groups in Nairobi County.

5.3 Discussion

The discussion of the study findings was presented in this study in line with the objectives of the study. The main objective of the study was to investigate the behavioral related determinants affecting investment risk profile of members of investment groups / Chamas in Nairobi County. The study analysis revealed that there was a positive and significant relationship between behavioral-related determinants and the investment risk profile of investment groups in Nairobi County.

5.3.1 Psychological Biases and Investment risk profile

The study sought to determine the relationship between psychological biases and investment risk profile of investment groups in Nairobi County. The study established that there existed a positive and significant effect of psychological biases and investment risk profile of investment groups in Nairobi County. This indicated that considering psychological biases within the youth groups will have a positive improvement on the investment risk profile, such as being more risk averse, risk neutral and risk seeking, which can lead to better management of the investments held by the groups. The study results were supported by De Bondt and Thaler's (1985) interpretation of the Behavioral finance theory which indicates that financial decisions are always guided by deep-seeded, pervasive, subconscious biases and heuristics.

The study findings were in line with findings by Kangatharan et al, (2014) who studied how performance and investment decisions were affected by behavioral factors. Similar to the current study, the study used questionnaires administered to investors to collect data, which was analyzed, the conclusion that investment decisions were made because of psychological factors including herding heuristics, was arrived at. Further, Antony (2017) studied the effect of psychological factors on real estate development in Nairobi. His investigation concluded that psychological factors such as too much confidence, frame dependence, representativeness, mental accounting and herd behavior are major contributors in making investment decisions. These findings were also supported by Onyango (2018) who investigated how real-estate performance is affected by

behavioral factors and found a positive and significant relationship between behavioral factors and growth of real-estate.

The study results were further corroborated by Chami (2017) who looked at how factors of behavior affect choices of investment among Nairobi's retail investors. The study concentrated on determining the behavioral factors and linked the identified behavioral factors to investment decisions. The results revealed that psychological factors indeed provided a bias while choosing investments. The study also concluded that education and market fundamentals played a key role in choosing investments. The study results were however disputed by Annamalah, et al. (2019) who conducted an experimental study to evaluate the factors that influence Malaysian investors' choice of unit trusts. The study revealed that psychological factors have an insignificant effect on an investor's decision. The study further concluded that information accessibility, followed by risk-taking and financial situation, had the most impact on an investor's behavior and purchase decision. The implication that can be drawn from the research findings is that is paramount that groups ensure they acquire professionals who will educate their members on the effect of psychological biases on their investment risk profile. This will improve their decision-making as they will use this information to recognize the psychological biases that influence their investment decisions.

5.3.2 Heuristics and Investment risk profile

The second objective of the study investigated the relationship between heuristic biases and investment risk profile of investment groups in Nairobi County. The study revealed a positive and significant effect of the variable heuristic biases on investment risk profile of investment groups. These findings show that heuristics biases of the groups can yield positive changes in the investment risk profile thus allowing for better diversification in the portfolio held by the groups due to significant improvement in risk averse, risk neutral and risk seeking behavior among the groups. The study results were in line with De Bondt and Thaler's (1985) publication of the Behavioral finance theory which proposed that financial decisions are not guided by strict rational thinking. The study findings were also in line with the moral hazard theory which noted that people's behavior is often irrational and driven by emotions or biases, which can lead to deviate outcomes.

The study findings were supported by Lowie, Hall and Cloete (2016) who investigated the relationship between heuristic bias and decisions in property investment in the investment sector in South Africa. The study results noted a significant effect of heuristic bias on investment decision making. The study results also suggested existence of modification and anchoring bias in decision making. The study results were further in line with Glaser and Weber (2013) who carried out an empirical evaluation of Overconfidence and Trading decisions and determined a positive and significant effect of Overconfidence on investment decisions. The study discovered that those individuals who believed their performance or investment talents were above average frequently traded at substantially bigger volumes.

The study results were however not in line with findings by Iroham, Ogunba and Oloyede, (2014) who studied how principal heuristics influences accuracy of property valuation in Nigeria. The study revealed that heuristics did not possess a significant effect on the accuracy of valuation. The study further concluded that heuristic behaviors though representative, are not accurate as compared to current market information. The implication of this finding is that heuristics do in fact influence investor's decision making in investment groups. Therefore, the members should ensure they educate themselves on the heuristic biases that can influence their investment decisions. This will improve the productivity of their investments.

5.3.3 Demographics and Investment risk profile

The study also sought to investigate the relationship between demographic factors and investment risk profile of investment groups in Nairobi County. The study determined that demographic factors clustered under; gender of officials, age of officials, size of the group, education level of officials and years of group membership all had an insignificant effect on the investment risk profile of investment groups. This indicated there was no direct effect of demographic factors on the level of investment risk profile of the selected groups. The study findings were in line with findings by Atkinson, Baird and Frye (2013) in their study of the impact of gender composition on investment portfolio performance of mutual funds. The study indicated that the gender mix of the management team wasn't a major indicator of investment portfolio performance. The study also showed that there is no appreciable difference between the returns produced by management teams with a male prominence and those with a female predominance in mutual funds.

The results of the study were however disputed by Riessen and Ruenzi (2017) who sought to find out the effect of gender diversity in a management team on investments risk profile and found that gender diversity in the leadership team had a detrimental effect on the risk profile of investments. The study findings were further out of line with Gebeyehu (2012) who investigated the main behavioral causes of the informal groups' loan default issue in Ethiopia and found that education and investment experience were determined to have a negative effect on the group's risk profile. The study determined that more educated and experienced investors may be more comfortable with risk, as they have a better understanding of how different types of investments work and how markets can fluctuate.

The study findings were also disputed by Ojiako, Idowu, and Ogbukwa (2014) who analyzed the investment performances of smallholder enterprises as well as their determinants in Nigeria. The study revealed that only 74.0% of all investments had a positive performance and a negative association was found between age and investment performance, concluding that younger investors had better investment performance rates. In Kenya, the study findings were also in disagreement with Kerga and Asefa (2018) who conducted a study on the moderating effect of income on an investor's risk profile in Kenya and revealed a significant relationship between income and an investors risk profile. This means that groups are encouraged to diversify their membership and strive to have a balance of members from different genders, ages and professional background. This would improve neutrality in decision making and perhaps encourage the groups to identify technologically-driven investments.

5.4 Conclusions

Based on the study's first objective, the study concluded that psychological biases had a positive and significant effect on investment risk profile of investment groups in Nairobi County. The study also determined that investors become more cautious when taking risks especially after experiencing a loss. However, the study also found out that the reverse is not always the case as investors do not always take up more risk than usual after a gain. The study also found that investors usually regret more about holding a losing investment for too long than about selling winning investment too soon which impacts their trading decision. The study also concluded that investors with a diversified portfolio tend to treat each element of the investment portfolio separately. The study further determined that investors do not always trade in investments that have appreciated in value and purchase those that have decreased in value.

The study also concluded heuristic biases presented a positive and significant effect on investment risk profile of investment groups. The study revealed that investors trust their skills and knowledge of the investment returns and market that can help them outperform the market. The study further determined that investors consider previous experiences in the market when making the decision for the next investment. Additionally, investors pay more attention to specific investments and decide based on the information easily recalled. The study also determined that investors are majorly unable to predict the change in investment in the future based on recent prices in the market. They are also generally unable to predict the end of good or poor market returns. The study also found that most investors are realists and do not consider that a recent good or bad performance streak of an investment will have influence on current and future performance.

Finally, the study concluded that demographic factors had an insignificant effect on the investment risk profile of investment groups. This means that investment risk profile of investment groups in Nairobi County is influenced by psychological biases and heuristic biases, rather than demographic factors. Overall, the study's findings suggest that investment groups in Nairobi County should not consider demographic factors but rather focus on improving their decision-making processes, enhancing their investment practices, and mitigating the impact of biases on their investment decisions.

5.5 Recommendations

The study concluded that behavioral-related determinants had a positive and significant effect on investment risk profile of investment groups in Nairobi County. Based on this conclusion, the study provided practical and policy recommendations.

5.5.1 Policy Recommendations

The study recommended that should provide oversight and supervision of investment groups to ensure that they comply with relevant laws and regulations. This can help to protect investors and promote a fair and transparent investment environment. Further, the government should establish a regulatory framework that promotes transparency, accountability, and good governance in investment groups. This can include requiring investment groups to disclose their investment strategies, performance, and risk management practices to investors. Additionally, the study recommends that the government through the relevant regulator should establish investor protection mechanisms such as investor education programs, investor compensation schemes, and dispute resolution mechanisms to protect the interests of investors in investment groups.

The study also recommends that a body that monitors and regulates the chamas is developed. This will be important to establish industry standards for investment groups. This can help to build trust among investors and promote a culture of responsible investing. The government and industry associations should also support research and development in behavioral finance to better understand the impact of behavioral-related determinants on investment risk. This can help to develop more effective policies and practices that promote responsible investing.

5.5.2 Practical Recommendations

The study recommends that investment groups organize training programs to educate their members about psychological and heuristic biases, their impact on investment decisions, and how to mitigate them. This training should focus on building awareness, enhancing decision-making skills, and instilling discipline in investment practices. Further, investment groups should conduct thorough due diligence on investment opportunities to ensure that investment decisions are based on sound financial analysis and not influenced by biases. They should also establish a rigorous investment appraisal process that incorporates multiple perspectives and considers all relevant factors.

Additionally, the investment groups should establish structured decision-making processes that minimize the impact of heuristic biases. This can include using a checklist to ensure that all relevant factors are considered, involving multiple perspectives in decision-making, and engaging in active debate and discussion. The study also recommends that Chamas adopt a diversified investment strategy across different asset classes and industries to mitigate the risk of loss associated with concentration risk. This can help to minimize the impact of any single investment's performance on their overall portfolio. These groups should also seek independent evaluation of their investment decisions and performance by reputable experts. This can help to identify any biases or weaknesses in investment strategies and make necessary adjustments. The study also recommends that the groups review and monitor their investments regularly to assess their performance and make any necessary adjustments whilst also developing a system for tracking their investment decisions to identify patterns of bias or mistakes.

5.6 Area for Further Research

The study focused on psychological biases and heuristics on the investment risk profile of investment schemes' members in Nairobi County. Further studies can be conducted on psychological biases and heuristics and their effect on the selection of portfolios from various investment schemes including the NSE. This can help to identify any variations in investment behavior and decision-making processes among different schemes. Additionally, a comparative analysis can be conducted on investment schemes in different regions of Kenya to investigate how psychological biases and heuristics affect investment risk profiles across different regions. This can help to identify any regional variations in investment behavior and decision-making processes. Further research work can also be conducted on other factors that affect investment behavior and decision-making processes including Socioeconomic Status and Technology advancements.

5.7 Limitations of the Study

The study was successful in its analysis but was not without certain challenges. Among these limitations was the access to the chamas of which many operate unregistered. Furthermore, the data from the official national registrar of groups was inconclusive given a high number of the groups collapse and /failed to register. The study also limited itself to an analysis of primary data

and did not include secondary data which was not available or accessible within the context of the organizations that participated in this study.

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APPENDICES

Appendix I: Ethics Review Committee Letter

Strathmore UNIVERSITY

17th February 2023

Ms Omoding Agnes Idee,
agnes.omoding@strathmore.edu

Dear Ms Omoding,

RE: Effect of Behavioural Factors on the Investment Risk Profile of Investment Schemes Members in Nairobi County

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU- master's** research proposal. Your application reference number is **SU-ISERC1561/23.** The approval period is from **17th February 2023 to 16th February 2024.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, and MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 48 hours of notification
iv. Any changes, anticipated or otherwise, that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 48 hours
v. Clearance for the export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

for: **Dr Ben Ngoye,**
Secretary; SU-ISERC

Cc: Mr Ambrose Rachier,
Chairperson; SU-ISERC

STRATHMORE UNIVERSITY INSTITUTIONAL SCIENTIFIC AND ETHICAL REVIEW COMMITTEE
(SU-ISERC)
17-Feb-2023
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

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Appendix II: NACOSTI Research Approval

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **486862**

Date of Issue: **02/March/2023**

RESEARCH LICENSE

This is to Certify that Ms.. Agnes Omoding of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: Effect of Behavioral Factors on the Investment Risk Profile of Investment Schemes Members in Nairobi County for the period ending : 02/March/2024.

License No: **NACOSTI/P/23/23961**

486862

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix III: Research Questionnaire

Kindly answer the following questionnaire by ticking in the appropriate box.

Section A: Demographic Information

1. What is your gender?

Female [ ] Male [ ]

2. Your age bracket (Tick whichever appropriate)

18-25 Years [ ] 26-35 [ ] 36-45 [ ] Over 46 [ ]

3. What is your highest education level? (Tick as applicable)

O level [ ] Certificate [ ] Diploma [ ] Bachelors' degree [ ] Other [ ]

Others-specify……..

4. Years of Chama membership (Tick as applicable)

Less than 1 year [ ] 6-10 years [ ]

1-5 years [ ] Over 10 years [ ]

6. Size of your Chama in terms of number of members (Tick as appropriate)

Below 10 members [ ] 11-30 members [ ] 31-60 members [ ]

61 members and more [ ]

Section B: Psychological Biases

Please evaluate and indicate the degree of your agreement with the following behavioral biases in relation to your investment decisions. Tick in the appropriate box. For Likert type of questions Use a scale of 1-5 where: 1= Strongly Disagree 2= Disagree 3= Neutral, 4= Agree and 5= Strongly Agree.

	1	2	3	4	5
You become more cautious in taking risks after a loss than before.					

You become more of a risk taker than usual after a gain.					
You regret more about holding a losing investment for too long than about selling winning investment too soon.					
You avoid selling investments that have decreased in value and readily sell those that have increased in value					
You tend to mentally treat each element of your investment portfolio separately**.**					

Section C: Heuristic Biases

Please evaluate and indicate the degree of your agreement with the following heuristic biases in relation to your investment decisions. Tick in the appropriate box. For Likert type of questions Use a scale of 1-5 where: 1= Strongly Disagree 2= Disagree 3= Neutral, 4= Agree and 5= Strongly Agree.

	1	2	3	4	5
You are generally able to predict the end of good or poor market returns.					
You are able to predict the change in investment in the future based on recent prices in the market.					
You trust that your skills and knowledge of the investment returns.					
You trust that your skills and knowledge of the investment market can help you outperform the market.					
You rely on your previous experiences in the market for your next investment.					
You tend to give more attention to specific investment and make your judgement based on the information easily recalled.					
You believe that recent good streaks of an investment will have influence on current performance.					
You believe that recent bad streaks of an investment will have influence on current performance.					

Section D: Investment risk profile

Please evaluate and indicate the degree of your agreement with the following questions in relation to your investment decisions. Tick in the appropriate box. For Likert type of questions Use a scale of 1-5 where: 1= Strongly Disagree 2= Disagree 3= Neutral, 4= Agree and 5= Strongly Agree.

	1	2	3	4	5
You would be willing to risk a percentage of your income/savings in order to get a good return on investment.					

To achieve high returns, it is necessary to choose high-risk investments.					
Even if you experienced significant loss in investment, you would not be put off in undertaking risky investments.					
You consider risk as an important criterion when making an investment decision.					
You rely on information gathered from friends, family and colleagues in selection of an investment					
You make fundamental analysis on all available information about an investment before selection.					
Based on your previous investment selection, you frequently invest.					

Thank you for your Participation!

Appendix IV: List of Investment Groups

1. Mukuru Fuata Youth Association
2. Mufya Nisisi Chapter
3. Youth empowerment through unity
4. Fuata Nyayo Nisisi Chapter
5. Mukuru Amazin
6. Nairobi South Youth Group
7. Hazina Market Nisisi chapter
8. Aoko Road Traders Association
9. Hazina Sanaa Nisis chapter
10. Environmental Youth Against Crime
11. Bismilahi Youth Groups
12. Comma Youth bunge
13. Island Youth bunge
14. Commercial Kaverera Youth Association (COKAYA)
15. Umoja Moja Youth Association
16. Jubilant Youth Group
17. South B Mosque youth group
18. South B wise ladies Youth group
19. Jitegemee Kenya Pamoja Youth Association
20. JKP YOMO youth group
21. JKP enterprises
22. Lower Pangani youth group
23. Mission of hope youth group
24. Muthurwa youth Group
25. Kayaba Nisisi Youth Association (KAYA)
26. Mandazi one youth bunge
27. Uprising youth group
28. Taliban youth group
29. Mola Kala youth group
30. County youth group

31. Simama Imara Youth Group
32. Bedjos youth Group
33. Rekebisho
34. Pavima Enterprises
35. Ngara Self help group
36. United youth bunge
37. U turn performing arts
38. Karanjo youth group
39. Niinue nikuunue women group
40. Nyakwerigeria women group
41. Nairobi South Youth Network
42. Sinai Reli Youth Group
43. Makadara Youth Network
44. Amusha Youth Organization (AYO)
45. Talent Search youth Association
46. Rauka Youth Bunge
47. Peer Educators Youth Group
48. Innovators Youth group
49. Vijana Mashinani
50. Huruma youth Group
51. Ngei One youth group
52. Seven Lions youth group
53. Fanaka youth group
54. Maendeleo Mashinani
55. Amusha Youth Organization
56. Makadara Youth Network
57. Gove Youth group
58. Fanatic youth Group
59. Ngado Youth Group
60. Kisa Self Help Group
61. Green Bufallo Youth Group

62. Innivation self help group
63. Give life Chance youth group
64. Mbele Daima Youth Group
65. Paradise Nisisi Chapter
66. Wajua Youth Group
67. Mavuno Youth
68. Paradise Can Youth
69. VICCO
70. Viwandani Progressive Youth Group (VPYG)
71. Blazing Stars youth group
72. Uprising youth group
73. Tuchanuke youth group
74. Generation Makers youth group
75. Ark Ni sisi youth group
76. Jamii Bora Youth Group
77. Nairobi South Youth Network
78. Nairobi County Youth Forum
79. Fuata Nyayo Sanitary Group
80. Corner A youth Group
81. Korna Youth Group
82. Kamaliza youth Group
83. Poverty Fighters Youth Group
84. Amazon Youth Group
85. Shimo La Tewa Youth Group
86. All stars Self Help Group
87. Simameni women Group
88. Fadema Enterprises
89. Fadema LTD
90. Cheza Africa football academy
91. Susa LTD
92. Mugambi construction company

93. Nyando community-based organization
94. South Kanaro Youth Group (SOKI)
95. Path Finder Nisisi Chapter
96. C- Right Ni sisi youth chapter
97. Dohnholm Nisisi Chapter
98. Elite Technologies youth bunge
99. Jamaica nisisi chapter
100. Vimandani Comprehensive Community based organization
101. A better tomorrow youth bunge
102. Kariokor youth group.
103. Kariokor Leather Self Help Group
104. Kiamaiko Youth Group
105. Basha youth group
106. Angola Community based Group
107. Kamkunji Network
108. Mathare Foundation
109. Badilika youth group
110. Riverside Self Help Group
111. Fezzo Flames Enterprises
112. Blackmamba Self Help Group
113. Kaloleni women group
114. Young Muslim youth chapter
115. Jipange Self Help Group
116. Nemesio Enterprises
117. Mafundi Sacco Society
118. Larry King enterprises
119. Hazina Women Group
120. Paradise Nisisi Chapter
121. Wajua Youth Group

Source: KAIG (2021)