BEHAVIOURAL BIASES OF REAL ESTATE INVESTORS AND INVESTMENT PERFORMANCE IN KENYA

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

I dedicate this project to my father Timothy Muchemi Kuria and my mother Beatrice Kuria for their inspiration and to my brothers, Daniel Kuria and Denis Kuria, my sister, Leah Kuria and my wife Anne Wanjiku thank you for your moral support.

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ACRONYMS AND ABREVIATIONS

CAPM	Capital Asset Pricing Model
CBK	Central Bank of Kenya
DJIA	Dow Jones Industrial Average
EARB	Estate Agents Registration Board
EMH	Efficient Market Hypothesis
GCI	Global Competitiveness Index
GIR	Global Investment Report
KIR	Kenya Investment Report
KPDA	Kenya Property Developers Association
KRA	Kenya Revenue Authority
PwC	PricewaterhouseCoopers
REA	Real Estate Agents
REIT	Real Estate Investment Trust
RoK	Republic of Kenya
WEF	World Economic Forum

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ABSTRACT

Kenya is the world's top performer in terms of real estate transparency and there has been a phenomenal growth in real estate investment in Kenya in the last ten years (2005-2016), with returns that way outdo the returns in the security markets. Despite this, in Kenyan market, which yields a 6% returns in East Africa remains the fastest growing compared to other emerging markets in Uganda and Tanzania. This study explored the behavioural biases of real estate investors in the Kenyan Market and assess the moderating role of financial literacy. The specific objectives of this study were; to explore the influence of heuristic based behavioural biases on the real estate performance in Kenya, to find the effect of prospect based behaviour biases on the performance of real estate investments in Kenya, to find the effect of investment behaviour based on herding on the performance of real estate investments in Kenya, to find the effect of market factors based behaviour biases on the performance of real estate investment in Kenya and finally, to assess the significance of financial literacy as a moderating factor between the real estate investors behavioural biases and investment performance in Kenya. Hypothesis for each regressor variable were developed and empirically tested. The study was guided by heuristics theory, prospect theory, herding theory and investment market theory. The study adopted a positivism research philosophy and a descriptive research design. The area of study was Nairobi, Kenya as it has the highest number dwellers as well as the highest demand for real estate in Kenya. A list of 284 registered real estate agents was obtained from the Estate Agents Registration Board (EARB). A multistage sampling approach was used to obtain a sample of 426 real estate investors in Nairobi region. Information was sought from the estate investors in Nairobi Kenya. Data was collected using a questionnaire and the Likert summated scale as the measurement scale from the investors. A pilot was conducted and test of reliability using Cronbach alpa coefficient was done. Descriptive analysis was made, generate and interpret the frequency Table. Measure of central tendency and dispersions were conducted using Mean (x) and Standard deviation (S.D) respectively. Principal component analysis, varimax rotation and orthogonal were used to test the construct validity. Test of factorability was conducted using Kaiser Meyer Olkin test. Tests of Sphericity was done using Bartlett's tests using Chi Coefficients and associated p-values. This data was transformed to continuous data and the returns tested for Gaussian assumptions using numerical Kolmogorov- Smirnov and Shapiro-Wilk (*W*) statistics. In the case of predictors, test of independence using Durbin Watson (*d)* statistic, test of multicollinearity using Variance Inflation Factor and Tolerance, test of heteroscedasticity using p-p plots was done before subjecting the data to bivariate linear and finally multiple linear regression. To test study hypothesis, Model R^2, ANOVA Statistics and Regression coefficients were generated and interpreted. Results were presented using interactive Tables, and figures. The results indicate that heuristic bias, prospect bias, herding bias and market based bias influence the performance of real estate industry. The results also indicate that financial literacy moderates the influence of the behavioural biases on the performance of real estate industry in Kenya. Based on these findings, the study recommends that when evaluating investments, investors should avoid at barely looking at the risk and return characteristics of that individual investment. Further, the study recommends that the Estate Agents Registration Board (EARB) which is the regulatory body for estate agency practice in Kenya and other individual and institutional market players use these findings as a basis of investor education and minimization of noise trading in the Kenyan real estate markets.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Real estate investment accounts for approximately 20% of all investments globally PricewaterhouseCoopers (PwC), 2014. Real estate investments make up a considerable percentage of investors portfolio. This means that Real Estate Investments (REI) and the drivers of these investments and even the determinants of the returns, is a global phenomenon.

1.1.1 Global Perspective of Real Estate Investment

Globally, investments in property markets make up 16% of the portfolios of global investors. A 31% of investors see real estate as being one of the three most attractive investments. In Australia, real estate investments accounts for over 27% of Australian investors' portfolios. PricewaterhouseCoopers, (PwC, 2015) survey showed investors are typically accessing income through active investment funds (29%), by investing directly in equities (20%) or by investing in real estate (10%). In the year 2014, flows of capital into worldwide real estate raised to US$835 billion, a figure approximately four times more than the US$232 billion which was recorded in year 2009. The Global Investor Intentions Survey carried out in the year 2015 indicates that investors of real estate worldwide remain certain moreover, their purposes are powerfully expansionary. The cross-regional investment appetite is raising and additional investors plan to deploy capital beyond their own region.

In Asia Pacific, real estate markets have remained resilient despite the weakening market fundamentals. According to the Emerging Trends in Real Estate, a global report of PricewaterhouseCoopers, (PwC), Japan remains the most favored country for real estate investment (PwC, 2015). Additional facts indicated that most investors in real estate in Asia Pacific prefer gate away cities. While the yields in these market average 4.5% to 6%, the demands for residential properties remains highest in Australia, Japan, Singapore and China. Approximately 49.6% of the investors in these regions regard the returns from real estate as good and a marginal percentage of 15 as excellent. Despite this, there is a huge mismatch between the demand and supply with slowed market activity due to high pricing of real estate investments. Emerging trends reveals that over 98% of the real assets in this region are owed by locals, low explaining the low turnover as locals could keep it for their dependents rather than selling at a discount (PwC, 2015).

In southern Europe, the residential real estate is moving out of the public or semipublic sector into the mainstream. Global report by PwC indicates that two thirds of the investors are active in the residential property-mainly building for same as opposed to holding for long-term investment (PwC, 2015). Statistics indicate that there is an emerging trend which points toward a unique scenario in this economy, that there is a huge exodus from commercial property to residential property in Europe. Approximately, 71% of the residents in Spain belief that there is a great opportunity in Spain for residential investment than commercial investment.

1.1.2 Real Estate Investment in Africa

South Africa remains the only SSA Country and regional leader in real estate market transparency (JLL, 2015). Its stands at the 20th position in the world close to Italy, Spain and Poland. In the recent past, Sub-Saharan Africa (SSA) has made the strongest progress in the world in the transparency of real estate. Five SSA markets that have made this significant progress include Kenya, Ghana, Nigeria, Zambia and Mauritius. These markets are cited to have demonstrated significant improvement in transparency score. Surprisingly, these SSA real estate markets have made it to the top 10 global improvers in transparency. The measures for transparency include cuts across three thematic areas, that is, steps toward regulation, data availability and transaction processes (JLL, 2015).

On the other hand Senegal, Ethiopia and Angola remain the three African countries at the bottom 10 in the indexed measure. SSA's drivers of performance in real estate transparency is attributed to a number of factors. Firstly, the corporations growing presence, investors as well as advisors of real estate who are involved in measurement of performance as well as tracking of market. Secondly, the launching of first performance index of direct real estate (outside of South Africa) within Botswana. Thirdly, to the raising quality of as well as easiness of access to information about land registry, evidenced by digitization of land registry in Kenya, Ghana, Uganda and Lagos in Nigeria. Fourthly, the passing of REIT legislation in South Africa, Kenya and finally contracts enforceability improvement as well as professional standards of real estate agents. In East Africa, Tanzania is regarded as one of the markets that has high potential to appear in the top 10 in the near future as legislation is underway for the transparency scores, (JLL, 2015). East Africa presents a stable real estate market for investors, (Jones Lang Lasale, 2016).

A report by PwC Asset Management 2020: A Brave New Global estimates that worldwide alternative investments, as well as real estate, will rise by 9.3% per annum to get to US$13 trillion by the year 2020. More than US$500 million within new real estate finances were listed on stock exchanges in Africa in the 12 months up to September 2014 and over twice the total number of projects were in the phase of development within the similar period compared to the year 2012. As per the African Economic outlook, 2015, Africa's population of 1 billion in 2010 should double by 2050, although the magnitude of the increase will vary across the continent. African countries will account for approximately 24% of the population worldwide by the year 2050. By the year 2014, 40% of the Africans populations were urbanized. The global average during the same time was 54%; by the year 2030 this will raise to 47%, furthermore, by the year 2050 approximately 56% of the population will be urbanized. This will be as a result of 400 million citizens within Africa moving to cities from rural areas.

Since triumphant cities attract increasingly citizens, the price of key urban real estate per square meter will keep on rising. The huge variance in demand as well as supply of homes will create a major opportunity for developers of real estate. Affordability will reduce, resulting to bigger urban density as well as smaller apartments. According to the Business Monitor International (IBM), (2014), the sector of real estate in Nigeria is growing at a faster rate as compared to the average GDP at a rate of 8.7% (growth of GDP at 7.4%) which is motivated by a growing demand of middle-class driving for development of residential property plus, indirectly, industrial, retail as well as development of commercial real estate.

The real estate industry value in 2015 was US$bn 11.36 and it is expected to grow to US$bn 16.45 in 2016 accounting for 45% increase in property value. It's predicted that there exists a deficit of 17 million housing units within Nigeria alone, having a grant requirement of approximately US$363 billion. This is an indication of the expected investment and growth in the real estate sector.

1.1.3 Major Infrastructure and Construction Projects across Africa

Night Frank's Africa Report to the Nations, Knight Frank, (2015) a report of the Africa's major infrastructure and the key mega projects driving the real estate development in Africa reports that Africa has turned out to be a world's real estate market continent of growth and opportunity. The fast growing African economies are attracting the attention of raised numbers of corporate occupiers as well as property investors.

The region of Africa is no longer viewed as a region of durable economic distress, but is progressively more viewed as a continent of prospects for the year 2015 to 2020. An example include the New Suez Canal in Egypt which aim at the building of a second channel of the Suez Canal, that will run corresponding to the already existing canal for about 72 km. Existing facts point that this is anticipated to twofold the capacity of shipping of the watercourse. This is a component of the larger Corridor Area Project of Suez Canal which predicts the creation novel industrial zones, development of urban about the canal as well as improved transport infrastructure creation. Closer to East Africa is the Grand Ethiopian Renaissance Dam which is estimated to cost around US$4.1 billion.

This mega Ethiopian project of building a hydroelectric dam with 170m tall across the river Nile is owing for completion in the year 2017 and is said to be the largest hydroelectric power plant in Africa when built, having a generating capability of 5,250 megawatts of electricity. In addition, Addis Ababa – Djiboiti Railway project, a 337 Km railway line is aimed, significantly get better landlocked Ethiopia's access to Djobouti port is planned to complete by ending of 2016.

In this list also is the highly published LAPSET Project in Kenya. Transport Corridor i.e. LAPSSET project intends to construct a corridor of transport which connects a new port at Lamu in Kenya, with Ethiopia and South Sudan. This project entails the construction of a port as well as oil refinery at Lamu, new networks of rail and road, oil pipelines and airports. In addition, the construction of a Mombasa-Nairobi-Kampala-Kigali-Juba Railway is also underway and will be on a standard gauge railway linking Nairobi city and the Kenyan port of Mombasa. It is cited as the primary phase of a designed network which will ultimately as well offer connections to Kigali, Juba and Kampala; the capital cities of Rwanda, South Sudan and Uganda. In Kenya, the city of Konza Technology, a planned city, that is situated 60 km south of Nairobi, Kenya is also in the listed of mega projects in Africa. It's envisioned as a focal point of Africa's growing sector of technology, providing approximately 100,000 careers by the year 2030.

In Tanzania, Bagamoyo Port construction is cited as one of the key mega projects by the Tanzanian government and is on course and is Chinese-financed to the tune of US$11 billion. The port of Bagamoyo within Tanzania, that could be the largest port in Africa, will allegedly have the capability to handle about 20 million containers per annum, with its first phase predicted to be completed in the year 2017.

Subsequently, Grand Inga Dam found in Democratic Republic of the Congo, is intended to bind the huge Congo River hydroelectric potential, and would be the biggest hydropower scheme in the world. The project is comprised of six phases, eventually having a capacity of generating approximately 40,000 megawatts of electrical energy.

In Nigeria, Lagos- Calabar Railway, a national Chinese company has granted a contract of US$12 billion to construct a railway that stretches over 1,400 km along the Nigerian coast. This project is scheduled to run from west in Lagos to the east in Calabar, linking cities together with Port Harcourt, Aba, Benin as well as Warri City. Similarly, Eko Atlantic is a novel city district that is being constructed on 10 Sq Km of land presently being domesticated from the sea off the coast of Victoria Island within Lagos. Building has begun on the first buildings of the district, with the foremost residential tower anticipated to be finished in the year 2016. Ultimately, it's predicted that Eko Atlantic will be residence to approximately 400,000 inhabitants. In West Africa, Cotonou-Niamey-Ouagadougou-Abidjan Railway is under construction, and it connects Ouagadougou and Niamey, the capital cities of landlocked Burkina Faso and Niger, with the Cotonou and Abidjan ports, in Benin and Côte d'Ivoire. This project involves the laying of 1,200 km of novel track as well as the rehabilitation of 1,800 km of lines that exists.

These mega projects point that, Africa as a continent has not only continued to be an investment hub but also that these projects will drive the demand for real estate growth including among others, residential houses. Table 1.1 presents the summary of the returns for the real estate investments in East Africa.

It is evident that office investment yield are highest in Tanzania, closely followed by Uganda and Kenya, making Kenya the least attractive in terms of office investment in east Africa. In addition, the Table shows that in terms of retail investments, Kenya and Tanzania compares well but Uganda remains the most attractive in terms of yield percentage. Kenya has the lowest yield in terms of industrial investment while Uganda is the most profitable.

Residential real estate investment in Kenya compared to Tanzania, where investors in residential real estate earn an average of 6% return in spite of the fact that Tanzania population in the capital City, is way above that of Kenya by 28.5%. Overall, Uganda real estate investors earn a higher yield irrespective of the type of real estate investment compared to Kenya. Other statistics indicate that Kenya is a world's top rank in terms of growth of the real estate market transparency. This contrast beg the question, are the returns of real estate market driven by objective market fundamentals? Based on these statistics, the answer is obviously negative. The fact that Kenya and specifically Nairobi, with the lowest residential investment returns is the fastest growing, could be a pointer that investors in real estate are not driven by sound and rational behaviour in making investment decisions.

Table 1.1: Real Estate in East Africa and REI Profile

Characteristic	Kenya	Tanzania	Uganda
Office Investment Yields (%)	8	9.1	9
Retail Investment Yields (%)	10	10	13
Industrial Investment Yields (%)	8	10	13
Residential Investment Yields (%)	6	6	9.5
Country Population – Million	45.0	44.9	34.9
Capital City Population	3.5	4.5	1.7
Global Competitiveness	136	131	150

Source: PwC, Africa Real Estate Market, 2015.

1.1.4 Real Estate Investment in Kenya

The Kenyan real estate market has delivered greater price stability than all of international markets surveyed – US, UK, UAE, Hong Kong, India, Australia as well as South Africa. The most outstanding feature is that the Kenyan market remained resilient and maintained price stability during global recession (Hass Consult, 2015). This can be attributed to rapid increase of the Kenyan population and vast interest in the market of real estate by MNCs.

Real estate contributes about 8% to GDP with an average growth rate of 4.1% per year (RoK, 2015). Real estate sector's contribution to GDP is way ahead of Wholesale and retail Trade (7.6%), Education (6.9%), Transport and storage (6.6%) and Finance and Insurance (5.9%). This means that it's one of the major sectors in the Kenya Economy. Economic survey, a key report by the Republic of Kenya indicates that construction registered an accelerated growth of 13.1% between the year 2013 and 2014 (RoK, 2015).

The index of reported private building works completed in Nairobi City County rose from 321.3 to 341.4 in the same period. During the same period, the public building works completed in the Country reduced from 103.7 in 2013 to a low of 61.4 in the year 2014. Cement consumption, a key indicator of the building and construction industry grew by 21.8% in 2014 to stand at 5,197 thousand tonnes. These statistics point towards one fact, that building in the private sector has been on the rise in the recent past, and that the private sector dominated the building and construction sector.

The Central bank of Kenya reports indicate that the credit extended to the building and construction sector went up by 13.6% to 32.4%, that is, from KSh 70.8 billion in 2013 to KSh 80.4 bilion in 2014. The sole factor contributing to this rise was the increased financing of real estate development (CBK, 2015). These highly interrelated statistics were mainly driven by the rising demand for housing in Nairobi and also the demands for new offices in the Country (Rok, 2015). In terms of domestic credit, real estate and households account for over 26% of the gross National Domestic credit, implying that these sectors are the key derivers of Credit in the Country (CBK, 2014).

Further statistics from the financial sector indicated that in terms of sectoral distribution of loans, real estate alone accounts for a significant 14.4% of the total loans in Kenya. These statistics exclude building and construction sector which accounts for 4.6% and household accounting for 24.8%. It is generally known that the cited three sectors are closely related and are or could be expected to drive the real estate development, it could therefore be concluded that the real estate sector could possibly account for a significant 43.8% of the loans in Kenya.

Further statistics from the Central Bank of Kenya, the sole regulator of the commercial sector of banking, indicate that real estate sector in the 4th largest borrower in Kenya (CBK, 2015). Between the years 2010 and 2016, there has been an important growth in real estate development, driven by rising demand for both office and residential houses (PwC, 2015). These are largely financed through mortgages and private borrowings by developers.

While the commercial banks play a major function in assessing the credit worthy of the projects, in terms of capacity to pay and timelines of repayment, there has been a worrying trend in terms of loan repayments, casting doubt as to whether the borrower's projections are realistic. For example, real estate alone accounts for over 12% of the Non Performing Loans (NPL) in Kenya, followed by building and construction 9.4% and household with 9.1%. These statistics indicate that the three sectors alone account for over 30% of the NPL in Kenya. These numbers are not only worrying but it implies that they have the capacity to bring the financial sector to its Knees. This contrast in loan repayment points to inadequate returns and begs the question as to whether the investment decisions of real estate investors are driven by objective market fundamentals? At the global arena, the Kenyan real estate market is the world's top transparency improver. This is according to the JLL transparency report (JLL, 2015). This global report points that Kenya's real estate market has notably increased in the past two years, evidenced by the growing attractiveness of the country as a Foreign Direct Investment (FDI) destination with flows increasing by 98% in the year 2013 alone.

The reports further indicate that one of the major drivers of this is the responsibility of Nairobi city as a regional commercial as well as the hub of transportation which has triggered construction in the County. Similarly "Kenya Vision 2030", a national long-term development blueprint with its flagship projects, Konza City, Garden City, Two Rivers and exponential growth of SME parks are among the recent project that could account for the growth. Kenya has between the years 2013 and 2016 become the host of the largest retail space in east Africa, The Garden City. Kenya registered two (2) Real Estate Investment Trust (REITs) between 2013 and the year 2014, Centum Asset Managers Limited as well as UAP Investments Limited respectively. Other upcoming REITS include Stanlib Kenya Limited, Fusiin Investment Management Limited and CIC Asset Management Limited.

Despite this, global reports indicated that Kenya's real estate market remains a challenging one. The sole reason for thus is the limited market data on the performance of the real estate markets in Kenya. While Kenya Property Developers Association (KPDA) maintains the most detailed data for the residential sector, the information for the office, industrial and retail markets remain significantly scanty (JLL, 2015).

1.1.5 Profile of Real Estate in Nairobi Kenya

Nairobi has an estimated population of 3.5 million, closely followed by Mombasa with an approximated population of 1.2 million and thirdly Kisumu with 1.0 million. The prime rentals yields for offices, retail investments and industrial investments are on average 8%, 10% and 8% respectively (Knight & Frank, 2015).

Further statistics indicate that although there are over supply of executive houses in Kenya, there remains an acute shortage of middle-income residential houses, owing to demand for those houses outstripping the supply in Nairobi and Mombasa unique to Kenya, the interest rate for Mortgage houses is way above the annual yields for such houses. Statistics indicate that the categories of real estate investment in Kenya are office premises, retail premises, industrial premises and residential premises. Except for the residential real estates, the rents are quoted on the basis of currency per month, all the other real estate investment rents are quoted in terms of currency per square meters per months.

In Kenya the practice is that the average lease period is six years, with payments of quarterly in advance. Rental escalations are on average 7.5% per year and is among the very few counties where subletting is not permitted by lessors but this is similar practice is Kenya, Uganda and Tanzania. The service charges average between 20% to 30% of the rent paid. Commercial properties attract a 165% Value Added Tax in case of commercial properties and a withholding tax of 10% in case of residential properties. Other occupational costs include internal repairs and external repairs and repair of common parts where the tenant and land lord are responsible respectively. In terms of transaction costs, agency fees is payable at the rate of 4% to 4.8% of the annual rent for new leases and 2.5% of the annual rent for renewal leases. Legal fees are paid by the tenant. Similarly, a stamp duty is paid at the rate of 2% of the collective total of the average rent over a period of six years in addition to the charge of service for one month for one year. Despite the very promising and potential investment market in Kenya, there is hardly any exhaustive study, testing the behavioural biases of real estate investors in Kenya.

1.1.6 Role of Behavioural Biases in real Estate Investment

One fundamental question remain unanswered, is the real estate market free from behavioural biases? Experimental evidence in the literature of behavioral finance indicate that persons don't behave reasonably. For example, Barberis and Thaler (2003) gives an excellent models summary which attempt to clarify the puzzle of equity investment premium, excessive trading, excess volatility , predictability of stock return by use of both Prospect Theory of Kahneman and Tversky (1979) as well as beliefs. The scrutiny that markets are not proficient and biases of investors affect the prices of assets considerably has been supported in literature (Daniel et al. 2002). Literature indicates that markets may not be competent or investors are not rational and as a result prices may considerably diverge from basic values because of irrational investors existence (Black, 1986; De Long et al, 1990; Shleifer and Vishny, 1997; Barberis et al., 2001; Hirshleifer , 2001; Daniel et al. ,2002; Subrahmanyam, 2007).

Survey data of investor optimism that was carried out by Gallup during the period of 1998 to 2002 was used by Vissing-Jorgensen (2004) and revealed that irrational behaviour (for instance self-attribution bias, representativeness heuristic, effect of disposition, status quo bias as well as under-diversification) are weaker for other complicated investors (experience of investor and wealth used as substitutes for investor complexity). Based on his findings, Vissing- Jorgensen hence recommended that behavioural biases have an effect on several investors less than other investors. Since biases may considerably affect the prices of stock, it's key to understand the factors that affect unfairness. Persons in different cultures/ societies might have behavioural biases that is different which might affect their monetary decisions (Fan and Xiao, 2005; Statman, 2010).

Most of the literature on the behavioural finance studies individual investors within developed markets for instance UK, Western Europe and USA. Literature reveals that Turkish citizens are more socialist as compared to UK, Western Europe and USA (Hofstede, 2001). In addition, the index of ambiguity avoidance, which captures the society tolerance for ambiguity as well as uncertainty, is high amongst the citizens of Turkey. Since Turkey is an upcoming market, furthermore, there exists differences in the culture as compared to UK, Western Europe and USA, it's worth studying individual investors in Turkey based on behavioural biases they display. If citizens in Turkey vary from those within the countries that are developed, the behavioural biases of individual investors in Turkey might vary from the results within the literature.

Most of the study in behavioural finance literature is based on information that is usually limited to the overall investor groups subsamples in the countries involved. The current study is exceptional in the sense that, even though there exists numerous studies by use of countrywide information (either in markets that are developed for instance Finland, or in markets that are emerging for instance Taiwan) to examine a specific bias, up to our understanding no study centers on countrywide data to study various biases. It's as well interesting to examine individual investors in Turkey as Istanbul Stock Exchange (ISE) has precise distinctiveness. ISE is a constituent of Federation of European Securities Exchanges (FESE) as well as World Federation of Exchanges (WFE).

The body with the uppermost turnover ratio amongst stock markets in the world is Japan Financial Services Agency ISE, which might be associated to the biases amongst stock investors in Turkey. ISE is the 5th uppermost stock market in terms of the ratio of turnover after Italy, Republic of Korea, China as well as USA (World Bank, 2011).

In ISE, the trading volume is comparatively high and provides investors with a liquid market. Even though foreign investors hold approximately 65% of the total free float in ISE, they comprise only approximately 15% of the trading quantity. Investors that are foreign in most cases prefer ISE30 as well as ISE100 (a chief benchmark) stocks, which have capitalization of high market, high liquidity plus they are delegate of regions they operate. Liquidity as well as trading volume is regularly provided by individual investors locally.

This study seeks to focus on four behavioural biases; Heuristics, Prospect, Herding and market drive biases. One of the crucial considerations in investment is investors' financial literacy. Financial literacy constructs of, the ability to make educated decisions about using money in the present and in the future has popularly been used to assess its moderating role in investment decisions (Hetling & Postmus, 2014). Similarly financial literacy has also been argued that it refers to an individual's ability for money management (Remund, 2010). Monetary literacy benefits the consumers in making decisions about investment by allowing them to increase the returns on wealth (Jappelli & Padula, 2013). Prior literature is showing the facilitating role of financial literacy with behavioural factors and investors' decision making. Hence this study wants to explore the function of financial literacy in real estate market within Kenya.

1.2 Statement of the Problem

Real estate sector contributes over 8% to GDP in Kenya. This contribution to GDP is way ahead of wholesale as well as retail trade sector having a contribution of 7.6%, Education 6.9%, transport and storage sector 6.6% and finance and insurance 5.9%. The average growth rate is estimated to be 4.1% per year. Further statistics in Kenya indicate that this sector ranks top five out of the twelve sector categories in the Kenyan Economy. Sector wise, real estate registered an accelerated growth of 13.1% in the construction industry alone in the year 2014. These statistics mean that it is among the major sectors in the Kenyan economy. Cement consumption, a key indicator of the real estate growth industry rose by 21.8% from 2013 to 2014 to stand at 5,197 thousand tonnes, implying that the consumption could double in five years as real estate development grows. Statistics from the Central bank of Kenya, the key regulator of financial the sector in Kenya report that the credit extended to the building and construction sector rose from KSh 70.8 billion in 2013 to KSh 80.4 billion in 2014, a significant rise of 13.6%.

Further, residential real estate investments in Kenya earn lower returns compared to Tanzania, where investors in residential real estate earn an average of 6% return in. Overall, Uganda real estate investors earn higher yields irrespective of the type of real estate investment compared to Kenya. These contrasts beg the question, are the returns of real estate market driven by objective market fundamentals? The fact that Kenya and specifically Nairobi, with the lowest residential investment returns is the fastest growing, could be a pointer that investors in residential real estate are not driven by sound and rational behaviour in making investment decisions. It could be argued that the mainly reasonable explanation for the theatrical raise in real estate prices cannot be found in investment finance fundamentals.

This could point that real estate investment are to a great extent, driven by the consumers' behavior as well as financial institutions rather than cash flows from investments. A study that informs which behavioural biases drive investment in real estate in the Kenya real estate investments would most possible explain the inconsistent investment behaviour in Kenya. This study therefore focused on the role of heuristics bias, prospect bias, herding bias and market based factors investor bias in real estate investment in a developing country Kenya. It could be disputed that monetary literacy is one of the explanations for the bias. This study as well assessed the moderating function of financial literacy on the relationship among the behavioural biases as well as real estate investment in Kenya.

1.3 Purpose of the Study

The purpose of this study is to explore the effect of behavioural biases of real estate investors and investment performance, Kenya with the aim of assessing if it is indeed unique to the financial markets which have been the focus of many researchers in the past.

1.4 Research Objectives

This study was guided by one general objective and five specific objectives

1.4.1 General Objective

The main objective of this study was to explore the behavioral biases of real estate investors and the moderating role of financial literacy on the selected investor biases and investment performance in Kenya.

1.4.2 Specific Objectives

Based on the general objectives of this research, the study pursued the following specific objectives:

i. To explore the effect of Heuristic based behavioural biases on the performance of real estate investment in Kenya.

ii. To analyze the effect of prospect based behaviour biases on the performance of real estate investment in Kenya.

iii. To examine the effect of investment behaviour based on herding on the performance of real estate investment s in Kenya.

iv. To evaluate the effect of market factors based behaviour biases on the performance of real estate investment in Kenya.

v. To assess the moderating effect of financial literacy on the relationship between real estate behavioural biases and investment performance in Kenya.

1.5 Study Hypotheses

From each of the study's specific objectives, this study has developed the following research study hypothesis.

$H_0$1: Heuristic driven behaviour biases have no effect on real estate investment performance in Kenya.

$H_0$2: Prospect based behaviour biases have no effect on investment performance of real estate investors in Kenya.

$H_0$3: Herding based behaviour biases have no effect on investment performance of real estate investors in Kenya.

$H_0$4: Market factors driven behaviour biases have no effect on investment performance of real estate investors in Kenya.

$H_0$5: Financial literacy has no effect on the relationship between the real estate behavioural biases and investment performance in Kenya.

1.6 Significance of the Study

This research is applicable to the following stakeholders;

First, the study is of importance to the government as it seeks to grow the economy through infrastructure development. Real estate is a major contributor to the country's GDP and therefore this study improves on literature that helps understand the significant factors that affect the real estate performance. This study cites the important role played by real estate investors in providing livable and functioning cities for a growing urban population and helps the government plan for the provision of adequate and decent housing facilities.

Further, this study is beneficial to commercial banks through a deeper understanding on the contributing factors to loan defaults by investors in the real estate sector. The Central bank of Kenya reports indicate that the credit extended to the building and construction sector went up by 13.6% to 32.4%, that is, from KSh 70.8 billion in 2013 to KSh 80.4 bilion in 2014. At the same time a significant percentage of loan defaulters come from the building and construction industry standing at 13%. This research adds value to existing body of knowledge as it develops insight on the role played by behavioural biases in real estate decisions made loan defaulters in the real estate.

1.7 Scope of the Study

This research covered the individual real estate investors in Kenya. The level of analysis in this study was therefore the investors who have enlisted Estate Agents that are registered which have renewed their practicing certificates as at 31st March 2015 with the Estate Agents Board of Kenya. There are several behavioural based biases among the investors. This study covered the five selected investor biases based on Heuristics, Prospect, herding, market factors and excludes all behavioural factors. This study further investigated the moderating effect of financial literacy on the association between investor biases as well as the performance of real estate investors in Kenya. Nairobi is selected for the fact that it is cited as one of the Africa's fastest growing City with over 3.5 Million dwellers, and continues to be a center of attraction for mega projects in sub-Saharan Africa, (Knight and Frank, 2015). Nairobi is located in Kenya; one of the Africa's Countries recently upgraded a middle income status based on a GDP recalculation.

1.8 Limitations of the study

Investments are generally categorized as financial assets, Real assets or financial derivatives. This study focused on real assets investments. Similarly, there are several categories of real asset investments, that is, Industrial real estate, Commercial real estate, retail real estate and residential real estate investments. This study covered all real estate investments. Behavioural finance nomenclature categorizes behavioural biases into several categories that include, Familiarity Bias, Overconfidence Bias, Loss aversion, Confirmation bias, Hindsight Bias, Achoring Bias, Regret avoidance bias, mental accounting, Herding behavioural bias, Heuristics Bias Prospect based bias, and market based bias. This study focused on the last four of the indicated behavioural biases.

1.9 Assumptions of the Study

This study is premised on the assumption that the real estate development professionals, specifically the real estate managers provided relevant and reliable information regarding the variables of this study. In addition, this study assumes that the population enlisted from the Nairobi County, Kenya is representative of the noted growth of real estate in Kenya. Similarly, this study has relied on constructs developed from existing literature and therefore assumes that the same have high and adequate construct and content validity. This study also assumes a clear understanding by the real estate managers and that the responses provided are meaningful to enable reach sound academic conclusions for each of the study variables.

1.10 Definition of Terms

Behavioural finance: Refers to the study of the influence of psychology on the financial practitioners behaviour as well as the consequent effect on markets

Overconfidence: Overconfidence is the tendency of people constantly overrating their abilities in a variety of activities (Mercer Consulting, 2006)

Herding Bias: According to Hirshleifer and Teoh (2003), herding in financial markets is joint imitation resulting to a junction of action

Loss aversion: Loss aversion is the belief that investors experience higher disutility from a loss than from an equivalent gain or profit (Dargham, 2009)

Heuristics Bias: Heuristics refers to easy rules of the thumb that explain how citizens make decisions, arrive at judgments as well as resolve problems when faced with complex situations or in cases where the available information is incomplete (Kahneman, 2011)

Prospect Bias: Prospect bias is the clear irregularity in individual behaviour when evaluating risk under doubt and an imperative asymmetry of human choices indicating that losses are prejudiced more greatly than equivalent amount of gains (Kahneman and Tversky, 1979)

Real estate: Is described as land, together with the air above it as well as the ground below it, and any structures or buildings on it. It's as well described as realty. It covers commercial offices, residential housing, trading spaces for instance hotels, restaurants and theatres, retail outlets, industrial buildings for instance government buildings and buildings, fences, roads, wells and other site improvements that are immovable.

Real Estate Agents: Licensed professionals who represent buyers and sellers in real estate transactions.

Anomaly: Anomaly is defined as a divergence from currently accepted paradigms that are too widespread to be ignored, too fundamental to be accommodated by relaxing the normative system" and too systematic to be dismissed as random error, Tversky and Kahneman (1986)

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter evaluates both theoretical literature in the popular behaviour biases of investors, and the empirical literature on behaviour biases and performance of real estate investment. The study also reviews empirical literature on the function of financial literacy in moderating the association between the study predictors and the predictand. This chapter further develops a conceptual framework, research gaps on behaviour biases in real estate investors. Finally, the chapter contains a critique of the various perspectives of the role of behaviour biases and investment.

2.2 Theoretical Review

Behavioural economists have borrowed information of human being cognitive behaviour theories from, sociology, anthropology as well as psychology in bid to clarify the different irrational investor behaviour in the investment markets. This study was guided by four theories, Prospect theory, Herding Theory, Regret Theory, Market Theory. The discussion of each of the theories is presented in section 2.2.1 to section 2.2.4.

2.2.1 Prospect Theory

According to Prospect theory, if a shareholder is risk-averse over achievements, as such he ought to sell a security which is trading at an achievement anchored to the purchase price; also if he is risk seeking over losses he ought to be motivated to grasp on a security which is trading at a defeat (Kahneman and Tversky, 1979).

Basically, the prospect theory elucidates the obvious irregularity in being behaviour when evaluating risk underneath doubt. Ideally this is not an indication of 'irrationality' but it is imperative to recognize the asymmetry of human choices; however this is an indication that losses are prejudiced more greatly than equivalent amount of achievements. The interpretation is that losses harm more than achievements satisfy therefore shareholders will be risk reluctant when selecting between risk and gains takers when selecting between losses.

Kahneman and Tversky (1979) came up with issues of anomalies and contradictions in human behaviour. They demonstrated that when investors encounter a choice formulated in a particular way they might demonstrate tendencies of risk aversion and once the same choice is rephrased in a different way then, the investors' exhibit risk seeking behaviour. For example, when investors are given a choice between receiving KSH.1000 with certainty or a 50% probability of getting KSH. 2500, they may well select making the KSH. 1000 in preference to the uncertain chance of getting KSH. 2500. This is a seemingly sensible attitude that is described as risk-aversion. However, Kahneman and Tversky recognized that when the same individuals are presented with a 100% probability loss of KSH. 1000 versus a 50% chance of zero loss or a KSH.2500 loss do often choose the risky alternative. This is a suggestion of risk-seeking character. Had the individuals answered rationally, they would have been consistent in their choices thereby choosing certainty in either the gain or loss scenarios and if they chose 50% chance of getting KSH. 2500 then they'd also choose 50% chance of zero loss or a KSH.2500 loss. The most core component of the theory of prospect is the function of S-shaped value illustrated in Figure as shown below:

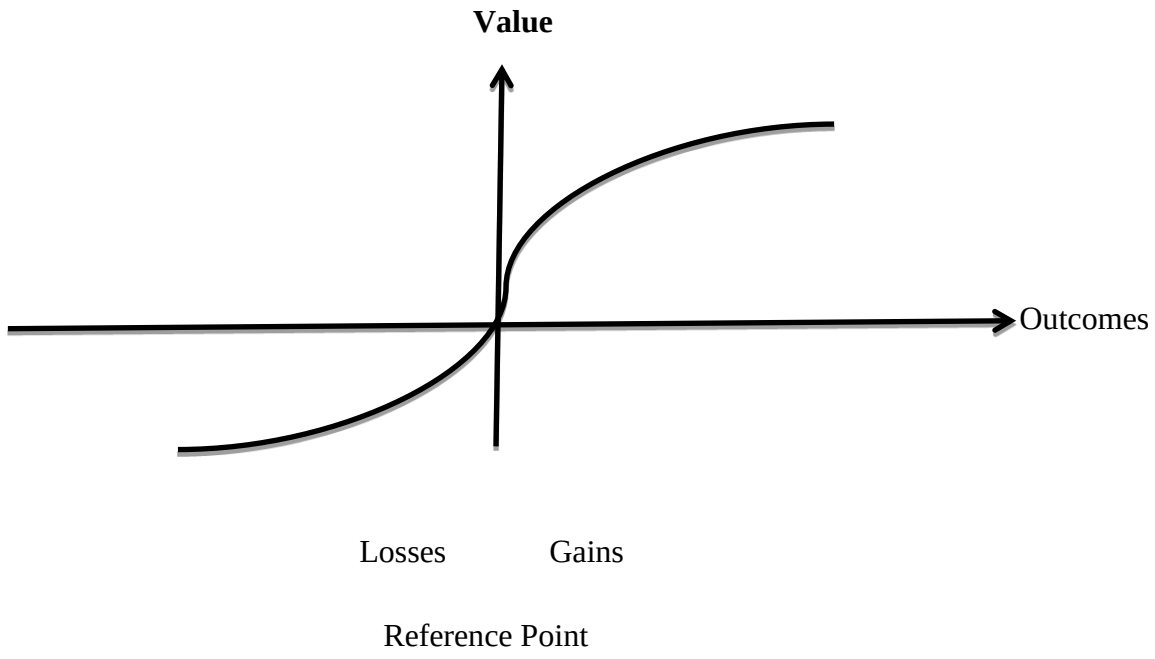

Figure 2.1: S- Shaped value function of Prospect Theory

Source: Kahneman and Tversky (1979): **Prospect Theory Value Function**

Within the area of gains the shape of the function is concave whereas it is convex in the region of loss, an indication of risk dislike in the area of risk and gain seeking in the area of losses. A motivating characteristic of the function of value is that it is steeper at the point of reference. This means that when the distance to the point of reference is great then a given variance in losses or gains, has a lesser effect on the experienced value by a security holder. The basis of theory of prospect is that, when persons are faced with gambles or situations where they have to make tough choices, they calculate the losses as well as gains for everyone and pick the one with the uppermost potential usefulness. Considering a financial context, this proposes that stockholders might choose a collection allocation by calculating, for every allocation, the possible losses and gains in the value of their assets, and after that taking the share with the uppermost potential utility.

An additional key factor of the theory of prospect is the function of weighting: Each outcomes value is multiplied by the decisions' weight. The weight of a decision measures the influence of events on the attractiveness of a given investment. These weights are not probabilities and usually they don't total to unity. According to Kahneman and Tversky (1979) such property is referred to as sub-certainty. Weights of decision are usually regressive with respect to factual probabilities, meaning that preferences are less receptive to disparities in probability as compared to coherent benchmark would propose.

The theory of prospect describes numerous mind states that could be imagined to influence an individual's processes of decision-making. However, even if prospect theory offers no psychological explanations for the processes stated in it. Furthermore, factors that are equally important to decision making processes have not been included in the model, such as emotion. Therefore this theory does not fully serve as a basis for rational decision making.

2.2.2 Herding Theory

Concerning financial markets, the term herding is typically termed as the behaviour of a shareholder emulating the observed events of others otherwise the market movements rather than following his/her own information and beliefs (Kudryavtsev, Cohen & Hon-Snir, 2013). Herd behaviour is possible amongst the mainly mentioned but less understood term in financial glossary. Difficulty in quantifying as well as measuring the being of the behaviour forms obstructions to broad research. Nonetheless, there exists at least two points citizens tend to unanimously concur upon. Foremost, as one of the origin pillars in the recently developed behavioural area of asset pricing, herd behaviour aids clarify market-wide irregularities (Kudryavtsev, Cohen & Hon-Snir, 2013).

Because human being biases are not powerful enough to shift returns as well as market prices, they only have actual irregular effects if they create communal contamination with a tough touching content, that leads to more extensive phenomena for instance herd behaviour, subsequent, it is normally accepted that the herding flood might result to a condition in which the price of market fail to reproduce all applicable information; therefore, the market turn into unstable as well as moves towards incompetence (Kudryavtsev, Cohen & Hon-Snir, 2013).

Decisions made by a single shareholder which are prejudiced by the decisions of other shareholders are usually affected by the behavior of herding (Hott, 2009). As a result, all the decisions of investment that are not exclusively based on the financial information of a given corporation or an industry field ought to be interpreted by the use of the Theory of Herding. The greater part of researchers as well as economic journalists concurs that unreasonable investment behaviour has an effect on capital markets. Nevertheless, the opinions concerning the impact level as well as its nature differ. Literature has shown that the major issue unreasonable investment decision-making results to is distortions of money market (Shiller, 200; Welch, 2000; Shleifer, 2000; Lu, 2010; Lawlor, 2009; Singh, 2012). Herding behaviour is particularly concluded to result to a chain of deceptive information fuelling the irregularities on capital markets. According to Welch (2000), the behavior results to a "snowball-effect" which is not easy to stop.

2.2.3 Regret Theory

The theory of regret is a significant theory of decision under doubt (Bell, 1982; Loomes and Sugden 1982). This theory has spontaneous appeal, and it's based on the view that human being do not care not only about what they get but also about what they could have gotten if they had a made a different choice.

Several literatures have shown the significance of regret in shaping the preferences of people under risk (Zeelenberg et al. 1996; Zeelenberg 1999; Larrick 1993). The theory of regret has a comparatively simple arrangement, which is based on only two functions: a function that captures the impact of regret and function of utility that captures attitudes toward results.

Despite its straightforward structure, the theory of regret can account for numerous of the observed divergence from expected usefulness. The important to giving details to such deviations is that makers of decisions are regret reluctant, the psychological perception that human being are disproportionally reluctant to big regrets. The regret theory unique feature is that it forecasts breach of transitivity. Such breaches are a consequence of aversion of regret. The breaches have been established experimentally (Loomes et al. 1991) furthermore, they cannot simply be contained by the other major nonexpected theories of utility, together with theory of prospect (Tversky and Kahneman 1992; Kahneman and Tversky 1979).

The theory of regret as well has implications of real-world and can give details on field data which is incompatible with probable usefulness. For instance, Braun and Muermann (2004) apply regret to insurance decisions, Barberis et al. (2006), Gollier and Salanié (2006), and Muermann et al. (2006) to decisions of finance, FelizOzbay and Ozbay (2007) and Engelbrecht-Wiggans and Katok (2008) to auctions and Perakis and Roels (2008) to the model of newsvendor. An explanation to this rolling interest in regret is the complexity that other nonexpected models of utility have in giving details about various field data. For example, the effect of disposition is extensively documented finding that shareholders appear unwilling to appreciate losses but are enthusiastic to appreciate gains.

It was normally considered that the effect of disposition might be explained through loss aversion, although the theory of prospect has been shown to have difficulty explaining it (Hens and Vlcek, 2006; Barberis and Xiong, 2009). Muermann and Volkman (2007) have revealed that by contrast, the theory of regret is reliable with the effect of disposition provided that human being is regret reluctant. In the analysis of regret theory a critical issue that comes up is that the pair wise choices brought about by the theory are intransitive. Therefore, this means that a person with preferences of regret theory is open to exploitation by a "money pump" by use of consecutive pairwise choices over three or else more forecast. Money pump of such kind would authorize the person's wealth to be driven to nil, given adequately a great deal of iteration. In the original article of Loomes and Sugden, it has been revealed that in this situation, individual with preferences of regret theory will take the whole choice set into explanation and will, consequently, not be susceptible to a money pump.

The problem of money bump can most excellent be assessed in the situation of a regret theory version that covers numerous, other than pairwise choices. The lone supposition additional to those forced in preceding presentations of the theory of regret is that choices must not be prejudiced by the alternatives availability which is dominated by statewise. It has been revealed that anybody whose choices are prejudiced by such evidently substandard alternatives is exposed to exploitation in the "money pump" form. If insignificance of statewise dominated options holds, it's revealed that regret have to be established exclusively by the most excellent achievable outcome in every state of the globe.

The universal form anticipated here does allow choices to be prejudiced by the actions availability which are dominated with regret, in a way that there is an additional action in the choice determined which could be chosen by every individual with preferences of regret-theory.

When a shareholder values current information over an institutions historical data anchoring theory is also useful. Investors who are not educated are most likely to have tendencies of anchoring. According to Singh (2012:116), the information which is utilized in decision-making is frequently gotten from informal sources such as web sites, magazines etc. Most of the unreasonable behaviour is clarified by greed as well as fear (Finkelstein and Greenwald, 2009:48). The ordinary advice for shareholders is to purchase low and trade high. Though, standard shareholders have propensities on behaving precisely on contrary. The investors usually purchase trendy stocks only. In most cases stocks that are trendy speedily lose their worth. Once this happens investors cling to their value-losing securities until when they cannot endure the difficulty. The act of irrational is to trade value while losing securities for an unbeneficial value. In the above mentioned example, the accurate resolution is to hold the value while losing stock and invest additional in them. After a while this kind of thinking will be helpful to the shareholders because their investments will achieve value.

A limitation of regret theory, as of any intransitive theory of binary choice, is that it is unclear how to extend the theory to choices among three or more actions. Further this theory disregards the fact that feelings of regret are part of life and that it is irrational to ignore them making investors less tolerant and more paternalistic about such feelings.

2.2.4 Market Theory

The role of market information on pricing of financial securities dates back to the 19th Century. Several scholars have been credited with shaping the techniques of assets valuation and use of information. Over the Century, two schools of thought have been developed (Bodie, 2005). On one extreme are those financial specialists to believe that information is irrelevant in valuation of security prices. These fundamentalist assume that investment prices take a random walk or a drunkard walk in which case then, it would be difficult to predict the return from an investment. There is a large convergence of opinion on the random walk theory Bachekier (1900), Cowels (1933), Kendall (1953), Roberts (1959). This implies that no one using either available or prospective information can determine the asset prices and that information available in the market is absolutely irrelevant. This is way contrary to available decision theory, which postulates that relevant and reliable information is crucial to sound decision making. However, in the event that this is not the case then, there could be market bias and inconsistencies based on this school of though.

On the other extreme in behavioural finance is the market efficiency Theorists. These positivists view that information is useful in evaluating and predicting asset prices. Fama (1965) developed Efficient Market Hypothesis (EMH) and in his view, it is impossible to rely on past information and make superior margins in the investment market. Based EMH, it is then possible to make better returns from using information, that is, past information, Publicly held information and also from insider information.

Fama (1970) affirms that a resourceful market is that market in which prices at all times completely reflect all accessible information. Jones (1993) and Shleifer (2000) stipulate that an efficient market can exist if there is existence of a big number of rational shareholders who participate actively in the market in the attempt to capitalize on profits and if irrational investors exist, then their irrational trades cancel each out without affecting the prices. The third and final assumption on EMH is that information exists freely and it is readily accessible to all participants of the market at roughly the same instance and shareholders react fast to this information triggering prices of stock to change accordingly.

EMH is separated into three segments; strong form, semi-strong form and weak form. Bodie *et al*. (2007) notes that in the efficiency of weak form, present prices of stock mirror all past data for instance past trading volumes and prices. This is consistent with the random walk hypothesis findings that one cannot make super normal profits by just analyzing past information. Efficiency of semi-strong form upholds that besides past information, information that is publicly available should be fully reflected in the stock price. Such publicly held information may include the firm's production line, accounting practices, stock split announcements, dividends, quality of management.

Strong form of efficiency states that prices of securities mirror all information together with the past, information that is publicly available in addition to all privately held information. Brealey *et al., (n.d.)* notes that prices in such a market could at all times be reasonable and that not even insider sellers can strike the market.

Based on this school of thought and the assumption of EMH, it is then expected that that in absence of market bias, those to make investment decisions using past information, publicly held information as well as insider information should earn higher returns compared to those who do not. Market Bias could either work in the real estate market to drive house prices in either direction. In skewed market information, that is, information that over emphasis volume of sales, location of houses, returns on investments and relevance of information in the markets.

Many factors would influence the decision regarding investment in real asset. Among these factors is the liquidity status of the investors. Liquidity theory demonstrates, when and how liquidity is a key function of investment. The theory of liquidity was established by Hicks. Nelson (1972) states that this theory forecasts that a term quality might be attained by investing capital in long term bonds since holders of bonds will need recompense for disclosure to fluctuations of capital. The liquidity preference theory illustrates that, investors are usually risk reluctant, have a preference to short term maturities plus they need a premium so as to entrust in securities that are long term.

The theory of Liquidity Preference confesses the significance of expected prospect spot rates, however, it provides more significance to the risk preferences effects of market contributors. Risk reluctant lenders are usually extra anxious towards the steadiness of principal other than the incomes stability. Additionally, it is said that widespread borrowers as well as lenders risk aversion and, does not restrain the expression structure in the way defined by the theory of liquidity preference.

According to Keynes (1936) liquidity preference is defined as the claim for money which is said to be liquidity. Money demand as an asset was hypothesized to depend on the foregone interest by not holding property. This theory disputes that the rate of interest cannot be a recompense for saving as such since, if an individual holds her/his saving in form of cash, keeping it won't receive any interest. The theory opines that the demand for as well as supply of money determines the interest. Liquidity preference has a meaning of the want of the public to grasp cash. Keynes reveals that exists three reasons behind the want of the people to hold liquid money: Motive of transaction: public choose liquidity to reassure fundamental transactions, since their proceeds are not continually available. The total quantity of liquidity claimed by public depends on the income level. The high the income the more money claimed for running improved spending.

Secondly, precautionary motive: public choose to have liquidity in the case of communal unforeseen problems that require extraordinary costs. The total amount of money claimed for this reason goes up as income goes down. Thirdly, Speculative motive: public hold on to liquidity to hypothesize that price of property will drop. It is expected then, that when the rate of interest goes down public demand more money to retain awaiting the rate of interest to go down, which could bring down the property price to maintain its yield in proportion to the rate of interest. Therefore, the lower the rate of interest, the more money claimed and the opposite is true. This theory offers a guide in determining why people or investors will hold money in liquid form and at what time they prefer to use the money. It is of importance in determining the issue of housing liquidity in the Kenyan real estate industry.

However the liquidity theory has some gaps. Firstly, it has been pointed out that the rate of interest is not purely a monetary phenomenon. Real forces like productivity of capital and saving by the people also play an important role in the determination of the rate of interest. Secondly the theory assumes that the rate of interest independent of the demand for investment funds. The cash-balances of the investors are largely influenced by their demand for saving for capital investment. This demand for capital investment depends upon the marginal revenue productivity of capital.

2.3 Empirical Review

According to Zikmund et al.,(2010) the term empirical literature review is described as a directed investigation of work that is published, together with books and periodicals that discuss speculation and gives experiential findings which are applicable to a given topic in hand. The available literature covers previous inquiries related to a research in question. Via the utilization of a orderly approach to preceding scholarship, review of literature permits a researcher to put her/his study into a historical as well as intellectual context helping the researcher affirm why their study is important (Miller and Kaifeng, 2008).

2.3.1 Heuristic Driven Biases and Financial Performance

2.3.1.1 Overconfidence

The examination of behavioural bias within the process of decision making has be conducted (Chira, Adams and Thornton, 2008). Unlike previous researchers this study was carried out on graduate as well as undergraduate business students' personal insight of bias and was meant to measure and evaluate behavioural faults students may slot in when making both non-financial and financial decisions. The study centered on excessive optimism as well as overconfidence, familiarity, and fallacy of sunk cost, loss aversion, confirmation bias, and an initial overview of illusion of control.

The findings of this study were that students were tremendously overconfident and optimistic when they are questioned to evaluate their ability of driving and performance of school/job but they are less hopeful about ability of investment or athletic ability. It implied that scholars are less likely to make the fault of being excessively optimistic and confident when there is additional impartiality implicated in making the evaluation. The study further revealed that scholars be likely to be as risk reluctant as the common people. This is especially right when there is financial loss/gain involved. Nevertheless, scholars are likely to be less risk reluctant regarding their grades and that the fallacy of sunk cost is living and well in college scholars when making decisions that are ex ante based. However, scholars' didn't show a propensity to be subject to the acquaintance heuristic. The study contributes to literature as it points out the relevance of the potential decision makers. However, this study however did not comprehensively explore other behavioural biases.

A study was done to examine the firms' determinants investment structure by introduction of a behavioural perspective. In this study a theoretical analysis was done and findings presented that emotional bias of CEO highlights responsibility (loss aversion, overconfidence, optimism) to give details on choice of capital structure. The analysis of data showed the importance of emotional biases of CEO in explaining the choice of capital capital structure (Azouzi and Jarboui's, 2012). Certainly, analysis of empirical relationship between the choice of capital structure and optimism reveals role of behavioural dimension in the explanation.

The level of CEO optimism is positively associated with a preference for debt and resources that are internally generated but negatively correlated with increase in capital. Optimistic of CEO is unwilling to inquire the market to keep away from being risk evaluated. According to Azouzi and Jarboui, (2012) the CEO prefers funding projects principally via internal capital debt and then lastly via external equity.

Additional results in the same study, is that boldness affects negatively the choice that is internally generated, equity as well as debt but it's positively associated with the debt choice as well as cash flow couple, and with the debt, equity and cash flow choice of combination. Overconfidence means that CEO aligns their option with the interests of the shareholders. Therefore, overconfidence of CEO usually overrates his skills to decrease the risks. Gervais et al. (2007) reports that this led him to prefer projects risk that is high which is in the importance of investors and boost the value of the firms. In order to finance its choices of investment, leaders who are overconfidence usually considers his organization undervalued by the limits of the market its emissions securities dangerous. Such leaders prefer primary resources that are internally generated (cash flow) and utilize combinations of capital structure.

Salzman & Zwinkels (2013) carried out an analysis of the effect if property market inefficiencies from a behavioural perspective in the UK. They explained this from two perspectives; the importance of housing as well as the different stakeholders within the market property. The review of both corporate shareholders and household showed that cognitive biases for instance over-confidence and over-optimism can clarify divergences from rationality.

This study also found that emotions as well as behavior are entrenched in the process of decision in the market of real estate either as an investor or a consumer is irrefutable and that the evaluator plays a vital role in determining prices of property: Real observed processes of appraisal mainly deviate from the agreed process of normative. Salzman & Zwinkels (2013) also found out that the nonfinancial consumer perspective in the market of housing highlights emotional attachment and residential mobility towards houses. This study by Salzman & Zwinkels (2013) contributes to literature as it points out the potential behavioural biases in real estate investments. However the study did not contribute on the relevance of financial knowledge in investment decisions. Similarly, this study was carried out in a developed real estate market and also in a developed economy.

Bashir, Rasheed, Raftar, Fatima and Maqsood, (2013) examined the influence of behavioural biases on decision making process of investors between female and male. The data collected was analyzed using two statistical techniques. The relationship of illusion of control bias with overconfidence bias, confirmation bias, loss aversion bias and familiarity bias was analyzed using correlation. To establish the significant difference between the replies of female and male about bias of overconfidence Chi-square was utilized. The findings of this research reported a weak negative association between other behavioural bias and overconfidence bias argued in the research. This research concluded that no significant difference existed between the replies of female and male decision making concerning bias of overconfidence. This research also concluded that merely a little percentage of employees and students were over confident when they were requested to evaluate their athletic ability, ability of driving, type of employee or student and performance of school/job but very optimistic about ability of investment as well as opportunity to substitute the previous examination failing scores.

Bashir et al (2013) also reported that, males are usually extra overconfident as compared to females whilst making both non-financial as well as financial decisions. Although this research concluded that no significant relationship existed between gender and overconfidence. From the section of respondents that were used, the majority of them were subject to delusion of bias of control and there exists a weak negative association between overconfidence bias and control illusion among respondents. Barely few respondents were exposed to bias of confirmation and there exist a weak negative association between bias of overconfidence and bias of confirmation. Majority of the respondents were exposed to bias of familiarity and there exists a weak negative association between bias of overconfidence and bias of familiarity. Respondents were exposed to bias of loss aversion when decisions concerns activities of job or investment related and not exposed to bias of loss aversion when decision concerns grades in examination. There was weak positive association amongst bias of loss aversion and bias of overconfidence. However this research does not take to account the respondents predisposition to finance knowledge that would impact on their decision making.

Bilgehan (2014) studied psychological biases and the capital structure decisions. He analyzed different cognitive as well as emotional biases among them, loss aversion, optimism, overconfidence and anchoring and their effect on the decisions of finance. He described irrational bosses to mean bosses whose decisions are affected by their behavioural characteristics. Bilgehan (2014) found that managers frequently are influenced by their behavioural characteristics as well as behavioural biases in the process of decision-making. Bilgehan also found that among all the behavioural biases, bias of overconfident is extra subjected as compared to others. Managers who are overconfident think that their organizations are valued in the value of market and they as well value the debt risk lover as compared to equity.

Such situation results to their level of debt higher than the rational bosses. Managers who are overconfident approximate the investment projects cost undervalued and approximate the projects value overvalued. Through extensive analysis this research contributes by ascertaining the psychological biases impact on decision making. Secondly this research also points out the most prevalent biases in decision making. However study does not state the significance of financial knowledge on decision making and how it impacts on the effects of behavioural biases.

Glaeser (2013) carried out an empirical analysis on the of investor rationality in the US housing markets. Using the "Gordonian" approach, which uses finance to establish the net present value of a property as well as the "Thunenite" approach which justifies prices by comparing local prices to the prices in similar geographic areas, Glaeser (2013) determined that investors acted irrationaly when making real estate investments. Studying the housing convulsions that occurred between 1996 and 2012 in the US, Glaeser attributes the rising real estate prices to the optimistic expectations where investors paid high prices with an optimistic assessment of future price growth. He noted that Americans speculated heavily on real estate and they paid high prices with optimistic expectations with the support of the credit market. Through extensive review of literature, Glaeser (2013) found that the optimistic projections fail to materialize due to the investor inability to forecast and the emotional expectations. The study contributes by ascertaining the psychological factors for real estate speculation. However the study did not contribute in terms of examining the different behavioural characteristics that investors and potential investors portrayed while investing in real estate.

Bilgehan (2014) also reviews Eichholtz and Yönder (2014) who gauge overconfidence of CEO via their activities of corporate investment options, plus differentiate Real Estate Investment Truths (REITs) guided by CEOs who are overconfident from additional REITs. The researchers merge the information of REIT with a sample of approximately 8000 transactions of commercial real estate and produced forecasted figures for every properties within the sample, and consequently compared the resulting forecasting's with the real prices of purchase as well as sales. The researchers developed a hedonic evaluation model of commercial assets to create forecasted prices for every transactions of real estate conducted by REITs, furthermore, relate the real prices of sales and purchase to these forecasting's, differentiating the transactions of REITs guided by CEOs who are overconfident from others. The researchers as well compute the difference between the calculated expected price and the actual price of transaction from a combined REIT transactions regression and a control model by other kinds of sellers and buyers, together with REITs for which they can't establish overconfidence. The researchers then contrasted the prices of residual transaction means for REITs with managers who were overconfident and their counterparts who were not overconfident and did a second stage analysis of regression. A study conducted by Eichholtz and Yönder, (2014) involved samples consisting of 11758 transactions. This study covered a period of 2001 to 2012.

Similarly Elahi (2014) examined behavioural biases in decision making of investment plus moderating investor's role type in Stock Exchange of Karachi. He divided investors into two types; passive and active investors. The data was collected from 348 investors of Karachi Stock Exchange using self-administered questionnaire. Elahi (2014) modeled investment decisions with herding, overconfidence, as well as effect of disposition, whilst investor type was considered as moderating variable.

The result showed that effect of disposition, biases of overconfidence and herding had important positive influence on decision making of investment. The findings also showed that type of behavioural investor had no moderating role in association between effect of disposition and decision making of investment. Further the findings showed that type of behavioural investor had negative moderating role in association between herding and decision making of investment. Behavioural type of investor also had positive moderating role in association between overconfidence and decision making of investment. The study showed that herding was linked with inactive shareholders whilst overconfidence was linked with active shareholders. The study contributes by ascertaining the behavioural factors impacting on investment. The unique contribution of this work is the study of the influence of investor's type on portfolio performance. However this study did not produce sufficient and persuasive evidence to determine the impact of disposition effect on portfolio performance.

Bilgehan (2014) carried out a literature review on psychological biases and the capital structure decisions. In his research Bilgehan reviews Uckar (2012) who notes that Behavioural Finance has totally dissimilar point of starting. They begin from experimental studies of participants as well as investors behaviour within the monetary markets. Through the development of various psychological models, they search for detecting behaviour which is not consistent with efficiency of the market and the investor rationality suppositions (Uckar, 2012:170).

In the study carried out by Uckar (2012) he provides information regarding the studies that were done by Heaton's (2002) and Shefrin (2001). A study by Shefrin (2001) about BF revealed that overconfidence might encourage a manager to take on a sub-optimal capital structure as well as an over thankful.

In a like study Heaton (2002) studied the overconfidence effect on decisions of finance in the lack of moral hazard problems or asymmetric information. Uckar reports that if the manager of an organization is overconfident, he thinks that shares of an organization are valued within the value of market, which gives way to the problem of mispricing. During such situations where the capital cost is not correctly defined, mistakes are likely in decisions regarding the investment projects viability. To be precise, because of overconfidence of managers, the managers in an organization create project with negative current value that she/he incorrectly thinks to be positive. In addition, since the confidence that stocks available are underpriced, then the manager will choose the debt securities issue as a foundation of financing for such projects of investment. According to Uckar, (2012: 174) overconfidence of managers results to the high debt ratio, excessive use of debt, and therefore, a high likelihood of financial suffering.

The study conducted by Ben-David, Graham and Harvey (2007) were reviewed by Bilgehan (2014) where they measured the managers overconfidence in a sole sample of more than 6,500 forecasts of stock market created by top financial executives of U.S. The researchers' overconfidence measure is founded on operationalized and beliefs miscalibration, by use of a method extracted from laboratory trials of overconfidence. The researchers associate their executive overconfidence estimate to archival data of firm-level and research how miscalibration is mirrored in commercial policies. During a period of March 2001 to March 2007, hundreds of U.S. Chief Financial Officers (CFOs) were surveyed each quarter and questioned to forecast probable one- and ten year returns of market equity plus the tenth as well as ninetieth percentiles of the market returns distribution. The researchers utilized the narrowness of the person likelihood distributions for returns of stock market as substitute for every confidence of the respondent.

According to Ben-David, Graham and Harvey, (2007), through assessing the similar forecasting job across every executive, they evaluate whether CFOs in an organization are miscalibrated moreover, unravel this prejudice from any possible prejudice in the mean approximate, hopefulness.

Ben-David, et al. (2007) examined the overconfidence cross sectional determinants and time series and studied the association between our measure of overconfidence and a variety of corporate policies together with acquisitions and mergers, investment, payout, compensation, financing and market timing. The researchers in conclusion reported that organizations with CFOs who are overconfident invest more plus involve themselves in more achievements; moreover, the reaction of the market to their achievement is negative. The researchers as well reported a positive association between overconfidence of managers and monetary structure: organizations of overconfident CFOs depend more on long-term debt, have superior debt influence, plus pay less shares following run-ups of price. An additional result from their study is that managerial compensation in organizations having overconfident CFOs is skewed towards pay that is performance-based.

Onsomu (2014) examines the influence of behavioural biases on decisions of investor in Kenya between female and male investors. The participants of the research were all individual shareholders of organizations programmed at the NSE. The population that was targeted was individual shareholders within the County of Mombasa, Kenya. Sampling was done by Random sampling technique in the research and a total of 58 investors replied. This research was based on the theory of prospect by Kahneman and Tversky's (1979).

This research aimed to determine if the shareholders at the NSE are influenced by Representativeness bias, Availability bias, Confirmation bias, overconfidence bias and effect of Disposition and as well to establish gender effect on the behavioural biases. In order to attain the aims of the study questionnaires were given to shareholders and a total of 58 responded to the questions. Pearson Chi-square test and Descriptive statistics was used to analyze data. In order to analyze the association between behavioural biases and gender, the technique of Pearson Chi-square was used. At the Nairobi Securities Exchange, investors are affected by Representativeness bias, Availability bias, effect of Disposition as well as Confirmation bias. Nonetheless, effect of Disposition and the effect by Representativeness bias were modest at an average of about 53%. Bias of Overconfidence has no important effect since less than 50% of the shareholders were affected. No significant association was established between Representativeness bias, Availability bias, effect of Disposition, Confirmation bias, gender and Overconfidence bias. This is for the reason that the Pearson P-Values attained were more than 0.05.

2.3.1.2 Anchoring and Adjustment bias

The association between anchoring as a behavioural bias displayed by bosses and their decisions on whether to issue equity or debt has been examined (Cole, Soufani, Tse, and Aboulamer, 2012).

The researchers examined whether anchoring detained by various proxies together with the proportion of shares sold off that are held by managers, market to-book ratios, share repurchases, the exercising of stock options held by managers long before their expiration dates, stock returns, sufficiently explains the changing levels of debt or capital structure mix adopted by firms, bond yields, 52-week share price highs, and share prices at last equity issue as well as last debt issue (Cole et al., 2012).

The findings of the above studies cannot be generalized to emerging real estate markets and they give different investor investment characteristics hence the need for the current study which is carried out in an emerging market. This guides the first alternative hypothesis; Ha: Heuristic based behavioural biases influence real estate performance in Kenya.

2.3.2 Prospect Bases Biases and Financial Performance

2.3.2.1 Regret aversion

Behavioural finance view investors as loss-averse instead of risk-averse. Dargham (2009) defines loss aversion as the belief that investors experience higher disutility from a loss than from an equivalent gain or profit. Tversky&Kahneman (1992) suggested that individuals value a loss roughly twice as a similar magnitude of profit. This is an indication that losses are twice as powerful as equivalent gains and investors tend to attach more value to losses than they do losses. As a result investors increase their risk/uncertainty to avoid the slightest possible loss. According to Dargham (2009), a gain of $2 may make an individual to feel better by as much as a loss of $1 makes them feel worse.

Mercer (2006) notes that, individuals seem to understand profits too rapidly in the fright that their unrealized earnings will vanish. Further still, when it comes to losses, the same individuals be inclined to grasp onto stocks that are loss making longer in the hope of converting them into profits rather than cutting the losses sooner. The facts that investors are not able to realize when to cut their losses and move on makes them suffer further loss.

Berkelaar, Kouwenberg and Post (2004), Barberis Huang and Thaler (2006), Polkovnichenko (2005) and Gomes (2005) demonstrate that loss-reluctant investors tend not to take part in equity markets otherwise will normally apportion significantly a smaller amount of their wealth to equities. If investors are loss-reluctant the possible gain from decline of stock market overshadows the delight from achievements even with a superior premium of equity (Mbaluka*et al.*, 2012). Consequently, loss-averse investors prefer to avoid any investment in equity. Loss aversion indicates that individuals categorize events to be either losses or gains in relation to a point of reference. In investments, this phenomenon is believed to manifest itself in what is known as "disposition effect". Individuals portray the tendency to get gains too rapidly in the fright that they might make losses.

Barberis and Thaler (2003) contend that the magnitude of loss aversion will impact the frequency with which investors appraise their portfolio and that the way investors frame losses as well as gains is reasonably manipulated by the manner in which information is availed to them. Investors that evaluate their portfolio frequently, also known as energetic investors, for instance, on a daily basis are more loss averse. Subsequently, they will apportion less of their wealth in equities. The combination of loss aversion and evaluations of frequent is termed as myopic loss aversion, which is a situation whereby investors base their decisions on current temporary fluctuations in their investments value rather than base them on implications that are long-term.

Literature review on Psychological biases and the capital structure decisions, Bilgehan (2014) looks at Ullah, Jamil, Qamar and Waheed (2012) who in their study, reveals that managers in an organization are risk reluctant, while profitability and size are positively associated to the structure of capital. This research elaborates that do the bosses alter their capital structure in agreement with risk of business and how the firm size, growth of sales as well as profitability, contributes to the formation of capital structure. This research covered five years from a period of 2006 to 2010 and utilized the data from five sectors which are of nonfinancial listed organizations on Stock Exchange of Karachi. In brief this research is contributing in study by examining risk effects on firm debt equity mix listed on Stock Exchange of Karachi. The researchers' paper is utilizing the data of the Trailers, Auto parts as well as Motor Vehicles sector of Karachi Stock Exchange during a period of 2006 to 2010. The researchers apply the technique of panel data to a total of 19 organizations. Two analysis are applied; regression analysis and descriptive analysis. The researchers as well perform collinearity analysis for the reason of examining multicollinearity factor. Business risk, capital structure, profitability, sales and size growth are the variables that were utilized in their study (Ullah et al., 2012).

A study on the organizations' capital structure determinants introducing a behavioural viewpoint revealed that the level of CEO loss aversion is negatively associated with organizations influence ratios as well as increase of capital (Azouzi and Jarboui's, 2012). CEO identifies operational risk level of firms and aversion of loss try to decrease its firms' entire risk by utilizing external funding low together with debt. High operational organizations' CEO attempts to manage the whole risk by restraining the financial risk brought about by debt plus the issuance of fresh shares. Such CEO chooses to finance its projects of investment via internal finances.

A study on behaviour of the firm and behavioural biases amongst retail shops in Kenya revealed that approval of scores on math tests as well as small risky gambles is connected with accumulation of inventory among shopkeepers in Kenya (Kremer, Lee, Robinson and Rostapshova, 2013). The researchers sampled 380 retail shops. They dispute that aversion of loss might be one factor that aids in explaining the wide puzzle of why elevated return rates on capital amongst small organizations in countries that are developing are equally arbitraged away furthermore; they do not result to the high rates of growth of utilization that the equation of Euler would forecast. A lot of shopkeepers in Kenya fail to create inventory investments that are small with elevated expected proceeds.

In this study, the inventory investments determinants were examined and revealed that those shopkeepers that invest single standard deviation more into an asset that is risky in a laboratory-style game have 10 to16% bigger inventories. Consistent with the outlook that skills of math might be important in degrading, the shopkeepers with deviation of one-standard superior scores of math have 14 to18% larger levels of inventory. Lastly, their findings showed that aversion of loss can potentially aid in explaining a chain of puzzles that are linked to the persistence of high-return opportunities of investment that are not realized. As the owner of a loss-averse firm might refuse small, extremely positive probable return investments if they bear risk, aversion of loss presents a possible explanation for numerous puzzles as well as current experiential results. The findings of the researchers showed that owners of small business act as if they are loss averse elevate the likelihood that nets of social safety may enhance investment amongst owners of small business more commonly.

This study as well propose that at least a number of the heterogeneity in proceeds to capital established by Hsieh and Klenow (2009) might be as result of differences in quality of management across organizations. In contrast, Kremer et al. (2013) reported that heterogeneity in proceeds to capital is influenced by regulatory distortion and tax across organizations. These contradicting studies on prospect biases inform the second alternative hypothesis; Ha_2: prospect based behavioural biases affect real estate performance in Kenya.

2.3.3 Herding Effect and Financial Performance

In financial markets herding is described as joint imitation that leads to action convergence (Hirshleifer and Teoh, 2003). Individuals are influenced by their surrounding and they tend to conform to what is norm within that environment. It is observed that fundamentally people who communicate regularly tend to think similarly. One reason why judgments by people who regularly communicate regularly are similar is because they share information and react to the same information. The social influence has an enormous power on an individuals' perception. Dargham (2009) conducted a study and found out that when an individuals' judgment is different from a group they tend to change their judgment to conform to the groups' thinking. They simply think that all other individuals could not be wrong. Shiller (2000) states that, in our daily livelihood we have learnt lesson that, when a big group of citizens is undisputed in its decisions then they are probably correct.

Herd behaviour may portray itself on the financial markets where even the most rational investors tending to be affected by this by taking into consideration the decisions of others, even when they are well aware that everybody else is acting in a group like way. A core variable to herding is word of mouth. People commonly tend to trust their relatives, friends and even the colleagues more than they do the investment agents.

One reason why the herding effect is pronounced is because of the *noise effect.* The term noise defines the continuous fluctuation in market prices and volumes that make investors to get confused about the market's direction. Black (1986) noted that value securities of investors based on a noise other than utilizing the available information regarding the security. Most noise traders tend to believe that they are making rational investment decisions when they rely on the market noise to make investment decisions. However, the investments they make are often not based on any fundamental data. Noise traders frequently try to join the other traders and react fast when they think the noise is skewing the market towards a particular direction. Thereby investors may make irrational decisions by overreacting to good and bad news thus affecting their financial performance.

Nofsinger and Sias (1999) established that institutional herding has a largereffect on prices than individual investors herding. This could be due to the reason that the investors in the institutions trade in high quantities as compared to individual investors. According to Welch (2000), analysts as well display the behavior of herding. He established that whenever an analyst reviewed his suggestions, it showed a positive association with the subsequent two analysts reviews possibly due to current information updates.

Prosad (2014) conducted an empirical analysis of the influence of behavioural biases of investors on the Equity Market in India and repercussions on decisions of stock selection. The study used a sample of diverse market pointers of Nifty 50 stocks. The pointers included; Daily transaction volume of the securities and index, Daily total returns of the securities and index, Daily low and high values of the index, the daily risk-free rate of return of the T-bill index as well as Daily closing prices of Nifty 50 index options.

The set of data was taken for a time period of 2006 to 2013. Additional, the research utilized both time-series data as well as cross sectional data. The study was based on overconfidence theory and the disposition effect theory. This study concentrated on four behavioural biases in the equity market of market, that is; herd behaviour, pessimism (optimism), disposition effect, overconfidence effect, by use of both secondary and primary data. Primary data provided the immediate insight into psychology of investors. Conversely, the approach of secondary data provided the results that could be widespread on the market as a total, for the period of 2006 to 2013. The analysis of secondary data determined the impact as well as presence of behavioural biases on several pointers of the equity market in India such as risk premium, return dispersion, volume of transaction and volatility.

In his study Prosad (2014) found that the herding behaviour is not observed in the general market, though, it persisted in the phase of bull. The study concluded that this bias may reduce the dispersion of security return. Furthermore, in the existence of harsh herding, the dispersion may turn out to be negative. In addition, the equity market in India was mostly negative for the period of 2006 to 2013. This research showed that precedent volatility is among the factors that lead to negativity. The bias is accountable for making a risk-return association that is negative within investors. In addition, the disposition as well as overconfidence effect as well prevailed within the equity market in India. These kinds of biases increased the volumes of individual, market security transaction correspondingly and ultimately their financial performance. Upon separating the influence of these biases, it was revealed that overconfidence bias predominates the effect of disposition. Lastly, the findings of survey captured the present state of behavioural biases of investors in India within the area of Delhi/ NCR.

The findings present the characteristics of the investors that are precise to every bias. The characteristics include trading sophistication and investors‟ demographics. It's reported that men are more optimistic as well as overconfident as compared to women, behavior of herd influences the aged investors and the effect of disposition is there in investors who are middle aged. In addition, the traders with high experience, investors of new organizations and intraday traders are prone to the majority of the biases. Profession and yearly income are additional parameters on which the above biases can be distinguished. In conclusion, the biases were ranked in their order of commonness; overconfidence bias showed to be the most significant bias in the equity market of market.

Nyamute, Lishenga and Oloko (2015) studied the association between portfolio performance and investor behaviour at the Nairobi Securities Exchange. This research was rooted in the behavioural finance theory which assumes that people go through the behavioural biases in making decisions of investment instead of following the customary theory of finance that needs shareholders to be rational plus to consider important basics in making investment as well as financial decisions. The research did depend on secondary and primary data gathered from a total of 385 individual shareholders. The primary data about the behaviour of investors was gathered by use of questionnaire which was given to investors while data on performance was extracted from investment statements provided by the investors. The study found that investor behaviour influence portfolio performance with effect of disposition and herding having a positive outcome on performance of portfolio whereas overconfidence had a negative outcome on performance. The above indicated that individuals who suffer and herd from effect of disposition made superior proceeds as compared to those who were overconfident.

This implied that overconfidence lead to taking of high risk because of a delusion of control or knowledge causing shareholders to overlook essential information that affected their proceeds. Effects of disposition and herding gave superior proceeds because the herders followed the prompt from others who had previously considered the early risk and were capable of deciding which prompt to go after depending on the pinpointing performance. Nyamute et al (2015) also found that effect of disposition allowed the shareholders to shun from regret therefore; they were improbable to undergo the negative costs of taking high risks. Even though herding had a positive influence on performance, it as well required a superior prompt to group. This study by Nyamute et al (2015) contributes to literature as it points out the relevance of the behavioural finance theory in the analysis portfolio performance. Secondly, it reinforces the role of behavioural biases in decision making. However the study did not contribute in terms of exploring other behavioural biases that could exist in the NSE and their potential impact on portfolio performance.

Allameh, Chitsaz, Hosseini and Esfahani 2015 conducted a research on the association between aspects of behaviour and the performance of individual investors in Tehran Stock Exchange. This study was mainly based on the Heuristics Theory which is behaviour based on experience and trial and error, the Prospect theory which focuses on decision making by investor's valued system and the expected utility theory which is based on rational expectation of investors. In the study, behavioural factors were categorized into four aspects of behaviours based on heuristic theory, behaviours based on prospect theory, behaviours based on market factors and behaviours based on herding effect.

Moreover, for evaluating them, quintuplet aspects including representation, access bias, meeting the mainstay, gambler sophistication and excessive trust were identified as variable parts of heuristic theory, triplet aspects including loss aversion, regret aversion and mental accounting were identified as variable parts of prospect theory ,sextet aspects including price variations, market information, past process of stock, priority and preferences of investors, excessive reaction to price variations and stock quantity as object of transaction with others were identified as parts of herding effect. Therefore, based on the questionnaire data and multiple regression and structural equations of path analysis, it proceeded to study the relation of behavioural variables and investors performance. Results indicated the rejection of first and second theories and also the approval of third and fourth theories; in other words, at 95 percent confidence level, there was not any significant relation between behaviours based on the heuristic theory with behaviours based on the prospect theory and investors performance in Tehran stock exchange and moreover there was significant relation between market factors with behaviours based on the herding effect and investors performance in Tehran stock exchange.

Li, Rhee and Wang (2009) in their study on the differences in herding behaviour between individual and institutional investors in the market of China reported that institutional investors who are the better informed exhibited intense herding compared to the less informed individual investors although individual investors were more likely to influence market sentiments and demand as they tended to rely heavily on public information. The study does not however explain why institutional investors herd more and the effect of their actions on investment performance.

Sharyari (2007), in a survey in the Iran, sort to establish whether market participants exhibited mass behaviour in their trading. He used stock yield variances from the whole market for the period 2001 to 2005 and found no herding behaviour in periods in which price index changes and cash yield are positive although there was some evidence of herding using the daily yield data. The results could be attributed to informational herding as the participants are exposed to the same information and may use similar methods of determining the factors that will influence trades. Kumar and Lee (2006) carried out a study on retail investor sentiments and find that the trading retail investors sell or buy single set of stocks and they are likely to sell or buy additional sets exhibiting herding behaviour. These differing observations regarding investor herding behaviour inform the third alternative hypothesis; $H_0$3: Investment behaviour based on herding has an effect on real estate performance in Kenya.

2.3.4 Market Based Biases and Investment Performance

2.3.4.1 Information content bias

EMH means that prices of future real estate are cannot be predicted basing on presently accessible information. To clearly indicate inefficiencies, Shiller (1981) and LeRoy and Porter (1981 did a study on DJIA, S&P 500 Index and a number of blue chip stocks. The researchers found out that instability in securities is 5 to 13 times higher than the variations in current worth of future bonuses which could not be explained by market efficiency perspectives. This contradicts EMH view point that an investment price varies barely when there is expectation of bonus or there is novel information available in the market. The term anomaly can be defined as a divergence from currently acknowledged paradigms which are too systematic to be dismissed as random error, too essential to be accommodated by relaxing the normative system and too prevalent to be assumed (Tversky and Kahneman, 1986).

Further still, according to EMH it's not likely to forecast the future value of an investment based on the available information. However various studies have been done and showed it's likely to forecast future value by utilizing. Other researchers have used yields of dividend and determined important signs to predict the investments future returns; to be precise, if the yield is high, then the return of investment will be high as well (Rozeff (1984): Fama and French, 1988).

2.3.4.2 Illiquidity Bias

Kluger and Miller (1990) studied the relationship between the property market liquidity and the opportunity cost. The study developed liquidity measure that is strongly linked to time on market. The study showed that their measure of liquidity is linked to the house characteristics in question.

Keogh and D'Arcy (1994) in 1993 carried out a comparative research of the performance and behavior of London plus two developing property markets in Europe – Milan and Barcelona. Considered middle to the center of this research, this literature review sought to determine how maturity of property market emerged. It also wanted to establish how various factors affected market maturity. Ever since 1994 when it was originally supported it has been more often than not used to the up-and-coming markets of South East Asia and Central Europe. The study derived that; diversity extent of use and objectives of investment provided for property profession, flexibility, market research and information, property rights and market practices standardization manipulate maturity of the market.

Kalra and Chan (1993) in their research on the effects of interest rates and economic conditions (macro-economic) on the time on market of real estate property, concluded that time on market is influenced by economic conditions of the region, with time on market being positively associated to rates of interest and negatively linked with employment area.

Jud, Winkler and Kissling (2005) undertook a study on Market Liquidity of Residential Housing and Price Spreads in Greensboro, North Carolina. This research was able to deduce that liquidity of housing stock is affected by costs of transaction, housing costs, time on the market as well as market information. Empirical estimates of the study indicated that spreads of housing market are positively connected to costs of transaction costs and prices and negatively linked with the prices standard deviation. Because spreads mirror liquidity of market, the study suggested liquidity to be transaction costs function and information of market.

Kwok and Tse, (2006) carried out a research on the liquidity effects on the housing markets, case study of China, Hong Kong real estate market. From the empirical evidence derived in the study from the housing market of Hong Kong powerfully supports the effects of transaction-based liquidity and combined market segmentation hypothesis in the market of housing in the section. Housing developments units with a superior return rate sell at a considerable quality. Generally, 9.2 percent of the total percentage variation in the prices of two certain units of housing in our example may be ascribed to effects of liquidity. Opposite to conservative wisdom, housing development size is not in universal positively associated to the turnover rate and therefore, liquidity of the asset, whilst a less clear factor of candidate –the housing units' quality appears to matter.

Lin and Vandell (2007) carried out a research to analyze biases of Pricing and Illiquidity in the market of Real Estate. Their study addressed the dynamics of price and illiquidity micro-analytic foundations in the market of real estate by incorporating theory of modern portfolio with copies describing the process of real estate transaction. They concluded that methods of estimation that are traditional of real estate risk and return, that copy in a inexperienced fashion from theory of finance by disregarding illiquidity of real estate, not only play down the risks of real estate but as well exaggerate returns of real estate.

Jing and Siqi (2008) from China in the University of Tsinghua under the Institute of Real Estate Studies carried out a research about the determinants of housing liquidity. A simple buyer offers' distributions model was utilized to hypothetically discover the housing liquidity determinants in a process of search. A model of experiential ordinary least squares of the time-on-market was established by use of data gathered in four cities in China (Beijing, Guangzhou, Shenzhen and Shanghai). The findings showed that in the selected four cities in China, maturity of market dominated the housing liquidity variation, with the housing characteristics effects, search strategy, conditions of market and seller's search cost being less important to the equation of time-on-market.

In a recent study related to housing liquidity and real estate market maturity by Chao He, Wright and Yu Zhu (2012) on housing and liquidity within the United States of America real estate market. This study also sought to examine various mechanisms for determining the terms of trade, and different ways of specifying credit restrictions. They also studied the monetary policy impact on housing markets.

The conclusion of this study was that there was a connection between the large rises in loans of home-equity and the United States house-price bang. Since liquidity is endogenous, and depends to some extent on beliefs, even when essentials are determinants and time invariant equilibrium house prices can show complex patterns, together with chaotic, stochastic as well as cyclic trajectories. The framework used was tractable; nevertheless it captured numerous most important housing markets features qualitatively and to some extent quantitatively.

2.3.5 Investment Performance

The use of earnings-price ratio has revealed that the ratio can significantly be used in the forecast of return of stock particularly when the precedent wages averaged over a period of 10 years (Campbell and Shiller, 1988). Price-to-book ratios (P/B) has been utilized and findings show that low P/B stocks provided higher return as compared to stocks with high P/B (Lakonishok, Shleifer and Vishny, 1994).Basu (1997) utilized price-earnings (P/E) and reported that securities with low ratio of P/E be liable to do better than the stocks with a comparatively high ratio of P/E fairly.

Clayton (1998) studied the short-run association between the direct real estate value and REIT prices possessed by REITs. The findings showed there is enough proof against efficiency of housing market with findings showing that apartment's future proceeds can be predicted using deviation measure from essential prices and past yearly proceeds. Further results as well show an important function for reaction in REIT returns, the timing of REIT equity offerings as well as prices.

Shleifer (2000) records that, EMH upholds that current investment prices are close to their essential values as existence of the arbitragers' or rational investors who sell and buy actions of overpriced or under investments. Nevertheless, Black (1986) contradicts these findings citing irrational investment activities such as *noise.* Black noted that investors value investments based on a noise rather than using the available information regarding the investment. This contradicts the principle of EMH that prices of securities at all times completely reflect all information available. This is an indication that the investment prices are also influenced by other factors. However, according to Brown and Matysiak (2000), current real estate returns can be predicted based on historical information.

Farlow (2004) disputes that the main reasonable clarification for the dramatic rise in prices of real estate cannot be established in demand as well as supply fundamentals rather, it's posited that prices of real estate are, significantly established by the behaviour of financial institutions and consumers. Yacin (2010) explains that very little investing activities are expected by rational investors based on the publicly available information; however we experience huge volumes of buying and selling for no apparent reason hence evidence of market anomalies. This pokes holes on the EMH principle that rational investors only trade or respond to the available information.

Firat & Fettahoglu, (2011) studied purchasing behaviour of investors using an approach of behavioural finance. The study focused on the communal dynamics that establish market prices, the factors shareholders consider and the resources of information they make use of when making decisions have in Turkey. X^2 and ANOVA were utilized to examine variables. In conclusion, the study showed that shareholders are not at all times reasonably; they act with their feelings in the process of decision making of investment.

Konstantinidis , Katarachia , Borovas and Voutsa (2012) in their study on Efficient Market Hypothesis to Behavioural Finance concluded that Behavioural Finance looks at shareholders as individuals and emphasizes that illusions, emotions as well as biases can't be rationalized; additionally, it highlights that the information available is not efficient. Prices of stock are not random; the prices are quite unpredictable as reaction of people to novel information is not predictable, too. Regarding this viewpoint, fundamental values of previous years as well as past prices guide and affect their decision making.

2.3.6 Financial Literacy and Investment Performance

Financial markets worldwide have more and more become reachable to the 'small investor,' as financial services as well as novel products grow extensive (Lusardi and Mitchell, 2013). Lusardi et al., (2013) describe financial literacy as ability of people to interpret financial information moreover make decisions that are informed concerning investment. Current hypothetical study shows how monetary information can be shed as investment type in individual capital. Regarding this approach, individuals who make financial know-how can receive beyond average probable proceeds on their investments; nonetheless there will still be various best financial ignorance levels.

Nevertheless, within the past few years, a small number of authors started to explore the decision in order to attain monetary literacy as well as the relations between, saving, investment behaviour and financial knowledge (Jappelli and Padula, 2013); Delavande, Rohwedder, and Willis, 2008); Hsu and Shiu, 2010; Lusardi, Michaud and Mitchell, 2013).

According to Delavande, Rohwedder and Willis (2008), people accumulate financial knowledge over their lives by investing time and energy educating themselves about issues that affect ability of households to control its expenditures, savings as well as income efficiently and effectively. People require knowledge on finance to control everyday issues for instance shopping for the lowest price, budgeting, paying bills, using a credit card and balancing a checking account. They also need the knowledge in search of goals that are long-run together with housing, having access to adequate resources during retirement and, children's education.

Broadly, financial knowledge includes appreciating matters for instance returns of alternative investments and knowledge of the risks, compound interest, benefits of risk diversification, tax law, options for mortgage finance, credit institutions, costs of alternative financial and trustworthiness et cetera., all of which help individuals with the aforementioned tasks. People with every day experience to monetary knowledge via their profession could gain by having superior monetary knowledge which could convert into superior assets build up as compared to people who don't enjoy such spillovers from their profession (Delavande, Rohwedder and Willis, 2008).

A strong association between the likelihood of engaging in a number of financial practices and monetary knowledge has been documented: tracking expenses, paying bills on time, budgeting, saving out of each paycheck, paying credit card bills in full each month, maintaining an emergency fund, setting monetary goals and diversifying investments (Hilgert et al., 2003).

Financial knowledge is investment behaviours predictive together with participation of stock market (Kimball and Shumway, 2006; Christelis et al. 2006; van Rooij, et al. 2011), improved diversification as well as more frequent trading of stock (Graham et al. 2009) and choosing a low fee investment portfolio (Hastings 2012; Choi et al. 2011).

Shao and Wang (2013) conducted a research on irrational behavior of managers. The researchers aim is to investigate irrational behaviour of managers as well as why it exists in decision-making of business capital investment. The researchers gives the approach on how to discover irrational behaviour of managers within decision-making of corporate capital investment; suggest hypotheses on reasons for each irrational behaviour; classify the irrational behaviour by the steps in decision-making; summarize the real reasons for each irrational behaviour according to the experiential findings; carry out experiential test via questionnaires and hypothesis testing. In this study, when approximating flow of cash, managers in a firm will utilize heuristics because they lack mind clear frame therefore psychological factors as well as cognitive bias occur in heuristics. The researchers report that the major reason that causes irrational behaviour in the establishment of discounted rate is the lack of monetary literacy. As the majority of managers are puzzled with the cost of capital concept, models of discounted rate and risk management method, psychological factors as well as cognitive bias work in this step. The researchers report that managers act irrational during the time of decision making because cognitive biases influence their behavior.

Individuals learn from the past, that is past experiences may influence the decisions an individual is going to take in the future. It seems reasonable to expect an investor to improve his returns as his trading experience increases. This is supported by Nicolosi*et al.* (2008) who found out that investor confidence in the ability to make rational future decisions increases as the level of experience rises. Gervais and Odean (2001) and Daniel *et al.* (1998) argue that individuals that get more precise private signs concerning returns of future surplus stock will seem to exhibit better ability of trading, since the increased sign accuracy improves their ability of selection and as a result their trades' successive proceeds.

Nevertheless, Barber and Odean (2000), Barber *et al.* (2007) found out that on average individuals make poor decisions. They noted that irrespective of a trader having participated in an event, the experience acquired doesn't help to improve investment performance. Nevertheless, errors of judgment only don't infringe rationality. According to Sargent, (1993), the rational expectations supposition doesn't refute that citizens frequently create errors of forecasting, however, it does propose that errors will not tirelessly happen on one side or the other. That is to say, agents aren't probable to create mistakes that are systematic. Establishing if individuals get a lesson from their past experiences specially, if experience of trading affects behaviour plus maybe more significantly, getting better performance of investment can be a major move towards determining the relevance of the rationality supposition.

Financial literacy was a significant issue in conquering the hurdles to investments and the associated risks (Haliassos and Bertaut, 1995). Further, they also found that the less literate were less likely to make informed investments compared to their financially literate counter parts. As such this study took financial literacy to be the moderating variable between behavioural biases and real estate investment performance.

2.4 Operational Framework

The operational framework of this study has developed from key research variables adopted from the literature review and the theories on investor behaviour. The independent variables include: heuristic driven behaviour, Prospect driven behaviour, Herding behaviour, market driven behaviour and financial literacy. The effects of these five factors on the individuals' investors' returns was analyzed. By reviewing both theoretical and empirical literature in behavioural finance, Heuristic based behaviour (Gamblers Fallacy, availability bias, Achoring bias, representational bias, and overconfidence), prospect driven behaviour (Regret aversion and Loss aversion), Herding behaviour (buying and selling of other investors, volume of investments, choice of investment), market based behaviour and financial literacy have been identified as possible regressors of investor biases. The investment performance was determined as the response variable. The operational framework is therefore based on five independent variables, and one dependent variable. The operational framework for this study is presented in Figure 2.1. This Figure indicates each of the selected drivers of each of the regressor variables of the study.

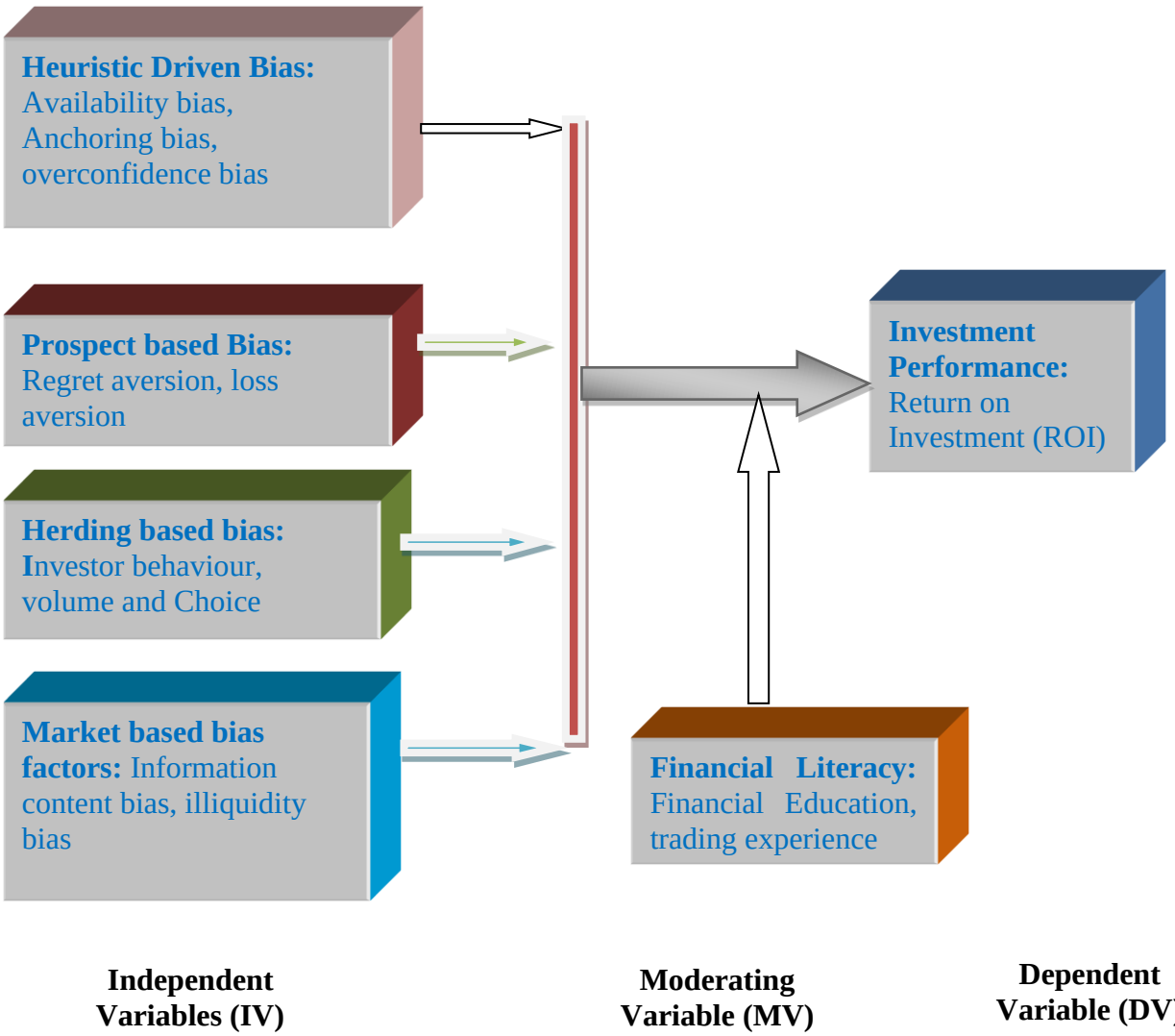

Figure 2.2: Operational Framework for Behavioural Biases of Real Estate Investors on Investment Performance in Kenya

2.5 Research Gaps

From the reviewed empirical literature, it is evident that research in the area of behavioural biases and their effects on real estate performance has not been done but in a comprehensive approach.

This study therefore intends to fill these pertinent gaps in literature by studying moderating role of financial literacy on the relationship between behavioural biases on Kenyan real estate investments and investment performance. This made the research more comprehensive.

A review of applicable literature has shown that there are hardly any researches precise to Kenya on behavioural real estate. This study added value to existing literature via providing experimental measure that real estate investors can take to improve on their investment performance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter describes the methodology which was utilized in this research in order to achieve the research aim and objectives. Section 3.2 describes the choice of the research philosophy adopted in this study and makes a justification for the same. Section 3.3 to 3.11 describe the research design, target population, frame of sampling, sampling method, size of the sample, data collection instrument and technique, pilot study, data collection instrument reliability, validity, measurement and scaling of research instruments and finally data analysis.

3.2 Research Philosophy

The question of what should be (or what is) considered as satisfactory information in a discipline is the major hub of epistemology, that is, the research on knowledge development (Bryman, 2012). Selecting an overall research philosophy is the choice between two primary alternatives, that is, phenomenological philosophy or positivism (Bryman, 2009; Cooper & Schindler, 2011). Phenomenological philosophy or "constructivism view" is concerned with how people seem sensible of the world surrounding them plus how in a particular the theorist ought to bracket out biases in her/his grab of the world (Bryman, 2012). This view thus focuses on immediate experience of researcher, open and unstructured interviews, introspective reports where the researcher is part and parcel of the phenomena (Saunders, Lewis & Thornhill, 2007).

Phenomenological study aims at describing the lived experience, assumes that the world is socially constructed, tries to understand what is happening rather than look for causality and fundamental laws, develops ideas through induction from data rather than formulating hypothesis and testing them (Merterns, 2009; Gay, Mills & Airasian, 2010). In a phenomenology study, small samples are investigated through numerous techniques to determine different phenomena views over a long period of time (McMillan & Schumacher, 2010; Mertens, 2010; Koshy, 2010).

As opposed to phenomenological approach, positivism is an approach of approach of epistemological that supports the relevance of the natural sciences methods to the learning of communal reality and beyond (Bryman, 2012). Positivism is based on four principles. The first principle is that only an occurrence which is measurable and observable can be said to be knowledge (phenomenalism). The second one; the aim of a theory is to create supposition which can be examined and thus permit law explanations to be evaluated (deductivism) (Saunders, Lewis and Thornhill, 2007; Hargrove, 2004).

The third principle is that this view of approach that knowledge is arrived at via facts gathering which give the foundation for laws (inductivism). Finally, that science ought to (and most probably can) be carried out in a manner that is free of value (objectivism). Cooper and Schindler, (2011, reports that positivism roots lie in empiricism, to be precise, the entire accurate knowledge is rooted in information that is positive achieved from visible experiences, moreover only statements that are analytic are permitted to be recognized as factual via reason only.

This study adopted the positivist research paradigm, a paradigm characterized by a conviction in theory before study (Koshy, 2010; Cooper and Schindler, 2011), numerical explanation of conclusions from hypothesis that is empirically testable which is the focus doctrine of social science (Koshy, 2010; McMillan & Schumacher, 2010).

3.3 Research Design

Research design refers to a plan for conducting a research with maximum control over variables which may hinder the validity of the findings (Burns & Grove, 2003). Cooper & Schindler (2008) describes a research design as a well thought structure and plan of study to help in obtaining answers to questions of research. Singh (2006), defines research design as a mapping strategy; a statement of the objective of the inquiry and the strategies for collecting the evidence analyzing the evidence and reporting the findings. According to Mugenda and Mugenda (2003), a research design is the general blue print of carrying out the study so as to reply to the questions of research and achieve the objective of the study.

Approaches of social science research are classified as explanatory or exploratory, descriptive (Kothari, 2008). Descriptive research studies are those studies concerned with describing the characteristics of a particular individual or group (Sekaran, 2008). The objective of descriptive research is to produce person's precise representation, situations and events while the explanatory research tries to ask questions, assess the phenomena in a new light as well as seek new insights into phenomena (Winter, 2000; Sekaran, 2006; Torochim, 2006). According to Robson (2002), exploratory research investigates a specified phenomenon, its nature and classification of the complexities.

According to Saunders, Gold & Gallimore (2008), an explanatory research is a research that aims on examining a problem or situation so as to explain the associations between variables. Consequently, descriptive research refers to the initial research concerning a matter; exploratory research refers to an effort to examine a social occurrence with no clear expectation. Explanatory research entails searching to establish the effects as well as causes of a social occurrence plus forecast how one variable will adjust in return to deviation in another variable.

This study took a descriptive design to achieve the study objectives. Cooper and Schindler (2011) view that descriptive studies serve a wide spectrum of objectives, that is, description of a phenomena or characteristics linked with a focus population, estimate the proportions of people exhibiting the selected characteristics, associations discovery amongst variables that are different as well as provide answer to the univariate question about the existence of a variable, size or distribution. Gay, Mills and Airasian (2010), and Cooper and Schindler (2011) state that a descriptive study that assesses the bivariate relationship between variables, determines if the variables are independent and if they are not, then determine the strength or magnitude of the relationships is more valuable than one that does not. Creswell (2003) opines that a descriptive kind of research design is utilized when data is gathered to describe organizations, persons, phenomena or setting.

Descriptive research as well explains the behaviours or characteristics of a certain population in a version that is accurate and systematic (Sekaran, 2008). A descriptive research design establishes as well as gives a report on the way issues are (Mugenda & Mugenda, 2003). Descriptive research defines the data plus the characteristics regarding a phenomenon population under study. The research design answers the questions who, when, where, how as well as what is the problem.

3.4 Population of the Study

The term population can be defined as any infinite or finite individual elements collection (Lavrakas, 2008). Mills & Airasian (2010) define a population to mean the total collection of elements about which an inference is prepared and refers to every probable case that is of importance to examine. Morrison, Lawrence & Loise (2007) and Zikmund (2010) view a population as a large set of the entire subjects from which a sample is taken. Kothari (2004) refers to a population as all things in any area of question which is as well referred as the 'universe'.

The study's target population was the real estate investors in Kenya, who have homogeneous investment expectations. Gay, Mills and Airasian (2010) highlight two attributes of a population. First, that a population can be of any size and may cover almost any geographical area. Secondly, the entire group of interest to the researcher is rarely available. Mugenda & Mugenda (2003) reports that when the study's population is located in a narrow geographical area and it's small, then the target population is strongly similar to the available population. The target population of real estate investors is 123,471 real estate investors represented by registered real estate agents. The population was accessed through the 284 registered real estate agents who are the custodians of the real estate investors in Nairobi, Kenya.

3.5 Sampling Frame

Bryman (2009) define sampling frame to be the list of reachable population of citizens, documents or events which can be incorporated in a study and from where the investigator will get a sample to gather data. On the other hand, sampling frame can be defined as a list of the population that is targeted from which the sample for study is picked.

For study designs, a sampling frame typically is consisted of a limited population (Lavrakas, 2008). McMillan and Schumacher, (2012) defines a sampling frame as a list of research population members from which a random sample might be picked. The sampling frame for this study is the 123,471 real estate investors who have homogeneous investment return expectations.

3.6 Sampling Technique and Sample Size

Gay, Mills & Airasian (2010) point that a sample is individual number, events or items picked from a study's population, if possible in such a manner that they stand for the bigger group from which they were picked.

According to Lavrakas (2008) a sampling frame is defined as a target population list from which the sample to be studied is picked and that of descriptive survey designs a sampling frame typically is made up of a limited population. Bryman (2012) and Spiegal & Stephens (2008), describe a sample as a fraction of the whole population. Mutea (2007), Orodho and Kombo (2002), Gordon & Marian (2010) define a sample as a representative as well as finite number of objects or people in a study population. During research a sample is required since a study that is in adequately specific lacks the authority to refuse a false null hypothesis plus is a will bete of money and time (Gerstman, 2003). A research which gathers a lot of data is as well will beteful and as such it's necessary to establish the size of the sample required before data is collected. Polit and Beck (2003), recommended that data is collected from a sample rather than from the whole population since it is more practical and less costly to do so.

McMillan & Schumacher (2012) and Gill & Johnson (2002) describe sampling frame to be a list of associates of the population of research from which a sample at random might be picked. Gatara (2010) and Bryman (2009) define sampling frame as a list of available population of individuals, documents or event that can be incorporated in a study and from where the investigator will select a sample to gather data.

This research utilized a process of multi-stage sampling in the choosing of the sample for this study. The target population is the real estate agents in Kenya. However the accessible population are the real estate investors who are represented by the registered real estate agents in Nairobi, Kenya. This study used the real estate investors who are enlisted with the Estate Agents Registration Board (EARB) in Kenya. EARB is a regulatory body for estate agency practice in Kenya and maintains a list of all registered real estate agents. The study used the list of real estate agents to get in touch with investors. Out of the registered EARB list of 331, 86% (284) operate in Nairobi. The accessible real estate agents population is regarded as 284. In order to access these investors, a multi-phase process was used. Multi stage or multiphase sampling entails a process of selecting a sample in two or more successive stages (Gatara, 2010; Cooper and Schindler, 2011).

To determine the size of the sample when the whole population is greater than 10,000 (n), Fisher *et al.* (1983) recommend the use of equation (3.1). In the equation, n refers to the preferred size of the sample (if the total population is more than 10,000), letter *Z* refers to the standard normal diverge at the necessary level of confidence, *p* refers to the proportion within the population of target predicted to have characteristic being examined.

In this expression, *q* is the proportion of the population of target predicted not to have the character being sought. On the other hand *d* is the level of statistical significance.

$$n = \frac{Z^2 pq}{d^2} \qquad \textbf{(3.1)}$$

The study used (0.5) to be the values of *p* and *q* in the formula. Fisher *et al*. (1983) recommended that if there are no estimates available in population of target assumed to have the characters of importance, 50% should be utilized for the proportion of the target population with characteristic being measured. Based on equation 3.1, at 95% desired level of confidence, the size of the sample for this study (*n*) was determined as a minimum of **384** respondents.

This study used a sample size which was arrived at in two successive stages. First, the list of registered real estate agents (REAs) operating in Nairobi, which is listed alphabetically, was used. This list has 284 REAs. From this list one investor each was selected giving a sample of 284 investors. In order to arrive at the remaining minimum of 100 respondents, a systematic random sampling was used. The 284 REA was divided by the required sample size of 100 REI. This process resulted into obtaining an investor from every second REA in the list of 284. Similarly as in the first phase of sampling, all the second REA was used to provide the second investor. A total of 142 investors were obtained in the second phase. The total sample size of the investors for this study was therefore the total of 284 arrived at in the first phase and an additional 142 computed in the second phase, which was 426 REI. This was deemed appropriate since the minimum sample size statistically computed was 384 respondents.

In social research, it is deemed more appropriate to oversample where the response rate is likely to be small. One of the reasons for low response rate in research is when the information sought is regarded as confidential or sensitive to the respondent. This study relied on real estate investors providing information on the performance of their investment. This information could in business finance be regarded as quite confidential to the investors themselves. It was therefore appropriate to retain the oversampling of approximately 10% over and above the statistically determined minimum sample size of 384 respondents. The list of the REA that was used to provide the REI is presented in the appendices.

3.7 Instrumentation

The study used questionnaires to obtain primary data. Questionnaires can be described as instruments of measurement that inquire people to respond to a number of questions or to respond to a number of statements (Schwab, 2005). Newing (2011) and Bryman (2012) point that questionnaires is made up of a sequence of precise, typically short questions which are either questioned orally by an interviewer, otherwise are self-administered by the respondents. A questionnaire can also be defined as a document consisting of several questions typed or printed in a specific arrangement on a set of forms or on a form (Kothari, 2004).

There are three essential types of questionnaires; open-ended, closed ended, and a combination of the two (Dawson, 2002). In closed ended questions, the response categories are exhaustive, that is, includes all possible responses expected from respondents. The responses are mutually exclusive, implying that only one category can be selected as the answer to a question.

Closed ended questions are utilized to create statistics in quantitative study. Questionnaires that are open-ended are utilized in qualitative study, though same scholars qualified the replies throughout the stage of analysis. The latter's popularity can be partly attributed to their usefulness in maintaining uniformity in response categories (Chava & David, 2009). The questionnaire doesn't have boxes to mark but in its place leaves an empty section for the respondent involved in study to write the reply. This study used a combination of the open-ended and closed ended questionnaire.

3.8 Pilot Study

To check the reliability and validity of the questionnaires, a pilot study was carried out between September 5, 2016 and September 26, 2016 in all other locations with real estate agents other than Nairobi. There are 47 registered real estate agents outside Nairobi. The pilot was conducted by giving each real estate investor through by a registered real estate agent a questionnaire to fill. Pilot testing was aimed at establishing the appropriateness as well as the accuracy of the instrumentation and research design (Bryman, 2012). A pilot test is as well referred to as a rehearsal and imitation of the major study (Kombo & Tromp, 2009; Kothari, 2004). Cooper &Schindler (2011), note that pilot test aims at detecting faults in design, implementation as well as give proxy for collection of data of a likelihood sample. Creswell (2012) argues that a pilot test is essential for checking the instruments reliability as well as legality of a research.

Polit and Beck (2003), defines a pilot study to be a trial run or a small scale version, performed in preparation of the major research. They further state that the aim of a pilot test isn't to examine study hypothesis, but quite to examine, instruments of data collection, protocols, strategies of sample recruitment plus other features of a research in preparation for a main research. Therefore, pilot testing is aimed in identifying possible problems before they turn into mistakes that are costly, give a sign of time needed for real field work as well as likely alterations of the data collection instrument as well as modality of collection of data.

Mertens (2009) points that the sample used in a pilot study should be large enough to enable the researcher gather reliability and validity of information. Baker, Morrall and Turkington (1988) reports that the sample size to be utilized in the pilot test differs depending on costs, time and realism, but the similar would be inclined to be 5% and 10% of the major study. Cooper and Schindler (2011) points that respondents involved a pilot test don't have to be selected statistically while examining the instruments reliability as well as validity. In this research, instrument of data collection, that is a questionnaire, was examined on a 10% of the main survey to make sure that the instrument is effective and relevant.

3.8.1 Data Collection Instrument Reliability

The term reliability is described to be the stability, repeatability or a questionnaire internal consistency (Cooper & Schindler, 2011; McMillan & Schumacher, 2010). Mertens (2009) opines that researchers can use several approaches to determine the reliability of a particular data collection instrument. Two of the most common approaches involve use of repeated measures, that is, test-retest and parallel form, and calculation of internal consistency, that is, Kuder-Richardson formulas or Cronbach alpha coefficient. Alpha of Cronbach's has the majority of the utility for multi-item scales at the measurement interval level, needs just a solitary management and gives an exclusive, quantitative estimation of the scale internal steadiness (Sekaran, 2008; Cooper and Schindler, 2006). Sekaran (2008) states that in roughly every cases, alpha of Cronbach could be considered an absolutely sufficient index of the inter item steadiness dependability.

Cronbach's alpha was used to examine the measures reliability in the questionnaire (Cronbach, 1951). Cronbach's alpha ranges between zero (0) (denoting no internal reliability) and one (1.0), (denoting perfect internal reliability and the closer the coefficient is to 1.00, the more reliable the measurement (Mertens, 2009).

The study predominantly used likert scale in measuring various variables. Heuristic behavioural biases, prospect based behavioural biases, herding based behavioural biases, market factors behavioural and the financial literacy. Chavandrakandan,Venkatapirabu, Sekar and Anandakumar (2011) assert that in a likert scale measurement scale, it is important to consider the precision of the measurement score. To increase the reliability of the measurement tool, separate Cronbach alpha coefficient was computed for separate domains of the questionnaire. Regarding the thresholds for the reliability, Nunnally (1978) suggested that as a rule of thumb, Cronbach alpha values for items included in a study should not be lower than 0.7. Griffin (2010) view that Cronbach's alpha between 0.6 and 0.8 as satisfactorily reliable. In this study, reliability coefficients were computed for each likert scaled items and the final reliability results are presented under each study objective.

3.8.2 Validity of Data Collection Instrument

Bryman, 2008 and Gatara, 2010 view that validity address a fundamental question of "whether a given questionnaire measures that which it claims to measure". Validity is described as the extent of similarity between the phenomena explanations and the actualities of the world (McMillan and Schumacher, 2010). It's generally agreed in social research that total validity is hard to determine but signifying the developing measure validity is very key in study (Bryman, 2012).

This research utilized equally content validity and construct validity. Content validity is often established using content experts to make judgments on the process followed. To ensure content validity, the questionnaire was taken thorough assessment by two sovereign resource individuals, from the Certified Security Analysis, Kenya Chapter. The resource persons were questioned to assess the statements within the questionnaire for significance plus whether they are clear, meaningful, offensive or loaded. Regarding evaluation, the instrument of study was suitably adjusted before taking it to the last exercise of data collection.

Kaiyer-Meyer-Olkin sampling adequacy measure (KMO) and Barttlet's test of Sphericity (Chi-Suqare) was utilized to assess factorability of each variable construct along each behavioural constructs. After factor analysis, each likert scaled construct was re-assessed for reliability of the measure. Principal Component Analysis (PCA) orthogonal rotation; method of varimax was used to extract quality constructs for each of the independent variables.

Tabachnick and Fidell (2014) opine that a loading of 0.32 is a superior rule of thumb for minimum item loading, which associates to roughly 10 percent overlapping variation with additional items in that factor. This study used a threshold of factor loading of 0.4 to assess validity of the variable constructs.

3.9 Measurement of Variables

All the other four objectives, that is, Heuristic Behavioural biases, Prospect based behavioural biases, Herding based behavioural biases, market factors behavioural and the moderating variable, financial literacy, were measured using ordinal scale data and summated scale as its scaling technique. Ordinal scale puts actions in line; however, there is no effort to create the scale intervals equivalent in terms of various rule.

The numbers in ordinal scale do not indicate absolute quantities, and they do not indicate the intervals between numbers are necessarily equal (Chavandrakandan,Venkatapirabu, Sekar & Anandakumar, 2011). The questionnaire was dominated by likert-type scale that ranges from 1 - 5 with the subsequent equivalences; "1": "strongly disagree"; "2": "disagree"; "3": "neutral"; "4": "agree"; and "5": "strongly agree".

Likert scales developed by Rensis Likert are the most frequently used variation of the summated rating scale and are more reliable. In addition, these scales provide a greater volume of data than many other scales. Cooper and Schindler, (2011) further reinforces that, likert scales are a better approximation of the normal response curve. The Likert scales help the respondents to respond more easily and further help to accumulate and summarize responses more efficiently (Chavandrakandan,Venkatapirabu, Sekar & Anandakumar, 2011). Likert scale is all over in almost all fields of business as well as scholarly and research so much as a result that it's utilized in a broad diversity of situations amongst them, effect or effect, when the value sought is a belief, when the value sought is considered to be of such a sensitive nature that respondents would not answer except categorically in large ranges and when the value sought cannot be answered or asked absolutely as well as with precision. The required data in this research displayed most of these characteristics and therefore Likert scale were considered appropriate (Chimi and Russel, 2009).

3.10 Data Analysis and Presentation

Data analysis is the reasoning application in order to understand the gathered data with an objective of establishing reliable patterns as well as making a summary of the applicable particulars exposed in the study (Zikmund, Babin, Carr and Griffin, 2010).

To establish the patterns exposed in the gathered data concerning the picked variables, analysis of data was directed by the objectives and aims of the study. In addition, consideration was given to the variable characteristics, normality of distribution of the criterion variable, independence of the predictors and multicollinearity of the predictor variables.

In multiple regression applications, independent variables may be correlated resulting to a statistical phenomenon referred to us multicollinearity. Multicollinearity occurs where two or else more forecaster variables in a multiple regression are extremely connected (Argyrous, 2011; Doane & Seward, 2008). In situation of the high correlation of independent variables, the estimate beta coefficients may significantly change from little modification in the model of the data (Doane & Seward, 2008; Farrar & Glauber, 2005). According to Robert (2007), a group of predictor variables are completely multicollinearity if there are one or more precise linear associations amongst a number of the variables. The test of multicollinearity aids to decrease the hypothesized variables which assess similar things plus as well checks the redundancy of the model.

Independence of observations is another important assumption in statistical procedures. Garson (2012) views that independence of regressor variables is generally assumed by most statistical procedures including multiple regression, logistic regression and most of the general linear model. In this study the assumption of independent variables were tested using Durbin-Watson Coefficient. Durbin-Watson coefficient uses standardized residuals of the proposed regression (Shevlin & Miles, 2010).

In many statistical methods, normality of the dependent variable is often conveniently assumed without any empirical evidence or test. But normality is critical in many statistical methods. There are several methods of testing normality of study variables distribution. The two main ways of testing normality distribution are graphical methods and numerical methods (Park, 2008). Performance of the real estate was subjected to the normality Kolmogorov-Smirnov (K-S) and Shapiro-Wilk test (Wilk & Shapiro, 1965).

For each of the study objective, statistical modeling was done through a series of procedures. First, factor analysis was done. Based on the output of the model parameters, the preferable model was selected. Secondly, bivariate regression was done and inferences drawn for each of the objectives. After each bivariate regression the resultant model residuals were used to test homoscedasticity and assess the suitability of the bivariate model between each independent variable and investment performance (Shevlin & Miles, 2010). For each bivariate regression, model fitness was assessed to determine the coefficient of determination for each predictor on dependent variable. Further, one way analysis of variance (ANOVA) was presented to determine the specified model suitability.

Zikmund, Babin, Carr and Griffin (2010), Bryman (2012) , Creswell & Clark (2011) are of the view that studies that includes three or additional variables, or which is aimed at underlying proportions amongst numerous variables will more frequently than not include multivariate statistical analysis. Multivariate statistical technique analyze numerous variables or still variables multiple sets concurrently (Zikmud *et al.*, 2010; Hair, Black, Babin & Carpenter, 2010).

To establish the influence of heuristic based behavioural biases on performance, bivariate regression expression was used. In this expression, (REP) is Real Estate Performance, α is the constant; β_1 is the rate of change of performance with a unit change in predictor and X_1, the composite measure of Heuristic based behavioural biases.

$$\boldsymbol{REP = \alpha + \beta_1 X_1} \quad \textbf{(3.2)}$$

Similarly, to establish the effect of prospect based behavioural biases on real estate performance in Kenya, a bivariate linear expression (3.3) was used. In this expression, β_2 is the rate of change in performance associated with a unit chance in management control systems measure.

$$\boldsymbol{REP = \alpha + \beta_2 X_2} \quad \textbf{(3.3)}$$

Further, to explore the influence of herding based behavioural biases on real estate performance in Kenya, a bivariate equation (3.4) was used. In this expression, β_3 is the rate of change in performance associated with a unit change in herding based behavioural biases.

$$\boldsymbol{REP = \alpha + \beta_3 X_3} \quad \textbf{(3.4)}$$

Likewise, to determine the effect of market factors driven behavioural biases on real estate performance in Kenya, a bivariate equation (3.5) was used. In this expression, β_4 is the rate of change in performance associated with a unit change in market factors driven biases.

$$\boldsymbol{REP = \alpha + \beta_4 X_4} \quad \textbf{(3.5)}$$

In addition, to measure the moderating role of financial literacy on real estate performance in Kenya; a bivariate equation (3.6) was used. In this expression, β_5 is the rate of change in performance associated with a unit change in financial literacy measures.

$$\boldsymbol{REP = \alpha + \beta_5 X_5} \quad \textbf{(3.6)}$$

The findings of the analysis were classified along every set research objective. The findings were presented primarily in figures, tables, charts, percentages and graphs.

Based on the results of the descriptive and inferential statistics on which the data was subjected to, inferences were drawn from each tested hypothesis and conclusions and recommendations were also made.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The main objective of this study was to explore the behavioural biases of real estate investors and the moderating role of financial literacy on the selected investor biases and the investment performance in Kenya. This chapter presents the response rate; the analyses of the data, interpretation and findings of the data.

4.2 Response Rate

This study targeted 426 respondents from real estate investors distributed geographically and area of real estate investments. Out of these 426 questionnaires, 353 were completed and returned. This represents a response rate of approximately 83%. The response rate was distributed firstly according to the region and secondly according to the three categories of investment, that is; commercial investors, industrial investors and residential investors. The regions were divided into Nairobi and its environs and any other region within Kenya. Table 4.1 shows the regions of investment which were categorized into towns. Nairobi accounted for the highest area of investment at 78% mainly because Nairobi has the highest number of dwellers as well as the highest demand for real estate in Kenya. 22% of the respondents also had investments in more than one geographical area in Kenya.

Table 4.1: Response Rate by Regions of Real Estate Investments

Region of Investment	Frequency	Percentage (%)
Nairobi and its environs	276	78
Investments in more than one geographical area	77	22

Table 4.2 shows the response rate for the areas of investment which were categorized into; commercial real estate investment, Industrial real estate investment and Residential real estate investment. Fifty seven percent (57%) of the respondents invested in residential real estate investors accounting for the highest followed by commercial real estate investors at 21% and industrial real estate investors at 7%. Approximately 16% of the respondents had investment in more than one area of investment. The overall response rate in this study was similar to Elahi (2014) who examined behavioural biases in investment decision making and moderating role of investor's type in Pakistan, which achieved 91% response rate. Interviewing the respondents partly contributed to the high response rate in both studies.

Table 4.2: Response Rate by Areas of Investment

Real Estate Investment Category	Frequency	Percentage (%)
Commercial	73	21
Industrial	23	7
Residential	200	57
More than one area	55	16

4.2.1 Sample Characteristics

The characteristics of interest in this study used to describe the targeted real estate investors were two. The first characteristic was the years of investment which was a pointer to the number of years an investor had in real estate. The key years of investment were categorized 0-10 years, 11-20 years, 21-30 years and above 30 years. This was to assist in understanding the trend in real estate development over the past years and the behaviour of different real estate investors. The second characteristic of interest of the sample was the trend of the investment returns; increasing, stagnant or decreasing.

4.2.2 Distribution by the Years of Investment

Figure 4.1 presents the distribution of real estate investors according to the years of investment. The ranges on years of investment were given a scale of 0-11 years, 10-21 years, 21-30 years and above 30 years. The respondents were asked to indicate the number of years that they had invested in real estate. The results are presented in figure 4.1. The figure shows that 123 respondents out of the 353 (34.9%) made up the highest number of real estate investors in the category of 5-10 years in the real estate investment followed by the category of 11-20 years at 32.7%. Both categories make up 67.6% of the respondents showing that there has been a great interest and investment in real estate over the last 20 years. This could be supported by the PwC (2015) report that showed that there has been a significant growth in real estate development, driven by rising demand for both office and residential houses in recent years. This is also in concurrence with Night Frank's Africa Report to the Nations, (Knight Frank, 2015) which shows that Africa has turned out to be a world's real estate market continent of growth and opportunity.

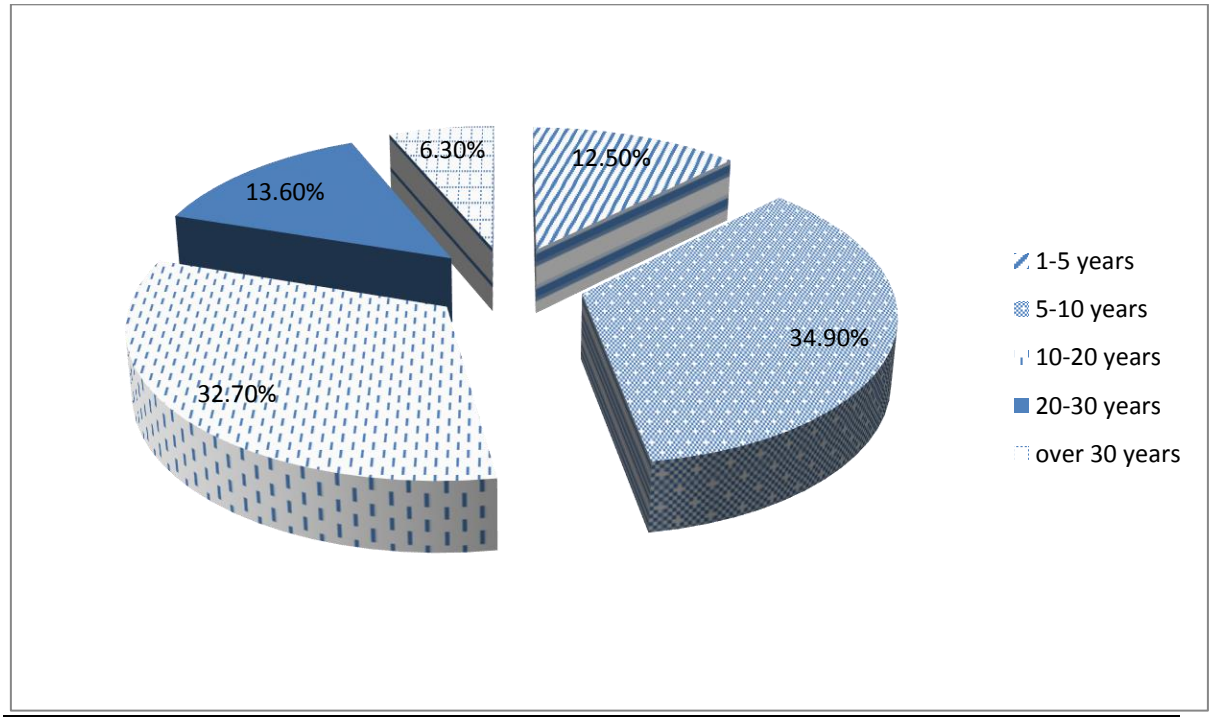

Figure 4.1: Distribution of Investors According to Years of Investment

4.2.3 Distribution by Trend of Returns

Trend was categorized into decreasing, stagnant or increasing. The respondents were asked to indicate what measure fairly represented their returns in the past 5 years (2011-2016). This was important in showing the trend of real estate returns over the past 5 years (2011-2016). The distribution among the investors according to trend of their returns is shown in Figure 4.2. The results show that a majority of investor's returns at 92% were increasing, 8% stagnant and a dismal 0.6% decreasing.

These results were supported by other studies which show that real estate contributes about 8% to GDP with an average growth rate of 4.1% per year (RoK, 2015). The prime rentals yields for offices, retail investments and industrial investments have been growing at an average rate of 8%, 10% and 8% respectively (Knight & Frank, 2015). Further still, Economic survey, a key report by the Republic of Kenya indicates that construction registered an accelerated growth of 13.1% between the year 2013 and 2014 (RoK, 2015). Also a study by PwC, 2015 conducted between the years 2010 and 2016, shows that there has been a significant growth in real estate development, driven by rising demand for both office and residential houses.

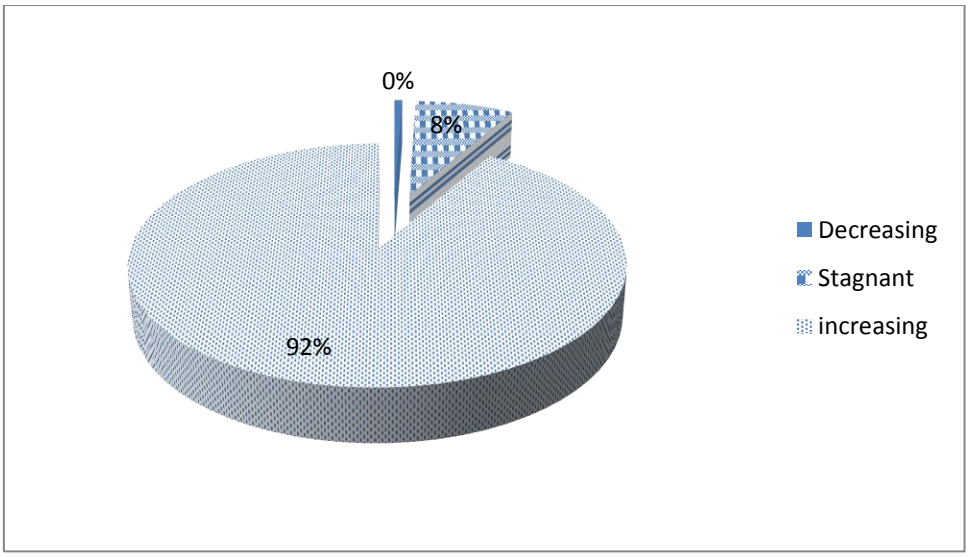

Figure 4.2: Distribution according to Trend of the Returns

4.3 Investment Performance in Real Estate

Investment performance was measured using three statements which were asked and measured using a likert scale. Respondents were asked to indicate to what extent they agreed or disagreed with statements measuring real estate investment performance. This was measured in a five point likert scale with "1" indicating "Not at all", "2" indicating "To a less extent", "3" indicating "To a moderate extent", "4" indicating "To a large extent", and "5" indicating "to a very large extent". Percentage frequencies of the responses on investment performance are presented in Table 4.3.

The first statement required the respondents to indicate to what extent the investors' expectations in terms of occupancy and returns had been met in the last five years. Thirty percent of the respondents indicated that their investment expectations were met to a moderate extent. The second statement asked whether the respondent's investment value had significantly grown over the past 5 years, only 23% felt that their investment value had grown to a very large extent. Forty five percent of the respondents felt that their income had grown to a large extent. Further the mean measure of the three measures was 3.82 indicating there was a strong convergence to their expectations being met. However, the results suggest that the investors' expectations have not been met fully as a result of the behavioural biases portrayed by the investors. This might have been as a result of over optimistic expectations.

This concurs with the study by Glaeser (2013) who carried out an empirical analysis on the of investor rationality in the US housing markets and found that the optimistic projections fail to materialize due to the investor inability to forecast and the emotional expectations.

Glaeser attributes the rising real estate prices to the optimistic expectations where investors paid high prices with an optimistic assessment of future price growth. Further studies by Nyamute, Lishenga and Oloko (2015) on the relationship between investor behaviour and portfolio performance at the Nairobi Securities Exchange indicated overconfidence, as a behavioural bias, had a negative effect on performance.

Table 4.3: Response Distribution for Investment Performance

Investment Performance	Not at all (%)	To a less extent (%)	To a moderate extent (%)	To a large extent (%)	To a very large extent (%)	Mean	Std. Deviation
Occupancy Expectations	1	5	30	41	23	3.82	0.87
Rental Income expectation	0	8	21	45	25	3.89	0.88
Value growth	2	7	29	39	23	3.75	0.94
Average						**3.82**	**0.9**

4.4 Assessment of Reliability of Measurement

In order to measure the internal consistency of Heuristic based biases, prospect based biases, herding biases, market biases and financial literacy, likert scales were used, reliability coefficients were computed for each likert scaled items and the results are presented in Table 4.4. The table shows that the Cronbach's alpha coefficients ranged between a low of 0.692 for anchoring bias and a high of 0.735 for Investment performance.

Regarding the thresholds for the reliability, Nunnally (1978) suggested that as a rule of thumb, Cronbach alpha values for items included in a study should not be lower than 0.7. Griffin (2010) view that Cronbach's alpha between 0.6 and 0.8 as satisfactorily reliable. Based on the Cronbach's alpha coefficients in Table 4.4, reliability of the measures was therefore considered sufficient in this study.

Table 4.4: Results for Reliability Assessment

Variable	Scale Item	Number of Items	Cronbach's alpha
Heuristic driven biases	Overconfidence	7	0.714
	Availability Bias	6	0.705
	Anchoring Bias	4	0.692
Prospect based bias	Loss Aversion	6	0.726
	Regret Aversion	5	0.705
Group Bias	Herding Bias	7	0.747
Market Anomalies	Market Bias	6	0.716
Financial Knowledge	Financial literacy	6	0.727
Investment Performance	Investment returns	3	0.735

4.5 Financial Literacy of Investors in Real Estate

4.5.1 Descriptive Statistics for Financial Literacy

To measure financial literacy, five statements were asked. The respondents were asked to indicate to what extent they agreed or disagreed with statements measuring financial literacy. This was measured in a five point likert scale with "1" indicating "Not at all", "2" indicating "To a less extent", "3" indicating "To a moderate extent", "4" indicating "To a large extent", and "5" indicating "to a very large extent". The results are presented in table 4.5.

The first statement asked whether the respondents have knowledge in various areas of investment. The results show that 40% percent of the respondents moderately acknowledged that they have knowledge of different areas of investment. Secondly, when asked whether they knew how to calculate their investment expected income, forty percent felt that they could calculate their returns a large extent. Forty four percent of the respondents to a large extent felt that investment in real estate market reduces the risk of being in a poor financial position. Further the mean measure of the five variables was 3.58, an indication that there is a strong convergence of investors being financially literate.

Table 4.5: Response Distribution for Financial Literacy

Statement	Not at all (%)	To a less extent (%)	To a moderate extent (%)	To a large extent (%)	To a very large extent (%)	Mean	Std. Deviation
Investment Knowledge in different areas	3	9	40	37	12	3.46	0.91
Knowledge to calculate expected income/returns	1	12	35	40	12	3.5	0.89
Financial Knowledge to make Personal financial decisions	1	13	34	38	14	3.51	0.92
Knowledge of investment options in real estate	1	6	36	44	14	3.65	0.82
Portfolio management reduces risk	1	7	27	44	21	3.77	0.88
Mean						**3.578**	

4.5.2 Drivers for Financial Literacy

Factor Analysis was carried out to find whether the test items for financial literacy were statistically significant or not. The results are presented in section a to section d.

a. Test of sampling adequacy of Heuristic bias

Keiser- Meryer- Olkin measure of adequacy and Bartlett's test of Sphericity were used to test the appropriateness of factor analysis for the data reduction for this measure. The results of this test are presented in Table 4.6. Table 4.6 shows a KMO score of 0. 693, which is well above 0.50 level (Malhotra, 2004), indicating an acceptable degree of sampling adequacy. Bartlett's test of Sphericity was used to test the appropriateness of factor analysis for data reduction for this measure and has a Chi-Square of 348.910with associated p-value of 0.000<0.001, indicating that the measures of financial literacy construct are significant.

Table 4.6: Test of sampling Adequacy-Financial Literacy

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.693
Bartlett's Test of Sphericity	348.910
	10
	.000

b. Rotated Pattern Matrix for Financial Literacy

One construct measure of financial literacy was subjected to factor analysis. The results of factor analysis are shown in Table 4.7. Factor loadings ranged from 0.623 to 0.779 indicating that the measures were well loaded.

Table 4.7: Component Matrix for Financial Literacy

		Component 1
FL1	I know about investments	.820
FL2	I know how to calculate the expected income/return on my investments	.802
FL3	I use financial knowledge to make personal financial decisions	.754
FL4	I understand investment options for real estate and the risks involved	.619

Extraction Method: Principal Component Analysis.

a. 1 component extracted.

c. Communalities for Financial Literacy

Communality measures the percent of variance in a specified variable explained by all the combined factors and is interpreted as the reliability of the indicator (Gason, 2008). The study shadowed the suggestion of Gerbing and Anderson (1998) that principal component analysis be generated separately for each individual study construct to establish that all items loaded onto one factor only. If communalities are high, recovery of population factors in sample data is normally very good.

The implication is that the variations of factors with higher extraction values can be explained by all other factors combined. The table of Communalities which shows the variance in each of the original variables is described in the Table 4.8.

Table 4.8 shows the variation in a single variable with respect to all the other variables put together in the factor analysis. The factors with higher extraction values mean that their variation is explained to a greater extent by all other factors combined together. The findings indicate that the most influential component for heuristic bias was FL1 with a communality of 0.606. This means that 60.6% of any changes in financial literacy were accounted for by the extracted factors.

Table 4.8: Communalities for Financial Literacy

		Initial	Extraction
FL1	I know about investments	1.000	.672
FL2	I know how to calculate the expected income/return on my investments	1.000	.642
FL3	I use financial knowledge to make personal financial decisions	1.000	.568
FL4	I understand investment options for real estate and the risks involved	1.000	.504

Extraction Method: Principal Component Analysis.

Table 4.9: Total Variance Explained for Financial Literacy

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.266	56.657	56.657	2.266	56.657	56.657
2	.818	20.440	77.097			
3	.564	14.111	91.208			
4	.352	8.792	100.000			

Extraction Method: Principal Component Analysis.

From the analysis in Table 4.9, one factor in the initial solution has Eigen values greater than 1. The factor accounts for almost 56.657% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model.

d. Scree plot for Financial Literacy

Factor analysis helped in formulating the hypotheses for the study. The scree plot forms the basis for decision criteria that informed hypothesis formulation. Factor numbers (independent variables) with the Eigen values greater than one indicate their high extent in affecting the total variance in the model. The leftmost section of scree plot shows the variance explained by the initial solution; only three factors in the initial solution have Eigen values greater than 1. Together, they account for almost 56.657% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model. Figure 4.3 shows the scree plot for heuristic based bias

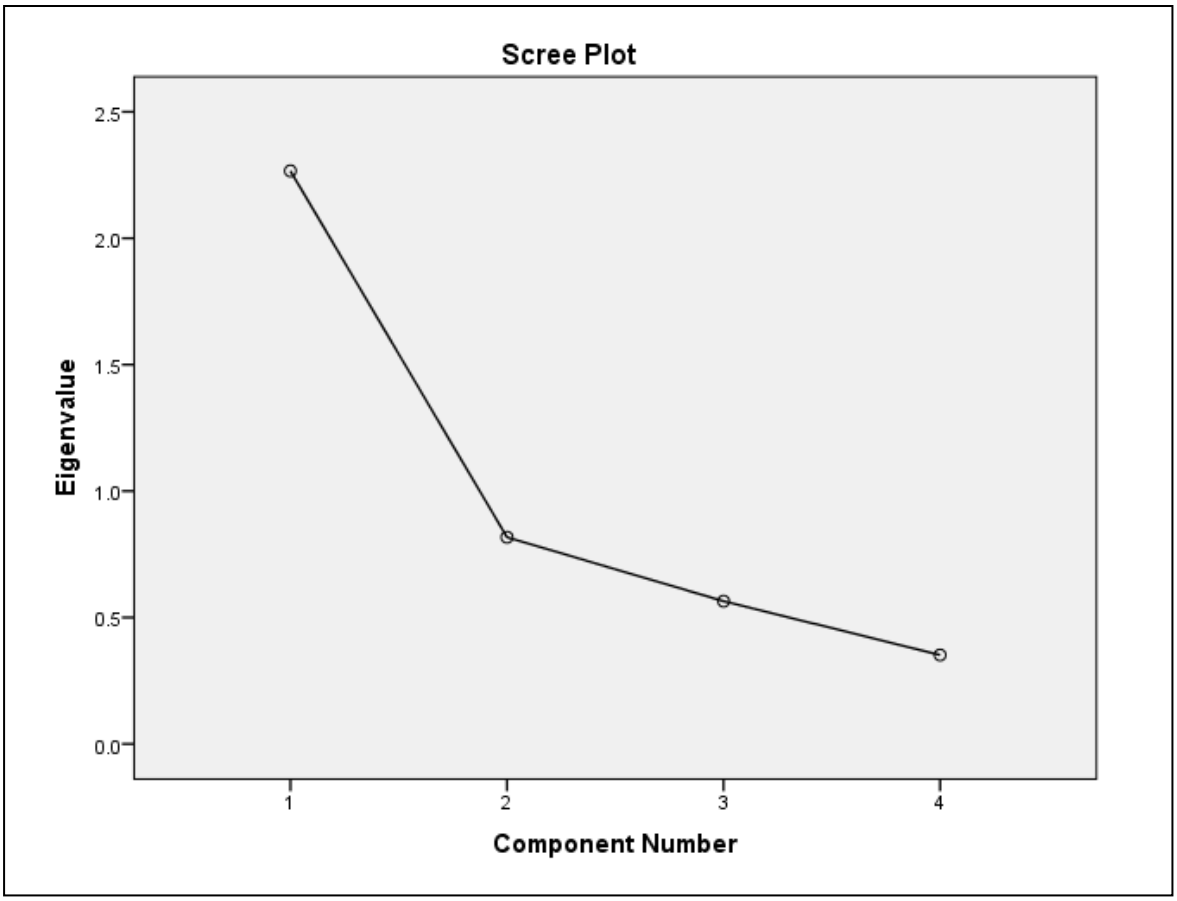

Figure 4.3: Scree Plot for Financial Literacy

4.6 Test of Statistical Assumptions

The main objective of this study was to examine the combined effect of all the four variables namely; heuristic bias, prospect bias, herding bias and market bias and the moderating role of financial literacy on Investment performance of real estate investments. The objective was to allow the study to explain the role that these multiple variables play in the performance of real estate market.

Shelvin and Miles (2010) state that before data analysis is done, it is important to assess a number of assumptions about the distribution of the variables. These assumptions include; the assumption of no multicollinearity among the independent variables, assumption of independence of predictor variables, assumption of normality of the criterion variable and the test of outliers. Therefore, in this study, data was subjected to these tests.

4.6.1 Test of Multicollinearity of Behavioural Biases

To test for strong correlations among the independent variables a test of Multicollinearity was conducted. Multicollinearity is the undesirable situation where the correlations among the independent variables are strong. In other words, multicollinearity misleadingly bloats the standard errors.

Multicollinearity of the independent variables was assessed using VIF and Tolerance. Variance Inflation Factor is the reciprocal of Tolerance. A variance inflation factor of more than 4.0 is an indication of high multicollinearity. The results are presented in Table 4.10. The findings in table 4.10 indicate that the study independent variables; heuristic bias, prospect bias, herding bias, market bias and financial literacy have hight tolerance. With VIF values ranging between 1.21(for market bias) and 1.538 (for prospect bias), it was concluded that there was no presence of multicollinearity in this study an indication that the beta values of the regression equation of the four independent variables would be stable with low standard errors.

Porter and Gujarat (2009), recon that as a rule of the thumb, if VIF of an independent variable exceeds 10, that variable is collinear. Based on this rule of the thumb, there was no collinearity among the independent variables. Nyamute (2015) used this method of testing for multicollinearity in her study that examined investor behaviour, investor demographic characteristics, investment style and individual investor portfolio performance.

Table 4.10: Collinearity Statistics for Behavioural Biases

Variable	Collinearity Statistics	
	Tolerance	**VIF**
Heuristic bias	.666	1.502
Prospect bias	.650	1.538
Herding bias	.813	1.230
Market bias	.826	1.210

a. Dependent Variable: Investment Performance

4.6.2 Test of Independence for Behavioural Biases

The independent test for each of the five variables was conducted using Dubin-Watson *d* statistic. Values of Dubin-Watson *d* statistic were extracted and results of the independence test are shown in Table 4.11. The statistic for each of the four regressor variables range between 1.994 (Heuristic Bias) and 2.0004 (prospect Bias). According to Garson (2012) these statistics should all be within the range of 1.5 and 2.5 for independent observations. The assumption of independence of the study predictor variables in a regression model was met for all the study variables based on the Dubin-Watson *d* statistic test for independence of observations.

Table 4.11: Coefficient of Durbin Watson d-statistic

Predictor Variable	Durbin-Watson Statistic
Heuristic Bias	1.997
Prospect Bias	2.004
Herding Bias	2.002
Market Bias	1.994

4.6.3 Test of Heteroscedasticity.

Heteroscedasticity was assessed using Breusch-Pagan test. The results are presented in table 4.12. A large chi-square value greater than 9.22 would indicate the presence of heteroscedasticity (Sazali, Hashida, Jegak & Raduan, 2009). The data in this study indicate a chi-square value of 2.285 and a significance of 0.131 indicating that heteroscedasticity was not a concern.

Table 4.12: Results of Heteroscedasticity Test

Test	Test value	Sig
Breusch-Pagan	2.285	.131

4.6.4 Test of Outliers of Independent Variables

To test for outliers, a test for outliers was conducted for all the independent variables; heuristic bias, prospect bias, herding bias and market bias. An outlier is a case that is significantly different from the main trend of the data and can thus cause bias in the data. Mahalanobis d-squared was used for multivariate testing on the independent variable where they produced reasonable box-plots as shown in Figure 4.4. Figure 4.4 indicates that all the constructs are symmetrical and with no outliers identified.

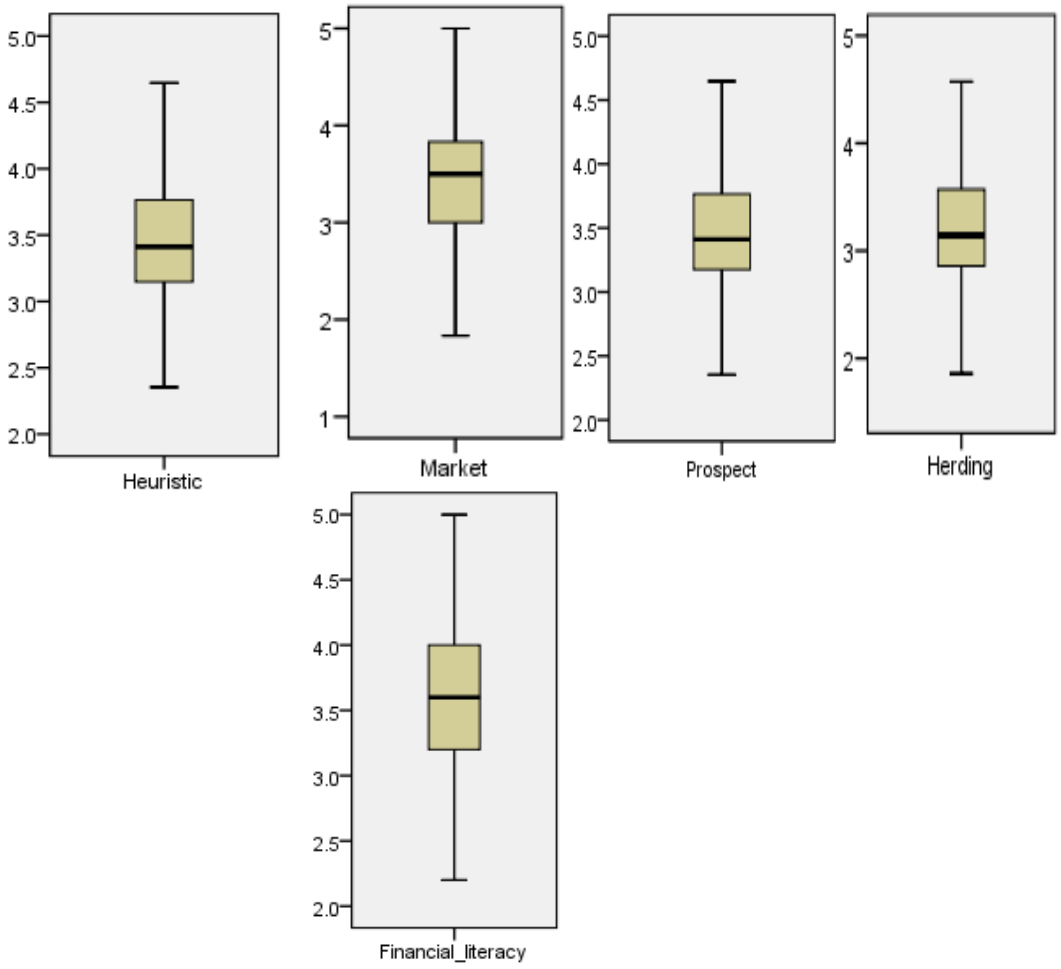

Figure 4.4: Test of Outliers in the independent variables

4.6.5 Linearity Test for Behavioural Biases

In order to establish the relationship among the sample characteristics, a Pearson's correlation coefficient between investment performance and each of the hypothesized explanatory variables was conducted. Table 4.13 presents the results of the Pearson Correlation analysis. The results indicates that there is a significant negative linear relationship between investment performance and heuristic bias, investment performance and prospect bias, investment performance and herding bias and investment performance and market bias at $P < 0.05$ significance level.

Table 4.13: Results of Pearson's Correlation Linearity Test

		Performance	Conclusion
Heuristic Bias	Pearson's Correlation	-.494**	Linear
	Sig. (2-tailed)	.000	
	N	352	
Prospect Bias	Pearson's Correlation	-423**	Linear
	Sig. (2-tailed)	.000	
	N	352	
Herding Bias	Pearson's Correlation	-.511**	Linear
	Sig. (2-tailed)	.000	
	N	352	
Market Bias	Pearson's Correlation	-.527**	Linear
	Sig. (2-tailed)	.000	
	N	352	

4.7 Heuristic Based Behavioural Biases and Investment Performance in Kenya

To analyze the first independent variable, Heuristic bias, both descriptive and inferential analyses were done for the variable. The analysis is presented in section 4.7.1 for descriptive analysis, 4.7.2 for Drivers for Heuristic Bias and 4.7.3 for inferential statistics.

4.7.1 Descriptive Analysis for Heuristic Bias

Heuristic bias was assessed using three behavioural biases constructs that is; overconfidence bias, availability bias and anchoring bias. Descriptive statistics for the sampled respondents (n=353) are presented in section a to section c respectively.

a. Descriptive Analysis for Overconfidence Bias

To test for overconfidence, the respondents were asked seven statements that were laid on a likert scaled questionnaire. Table 4.14 displays the frequencies of responses in terms of percentages against each overconfidence statement.

Sixty eight percent of the real estate investors agreed that they possessed market predictive skills that aided in outperforming other investors. The results further indicate that 58% of the real estate investors agreed that they considered themselves to have excellent real estate investment skills. In addition 62% of the respondents indicated that they are able to use their own skills and confidence to make sound real estate investment decisions.

Sixty percent (60%) of the respondents agreed that if they lost their current investment they can easily find another real estate investment that is close. Fifty one percent (51%) of the investors thought themselves to have better investment ability compared to their peers and 55% considered themselves to be high performance in real estate investments. The mean score was 3.56, which was well above the mid-point on a scale of 1-5.

These findings point out that a high number of respondents portrayed characteristics of overconfidence bias. Glaeser (2013) carried out an empirical analysis on the of investor rationality in the US housing markets found that the respondents portrayed overconfidence and their projections fail to materialize due to the investor inability to forecast and the inhibiting emotional expectations. Similarly, Salzman & Zwinkels (2013) carried out an analysis of the effect if inefficiencies in the property market from a behavioural perspective in the UK and concluded that the investors portrayed characteristics of over-optimism and over-confidence which explained deviations from rationality.

Table 4.14: Descriptive Statistics for Over Confidence

Over Confidence	Strongly Disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly Agree (%)	Mean	Std. Deviation
Excellent investment Skills	3	12	28	43	15	3.55	0.97
Above average perform.	2	13	30	38	17	3.54	0.99
Better investment Abilities	1	12	37	40	11	3.47	0.88
Easily find a venture close to mine	3	14	30	40	14	3.48	0.99
Investment even after fail	3	16	21	43	17	3.56	1.05
Able to use my skills and confidence.	2	17	19	44	18	3.6	1.02
Predictive skills	2	11	22	43	22	3.72	0.98
Mean						**3.56**	**0.98**

b. Descriptive Analysis for Availability Bias

To measure for availability bias, the respondents were presented with six statements that were laid out on a likert scaled questionnaire. Table 4.15 displays the frequencies of responses in terms of percentages against each Availability bias statement.

Sixty two percent of the respondents felt that they would be cautious about investments that have reported losses. On the other hand 61% of the respondents felt that they would be excited about investments that have made profits. Fifty seven percent (57%) of the respondents felt that they would expect subsequent profits after making profit in their first investment. When asked about investing in a company that is undergoing financial crisis only a mere 33% of the respondents agreed. The mean score was 3.335, which was well above the mid-point on a scale of 1-5 and a standard deviation of 1.085. This shows that a high number of respondents portrayed characteristics of availability bias.

These findings point out to the existence of availability bias among real estate investors. Onsomu (2014) examined the impact of behavioural biases on investor decisions in Kenya and concluded that Investors at the Nairobi Securities Exchange are affected by Availability bias which impacted on their investments.

Table 4.15: Descriptive Statistics for Availability Bias

Availability Bias	Strongly Disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly Agree (%)	Mean	Std. Deviation
Cautious about investment that have lost	1	9	28	42	20	3.69	0.93
Excited about investment that have made profits	1	11	27	40	21	3.7	0.96
Expect to make similar profits as my friends	6	21	25	36	13	3.28	1.10
Expect to make profits after first prof	2	16	25	39	18	3.54	1.03
Rely on advert rather than own	14	24	25	23	14	3	1.26
Invest in a company that is in financial Crisis	18	26	23	25	8	2.8	1.23
Mean						**3.335**	**1.085**

c. Descriptive Analysis for Anchoring Bias

Anchoring bias was the third construct to be analyzed in the measurement of heuristic bias. To test for anchoring bias, the respondents were asked four statements that were laid on a likert scaled questionnaire. Table 4.16 displays the frequencies of responses in terms of percentages against each anchoring bias statement. Table 4.16 shows the response rate for anchoring bias which was the third measure of heuristic bias. Fifty percent (50%) of the respondents felt that their past experiences would affect how they invest currently and in the future. When asked about their past investment returns, 52% of the respondents agreed that their past investment returns influence their current and future investment decisions.

The mean score for the anchoring bias was 3.5 which is well above the mid-point (2.5) of a scale of 1-5 and a standard deviation of 0.98 indicating that a significant number of real estate investors portrayed anchoring bias. Cole, Soufani, Tse, and Aboulamer (2012) examined the relationship between anchoring as a behavioural bias exhibited by managers and their investment decisions and concluded that existence of anchoring bias affected the investor's investment decisions.

Table 4.16: Descriptive Statistics for Anchoring Bias

Anchoring Bias	**Strongly Disagree (%)**	**Disagree (%)**	**Neither agree nor disagree (%)**	**Agree (%)**	**Strongly Agree (%)**	**Mean**	**Std. Deviation**
Past experiences influences future decisions.	3	17	30	32	18	3.45	1.05
Previous profits influence future investment.	1	14	32	38	14	3.5	0.94
Consider past performance in future investment.	1	14	33	36	16	3.53	0.94
Expect to make profits after first prof	2	16	25	39	18	3.51	1.03
Mean						**3.5**	**0.98**

4.7.2 Drivers for Heuristic Bias

To find whether the test items for Heuristic Bias were statistically significant or not, factor analysis was carried out. The results are presented in section a to section d.

a. Rotated Pattern Matrix for Heuristic Bias

Three main construct measures of heuristic bias; anchoring bias, overconfidence bias and availability bias were jointly subjected to factor analysis. The results of factor analysis are shown in Table 4.17. Factor loading for the first component, anchoring bias, ranged from 0.601 to 0.855 indicating that the measures were well loaded. On the second component, overconfidence bias, the loadings ranged from 0.652 to 0.845. The third component for availability bias has factor loadings ranging from 0.677 to 0.781 an indication that the measures were well loaded on each other.

Table 4.17: Pattern Matrix for Heuristic Bias

		Component		
		1	2	3
OC1	To have excellent real estate investment skills		.845	
OC2	An above average performer when it comes to my real estate investment related activities		.812	
OC3	I have better real estate investment athletic ability in comparison to my peer age group		.807	
OC4	I can easily find a real estate venture that close to my returns if I lost my current one.		.728	
OC5	I invest in a new real estate opportunity even if I failed in my previous investment and I have little time to research on the new investment and a slight chance that I will succeed		.690	
OC6	I am able to use my own skills and confidence to make a sound real estate investment decision		.751	
OC7	I am able use my predictive skills to outperform the real estate market		.652	
AB1	I tend to be more cautious of investment that have recently reported losses/negative returns			.677
AB2	I tend to be more excited of investments that have reported gains			.728
AB3	If my friend made profits in an investment I would make the same investment in hopes of making similar profits			.693
AB4	If I made profits in one investment, I would hope to make similar investment in succeeding ventures			.751
AB5	I make investments largely based on advertisements rather than own analysis			.704
AB6	I would invest in a company that is currently going through financial crisis			.781
ACB1	My past history influences my present investment decisions	.601		
ACB2	The previous profits generated from similar investments made it very attractive to me to invest in it.	.711		
ACB3	I consider the past performance of an investment before investing in it	.855		
ACB4	I will have an attraction towards an investment which has fallen considerably from their previous or all-time highs – say even from a 52 week high.	.666		

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 11 iterations.

b. Test of sampling adequacy of Heuristic bias

In order to identify and validate the appropriateness of prospect bias the characteristic measures' were subjected to Keiser- Meryer- Olkin measure of adequacy. The results of this test are presented in Table 4.18. Table 4.18 shows a KMO score of 0.734, which is well above 0.50 level (Malhotra, 2004), indicating an acceptable degree of sampling adequacy. Bartlett's test of Sphericity was used to test the appropriateness of factor analysis for data reduction for this measure and has a Chi-Square of 1187.838 and a significance value of 0.000 which is less than 0.001, supporting use of factor analysis as a data reduction technique for prospect bias.

Table 4.18: Test of sampling Adequacy-Heuristic Bias

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.734
Bartlett's Test of Sphericity	Approx. Chi-Square	1187.838
	Degrees of freedom	136
	Significance	.000

c. Communalities for Heuristic Bias

Communality measures the per cent of variance in a specified variable explained by all the combined factors and is interpreted as the reliability of the indicator (Gason, 2008). The study shadowed the suggestion of Gerbing and Anderson (1998) that principal component analysis be generated separately for each individual study construct to establish that all items loaded onto one factor only. If communalities are high, recovery of population factors in sample data is normally very good. The implication is that the variations of factors with higher extraction values can be explained by all other factors combined. Table 4.19 shows the Communalities and the variance in each of the original variables.

The Table shows the variation in a single variable with respect to all the other variables put together in the factor analysis. The factors with higher extraction values mean that their variation is explained to a greater extent by all other factors combined together. As shown in Table 4.19 all the variables had their variability explained to a greater degree by all the others combined. The findings indicate that the most influential component for heuristic bias was AB3 with a communality of 0.721. This means that 72.1% of any changes in prospect bias were accounted for by the extracted factors. The other most influential components for heuristic bias were OC2 and OC1with communalities of 0.693and 0.691. This means that the extracted factors in heuristic bias influenced 69.3% and 69.1% of the changes in OC2 and OC1 respectively.

Table 4.19: Results for Communalities for Heuristic Bias

		Initial	Extraction
OC1	To have excellent real estate investment skills	1.000	.691
OC2	An above average performer when it comes to my real estate investment related activities	1.000	.693
OC3	I have better real estate investment athletic ability in comparison to my peer age group	1.000	.624
OC4	I can easily find a real estate venture that close to my returns if I lost my current one.	1.000	.475
OC5	I invest in a new real estate opportunity even if I failed in my previous investment and I have little time to research on the new investment and a slight chance that I will succeed	1.000	.552
OC6	I am able to use my own skills and confidence to make a sound real estate investment decision	1.000	.688
OC7	I am able use my predictive skills to outperform the real estate market	1.000	.614
AB1	I tend to be more cautious of investment that have recently reported losses/negative returns	1.000	.599
AB2	I tend to be more excited of investments that have reported gains	1.000	.627
AB3	If my friend made profits in an investment I would make the same investment in hopes of making similar profits	1.000	.721
AB4	If I made profits in one investment, I would hope to make similar investment in succeeding ventures	1.000	.522
AB5	I make investments largely based on advertisements rather than own analysis	1.000	.597
AB6	I would invest in a company that is currently going through financial crisis	1.000	.695
ACB1	My past history influences my present investment decisions	1.000	.647
ACB2	The previous profits generated from similar investments made it very attractive to me to invest in it.	1.000	.587
ACB3	I consider the past performance of an investment before investing in it	1.000	.638
ACB4	I will have an attraction towards an investment which has fallen considerably from their previous or all-time highs – say even from a 52 week high.	1.000	.457

Extraction Method: Principal Component Analysis.

Table 4.20: Total Variance Explained for Heuristic Bias

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.515	35.928	35.928	2.515	35.928	35.928
2	1.081	15.444	51.372	1.081	15.444	51.372
3	1.045	14.931	66.303	1.045	14.931	66.303
4	.888	12.691	78.994			
5	.602	8.594	87.588			
6	.546	7.793	95.381			
7	.323	4.619	100.000			

From Table 4.20, three factors in the initial solution have Eigen values greater than 1. Together, they account for almost 66.303% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model.

d. Scree plot for Heuristic Bias

Factor analysis helped in formulating the hypotheses for the study. The scree plot forms the basis for decision criteria that informed hypothesis formulation. Factor numbers (independent variables) with the Eigen values greater than one indicate their high extent in affecting the total variance in the model. The leftmost section of scree plot shows the variance explained by the initial solution; only three factors in the initial solution have Eigen values greater than 1. Together, they account for almost 66.303% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model. Figure 4.5 shows the scree plot for heuristic based bias

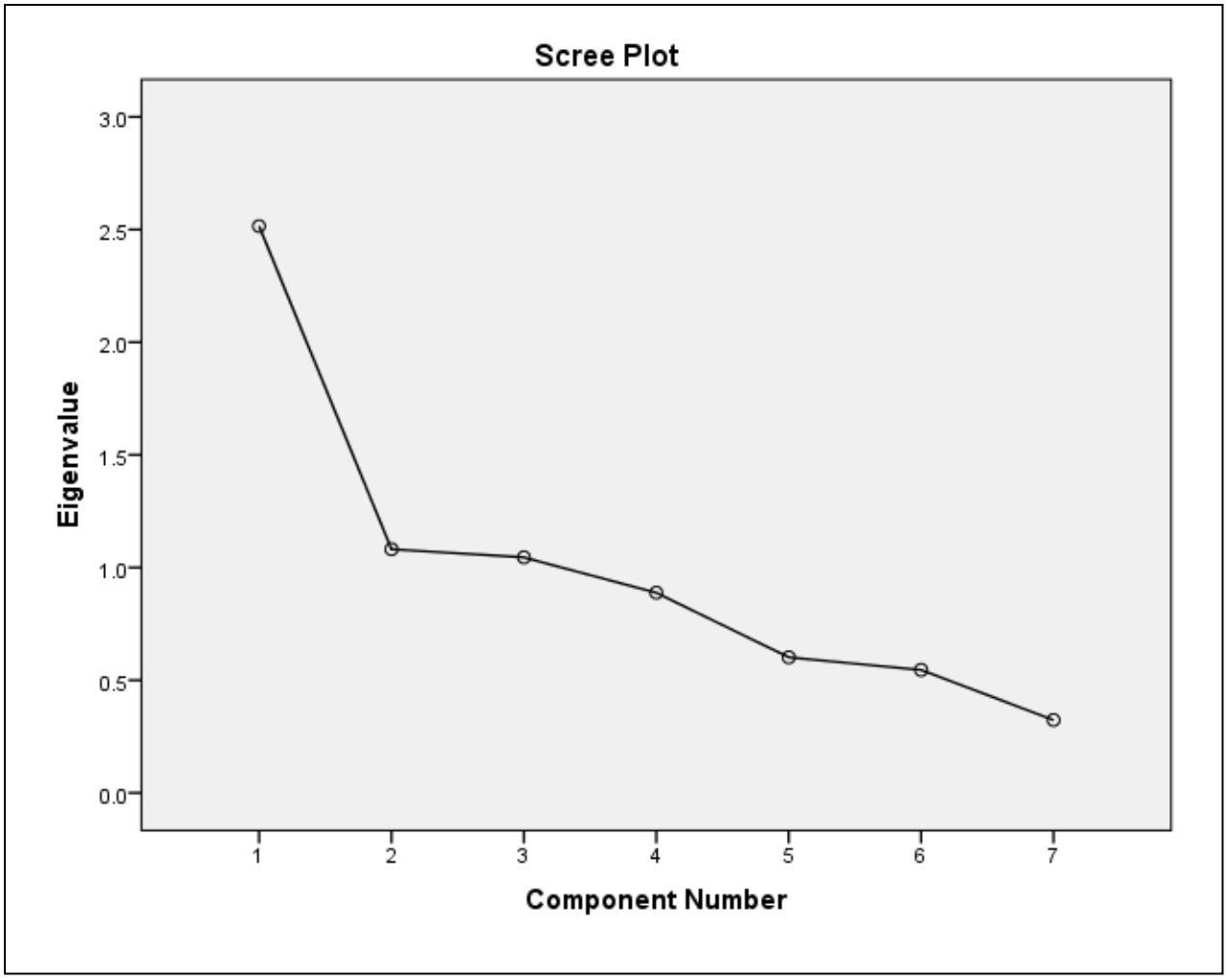

Figure 4.5: Scree plot for Heuristic Bias

4.7.3 Inferential Analysis for Heuristic Bias and Real Estate Investment Performance

To explore the influence of Heuristic based behavioural biases on the real estate performance in Kenya. The following hypothesis was formulated'

$H_0$1: Heuristic driven behaviour biases do not affect the real estate investment performance in Kenya.

In order to test this hypothesis, the first step was to model the relationship between heuristic bias and real estate investment performance.

a) Bivariate Linear Regression of Heuristic Based Bias and Real Estate Investment Performance

In order to assess the influence of heuristic bias on investment performance in Kenya, weighted measures of heuristic biases were regressed on weighted real estate investment performance measures. Results of bivariate linear regression model; model summary, ANOVA and regression model coefficients were generated. The results of the model are presented in Table 4.21, Table 4.22 and Table 4.23 respectively.

The results in Table 4.21 indicate that there is moderate correlation, R=0.494 between heuristic biases and real estate investment performance in Kenya. Further Table 4.21 shows that $R^2 = 0.244$. This statistic means that 24.4% of the corresponding variation in real estate investment performance can be explained by a unit change in heuristic biases.

Table 4.21: Model Fitness for Heuristic Biases and Real Estate Investment Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.494[a]	.244	.235	.322

a. Predictors: (Constant), Heuristic bias

b. Dependent Variable: Investment performance

The model summary presented in the Table 4.22 was assessed for its significance using ANOVA. The ANOVA for heuristic biases and investment performance is presented in Table 4.22. Table 4.13 shows that F=14.412, p value=0.000 which is less that p=0.05 an indication that the linear model robustness presented is significant at 95% level.

Based on these findings, we reject the null hypothesis that heuristic driven behaviour biases do not affect the real estate investment performance in Kenya, and confirm that indeed there is an inverse and statistically significant relationship between heuristic driven biases and real estate investment performance in Kenya.

Table 4.22: ANOVA for Heuristic Bias

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.639	1	4.639	14.412	.000[b]
	Residual	112.665	350	.322		
	Total	137.304	351			

a. Dependent Variable: Investment performance
b. Predictors: (Constant), Heuristic bias

In order to determine the significance of beta coefficients in the model summary presented in Table 4.22, results of the standardized regression were generated and the coefficients are presented in the Table 4.23. Test on the beta coefficients of the resulting model show that the constant $\alpha=0.507$ is significantly different from 0, $p=0.000<0.005$. Further, the coefficient $\beta=-0.350$, p value of $p=0.000<0.005$ meaning that it is also significant in the model. The regression model coefficients show that a -0.350 change in heuristic driven biases is associated with a unit change in real estate investment performance in Kenya. This implies that a unit change in heuristic biases explain a significant change in real estate investment performance.

The above findings indicate that there is an inverse and significant relationship between heuristic bias and investment performance in real estate investments in Kenya. These results collaborate with Salzman & Zwinkels (2013) who reviewed both corporate investors as well as household and showed that cognitive biases such as over-optimism and over-confidence which are under heuristic biases, embedded in the decision process in the real estate market either as a consumer or investor and that the appraiser plays an important role in the determination of property prices: actual observed appraisal processes largely deviate from the prescribed normative process.

Similarly, Ben-David, et al., (2007) established that there is positive relation between managerial overconfidence and financial structure and a range of corporate policies including investment, mergers and acquisitions, financing, pay-outs, market timing and compensation.

Table 4.23: Regression Coefficients for Heuristic Bias and Investment performance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	.507	.072		6.993	.000
	Heuristic bias	-.350	.072	-.494	-4.896	.000

a. Dependent Variable: Investment performance

The bivariate linear model between Investment performance and Heuristic bias thus is;

Investment Performance =0.507-0.350Heuristic Bias

b) Assessment of Homoscedasticity for Heuristic Driven Biases

The bivariate model between heuristic biases and investment performance was evaluated for a serial correlation of the model predictors. This assessment was conducted through normal P-P plot of standardized model residuals. The results of the regressed standardized residuals of the resultant model between heuristic biases and real estate investment performance are presented in the Figure 4.6.

Results of the plot of the expected probability and the observed probability of the standardized residual of the regressor indicate that they plot close to the cumulative probability line from 0 to 1. Based on these findings, it was concluded that the selected model results are normally distributed standardized residuals and that the model was appropriate for the robust analysis (Shevlin & Miles, 2010).

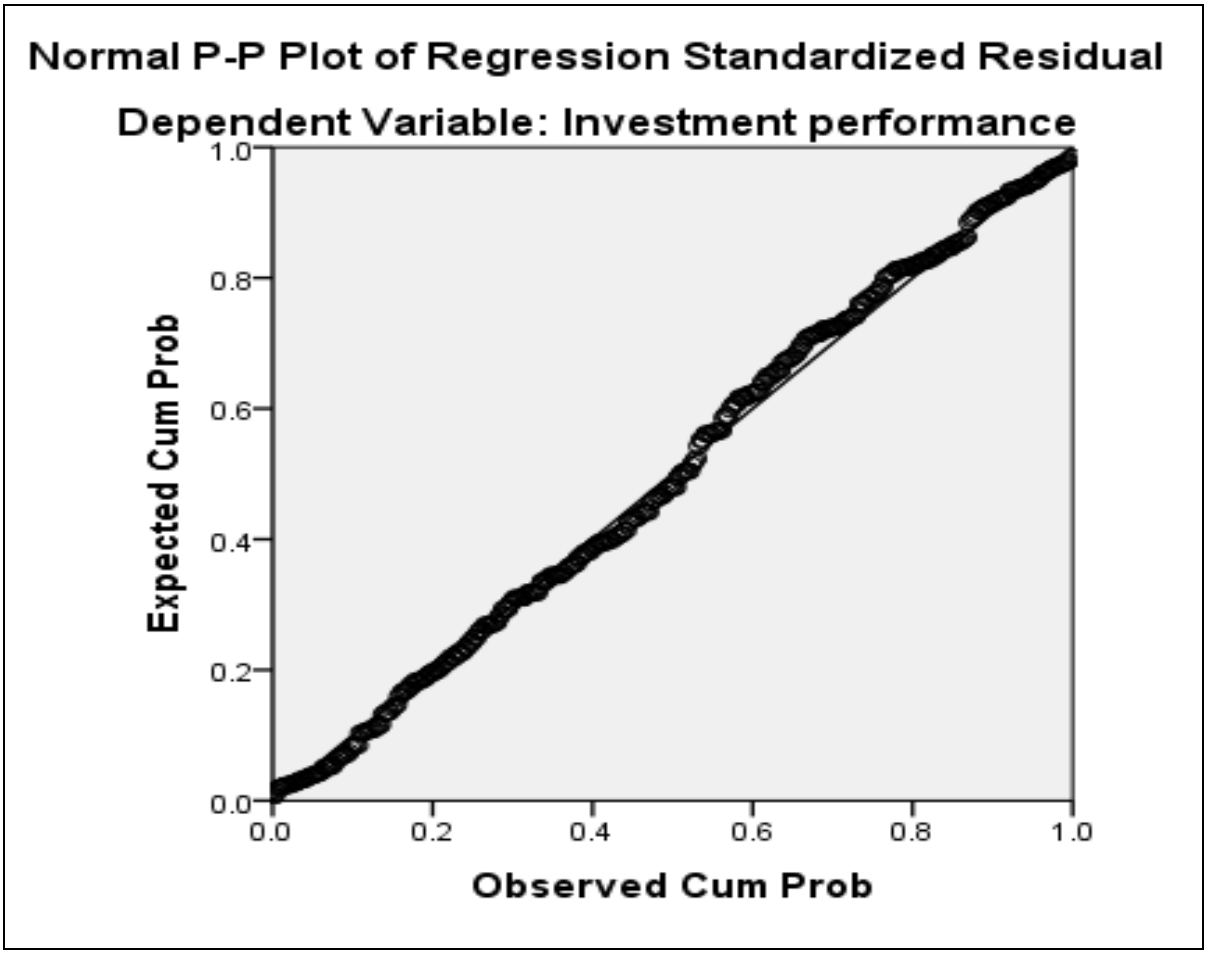

Figure 4.6: Normal P-P Plot for Standardized Residuals of Heuristic Bias

4.8 Prospect Based Bias and Real Estate Investment Performance in Kenya

To analyze the second objective of the study, the effect of prospect based behaviour biases on performance of real estate investments in Kenya, both descriptive and inferential statistics were conducted. The analysis is presented in section 4.8.1 for descriptive statistics, 4.8.2 for Drivers of Prospect Bias and 4.8.3 for inferential statistics.

4.8.1 Descriptive Analysis for Prospect Based Bias

To assess prospect based bias two constructs namely; loss aversion and regret aversion, were analyzed. Descriptive statistics for loss aversion and regret aversion on the sampled respondents (n=353) are presented in section 4.8.1 (a) to section 4.8.1 (b) respectively.

a. Loss aversion and real estate investment performance

The first aspect of prospect based bias tested in this study was loss aversion. To test for loss aversion bias, the respondents were asked six statements that were laid on a likert scaled questionnaire. Table 4.24 displays the frequencies of responses in terms of percentages against each loss aversion statement.

Fifty three percent of the respondents said that they would cut their losses by disposing-off their losing investments and maintain the gaining ones. On the other hand a mere 22% said that they would dispose-off their profitable investments and maintain the losing investments. Forty five percent of the respondents said they would prefer to have an investment with a guaranteed low return as opposed to an investment with high returns but which is highly volatile. Forty four percent of the respondents said that they would gamble with windfall gains as opposed to their savings meaning that they would invest in risky ventures using windfall gains as opposed to money they have saved. The mean score was 3.19, which was well above the mid-point on a scale of 1-5 and a standard deviation of 1.07 pointing that there was high convergence of responses among the various respondents in the real estate industry.

These findings indicate that a high number of real estate investors portray characteristics of loss aversion bias which may impact their investment performance negatively. The findings concur with Berkelaar, Kouwenberg and Post (2004), Barberis Huang and Thaler (2006), Gomes (2005), and Polkovnichenko (2005) who demonstrate that loss-averse investors tend not to participate in volatile markets or will normally apportion significantly a smaller amount of their wealth to volatile investments.

Further Barberis and Thaler (2003) contend that the magnitude of loss aversion will impact the frequency with which investors appraise their portfolio and that the investors base their decisions on recent short-term fluctuations in the value of their investments rather than base them on long-term implications consequently negatively impacting their portfolio performance. In another study Mercer (2006) found that individuals seem to realize profits too quickly in the fear that their unrealized profit will disappear and when it comes to losses, the same individuals tend to hold onto loss making stocks longer in the hope of converting them into profits rather than cutting the losses sooner. However this contradicts Tversky&Kahneman (1992) who found that investors increase their risk/uncertainty to avoid the slightest possible loss.

Table 4.24: Descriptive Statistics for Prospect Based Bias

Loss Aversion	Strongly Disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly Agree (%)	Mean	Std. Deviation
Guaranteed return in spite of low returns	8	17	31	32	13	3.26	1.12
Dispose gaining and retaining losing	25	36	17	15	7	2.43	1.22
Buy undervalued investment	5	13	38	36	9	3.32	0.96
Take risk with win falls compared to savings	4	13	40	34	10	3.33	0.95
Sell losing and invest in gaining	4	19	25	37	15	3.4	1.08
Invest in ignored investments	6	17	25	38	14	3.39	1.10
Mean						**3.19**	**1.07**

b. Regret Bias and real estate investment performance

The second aspect of prospect based bias used in this study was regret aversion. To test for regret bias, the respondents were asked five statements that were laid on a likert scaled questionnaire. Table 4.25 displays the frequencies of responses in terms of percentages against each overconfidence statement.

The table shows that 60% of the respondents stated that they would regret not purchasing an investment today then the price happens to increase in the future. Sixty one percent of the respondents agreed that they would not sell profitable real estate investments in the hope that prices would increase in the future.

When asked whether they would regret not buying investments when prices were low, 52% agreed. Forty five percent of the respondents agreed that they would prefer investments with fixed incomes rather that those with fluctuating incomes as opposed to 28% who disagreed. The average mean score on the likert scale was 3.39 which is above the mid-point of 1 to 5 indicating that most respondents agreed with the assertion that regret aversion has an influence on real estate investment performance. The overall standard deviation was 1.08, pointing that there was high convergence of responses among the various respondents in the real estate industry.

The findings regarding prospect bias show the need for real estate investors to be rational in decision making. There is an indication that real estate investors elucidate the apparent irregularity in human behaviour when evaluating risk under uncertainty. This implies that losses are weighted more heavily than equivalent amount of gains. The interpretation is that losses hurt more than gains satisfy therefore investors will be risk averse when choosing between gains and risk takers when choosing between losses. Further still, the irrational act is to sell value losing securities for an unprofitable price

Table 4.25: Descriptive Statistic for Regret Aversion

Regret Aversion	Strongly Disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly Agree (%)	Mean	Std. Deviation
Regret when I don't invest then it gains	4	13	24	40	20	3.59	1.06
Don't sell profitable investment	1	15	23	45	16	3.6	0.96
Invest with fixed income	5	23	26	30	15	3.28	1.12
Regret not buying when price=low	3	21	24	32	20	3.45	1.13
Sell poor performing investments	8	27	32	22	12	3.03	1.13

4.8.2 Drivers for Prospect Bias

Factor Analysis was carried out to find whether the test items for prospect bias were statistically significant or not. The results are presented in section a to section d.

a. Test of sampling adequacy of prospect bias

Keiser- Meryer- Olkin test of measuring adequacy and Bartlett's test of Sphericity were used to test the appropriatness of factor analysis for data reduction for this measure. The results of this test are presented in Table 4.26. The KMO measure of Sampling Adequacy measure varies between 0 and 1, and values closer to 1 are better. To measure the KMO, test statistics was used against the minimum acceptable level of 0.6 (Tabachnick and Fidell, 2001). The KMO measure of sampling adequacy indicates an approximate score 0.684, well above 0.50 level (Malhotra, 2004), indicating an acceptable degree of sampling adequacy. Bartlett's test of Sphericity show a Chi-Square of 504.717 with associated P-value of 0.000<0.001 indicating that the items retained to measure prospect bias sre significant.

Table 4.26: Test of sampling Adequacy-Prospect Bias

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.684
Bartlett's Test of Sphericity	Approx. Chi-Square	504.717
	Degrees of freedom	55
	Significance	.000

b. Rotated Pattern Matrix for Prospect bias

Two main measures of prospect bias; regret aversion and loss aversion were jointly subjected to factor analysis. The results of factor analysis are shown in Table 4.27. Factor loading for the first component, regret aversion, ranged from 0.588 to 0.896 indicating that the measures were well loaded. On the second component, loss aversion, the loadings ranged from 0.543 to 0.845 an indication that the measures were well loaded.

Table 4.27: Pattern Matrix for Prospect Bias

		Component	
		1	2
LA1	Build a guaranteed income from real estate investments even if the rate of return is low	.896	
LA2	Given two real estate investments, one that was 50% up or the one that was 50% down, I will dispose the gaining investment and keep the losing one	.861	
LA3	I usually buy investments that I believe their prices are below their true prices so that I can make a gain when their price goes up.	.634	
LA4	I am more venturesome with money received as bonus but very conservative with money set aside for children's education	.756	
LA5	If the market goes down, I will tend to sell some of my riskier investments and put the money in safer investments	.742	
LA6	I usually buy real estate investments that are ignored by other investors	.588	
RA1	I regret when I don't purchase an investment today then its price increase		.845
RA2	I don't sell profitable real estate investments with the hope that they will continue increasing in value		.543
RA3	I prefer investments with fixed incomes rather than those with fluctuating incomes		.675
RA4	I regret not buying into a real estate investment when prices were low		.797
RA5	I tend to sell my investments immediately the price goes back to its acquisition price		.820

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 8 iterations.

c. Communalities for Prospect Bias

Communality measures the percent of variance in a specified variable explained by all the combined factors and is interpreted as the reliability of the indicator (Gason, 2008). The study shadowed the suggestion of Gerbing and Anderson (1998) that principal component analysis be generated separately for each individual study construct to establish that all items loaded onto one factor only. If communalities are high, recovery of population factors in sample data is normally very good. The implication is that the variations of

factors with higher extraction values can be explained by all other factors combined. The table of Communalities which shows the variance in each of the original variables is described in the Table 4.28.

Table 4.28: Results for Communalities for Prospect Bias

		Communalities	
		Initial	**Extraction**
LA1	Build a guaranteed income from real estate investments even if the rate of return is low	1.000	.657
LA2	Given two real estate investments, one that was 50% up or the one that was 50% down, I will dispose the gaining investment and keep the losing one	1.000	.623
LA3	I usually buy investments that I believe their prices are below their true prices so that I can make a gain when their price goes up.	1.000	.614
LA4	I am more venturesome with money received as bonus but very conservative with money set aside for children's education	1.000	.576
LA5	If the market goes down, I will tend to sell some of my riskier investments and put the money in safer investments	1.000	.556
LA6	I usually buy real estate investments that are ignored by other investors	1.000	.483
RA1	I regret when I don't purchase an investment today then its price increase	1.000	.419
RA2	I don't sell profitable real estate investments with the hope that they will continue increasing in value	1.000	.639
RA3	I prefer investments with fixed incomes rather than those with fluctuating incomes	1.000	.678
RA4	I regret not buying into a real estate investment when prices were low	1.000	.465
RA5	I tend to sell my investments immediately the price goes back to its acquisition price	1.000	.696

Extraction Method: Principal Component Analysis.

Table 4.28 shows the variation in a single variable with respect to all the other variables put together in the factor analysis. The factors with higher extraction values mean that their

variation is explained to a greater extent by all other factors combined together. As shown in Table 4.28 above, all the variables had their variability explained to a greater degree by all the others combined. The findings indicate that the most influential component for prospect bias was RA5 with a communality of 0. 696. This means that 69.6% of any changes in prospect bias were accounted for by the extracted factors. The other two influential components for prospect bias were LA1 and RA3 with communalities of 0.657and 0.678. This means that the extracted factors in prospect bias influenced 65.7% and 67.8% of the changes in LA1 and RA3 respectively.

Table 4.29: Total Variance Explained for Prospect Bias

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	2.128	35.459	35.459	2.128	35.459	35.459
2	1.322	22.041	57.500	1.322	22.041	57.500
3	.879	14.654	72.154			
4	.675	11.246	83.401			
5	.539	8.976	92.376			
6	.457	7.624	100.000			

Extraction Method: Principal Component Analysis.

From Table 4.29 analysis, two factors in the initial solution have Eigen values greater than 1. Together, they account for almost 57.500% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model.

d. Scree plot for Prospect Bias

Factor analysis helped in formulating the hypotheses for the study. The scree plot forms the basis for decision criteria that informed hypothesis formulation. Factor numbers (independent variables) with the Eigen values greater than one indicate their high extent in affecting the total variance in the model. The leftmost section of scree plot shows the variance explained by the initial solution; only two factors in the initial solution have Eigen values greater than 1. Together, they account for almost 57.500% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model. Figure 4.7 shows the scree plot for prospect based bias

Figure 4.7: Scree Plot for Prospect Bias

4.8.3 Inferential Statistics of Prospect Bias and Real Estate Investment Performance

To determine the effect of prospect based behaviour biases on the performance of real estate investments in Kenya, the following hypothesis was formulated'

$H_0$2: Prospect based behaviour do not affect the investment performance of real estate investors in Kenya.

In order to test this hypothesis, the first step was to model the relationship between prospect bias and real estate investment performance.

a) Bivariate linear regression of prospect based bias and real estate investment performance

Weighted measures of prospect based bias were regressed on weighted real estate investment performance measures. Results of bivariate linear regression model; Model summary, ANOVA and regression model were generated. The results of the model summary are presented in Table 4.30.

Table 4.30 shows that there is a moderate correlation, R= 0.423, between prospect based bias and real estate investment performance in Kenya. Further Table 4.26 shows that R^2 = 0.179 which means that approximately 18% of the corresponding variation in real estate investment performance can be explained by a unit change in prospect based biases.

Table 4.30: Model fitness of Prospect Bias and Investment performance in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.423[a]	.179	.169	.392	2.004

a. Predictors: (Constant), Prospect bias

b. Dependent Variable: Investment performance

The model summary presented in Table 4.30 was assessed for its significance using ANOVA for prospect bases bias and investment performance. The ANOVA for prospect based bias and real estate investment performance is presented in Table 4.31 and shows that the linear model robustness presented in Table 4.30 is significant at 95% level of confidence with F= 13.016, p value p=0.000 which is less than p=0.05.

Based on these findings we reject the null hypothesis that Prospect based behaviour does not affect the investment performance of real estate investors in Kenya, and confirm that indeed, there is a significant relationship between prospect based bias and real estate investment performance in Kenya.

Table 4.31: ANOVA of Prospect Based Bias and Real Estate Investment Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.106	1	5.106	13.016	.000[b]
	Residual	137.294	350	.392		
	Total	137.304	351			

a. Dependent Variable: Investment performance

b. Predictors: (Constant), Prospect bias

In order to determine the significance of the beta coefficients in the Model summary presented on Table 4.31, results of standardized regression were generated and the coefficients are presented in Table 4.32. Test on the beta coefficients of the resulting model show that the constant $\alpha = 0.834$ is significantly different from 0, $p=0.000<0.005$. Further, the coefficient $\beta=-0.423$, p value of $p=0.000<0.005$ meaning that it is also significant in the model.

The regression model coefficients show that a -0.324 change in prospect based biases is associated with a unit change in real estate investment performance in Kenya. This implies that a unit change in prospect based bias explain a significant change in real estate investment performance.

Table 4.32: Regression Coefficients of Prospect Bias and Investment Performance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	.834	.071		11.707	.000
	Prospect bias	-.324	.069	-.423	-4.698	.000

a. Dependent Variable: Investment performance

The above findings are collaborate with findings by Bilgehan (2014) and Ullah, Jamil, Qamar and Waheed (2012) who in their research, show that managers are risk averse, whereas size and profitability are positively related to the capital structure. Their study explains that do the managers adjust their capital structure in accordance with business risk and how the profitability, size of the firm and sales growth are contributing to the capital structure formation. Further studies on behavioural biases and firm behaviour among Kenyan retail shops by Kremer, Lee, Robinson and Rostapshova (2013) show that acceptance of small risky gambles and scores on math tests is associated with inventory accumulation among Kenyan shopkeepers.

However these studies contradict a study by Mercer (2006) who notes that, individuals seem to realize profits too quickly in the fear that their unrealized profit will disappear. Further still, when it comes to losses, the same individuals tend to hold onto loss making stocks longer in the hope of converting them into profits rather than cutting the losses sooner. The facts that investors are not able to realize when to cut their losses and move on makes them suffer further loss.

b) Assessment of Homoscedasticity for Prospect Based Bias.

The bivariate model between prospect based biases and investment performance was evaluated for a serial correlation of the model predictors. This assessment was conducted through a normal P-P plot of standardized model residuals. The results of the regressed standardized residuals of the resultant model between prospect based biases and real estate investment performance are presented in Figure 4.8

Results of the plot of the expected probability and the observed probability of the standardized residual of the regressor indicate that they plot close to the cumulative probability line from 0 to 1. Based on these findings, it was concluded that the selected model results are normally distributed standardized residuals and that the model was appropriate for the robust analysis (Shevlin & Miles, 2010).

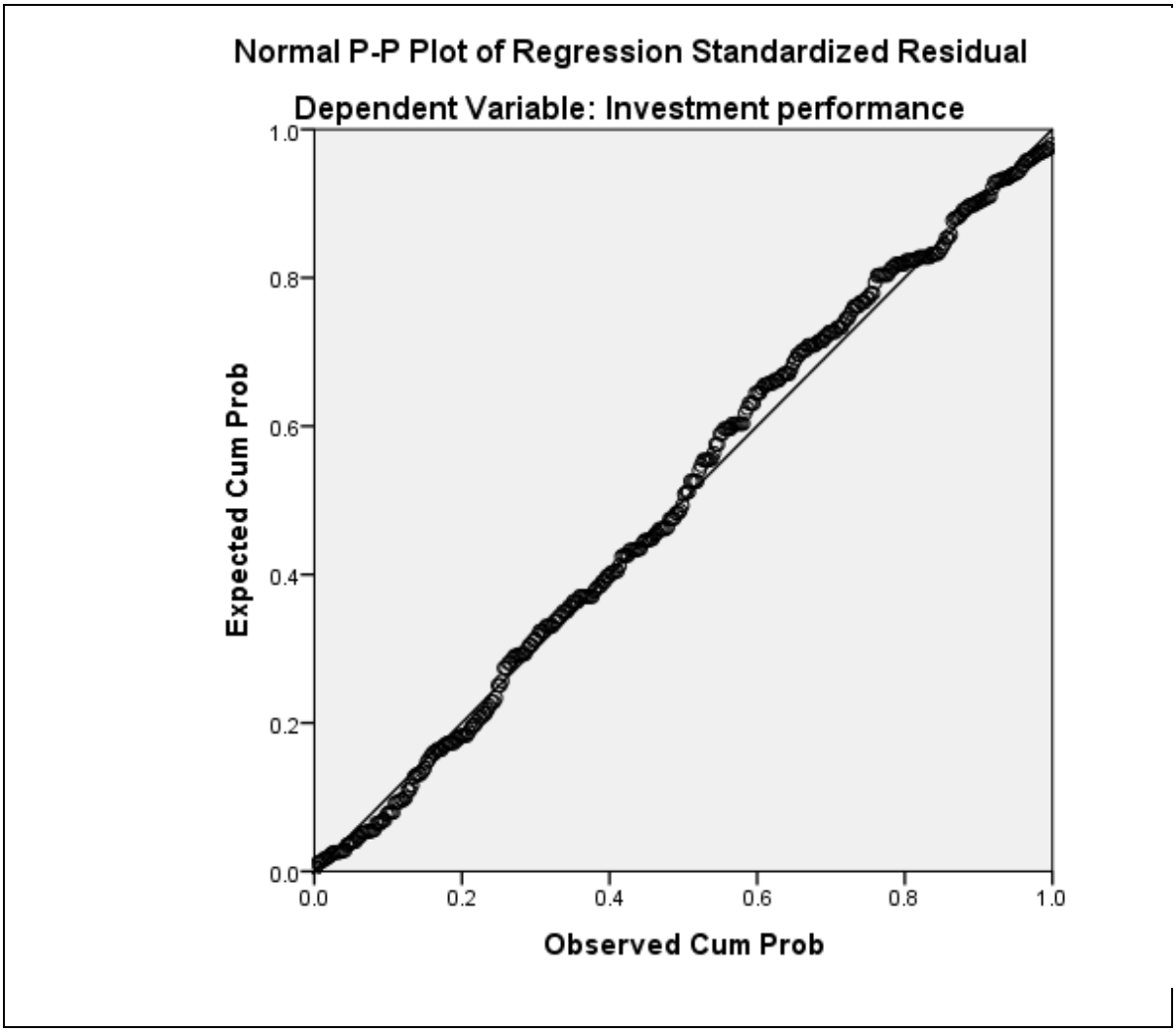

Figure 4.8: Normal P-P Plots for Standardized Residual for Prospect Bias

4.9 Herding Bias and Real Estate Investment Performance in Kenya

The third objective was to examine the effect of investment behaviour based on herding on the performance of real estate investment in Kenya. To analyze this objective, both descriptive and inferential analyses were done for the variable. The analysis is presented in section 4.9.1 for descriptive analysis, 4.9.2 for drivers for herding bias and 4.8.3 for inferential statistics.

4.9.1 Descriptive Analysis for Herding Bias

To test for herding bias the respondents were asked six statements which were laid on a likert scaled questionnaire. Table 4.33 displays the frequencies of responses in terms of percentages against each Herding Bias statement.

The results indicate that 47% of the respondents did not consult anyone when important making their real estate investment decisions. Forty four percent (44%) of the respondents agreed that they rely on their own knowledge other than trusting other people when making investment decisions. A small 41% said they would change their opinions about an investment if they heard a famous analyst that conflicts with their opinion. Thirty 39% of the respondents trust their friends, family or colleague's judgment while making real estate investment as opposed to a close 33% who disagreed with this statement. The mean score was 3.12, which was well above the mid-point of 2.5 on a scale of 1-5 and a standard deviation of 1.05 pointing that there was high convergence of responses among the various respondents in the real estate industry.

The findings on herding behaviour show that herding bias had significant impact on investment decision making among real estate investors in Kenya. This study concurs with Kumar and Lee (2006) who carried out a study on retail investor and found that the trading retail investors buy or sell one group of investment and they tend to buy or sell other groups exhibiting herding behaviour. Li, Rhee and Wang (2009) in their study on the herding behaviour among investors in the Chinese market found that institutional investors who are the better informed exhibited intense herding compared to the less informed individual investors.

Table 4.33: Descriptive Statistics for Herding Based Bias

Herding	Strongly Disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly Agree (%)	Mean	Std. Deviation
Trust friends, family	11	22	28	30	9	3.05	1.15
Rely on friends, family	11	27	32	22	8	2.89	1.11
Rely on family, friends for First investment advise	9	27	36	24	4	2.86	1.01
Rely on own rather than others	5	14	37	32	12	3.31	1.02
Change opinion based on a prof.	5	24	30	35	6	3.14	1
buy/sell when others buy/sell	2	17	28	40	12	3.44	0.98
Mean						**3.115**	**1.045**

4.9.2 Drivers for Herding Bias

In order to find whether the test items for herding bias were statistically significant or not, factor analysis was carried out. The results are presented in section a to section d.

a. Test of sampling adequacy of Herding Bias

In order to identify and validate the appropriateness of herding bias the characteristic measures' were subjected to Keiser- Meryer- Olkin measure of adequacy. The results of this test are presented in Table 4.34. Table 4.34 shows a KMO score of 0.599, which is well above 0.50 level (Malhotra, 2004), indicating an acceptable degree of sampling adequacy. Bartlett's test of Sphericity was used to test the appropriateness of factor analysis for data reduction for this measure and has a Chi-Square of 410.015and a significance value of 0.000 which is less than 0.001, supporting use of factor analysis as a data reduction technique for herding bias.

Table 4.34: Test of sampling Adequacy-Herding Bias

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.599
Bartlett's Test of Sphericity	Approx. Chi-Square	410.015
	Degrees of freedom	21
	Significance	.000

b. Rotated Pattern Matrix for Herding Bias

When the 7 statements on herding bias were subjected to factor analysis, the results indicated that the items had a factor loading of between 0.644 and 0.905 indicating that the measures were well loaded. The results of factor analysis are shown in Table 4.35.

Table 4.35: Component Matrix for Herding Bias

		Component 1
H1	I trust my friends/colleague/family member judgment while making real estate investments	.905
H2	I mostly rely on a friends/colleague/family member opinion while making real estate decisions	.608
H3	I was advised by friends/colleague/family member my first real estate investment	.750
H4	I rely on my knowledge other than trusting other people	.644
H5	If I hear views from a famous real estate analyst that conflicts with my opinion about an investment, I usually change my opinion	.731
H6	I like buying/selling real estate investments that other investors are buying /selling	.738
H7	I make all the important real estate investment decisions myself.	.644

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

c. Communalities for Herding Bias

Communality measures the per cent of variance in a given variable explained by all the factors jointly and may be interpreted as the reliability of the indicator (Gason, 2008). If communalities are high, recovery of population factors in sample data is normally very good. The implication is that the variations of factors with higher extraction values can be explained by all other factors combined.

Table 4.36 shows the variation in a single variable with respect to all the other variables put together in the factor analysis. The factors with higher extraction values mean that their variation is explained to a greater extent by all other factors combined together. As shown in the table all the variables had their variability explained to a greater degree by all the others combined. The findings indicate that the three most influential components for herding bias were H1 with a communality of 0.848, H2 with a communality of 0.822 and H3 with a communality of 0.616. This means that 84.8%, 82.2% and 61.6% of any changes in herding bias were accounted for by the three extracted factors.

Table 4.36: Results for Communalities for Herding Bias

		Initial	Extraction
H1	I trust my friends/colleague/family member judgment while making real estate investments	1.000	.848
H2	I mostly rely on a friends/colleague/family member opinion while making real estate decisions	1.000	.822
H3	I was advised by friends/colleague/family member my first real estate investment	1.000	.616
H4	I rely on my knowledge other than trusting other people	1.000	.509
H5	If I hear views from a famous real estate analyst that conflicts with my opinion about an investment, I usually change my opinion	1.000	.586
H6	I like buying/selling real estate investments that other investors are buying /selling	1.000	.571
H7	I make all the important real estate investment decisions myself.	1.000	.587

Extraction Method: Principal Component Analysis.

Table 4.37: Total Variance Explained for Herding Bias

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.064	41.278	41.278	2.064	41.278	41.278
2	.978	19.558	60.836			
3	.932	18.638	79.474			
4	.687	13.747	93.221			
5	.339	6.779	100.000			

Extraction Method: Principal Component Analysis.

From Table 4.37, one factor in the initial solution has Eigen values greater than 1. This factor accounts for 41.278% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model.

d. Scree plot for Herding Bias

Factor analysis helped in formulating the hypotheses for the study. The scree plot forms the basis for decision criteria that informed hypothesis formulation. Factor numbers (independent variables) with the Eigen values greater than one indicate their high extent in affecting the total variance in the model. The leftmost section of scree plot shows the variance explained by the initial solution; only one factor in the initial solution has Eigen values greater than 1. This factor accounts for 41.278% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model. Figure 4.9 shows the scree plot for herding bias

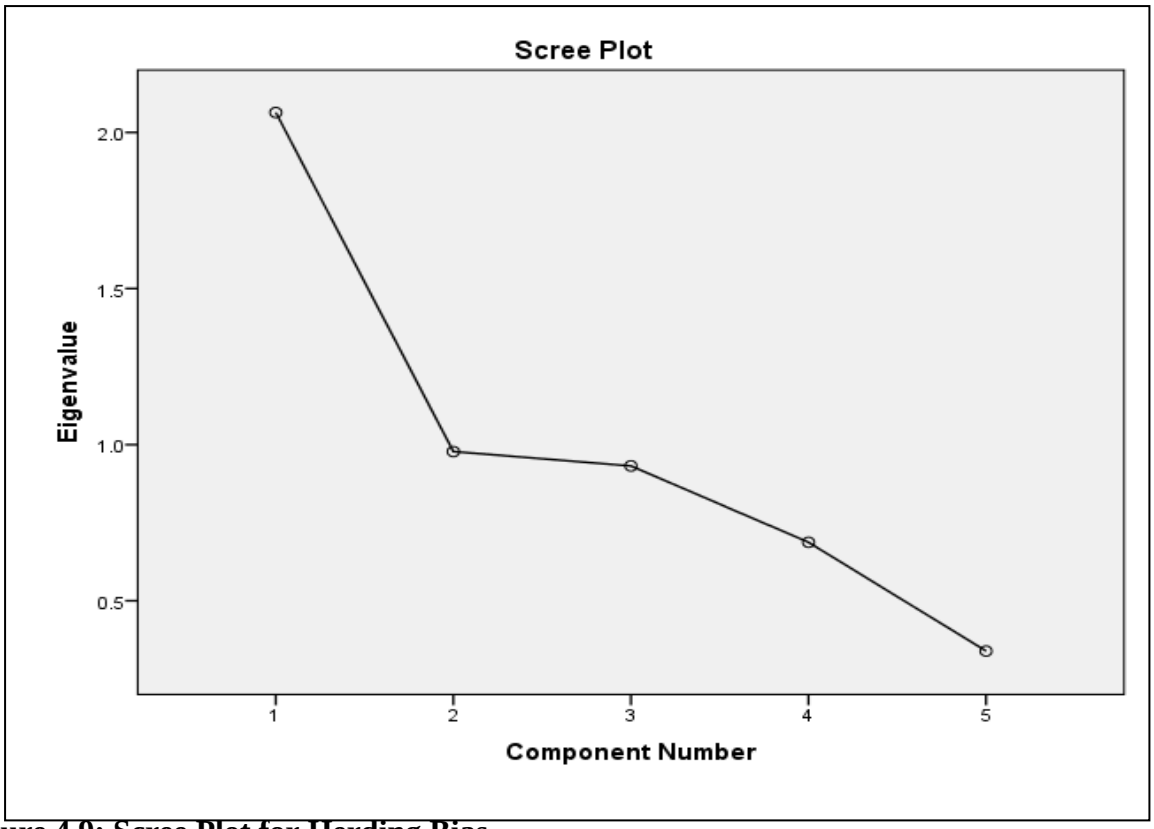

Figure 4.9: Scree Plot for Herding Bias

4.9.3 Inferential Statistics of Herding Bias and Real Estate Investment Performance

To examine the effect of investment behaviour based, herding bias, on the performance of real estate investments in Kenya the following hypothesis was formulated'

$H_0$3: Herding based behaviour has no effect on the investment performance of real estate investors in Kenya.

In order to test this hypothesis, the first step was to model the relationship between herding bias and real estate investment performance.

a) Bivariate linear regression of herding bias and real estate investment in Kenya

When the weighted herding bias measures were regressed on weighted real estate investment performance, linear regression model summary, ANOVA and regression model coefficients were generated for further analysis.

The results summaries are presented in Table 4.38. The linear summary in Table 4.34 show that R=0.511 which means that there is a moderate correlation between herding bias and investment performance. R^2= 0.261 which means that approximately 26.1% of the corresponding variation in investment performance is explained by a unit change on herding bias.

Table 4.38: Model fitness of Herding bias and Investment Performance in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.511[a]	.261	.252	.389	2.002

a. Predictors: (Constant), Herding bias

b. Dependent Variable: Investment performance

The model presented in Table 4.38 was further assessed for its significance using ANOVA. The ANOVA results for the linear model are presented in Table 4.39. The table indicates the model F value is 23.557 which is significant with p value p=0.000<p=0.05. This implies that the overall model is significant in the prediction of real estate investment in Kenya.

Based on the results we therefore reject the null hypothesis that Herding based behaviour has no effect on the investment performance of real estate investors in Kenya and confirm that indeed there is a statistically significant effect of herding bias on real estate investment performance in Kenya.

Table 4.39: ANOVA for Herding Bias

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.163	1	9.163	23.557	.000[b]
	Residual	136.141	350	.389		
	Total	137.304	351			

a. Dependent Variable: Investment performance

b. Predictors: (Constant), Herding bias

The linear regression model coefficients were further assessed for their significance in the model. Analysis of the regression model coefficients is shown in the Table 4.40. A test on beta coefficient of the resulting model indicate that the linear model's constant α=-0.580 is significant with p value p=0.000<0.05. The coefficient β=-0.453, has a p value p=0.000<0.05, implying that it is statistically significant in the model.

The above findings show that there a strong relationship between herding bias and investment performance in Kenya. The findings are in concurrence with prior findings. Kumar and Lee (2006) carried out a study on retail investor sentiments and found that the trading retail investors buy or sell one group of investment and they tend to buy or sell other groups exhibiting herding behaviour. Nyamute, Lishenga and Oloko (2015) studied the relationship between investor behaviour and investment performance which found that investor behaviour influence investment performance.

Table 4.40: Regression Coefficients of Herding Bias and Investment Performance

		Unstandardized Coefficients		Standardized Coefficients		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	.580	.072		8.071	.000
	Herding bias	-.453	.054	-.511	-8.431	.000

a. Dependent Variable: Investment performance

b) Assessment of Homoscedasticity for Herding Bias

The bivariate model between herding based biases and investment performance was evaluated for a serial correlation of the model predictors. This assessment was conducted through a normal P-P plot of standardized model residuals. The results of the regressed standardized residuals of the resultant model between herding based biases and real estate investment performance are presented in the Figure 4.10

Results of the plot of the expected probability and the observed probability of the standardized residual of the regressor indicate that they plot close to the cumulative probability line from 0 to 1 at approximately 45 degrees to the axis, an indication that the residuals are normally distributed. Based on these findings, it was concluded that the selected model results are normally distributed standardized residuals and that the model was appropriate for the robust analysis (Shevlin & Miles, 2010).

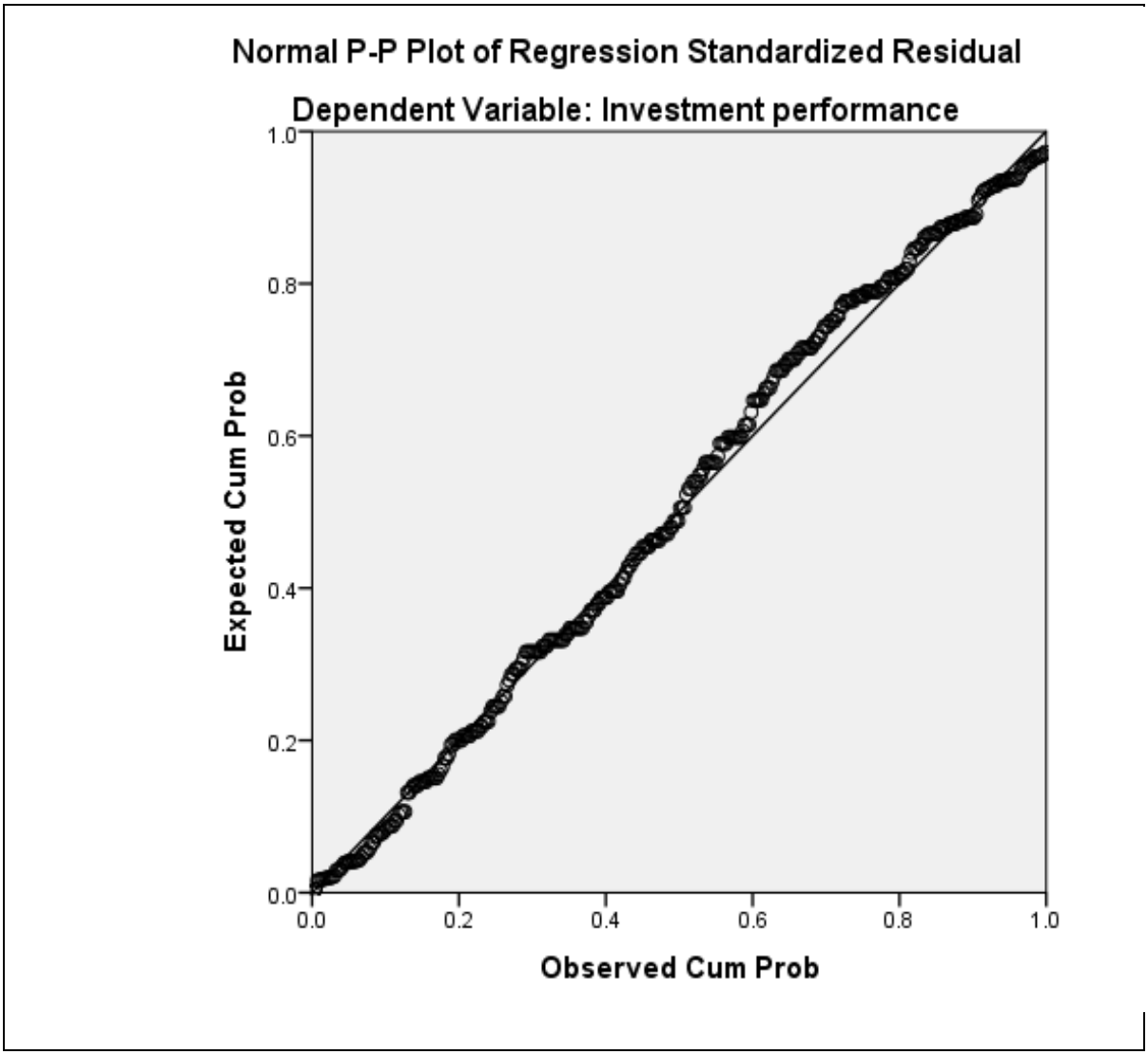

Figure 4.10: Normal P-P Plot for Standardized Residual for Herding Bias

4.10 Market Based Bias and Real Estate Investment Performance in Kenya

To analyze the forth objective of the study, effect of market factors based behaviour biases on the performance of real estate investment in Kenya, both descriptive and inferential statistics were conducted. The analysis is presented in section 4.10.1 for descriptive statistics, 4.10.2 for drivers of market bias and 4.10.3 for inferential statistics.

4.10.1 Descriptive Analysis for Market Based Bias

To assess Market Based Bias the respondents were asked six statements which were laid on a likert scaled questionnaire. Table 4.41 displays the frequencies of responses in terms of percentages against each Market Bias statement. Frequencies of the responses on the effect of market based bias on real estate investment performance are presented on Table 4.41 indicate that sixty eight percent (68%) of the respondents consider past information of the real estate industry before making an investment decision. Further, 56% respondents agreed that they would use the proceeds from real estate for long term savings. Similarly, 53% of the participants felt that they would use the real estate earnings to fund other short term projects. 54% of the respondents agreed that currently information about real estate influences their future investment decisions.

The mean score for the responses was 3.47 indicating that many participants agreed with the statements that market based bias has an influence on real estate investment performance. The standard deviation for the responses was 1.02 indicating a reasonable convergence of the respondents towards the response.

These findings support the findings by Yacin (2010) who explains that very little investing activities are expected by rational investors based on the publicly available information; however huge volumes of buying and selling are experienced for no apparent reason hence evidence of market anomalies. This is an indication that investors do not take into consideration available information when making relevant investment decisions.

Further Konstantinidis , Katarachia , Borovas and Voutsa (2012) in their study on Efficient Market Hypothesis to Behavioural Finance concluded that Behavioural Finance treats investors as individuals and highlights that emotions, biases, and illusions cannot be rationalized; in addition, it emphasizes that information is inefficient.

The findings support the findings by Clayton (1998) who examined the short-run relationship between REIT prices and the value of direct real estate owned by REITs. The findings showed that future returns for apartments can be predicted using historical annual returns and a measure of deviation from fundamental prices. Further still, studies by Farlow (2004) argues that the most plausible explanation for the dramatic increase in real estate prices cannot be found in supply and demand fundamentals rather, it is posited that real estate prices are, to a large extent, determined by the behaviour of consumers and financial institutions which support the results of this study.

The findings regarding market based bias shows there is irrationality in decision making among real estate investors in Kenya. Further these results show that information is inefficient market performance is rather unpredictable as people's reaction to new information is unpredictable. In this perspective, information of previous years affect and guide their decision making.

Table 4.41: Descriptive Statistics for Market Based Bias

Market Based Bias	Strongly Disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly Agree (%)	Mean	Std. Deviation
I consider past information	3	6	27	43	22	3.75	0.95
Short term returns	7	15	28	34	16	3.35	1.14
Rely on public information.	1	11	34	40	14	3.54	0.91
Capital withdrawal	5	25	36	24	10	3.1	1.03
Short term projects	1	14	32	37	16	3.52	0.97
Long term savings	3	15	26	33	23	3.57	1.10

4.10.2 Drivers of Market Bias

a. Test of sampling adequacy of Market Bias

In order to identify and validate the appropriateness of market based biases, the characteristic measures' were subjected to Keiser- Meryer- Olkin measure of adequacy. The results of this test are presented in Table 4.42. Table 4.42 shows a KMO score of 0.518, which is well above 0.50 level (Malhotra, 2004), indicating an acceptable degree of sampling adequacy. The table also shows the Bartlett's test of Sphericity has a Chi-Square of 236.365and a significance value of 0.000 which is less than 0.001, supporting use of factor analysis as a data reduction technique for market bias.

Table 4.42: Results for Sampling Adequacy-Market Bias

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.518
Bartlett's Test of Sphericity	236.365
	15
	.000

b. Rotated Pattern Matrix for Market Bias

Six statements on Market based behavioural bias were subjected to factor analysis, the results indicated that the items had a factor loading of between 0.668 and 0.734 indicating that the measures were well loaded. The results of factor analysis are shown in Table 4.43.

Table 4.43: Results for Rotated Pattern Matrix for market Bias

		Initial	Extraction
MBB1	I consider past information on the real estate industry before making an investment decision	1.000	.734
MBB2	I prefer investments whose returns are short term	1.000	.758
MBB3	Published information about real estate influences my future investment decisions	1.000	.534
MBB4	Do you anticipate the need to withdraw a significant portion of your portfolio's value within the next year	1.000	.868
MBB5	I use my real estate earnings to fund short term other projects	1.000	.653
MBB6	I use my real estate earnings for long term savings	1.000	.668

Extraction Method: Principal Component Analysis.

c. Communalities for Market Bias

Communality measures the percent of variance in a given variable explained by all the factors jointly and may be interpreted as the reliability of the indicator (Gason, 2008). If communalities are high, recovery of population factors in sample data is normally very good. The implication is that the variations of factors with higher extraction values can be explained by all other factors combined.

Table 4.44 shows the variation in a single variable with respect to all the other variables put together in the factor analysis. The factors with higher extraction values mean that their variation is explained to a greater extent by all other factors combined together. As shown in table 4.44 above all the variables had their variability explained to a greater degree by all the others combined.

The findings indicate that the most influential component for market bias is MBB4 with a communality of 0.868. This means that 86.8% of any changes in market bias were accounted for by the extracted factors. The second most influential component for market bias was MBB2 with a communality of 0.758. This means that 75.8% of any changes in market bias were accounted for by the extracted factors.

Table 4.44: Results for Communalities of Market Bias

		Initial	Extraction
MBB1	I consider past information on the real estate industry before making an investment decision	1.000	.734
MBB2	I prefer investments whose returns are short term	1.000	.758
MBB3	Published information about real estate influences my future investment decisions	1.000	.534
MBB4	Do you anticipate the need to withdraw a significant portion of your portfolio's value within the next year	1.000	.868
MBB5	I use my real estate earnings to fund short term other projects	1.000	.653
MBB6	I use my real estate earnings for long term savings	1.000	.668

Extraction Method: Principal Component Analysis.

Table 4.45: Total Variance Explained for Market Bias

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.069	51.714	51.714	2.069	51.714	51.714
2	.919	22.980	74.694			
3	.668	16.697	91.391			
4	.344	8.609	100.000			

Extraction Method: Principal Component Analysis.

From the analysis in Table 4.45, one factor in the initial solution has Eigen values greater than 1. This factor accounts for 51.714% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model.

d. Scree plot for Market Bias

Factor analysis helped in formulating the hypotheses for the study. The scree plot forms the basis for decision criteria that informed hypothesis formulation. Factor numbers (independent variables) with the Eigen values greater than one indicate their high extent in affecting the total variance in the model. The leftmost section of scree plot shows the variance explained by the initial solution; only one factor in the initial solution has Eigen values greater than 1. This factor accounts for 51.714% of the variability in the original variables. If a factor has a low Eigen value, then it is contributing little to the model. Figure 4.11 shows the scree plot for market based bias

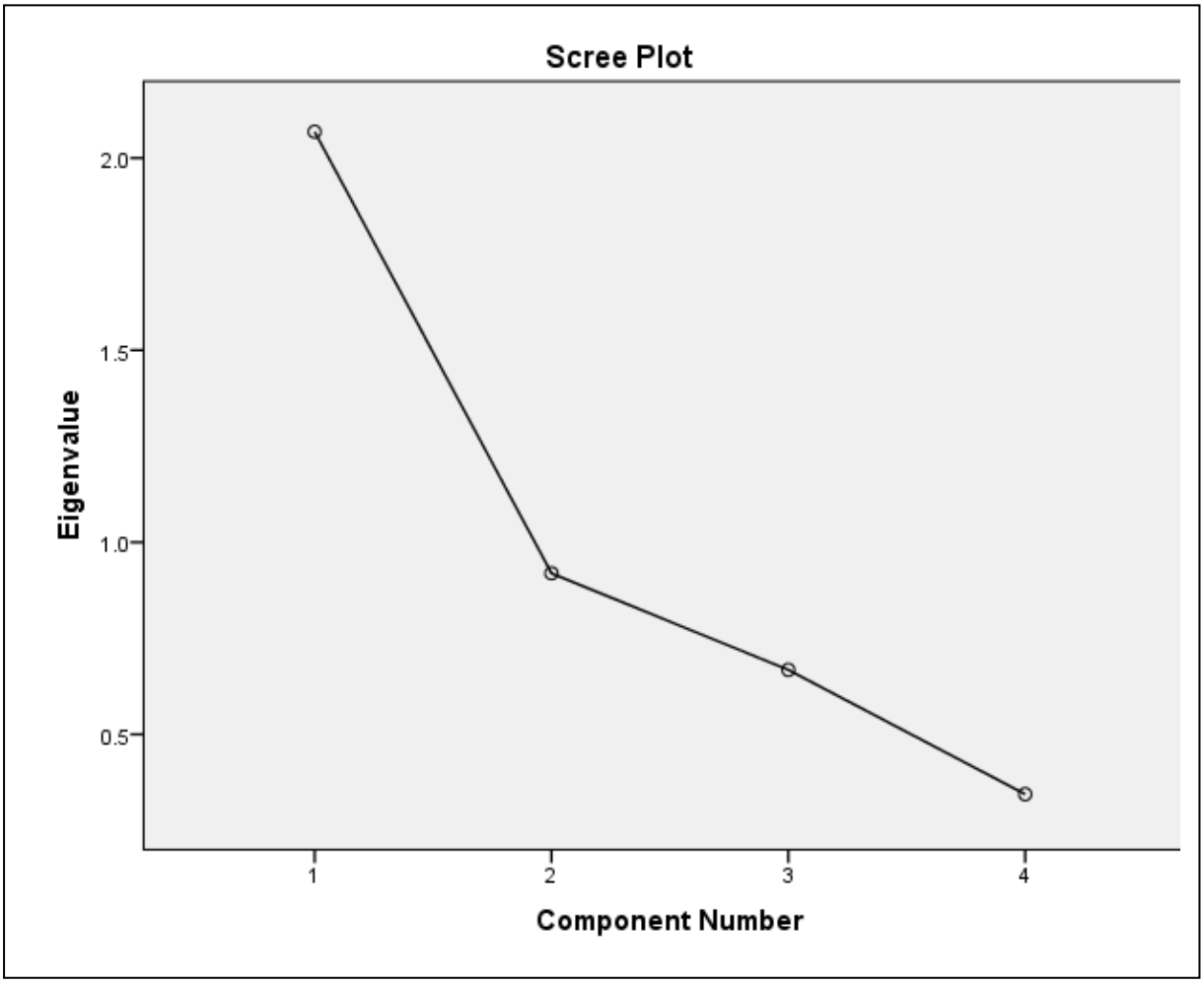

Figure 4.11: Scree Plot for Market Based Bias

4.10.3 Inferential Statistics of Market Bias and Real Estate Investment Performance

To examine the effect of investment behaviour based, herding bias, on the performance of real estate investments in Kenya, the following hypothesis was formulated:

$H_0$3: Herding based behaviour has no effect on the investment performance of real estate investors in Kenya.

In order to test this hypothesis, the first step was to model the relationship between herding bias and real estate investment performance.

a. Bivariate linear regression of market bias and investment performance

When the weighted market bias measures were regressed on the weighted investment performance, linear regression model summary, ANOVA and regression model coefficients were generated for further analysis.

The results of the model are presented in Table 4.46. The linear model summary in Table 4.46 show that R=0.527 which means that there is a moderate correlation between market bias and investment performance. R^2= 0.278, meaning that approximately 27.8% of the corresponding variation in investment performance can be explained by a unit change in market bias.

Table 4.46: Model fitness of market bias and investment performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.527[a]	.278	.269	.387	1.994

a. Predictors: (Constant), Market bias

b. Dependent Variable: Investment performance

The model presented in Table 4.46 was further assessed for its significance using ANOVA. The ANOVA results for the linear model are presented in Table 4.47.

The table indicates the model F value is 14.783 which is significant with p value p=0.000<p=0.05. This implies that the overall model is significant in the prediction of real estate investment in Kenya.

Based on the results we therefore reject the null hypothesis that Market factors driven behaviour does not influence on the investment performance of real estate investors in Kenya and confirm that indeed there is a statistically significant effect of market bias on real estate investment performance in Kenya.

Table 4.47: ANOVA of Market Based bias and Investment performance in Kenya.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.726	1	5.726	14.783	.000[b]
	Residual	135.578	350	.387		
	Total	137.304	351			

a. Dependent Variable: Investment performance

b. Predictors: (Constant), Market bias

The linear regression model coefficients were further assessed for their significance in the model. Analysis of the regression model coefficients is shown in the Table 4.48. A test on beta coefficient of the resulting model indicate that the linear model's constant α=0.411 is significant with p value p=0.000<0.05. The coefficient β=-0.398, has a p value p=0.000<0.05, implying that it is statistically significant in the model. The findings concur with Clayton (1998) who examined the short-run relationship between REIT prices and the value of direct real estate owned by REITs. The findings showed there is enough evidence against housing market efficiency with results showing that future returns for apartments can be predicted using historical annual returns and a measure of deviation from fundamental prices. Further findings also indicate a significant role for sentiment in REIT prices, returns, and the timing of REIT equity offerings.

Further, Shleifer (2000) records that, EMH upholds that current investment prices are close to their fundamental values because of existence of rational investors or the arbitragers' who buy and sell actions of under or overpriced investments.

Table 4.48: Regression Coefficients of Market Bias and Investment performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.411	.065		6.299	.000
	Market bias	-.398	.063	-0.527	-6.270	.000

a. Dependent Variable: Investment performance

c. Assessment of Homoscedasticity of the Bivariate Regression Model between Market Bias and Investment Performance

The bivariate model between market based biases and investment performance was evaluated for a serial correlation of the model predictors. This assessment was conducted through a normal P-P plot of standardized model residuals. The results of the regressed standardized residuals of the resultant model between market based biases and real estate investment performance are presented in the Figure 4.12.

Results of the plot of the expected probability and the observed probability of the standardized residual of the regressor indicate that they plot close to the cumulative probability line from 0 to 1 at approximately 45 degrees to the axis, an indication that the residuals are normally distributed. Based on these findings, it was concluded that the selected model results are normally distributed standardized residuals and that the model was appropriate for the robust analysis (Shevlin & Miles, 2010).

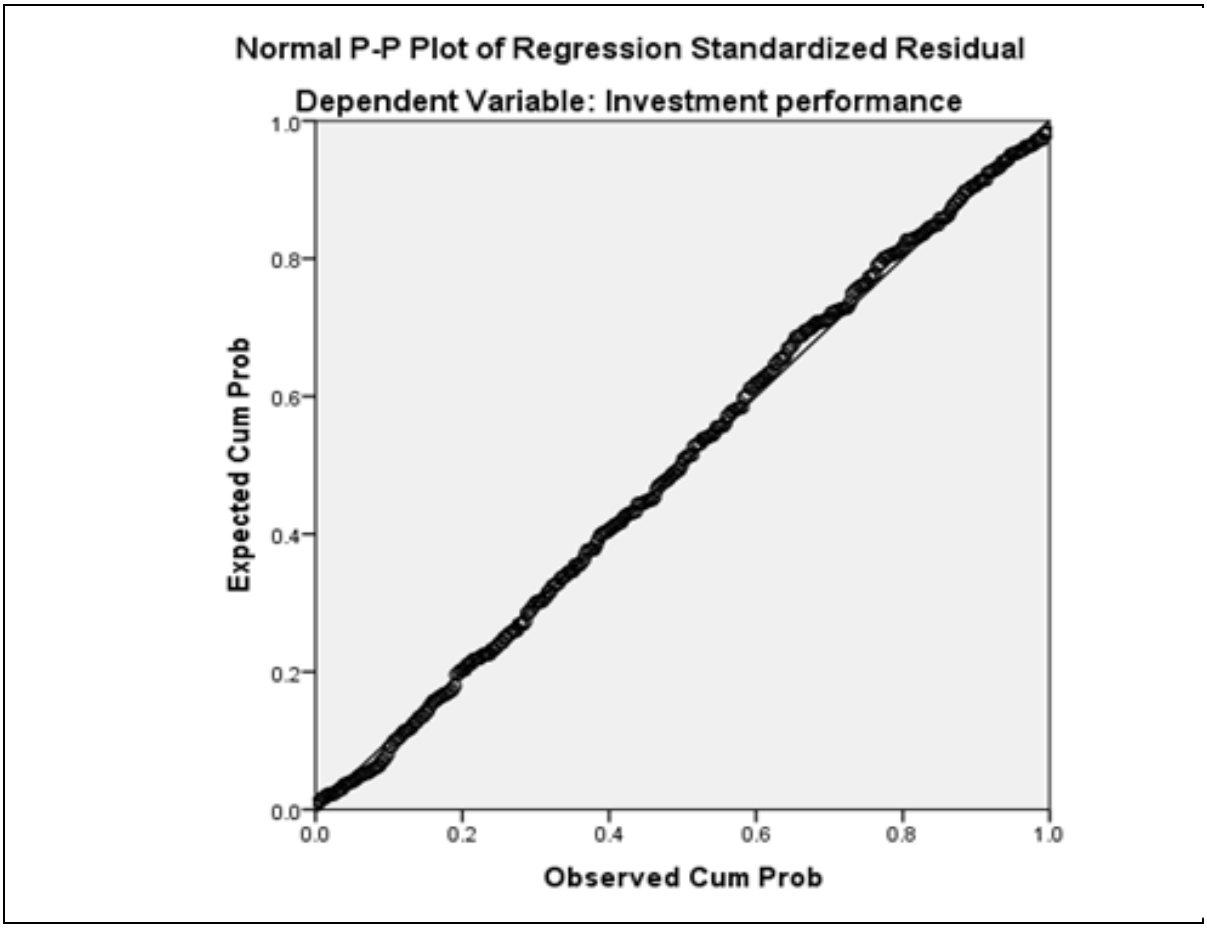

Figure 4.12: Normal P-P Plot for Standardized Residual for Market Bias

4.11 Behavioural Biases and Real Estate Investment Performance

In order to examine the combined effect of the four regressor variables namely; heuristic based bias, prospect bias, herding bias and market based bias on investment performance in real estate in investments in Kenya, the study set out the following null hypothesis;

HO: the independent variables (heuristic based bias, prospect bias, herding bias and market based bias) do not have a combined influence on real estate investment performance in Kenya.

The multiple regression model analysis in Table 4.49 below shows a positive and strong linear relationship. R^2=0.576 and adjusted R^2=0.571 which means that there is 57.1% of corresponding change in investment performance for every change in all the predicator variables jointly.

Table 4.49: Model Fitness of Behavioural Biases

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.759a	0.576	0.571	0.376	2.001

a. Predictors: (Constant), Market bias, Herding bias, Prospect bias, Heuristic bias

b. Dependent Variable: Investment performance

Significance of the model is shown in table 4.50. ANOVA presented in Table 4.50 shows the variability in real estate investment performance in Kenya and the proportion accounted for that variance that is accounted for jointly, by the four predictor variables in the hierarchical regression model. The findings indicate that the resultant model of the four predictor variables id significant at F= 5.275 and p-value p=0.000<p=0.05. based on these results we reject the null hypothesis the independent variables (heuristic based bias, prospect bias, herding bias and market based bias) do not have a combined influence on real estate investment performance in Kenya and confirm that indeed, the four independent variables do significantly influence real estate investment performance in Kenya.

Table 4.50: ANOVA for Behavioural Biases

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7.938	4	1.985	5.275	.000b
	Residual	130.556	347	0.376		
	Total	137.304	351			

a. Dependent Variable: Investment performance

b. Predictors: (Constant), Market bias, Herding bias, Prospect bias, Heuristic bias

Model coefficients are presented in Table 4.51. The model constant α=0.419 and has a p value p=0.001<p=0.05 meaning that it is considered statistically significant in the model.

Further, the results show that the four predictors; heuristic based bias, prospect bias, herding bias and market based bias have associated coefficients and beta significances of β=-0.411, p=0.000<p=0.05, β=-0.221, p=0.007<p=0.05, β=-0.357, p=0.000<p=0.05 and β=-0.251, p=0.000<p=0.05 respectively. This means that they have statistically significance influence of behavioural bias on real estate performance in Kenya.

Table 4.51: Regression of Behavioural bias on Investment Performance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	.516	.210		2.452	.015
	Heuristic bias	-.411	.085	-.501	-4.856	.000
	Prospect bias	-.221	.082	-.327	-2.700	.007
	Herding bias	-.357	.058	-.271	-6.176	.000
	Market bias	-.251	.068	-.234	-3.703	.000

a. Dependent Variable: Investment performance

4.12 The Moderating role of Financial Literacy on the Relationship between Behavioural Biases and Real Estate Investment Performance in Kenya.

The multiple regression analysis in Table 4.52 shows a positive and strong relationship, R^2=0.667 and adjusted R^2 = 0.611 which shows that 66.7% change of real estate performance can be explained by a change of one unit of all the predictor variables; heuristic based bias, prospect bias, herding bias and market based bias jointly with the moderating variable of Financial Literacy. This is an increase from 57.6% to 66.7% when the moderating valuable was held constant implying that the moderator has a positive effect on the overall change in all the variables jointly.

Table 4.52: Model Summary for Relationship between Behavioural Biases and Real Estate Investment Performance Moderated by Financial Literacy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.817a	.667	.611	.80015

a. Predictors: (Constant), Bias X financial literacy, Bias, financial literacy
b. Dependent Variable: Investment performance

Hypothesis H_05: Financial literacy does not affect the relationship between the real estate behavioural biases and investment performance in Kenya.

To test this hypothesis, which had the null hypothesis that financial literacy does not affect the relationship between the real estate behavioural biases and investment performance in Kenya a multilinear regression F-test was carried out. Using the Analysis of Variance (ANOVA) to determine whether there is a regression relationship, financial literacy, real estate investor behaviour and investment performance, Table 4.53 indicates that F= 32.677, and is significantly different from 0, p= 0.000 which is less than p value, p= 0.05. The critical values for F-test (at 0.05 alpha is 2.488) which is less than the computed F-value, we therefore fail to accept the null hypothesis and conclude that there is a linear relationship between the aggregated real estate investors behaviour moderated by financial literacy and investment performance in Kenya.

Table 4.53: ANOVA of Moderating role of Financial Literacy on the Relationship between Behavioural Biases and Real Estate Investment Performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	77.268	3	25.756	32.677	.000[b]
	Residual	274.291	348	.788		
	Total	351.559	351			

a. Dependent Variable: Investment performance
b. Predictors: (Constant), Bias X financial literacy, Bias, financial literacy

The beta coefficient was computed and t-test used to test the behavioural biases of real estate investors and the role of financial literacy on investment performance in Kenya. It was tested at 5% significance level. The results are tabulated in Table 4.54.

The results for the relationship between behavioural biases and investment performance indicate that the t-test found beta coefficient of – 0.495 for the behavioural biases and has a p-value of p=0.000 which is less than p value p=0.05 and are therefore significantly difference from 0. The corresponding t value for the combined behavioural biases was t= -9.340, p=0.000 which was found to be statistically significant, because t value, at 0.05 were less than p value, p=0.05. When the financial literacy was included as a moderating variable the beta coefficient was -0.310with a p-value of p=0.000 which is less than p value p=0.05 and are therefore significantly difference from 0. We therefore conclude that:

H_5: Financial literacy has a significant effect on the relationship between the real estate behavioural biases and investment performance in Kenya.

The findings are supported by studies of Hilgert et al. (2003) who documented a strong relationship between financial knowledge and the likelihood of engaging in a number of financial practices: paying bills on time, tracking expenses, budgeting, paying credit card bills in full each month, saving out of each paycheck, maintaining an emergency fund, diversifying investments, and setting financial goals.

Further studies show that financial literacy is predictive of investment behaviours including stock market participation (van Rooij, et al. 2011, Kimball & Shumway 2006, Christelis et al. 2006), choosing a low fee investment portfolio (Choi et al. 2011, Hastings 2012), and better diversification and more frequent investments (Graham et al. 2009). Other studies by Haliassos and Bertaut (1995) pointed out that financial literacy was an important factor in overcoming the barriers to investments and the associated risks and that the less literate were less likely to make informed investments compared to their financially literate counter parts.

Table 4.54: Regression Coefficients of determinants of Investment Performance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.230	.048		4.792	.000
	Bias	-.495	.053	-.514	-9.340	.000
	Financial literacy	.280	.052	.381	5.385	.000
	Bias X financial literacy	-.310	.047	-.412	-6.596	.000

a. Dependent Variable: Investment performance

4.14 Chapter Summary

The study results presented and discussed in this chapter reveals that heuristic bias, prospect bias, herding bias and market biases are among the factors that influence investment performance in Kenya. Further, the study indicated the moderating role of financial literacy in the relationship between the behavioural biases and investment performance in Kenya. The results also do offer partial but important support to extensive studies on the relationship between selected biases and investment performance. The results of this study indeed indicate that real estate investors in Kenya should not overlook the critical behavioural biases in the real estate industry and the core role of financial literacy in investment performance in Kenya. The summary of the findings are presented in Table 4.55.

Table 4.55: Summary of Research Findings

Objective	Hypothesis	Model	Results of Hypothesis Test
Objective 1 To explore the effect of Heuristic based behavioural biases on the real estate performance in Kenya.	**Ho1:** Heuristic driven behaviour biases do not affect the real estate investment performance in Kenya.	**REP= α + β1X1**	**Rejected**
Objective 2 To find the effect of prospect based behaviour biases on the performance of real estate investments in Kenya.	**Ho2:** Prospect based behaviour do not affect the investment performance of real estate investors in Kenya.	$REP = \alpha + \beta_2 X_2$	**Rejected**
Objective 3 To examine the effect of investment behaviour based on herding on the performance of real estate investment s in Kenya.	**Ho3:** Herding based behaviour has no effect on the investment performance of real estate investors in Kenya.	**REP = α + β3X3**	**Rejected**
Objective 4 To establish the effect of market factors based behaviour biases on the performance of real estate investment in Kenya.	**Ho4:** Market factors driven behaviour does not influence on the investment performance of real estate investors in Kenya.	**REP = α + β4X4**	**Rejected**
Objective 5 To assess the effect of financial literacy on the relationship between real estate behavioural biases and investment performance in Kenya.	**Ho5:** Financial literacy does not affect the relationship between the real estate behavioural biases and investment performance in Kenya.	**REP = α + β5X5**	**Rejected**

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The main objective of the study was to explore the behavioral biases of real estate investors and the moderating role of financial literacy on the selected investor biases and the investment performance in Kenya. From the overall objective, the study aimed at finding if heuristic biases, prospect biases, herding biases and market biases influence real estate investment in Kenya. Further, the study sought to establish the moderating role of financial literacy between the observed behavioural biases and investment performance. This chapter presents the summary of the study findings, overall conclusions based on behavioural biases implications and the moderating role of financial literacy on investment performance. The chapter also makes important recommendations for further research.

5.2 Summary

The study was conducted based on the premise that behavioural biases and financial literacy in real estate investors do not affect the investment performance. This study reviewed both theoretical and empirical literature of behavioural biases. A comprehensive conceptual framework was developed based on the argument of a relationship between the identified behavioural biases and investment performance and the moderating role of financial literacy.

The hypothesized relationship was tested empirically guided by the following specific objectives; to explore the influence of Heuristic based behavioural biases on the real estate performance in Kenya; to find the effect of prospect based behaviour biases on the performance of real estate investments in Kenya; to examine the effect of investment behaviour based on herding on the performance of real estate investments in Kenya; to establish the effect of market factors based behaviour biases on the performance of real estate investment in Kenya and to assess the effect of financial literacy on the relationship between real estate investors behavioural biases and investment performance in Kenya. The study also sought to examine the combined effect of the predictors namely; heuristic biases, prospect biases, herding biases and market biases on investment performance. Further the study aimed at examining the role of financial literacy on the relationship of the observed behavioural biases and investment performance. The hypothesized relationship between the predictors and investment performance were presented in a conceptual framework that guided this study.

5.2.1 Objective 1: To explore the effect of Heuristic based behavioural biases on the real estate performance in Kenya.

The first objective was to explore the influence of heuristic based behavioural biases on the real estate performance in Kenya. To achieve this objective, respondents were asked to indicate their level of agreement to various heuristic based behavioural biases. These activities included availability bias, anchoring bias and overconfidence bias in investment decisions. The study hypothesized that there was no statistically significant relationship between heuristic based behavioural biases and the real estate performance in Kenya. The results showed that there was a significant relationship between heuristic based behavioural biases on the real estate performance in Kenya.

The null hypothesis; **$H_0$1:** Heuristic driven behaviour biases do not affect the real estate investment performance in Kenya, was rejected and the alternative hypothesis accepted. Using the standardized coefficient heuristic bias had a beta value of -0.350 with a t value of -4.896 and p=0.000. Since p is < 0.05, we reject H_0 at 0.05 level of significance.

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5.2.2 Objective 2: To find the effect of prospect based behaviour biases on the performance of real estate investments in Kenya.

This objective analysed the effect of prospect based behaviour biases on the performance of real estate investments in Kenya. To achieve this objective, respondents were asked to indicate their level of agreement to various prospect based behaviour biases. Prospect based behaviour biases included the regret aversion and loss aversion. The results showed that there was a significant relationship between prospect based behaviour biases and performance of real estate investments in Kenya. The null hypothesis; **$H_0$2:** Prospect based behaviour do not affect the investment performance of real estate investors in Kenya, was rejected and the alternative hypothesis accepted. Using the standardized coefficient, prospect bias had a beta value of -0.324 with a t value of -4.698 and p=0.000. Since p is < 0.05, we reject H_0 at 0.05 level of significance.

5.2.3 Objective 3: To examine the effect of investment behaviour based of herding on performance of real estate investments in Kenya.

The third objective was to examine the effect of investment behaviour based of herding on performance of real estate investments in Kenya. To achieve this objective, respondents were asked to indicate their level of agreement to various investment behaviour based of herding bias. The study hypothesized that there was no statistically significant relationship between herding bias and performance of real estate investments in Kenya.

The results showed that there was a significant relationship between herding bias and investment performance of real estate in Kenya. Therefore, the null hypothesis; **$H_0$3:** Herding based behaviour has no effect on the investment performance of real estate investors in Kenya, was rejected and the alternative hypothesis accepted. Using the standardized coefficient, herding bias had a beta value of -0.511 with a t value of -8.431 and p=0.000. Since p is < 0.05, we reject H_0 at 0.05 level of significance.

5.2.4 Objective 4: To establish the effect of market factors based behaviour biases on the performance of real estate investment in Kenya

This objective sort to establish the effect of market factors based behaviour biases on the performance of real estate investment in Kenya. To achieve this particular objective, respondents were asked to indicate their level of agreement to various reverse market factors based behavioural biases. The study hypothesized that there was no statistically significant relationship between market factors based behaviour biases and the performance of real estate investment. The results showed that there was a significant relationship between market factors based behaviour biases and the performance of real estate investment. Therefore the null hypothesis; **$H_0$4:** Market factors driven behaviour does not influence on the investment performance of real estate investors in Kenya, was rejected and the alternative hypothesis accepted. Using the standardized coefficient, prospect bias had a beta value of -0.527 with a t value of -6.270 and p=0.000. Since p is < 0.05, we reject H_0 at 0.05 level of significance.

5.2.5 Objective 5: To Assess the Moderating Effect of Financial Literacy on the Relationship Between Real Estate Investors Behavioural Biases and Investment Performance in Kenya.

The final objective was to assess the moderation effect of financial literacy on the relationship between real estate investor's behavioural biases and investment performance in Kenya. To achieve this objective the respondents were asked to indicate their level of agreement in response to identified financial literacy statements. The study hypothesized that financial literacy has no statistically significant effect on the relationship between real estate investor's behavioural biases and investment performance. The results showed that the moderating variables improved the strength of the relationship between real estate investor's behavioural biases and investment performance. Thus the null hypothesis; **$H_0$5:** Financial literacy does not affect the relationship between the real estate behavioural biases and investment performance in Kenya, was rejected and the alternative hypothesis accepted that, "Financial literacy has a statistically significant positive influence on the real estate investment performance". Using the standardized coefficient financial literacy had a beta value of 0.381 with a t value of 5.140 and p=.000. Since p is < 0.05, we reject H0 at significance level 0.05.

5.3 Conclusions

The main purpose of this study was to determine the interrelationships among Heuristic Driven Behaviour Biases, Prospect Based Behaviour Biases, Herding Behaviour Bias and Market Based Behaviour Biases on Investment Performance in Kenya. This study had a 83% response rate with 78.4% of the respondents having investments in Nairobi and 21.7% having investments in more than one geographical area in Kenya. This indicates that most of the real estate investors have an interest in having investments in Nairobi.

This is as a result of rising demand for housing in Nairobi and also the demands for new office spaces.

The rejection of the first hypothesis ($H_0 1$) which explored the relationship between Heuristic driven behaviour biases and the real estate investment performance in Kenya shows that the behaviour of investors will influence the performance of their investments. Heuristic biases were found to have a statistically significant influence on the human decision making process among real estate investors in Kenya. This is an indication that investors are not rational or markets may not be efficient and real estate investment performance may significantly deviate from fundamental values due to existence of irrational investors. The implication thus is that investors do not often evaluate their biases and the effect they have on performance hence they keep on suffering from the consequences of the same mistakes.

These findings reflect a similarity to the findings by Azouzi and Jarboui's (2012) whose research examined the determinants of firms' investment structure introducing a behavioural perspective. In their research a theoretical analysis was made and results presented that CEO emotional biases highlights role (optimism, loss aversion, overconfidence) to explaining investment choice. Further the research showed that overconfidence negatively affects investment performance. Further studies by Salzman & Zwinkels (2013) on an analysis of the effect of inefficiencies in the property market from a behavioural perspective in the UK, found that both corporate investors as well as household showed that cognitive biases such as over-optimism and over-confidence explaining deviations from investment rationality and investment performance.

The rejection of the second hypothesis ($H_0$2) which sort the relationship between prospect based behaviour and the investment performance of real estate investors in Kenya implies that prospect biases (Regret aversion and loss aversion) affect investment performance of real estate. This finding has an implication that there is apparent irregularity in human behaviour when evaluating risk under uncertainty thus affecting the performance of their investments. Further interpretation is that losses hurt more than gains satisfy therefore real estate investors in Kenya tend to be risk averse when choosing between gains and risk takers when choosing between losses.

These findings collaborate with the findings by Barberis and Thaler (2003) who found out that the magnitude of loss aversion will impact the frequency with which investors appraise their portfolio or investment and that the way investors frame gains and losses is reasonably influenced by the way information is availed to them. Similarly, in their study on behavioural biases and firm behaviour among Kenyan retail shops Kremer, Lee, Robinson and Rostapshova (2013) showed that loss aversion can potentially help explain a series of puzzles related to the persistence of unrealized high-return investment opportunities.

The rejection of the third hypothesis $H_0$3: Herding based behaviour has no effect on the investment performance of real estate investors in Kenya implies that herding behaviour has a statistically significant influence on investment performance. This means that real estate investors in Kenya imitating the observed actions of others or the movements of the market instead of following her own beliefs and available information. Further implication is that real estate investors in Kenya commonly tend to trust their relatives, friends and even the colleagues more than they do the investment agents.

These findings imply that herding based behaviour influence investment performance. This study is in concurrence with study a study by Prosad (2014) which found that the herding bias can lower the security return dispersion and in the presence of severe herding, the dispersion might become negative.

The fourth objective of this study sought to establish the effect of market factors based behaviour biases on the performance of real estate investment in Kenya. Hypothesis four ($H_0$4) explored the effect of market factors based behaviour biases on the performance of real estate investment by suggesting that Market factors driven behaviour does not influence on the investment performance of real estate investors in Kenya. Results of this study indicate that the model has a predictive value implying that there is a significant relationship between market factors based behaviour biases and performance of real estate investment. We therefore reject hypothesis ($H_0$4) and conclude that market factors based behaviour biases affect the performance of real estate investment in Kenya.

This finding implies that market based behavioural biases affect the performance of real estate investment in Kenya. These findings are in concurrence with findings of prior studies. For example, Yacin (2010) explains that very little investing activities are expected by rational investors based on the publicly available information; however huge volumes of buying and selling are experienced for no apparent reason hence evidence of market anomalies.

Further, studies by Farlow (2004) argues that the most plausible explanation for the dramatic increase in real estate prices cannot be found in supply and demand fundamentals rather, it is posited that real estate prices are, to a large extent, determined by the behaviour of consumers and financial institutions which support the results of this study.

The rejection of the fifth hypothesis ($H_0$5) which tested the moderating role of financial literacy on the relationship between the behavioural biases and real estate investment in Kenya indicates that financial literacy moderates the relationship between investor behaviour and real estate performance in Kenya. The implication of these findings is that the real estate markets players in Kenya need to identify the financial literacy of the investors and how it affect the behaviour of the investors plus their investment performance then target these areas for investor education to avoid distorting the market.

This means that financial literacy positively influence the relationship between real estate Investors behavioural biases and investment performance in Kenya. The findings are supported by studies of Hilgert et al. (2003) who documented a strong relationship between financial knowledge and the likelihood of engaging in a number of financial practices including investment management and setting financial goals. Further studies show that financial literacy is predictive of investment behaviours including stock market participation (van Rooij, et al. 2011, Kimball & Shumway 2006, Christelis et al. 2006), choosing a low fee investment portfolio (Choi et al. 2011, Hastings 2012), and better diversification and more frequent investments (Graham et al. 2009).

Other studies by Haliassos and Bertaut (1995) pointed out that financial literacy is an important factor in overcoming the barriers to investments and the associated risks and that the less literate are less likely to make informed investments compared to their financially literate counter parts.

The sixth hypothesis ($H_0$6) was rejected. This hypothesis tested the combined effect of the study independent variables, that is, Heuristic Driven Behaviour Biases, Prospect Based Behaviour Biases, Herding Behaviour Bias and Market Based Behaviour Biases on Investment Performance in Kenya. Investors and other market players must review the interactions among these variables when making investment decisions to avoid making poor returns from investments that discourage them and other potential market players from investing in capital markets.

This study found put that there is a strong combined effect of the study independent variables, that is, Heuristic Driven Behaviour Biases, Prospect Based Behaviour Biases, Herding Behaviuor Bias and Market Based Behaviour Biases on Investment Performance in Kenya. The effect was further found to be statistically significant. Hence the null hypothesis (HO_6); the independent variables (Heuristic Biases, Prospect Based Biases, Herding Bias and Market Based Biases) do not have a combined effect on Investment Performance in Kenya was rejected.

These findings collaborate the findings by Nyamute, Lishenga and Oloko (2015) who found that investor behaviour and had an effect portfolio performance. Additional findings by Allameh, Chitsaz, Hosseini and Esfahani (2015) showed that there is a relationship between aspects of behaviour and the performance of individual investors.

5.4 Recommendations

This study indicates that behavioural biases have a negative impact on investment performance. To avoid the negative impact of behavioural biases firstly, when evaluating investments, investors should avoid at barely looking at the risk and return characteristics of that individual investment. Rather, analyze how that particular investment will impact to the total portfolio performance, and determine whether it will enhance the total return, minimize risk, or both.

Behavioural finance is a contemporary way of analyzing and explaining the forces underpinning investment decisions the world over. In doing so, through the establishment of certain psychological patterns, behavioural finance seeks to detect behaviour that is inconsistent with the assumptions of investor rationality and market efficiency. This study has found that investor behaviour does influence portfolio performance for those investing in the real estate market in Kenya. The findings clearly indicate that behavioural biases affect investors in the real estate market in Kenya and their effect on performance is significant. Therefore the study recommends that the government establishes a regulatory body that will come up with investment policies and regulations. These is of help to investors when it comes to making investment decisions regarding to which areas of real estate investment to venture and for them to develop their own market niche. These policies and regulations will also be useful to the government when it comes to tax regulations and control of the real estate industry.

These findings contribute to the volume of empirical evidence that helps to build literature and theories on investor behaviour and investment performance in the real estate industry in Kenya. The findings of this study provide a review of theory and empirical evidence on behavioural finance which the learning institutions and researchers can use to open up further areas of study.

The real estate market in Kenya is drawing attention from institutional and individual investors as well as foreign and local investors. These investors can use the findings of this study to understand how investor behaviour influence the performance of real estate and hence be able to informed decisions that will yield optimum returns without distorting the market. The moderating effect of financial literacy on the relationship between behavioural biases of real estate investors and investment performance in Kenya will also help the real estate market players in understanding market dynamics which could help in policy setting and practice. This study therefore recommends that the real estate agents and their staff get training on effects of behavioural biases in order to offer informed decisions to their clients regarding their investment portfolios.

The study has found that heuristic based biases, prospect based biases, herding bias and market based biases are present in the Kenyan real estate market leading to a significant negative effect on performance due to illusion of knowledge and control hence under estimation of risk by the investors. The investors can use the findings of this study to understand how their behaviour affects their investment performance and thus they can learn to avoid those behaviours that have a negative impact on the value of their investment and also incorporate fundamental information in their buying and selling decisions.

This study therefore recommends that the government, through the ministry of planning, conducts regular risk assessments of the real estate industry in order to avoid negative effects of unprecedented activities like real estate burble bursts which have been experienced in other developed markets.

The study finds that as much as investors are financially literate, their investments are still affected by behavioural biases. These findings can be informative to policy making and regulation of the real estate markets especially with regard to the role played by investor behaviour on real estate market developments. The findings of the study provide a basis for policy setting in the real estate market. The Estate Agents Registration Board (EARB) which is the regulatory body for estate agency practice in Kenya and other individual and institutional market players can use these findings as a basis of investor education and minimization of noise trading in the Kenyan real estate markets. Therefore, this study recommends that the government, through the ministry of planning and in conjunction with the real estate agents make periodical publications on the performance of the real estate market. These publications would serve as a reliable source of information and provide insight to current and potential investors regarding price movements since they can be able to make viable investment decisions without relying on incorrect information based on market sentiments and individual perceptions.

5.5 Areas of Further Research

Due to constraints highlighted in the first chapter, this study provides the following further areas of research. First, investments are generally categorized as financial assets, Real assets or financial derivatives. This study focused on real estate investments. It was not possible to study all investments in Kenya. Certainly, these other investments could be affected by behavioural biases and could provide an insight of the effects of behavioural biases of the entire investment opportunities.

Secondly, behavioural finance nomenclature categorizes behavioural biases into several categories that include, overconfidence bias, familiarity bias, loss aversion, hindsight bias, confirmation bias, achoring bias, mental accounting, regret avoidance bias, herding behavioural bias, heuristics bias prospect based bias, and market based bias. This study focused on the last four of the indicated behavioural biases. Certainly, the other behavioural biases could affect the performance of real estate investments.

In addition, the study relied on cross sectional data which respondents were asked to assess perspective on the item in the data collection tool. While determinants of real estate investment performance could be dynamic in nature and change over time under different macro-economic variables, this study provides only a cross sectional view. Longitudinal study would probably supplement this study and provide a better view of the subject of the study and further inform the guidelines to real estate investments.

Further the study assessed the effect of behavioural biases on real estate investment performance in Kenya. There are however other investment opportunities in Kenya. Although specifity of a study enhances its internal validity, it also limits the generalizations of its findings. A multi-industry could provide more value in informing the general effects of behavioural biases on investment performance.

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APPENDICES

APPENDIX I: Questionnaire

SECTION I: DEMOGRAPHIC CHARACTERISTIC

Please tick the appropriate bracket

1. In which area have you invested geographically

   Nairobi ( ) Mombasa ( ) Kisumu ( ) Nakuru ( ) Thika ( )

   Others _____ (specify)

2. Which of the following real estate investments do you have interest in?

   Commercial ( ) Industrial ( ) Residential ( )

   Others _____ (specify)

3. How many years have you invested in real estate

   i. 1-5 years ( ) ii. 5-10 years ( ) iii. 10-20 years ( ) iv. 20-30 years ( ) v. Over 30 years ( )

4. Which of the following fairly indicates your trend of returns in the last five years

   Decreasing ( ) Stagnant ( ) Increasing ( )

The following questions relate to real estate investments. Please indicate to what extent you either AGREE or DISAGREE with the following statements under each category below. Use the key below and tick as appropriate

Strongly disagree [1]; disagree [2]; Neither agree or disagree [3]; Agree [4]; Strongly agree [5]

SECTION II: INVESTOR BEHAVIOR

Heuristic Driven Bias	1	2	3	4	5
I consider myself to have excellent real estate investment skills					
I am a high performer in real estate investments					
I have better real estate investment ability in comparison to my peers					
I can easily find another real estate venture that close to mine if I lost my current one.					
I would invest in a new real estate opportunity even if I failed in my previous investment					
I am able to use my own skills and confidence to make a sound real estate investment decision					
I am likely to use my ability to foresee the future in order to perform better than other investors					
I tend to be more cautious of investment that have recently reported losses returns					
I tend to invest in areas that have made profits in the past					
I am likely to invest in areas that my friends have previously invested and made profits					
If I made profits in one investment, I am likely to make a similar investment in the future					
I make investments largely based on advertisements rather than doing research					

Please indicate to what extent you either AGREE or DISAGREE with the following statements under each category below. Use the key below and tick as appropriate

Strongly disagree [1]; disagree [2]; Neither agree or disagree [3]; Agree [4]; Strongly agree [5]

Heuristic Driven Bias					
	1	2	3	4	5
I would invest in a company that is currently going through financial crisis					
My past experience influences my present investment decisions					
My past investment returns influences my current investment decisions					
I consider the past performance of an investment before investing in it					
I fix a target price for buying an investment product well in advance.					

Please indicate to what extent you either AGREE or DISAGREE with the following statements under each category below. Use the key below and tick as appropriate

Strongly disagree [1]; disagree [2]; Neither agree or disagree [3]; Agree [4]; Strongly agree [5]

SECTION III:

Prospect based Bias:	1	2	3	4	5
I would build a guaranteed income from real estate investments even if the return is low					
Given two real estate investments, one that was going up or the one that was going down, I will sell the gaining investment and keep the losing one					
I usually buy investments that I believe their prices are below their true prices so that I can make a gain when their price goes up.					
I will take risk in investing money received as a bonus but I will not risk using money set aside for my children's education					
If the market is not doing well, I will tend to sell some of my riskier investments and put the money in safer investments					
In real estate I usually invest in areas that other investors ignore					
I regret when I don't purchase an investment today then its price increase					
I don't sell profitable real estate investments with the hope that they will continue increasing in value					
I prefer investments with fixed incomes rather than those with fluctuating incomes					
I regret not buying into a real estate investment when prices were low					
I tend to sell my poorly performing investments immediately the price goes back to its acquisition price					

Please indicate to what extent you either AGREE or DISAGREE with the following statements under each category below. Use the key below and tick as appropriate

Strongly disagree [1]; disagree [2]; Neither agree or disagree [3]; Agree [4]; Strongly agree [5]

SECTION IV

Herding based bias:	1	2	3	4	5
I trust either my friends/colleague/family members judgment while making real estate investments					
I mostly rely on a friends/colleague/family member opinion while making real estate decisions					
I was advised by friends/colleague/family member my first real estate investment					
I rely on my knowledge other than trusting other people when making investment decisions					
If I hear views from a famous real estate analyst that conflicts with my opinion about an investment, I usually change my opinion					
I like buying real estate investments that other investors are selling					
I don't consult anyone when making real estate investment decisions					

Please indicate to what extent you either AGREE or DISAGREE with the following statements under each category below. Use the key below and tick as appropriate

Strongly disagree [1]; disagree [2]; Neither agree or disagree [3]; Agree [4]; Strongly agree [5]

SECTION V

MARKET BASED BIAS	1	2	3	4	5
I consider past information on the performance of real estate industry before making an investment decision					
I prefer investments whose returns are short term					
Information currently available about real estate influences my future investment decisions					
I am likely to reduce my investment in real estate in the next year					
I use my real estate earnings to fund short term other projects					
I use my real estate earnings for long term savings					

Please indicate to what extent you either AGREE or DISAGREE with the following statements under each category below. Use the key below and tick as appropriate

Strongly disagree [1]; disagree [2]; Neither agree or disagree [3]; Agree [4]; Strongly agree [5]

SECTION VI

FINANCIAL LITERACY	1	2	3	4	5
I have knowledge in different areas I can invest my money					
I know how to calculate the expected income on my investments					
I use financial knowledge to make personal financial decisions					
I understand the risks involved in real estate investments					

SECTION VII: FINANCIAL PERFORMANCE

Please indicate to what extent you either AGREE or DISAGREE with the following statements under each category below. Use the key below and tick as appropriate

Strongly disagree [1]; disagree [2]; Neither agree or disagree [3]; Agree [4]; Strongly agree [5]

FINANCIAL PERFORMANCE	1	2	3	4	5
Occupancy level expectations of my real estate investment have been met in the past five years					
The yearly rental real estate income has highly increased over the past five years					
The value of my real estate investment has significantly grown over the last five years					

APPENDIX II: Registered Real Estate Agents in Nairobi

No.	NAME	COMPANY AND ADDRESS	EMAIL
1	ABDUL O. RAMADHAN	MILLIGAN INTERNATIONAL LTD P.O BOX 10724-00400 NAIROBI	info@milliganinternational.com
2	ABILA DICKENS OWUOR	ADVENT VALUERS LIMITED, P.O. BOX 6171 - 00200, NAIROBI	kowuor04@yahoo.com
3	AGILI DANIEL OJIJO	VILLA CARE LIMITED P.O BOX 66331-00100 NAIROBI	info@villacare.kenya.com
4	AGUTU JOHN WASHINGTONE OTIENO	MESSRS SWATZ DEVELOPERS LIMITED BOX 958-00100 NAIROBI	jkorayo72@yahoo.com
5	AKELLO EDWARD OWUOR	EACKELBERG & CO. LIMITED P.O BOX 180-00200 NAIROBI	info@eackeberg.com
6	AMUOK FREDRICK OPIYO	KNIGHT FRANK LIMITED P.O BOX 39773-00623 PARKLAND, NAIROBI	
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