EFFECT OF BEHAVIORAL BIASES ON THE RELATIONSHIP BETWEEN REAL ESTATE INVESTMENT STRATEGIES AND OPERATIONAL EFFICIENCY OF REAL ESTATE FIRMS IN NAIROBI COUNTY, KENYA

BY

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DECLARATION

DECLARATION BY THE STUDENT

This proposal is my original work and has not been submitted for the award of any Degree in any other University.

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This thesis is dedicated to my husband James Owuor Ogoto, and my children Joy James Ogoto and Zahra Juddie Ogoto.

ABSTRACT

Despite several interventions that help cushion developers in Kenya, the supply of housing units stands at approximately 50,000 a year against an annual demand of 250,000. Over the past five years' operational efficiency has been on the downward trend with rental yield dropping from 7.6% in 2017; fell to 7.4% in 2018, to 7% in 2019 than 4.0% in 2020 and 6.1% in 2021 so was occupancy rate reducing to approximately from 86% in 2017 to 74% in 2021.Personality traits of investors have been blamed for these trends since managers are biased in their investment decision making thus creating investment portfolios that are familiar to them. This study sought to analyze this trend with an analysis of three variables; behavioral biases, real estate investment strategies and operational efficiency. Theoretical literature illustrates primary relationships between these variables and indicates that there is indeed a relationship between real estate investment strategies and operational efficiency, however, the moderating aspect of behavioral bias on the relationship between the two variables has not been previously studied. Behavioral bias was examined to identify its effect on the relationship between real estate investment strategies and operational efficiency of real estate firms in Nairobi County. The specific goals were to establish the effect of behavioral biases on operational efficiency, to determine the effect of real estate investment strategies on operational efficiency and to assess the moderation effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County. The study employed a correlational survey design and census sampling technique was used to draw a sample of 234 active and registered firms in Nairobi County. Primary data was collected using questionnaires and reliability tested using Cronbach Alpha's method with a 0.7 cut off. Face validity was done by pre-testing 10% of the population which did not form part of the sample whereas convergence and divergence validity were measured using correlations. Data was analyzed using statistical techniques such as hierarchical regression, frequencies, means, and standard deviations. Pearson's product moment correlation coefficients tested for linearity and independence of variables tested using the Durbin-Watson statistics. The study found out that behavioral biases and real estate investment strategies had a positive and significant effect on operational efficiency with an explanatory power of R^2=27.1% and R^2=60.3% respectively. Behavioral biases and real estate investment strategies as predictor variables had a significant R^2 of 36.2%; ($p<0.01$). The R^2 of incorporating the interaction term between behavioral biases and real estate investment strategies was R^2=42.4% ($p<0.01$; change of R^2=6.2% ($p<0.01$) implying that behavioral biases moderates the relationship between real estate investment strategies and operational efficiency. However, the moderation effect of behavioral biases reduced the strength of the relationship between real estate investment strategies and operational efficiency from 60.3% to 27.1%. In conclusion, behavioral biases diminish the relationship between real estate investment strategies and operational efficiency. The study recommends firms to focus on making informed and accurate investment decisions so as to create investment portfolios that will enhance their operational efficiency and focus on eliminating the negative effects of behavioral biases affecting their decision-making. This study has brought new knowledge that indeed behavioral biases moderate the relationship between real estate investment strategies and operational efficiency but reduces the strength of this relationship and it will be of importance to investors and government in rational investment decision making and policy formulation.

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ABBREVIATIONS AND ACRONYMS

CMA	Capital Market Authority
EMH	Efficient Market Hypothesis
EUI	Economist Intelligence Unit
ICT	Information and Communications Technology
IPS	Investment Policy Statements
MPT	Modern Portfolio Theory
NSE	Nairobi Securities Exchange
RCA	Real Capital Analytics
HOSP	Home Ownership Savings Plan
NHFR	National Housing Fund Regulations
AHS	Affordable Housing Scheme
KMRC	Kenya Mortgage and Refinance Company
VAT	Value Added Tax
GBP	Great Britain Pounds
UKCI	United Kingdom Climate Investment
NHDF	National Housing Development Fund
NHC	National Housing Corporation
CBD	Central Business District

OPERATIONAL DEFINITION OF TERMS

Behavioral biases: refer to the tendency of decision making that results in irrational financial decisions caused by faulty cognitive reasoning or reasoning influenced by emotions.

Overconfidence bias: Overconfidence is the tendency of people constantly overrating their abilities in a variety of activities. It is an unwarranted faith in one's intuitive 'reasoning, judgments, and cognitive abilities.

Herding based Bias: is joint imitation resulting to a junction of action. It is the phenomenon where investors follow what they perceive other investors are doing, rather than their own analysis. In other words, an investor exhibiting herding will gravitate toward the same or similar investments based almost solely on the fact that many others are buying the securities. Examples of herding biases include investor behavior and volume and choice biases.

Loss aversion: Loss aversion is the belief that investors experience higher disutility from a loss than from an equivalent gain or profit.

Heuristic driven 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. Examples include: availability, anchoring and overconfidence biases.

Prospect based Bias: Prospect bias is the clear irregularity in individual behavior when evaluating risk under doubt and an imperative asymmetry of human choices indicating that losses are prejudiced more greatly than equivalent amount of gains. In this study prospect based bias will be surrogated by regret aversion and loss biases.

Anchoring: is a psychological heuristic which can be said to occur when investors give unnecessary importance to statistically random and psychologically determined anchors which leads them to investment decisions.

Bias: is tendency to overestimate the likelihood of favorable events, and to underestimate the likelihood of unfavorable events.

Real Estate Investment strategies: is the determination made by the investors, in case of an individual investment or management where a corporation is involved, as to how, when, where, and how much capital will be spent on investment opportunities

Buy and hold: is a passive investment strategy in which an investor buys stocks or other types of securities and holds them for a long period regardless of fluctuations in the market.

Own and operate: is where the investor buy gets a property and manages it for business purposes.

Development strategy: is where the investor constructs on property or land for sale or for rental purposes.

Cognitive bias: A cognitive bias is a systematic discrepancy between the correct answer in a judgmental task, given by a formal normative rule, and the decision makers or experts actual answer to such a task

Operational efficiency: is what occurs when the right combination of people, process, and technology come together to enhance the productivity and value of any business operation, while driving down the cost of routine operations to a desired level.

Rental yield: is what a landlord can expect as return on his investment before taxes, maintenance fees and other costs

Occupancy rate: These numbers of occupied units that provide an indication of anticipated cash flows.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Operational Efficiency occurs when the right combination of people, process, and technology come together to enhance the productivity and value of any business operation, while driving down the cost of routine operations to a desired level. It is the ratio of a business's inputs which are the costs of producing products and services to its outputs which are the revenues generated by selling those products and services. The end result is that resources previously needed to manage operational tasks can be redirected to new, high value initiatives that bring additional capabilities to the organization. Several relationships are investigated between operational efficiency & profitability and between operational efficiency & service quality. Over the past five years' operational efficiency has been on the downward trend with rental yield at 7.6% in 2017; fell to 7.4% in 2018, then to 7% in 2019 to 4.0% in 2020 and 6.1% in 2021 with occupancy rate reducing to approximately from 86% in 2017 to 74% in 2021. According to S.P. Gupta (2001), the return on capital employed is used to study the operational efficiency of the business. It shows the overall earning capacity of the capital employed. As such, it may be used to examine the managerial efficiency.

Real estate is shifting from a mostly passive bricks and mortar industry to more dynamic and operational, focusing on access and outcomes rather than ownership. There are declining returns on investment if investors do not develop new and cost-effective methods to gain access to operational experience and innovation (Karakozova, 2015). According to Murugan, (2008) activity ratios highlight upon the operational efficiency of the business firm and the analysis of rental yield and occupancy rate for real property are significant elements in determining the operational efficiency of real estate firms. The two indicators of operational efficiency are

fundamental instruments for managers to quantify the profitability of their portfolio and to identify the most appropriate solutions for maximizing income.

Investors in the commercial property market expect return on their investments in the form of rent making rental yield and occupancy rates important indicators for each building as they contribute to the overall real estate value (Hoesli and MacGregor, 2015). Realizing a building is a rather expensive process and the result is usually measured in terms of the achieved market price often determined by the investment strategies of any organization. Fama & French (1992) states that investment strategies adopted at market levels, organizational or industry levels should guide inventors in selecting and constructing most efficient investment portfolios. The relationships of all these variables are described by the behavior of the general investor who expects a higher return on higher risk, and vice versa. Most economic and financial theories assume that individuals make investment decisions based on their rationality and consideration of all available facts (De Bondt et al.,2013). However, according to Bernstein (1996), there is evidence to suggest that human beings make decisions and choices based on irrationality, inconsistency and ineptitude when confronted with ambiguity.

Real estate constitutes nearly half of the world's wealth thus representing the most significant investment class in terms of value. Real property makes 49% or $21.41 trillion of the world's wealth ($44 trillion) whereas stocks and bonds comprise 25.5% and 18.8% respectively (Karakozova, 2015). Commercial real estate investment transactions in the United States have fallen by 8%, the greatest reduction since 2010. According to Real Capital Analytics, a total of $375.6 billion in real estate transactions more than $10 million were executed in the United States in 2017, an 8 percent decrease from the previous year and the second consecutive year of dropping investment. An increase in Asia Pacific and Europe offset a decline in the United

States, which is the world's largest commercial real estate investment market, according to Real Capital Analytics (RCA, 2018), which reported global volumes for completed sales of commercial properties totaling $873 billion in 2017. Both 2016 and 2017 trailed 2015 in terms of investment activity, which saw a spike in Europe and Asian markets like Hong Kong and Singapore. (Real Capital Analytics, (2020).

In Africa, the real estate market varies considerably among nations. For instance, the formal introduction of Real Estate Investment Trusts (REITs) in 2013 by South African listed property sector has consistently performed well in terms of international standards (Anderson and Cloete, 2016). South Africa's listed property market has traditionally invested in the office, retail and industrial sectors. Unlike many developed and developing property markets, there has been very little investment in the residential property sector by the South African listed property sector (Anderson and Cloete, 2016). In Nigeria, the commercial property market in particular has remained relatively under researched in the past five decades due to the absence of reliable and standard property market database. Most of the property market studies in Nigeria within this period have been focused on the residential property market with little empirical relevance to the commercial property market in the country (Wyatt, 2014).

In East Africa, Tanzania has been ahead of Kenya since 2017 with its real estate transactions valued at $12Billion against Kenya's $9.2Billion. At $22 per square meter in Dar-el-Salam, Tanzania's capital city, compared to Nairobi's $14 per square meter, the country's real estate market has higher charges for office space, with low occupancy rates of up to 40%, compared with Tanzania's 70%. Nairobi has the highest replacement value ahead of Darussalam, Addis Ababa, and Kigali, despite falling behind global standards in its built-up and built-floor areas and its property market booming and attracting the attention of foreign developers who have

invested heavily in cutting-edge buildings. The objective of providing decent housing in Kenya was included in the first National Development Plan of 1964 to 1970, all through to the ninth National Development Plan of 2002 to 2008. The Kenyan constitution was amended with a number of clauses in order to legally entrench housing among other rights to be enjoyed by persons (National Development Plan, (2008).

Housing is a backbone of Kenya's real estate sector, which contributed approximately 5.3 percent of gross domestic product (GDP) in the third quarter of 2020. Championed by the government's Big 4 Agenda, which established the Affordable Housing Programme (AHP), activities by both the private sector and government have increased to resolve the housing deficit that stands at two million. The government is working with several private developers such as Chinese companies and continues to lobby for partnerships with local strategic partners in implementing the projects (Kenya National Bureau of Statistics, (2020). AHP has introduced incentives such as a 50 percent corporate tax break for developers of over 100 units and exemption of VAT on importation and local purchase of goods for the construction of houses under the scheme (Kenya law, (2020). Despite several interventions that help to cushion developers, the incoming supply of housing units stands at approximately 50,000 housing units a year with only two percent of this being for the low income market against an annual demand of 250,000 units (Kenya National Bureau of Statistics, (2020).

Nairobi's housing market has been on the downward trend with an oversupply of high-end, expensive properties which are mostly vacant in places such as Kilimani, Lavington, Westlands and Kileleshwa. and a decline in supply of low to middle income housing in areas like Ruaka and Ruiru with prices of houses increasing over the years since the owners usually want to recoup their investment outlays by charging tenants extremely high rents. In the year 2017, the

average rental yield in Nairobi was at 7.6%, dropped to 7.4% in 2018, then further declined to 7% in 2019 and the worst was 2020 when it fell to 4.0% with a slight increase to 6.1% in 2021. There was a slump between 2017-2021 in real estate returns with a slowdown in demand for property amidst growing supply. This was evidenced by a 3.0% decline in the residential sector occupancy rates and the 0.4% decline in occupancy rates in the retail space on account of increased supply of mall space recording a growth of 4.8% in Nairobi to 6.5million square feet in 2018 from 6.2million square feet in 2017 (Vuluka & Gachanja, (2014). The COVID-19 pandemic also saw real estate revenue collections drop significantly due to decline in economic activities, occupancy rates and the subsequent decline in disposable incomes, thereby affecting developers' ability to continue with ongoing projects. (Cytton, (2020).

Theoretical literature links real estate investment strategies to investment performance both positively and negatively (Lamont, 2005; Baxter & King, 1999). The Real Estate Investment strategies are the procedures, rules and policies that guide investors in constructing an efficient real estate portfolio. This means therefore that investor's risk-return trade-off is determined by real estate investment strategy adopted. Therefore, an investor should plan his investment strategy well before making any real estate investment decisions (Jones, 2009). Fama & French (1992) further argues that investment strategies adopted at market levels, organizational or industry levels should guide inventors in selecting and constructing most efficient investment portfolios. Real estate investment strategy is the decision made by the investors or the top level management concerning the amount of funds that can be utilized or deployed in real estate investment opportunities in order to enhance its operational efficiency (Shilling, 2003).

Pompian (2012) found that in finance and economics, behavioral biases refer to the tendency of decision making that results in irrational financial decisions caused by faulty cognitive

reasoning or reasoning influenced by emotions. The interest in biases caused by faulty cognitive reasoning or emotions that affect individual financial outcomes has seen the emergence of research on behavioral finance as a concept. Foreign scientists Berber &Odean(1999), Huberman (2001), Pompian (2008) &Shefrin (2011) have found out that human psychological state affects their investment decision making. Various changes of setting including price volatility and variations of economic situation have a gross impact on investors' thinking. Individuals constantly feel the fear of losing money, so impulsively react to market changes and responds to every financial expert's opinion thus begins to have doubts of their investments. A study by Rehma (2016) depicted that behavioral biases influence corporate performance as managers take a decision under the influence of personal feelings, perceptions, and intuitions. The results indicated that the effect of biases i.e. mental accounting, optimism, and loss aversion is significant on long term financial decisions.

Solvency of an organization is dependent upon the sales revenues generated by its assets utilization in total as well as its components. Activity ratios include those ratios, which highlight upon to the activity and operational efficiency of the business firm (Murugan, (2008). Rental yield is a number which is calculated like the bond yield in the bond markets are calculated. The annual rent generated by the property is used as the numerator. Usually, the gross rental value is used in the numerator and no deductions are carried out. However, there are no fixed rules to ratio calculations and every investor calculates the ratios based on their own heuristics. In the denominator, the price paid for the property is used which may be different from its current market value. Rental Yield can only be calculated once the value of the investment is considered (Koli et. al, (2011).

Occupancy rate on the other hand important indicator for each building as it contributes to the overall real estate value, which maybe the most important parameter of any building. The real estate value incorporates many different aspects of a property, but they always sum up into a single price, which can be realized on the market. However, this price and thus the real estate value is a very uncertain variable. Occupancy rate and real estate value correlate because these figures give a forecast of potential future cash flows to the investors (Pandey, (2002). Abdullah & Hamdan, (2012) state that to improve occupancy rates some Business Intelligence solutions that will allow an increase in the income and the maximization of the occupancy rate for every unit of accommodation need to be applied. On the other hand, it is compulsory to identify some strategies that will allow the prolongation of property which will assure higher occupancy rates and rental yields for all accommodation structures, with identification of the resources which will make them attractive throughout the entire year thus increase the operational efficiency of firms (Abdullah &Hamdan, (2012).

Empirical studies have given varying results in the relationship amongst the study variables. A study by Hoffman et al. (2010) examines how investors' investing intentions and techniques impact the portfolios they choose and their results. This study's results are based on data from a representative sample of customers at the Netherlands' largest online broker. Investors who depend on fundamental analysis beat those who rely on technical analysis because they have greater ambitions and turnover, take more risks, and are more overconfident. Most property investors feel that capital expansion is the best technique for earning from real estate, according to Baxter &King (1999). The only way to develop money in real estate is to double your asset holdings every seven to 10 years. It was shown in their research that human beings are reasonable and that contemporary economic model are founded on the notion that most investors aim to avoid risk and maximize rewards. To construct a compelling portfolio,

investors weigh the risks and rewards of various investment possibilities. Investors need to build a well-diversified portfolio to guarantee that the risk is evenly distributed. As a result, investors are more concerned with risk than rewards when making investment decisions (Baxter &King, 1999).

As Bokhari and Geltner (2010) discovered in their study of commercial real estate market data on loss aversion and anchoring, experienced investors and more significant, more sophisticated investment institutions exhibit at least as much risk-averse behaviour. Speculative price bubbles in the real estate market are impossible if they are not accompanied by behavioural elements. In their study of the price bubble in real estate co Brezezicka and Winsniewski, (2014) concluded that if the real estate market (REM) had no behavioural characteristics, there would be no bubble in the housing market's price. According to findings from behavioral science, the study was done in the context of a worldwide economic crisis. Nevertheless, researchers demonstrated that the typical financial models used by market practitioners failed to account for market anomalies because of market inefficiencies. A reasonable assumption was that managers of unit trusts adhered rigorously to and follow established financial models when making decisions though according to research, individual and even institutional investors, relied too heavily on heuristics or rules of thumb when making investing decisions (Brezezicka &Winsniewski, 2014).

Researchers do not fully understand the link between behavioral biases, real estate investment decisions and operational efficiency which is still open research. The backbone in the process of decision-making is how the investor registers risk. Risk will be extra important to analyze in decision situations under uncertainty. Individual investors' investing choices are influenced by heuristics such as overconfidence, anchoring, and herd behavior (French 2001). Most

economic and financial theories assume that individuals make investment decisions based on their rationality and consideration of all available facts (De Bondt et al.,2013). However, according to Bernstein (1996), there is evidence to suggest that human beings make decisions and choices based on irrationality, inconsistency and ineptitude when confronted with ambiguity. These findings indicate mixed results on the relationship between behavioral biases and operational efficiency of real estate investment firms. There exists a study gap on whether behavioral biases have a positive or negative effect on operational efficiency and to what extent and this study sought to determine this by analyzing the effect of behavioral biases on operational efficiency of real estate firms in Nairobi county.

Marete (2011) found out that the key determinants of real estate property prices in Kiambu Municipality in Kenya, Miregi and Obere (2014) looked at the impact of market fundamentals on property prices in Kenya and Makena (2012) studied determinants of residential real estate prices .Jumbale (2012) sought to determine if there exist a relationship between house prices and real estate financing by financial institutions in Kenya and Mbogo (2016) studied then effect of real estate investment strategies on Financial performance of investment groups in Kenya. These studies have majorly looked at price and performance and not focused on the aspect of a firm's operational efficiency. Therefore, empirical studies focused on the establishing the relationships between real estate investment strategies and other factors like price and financial performance but no studies have been done to determine the effect of real estate investment strategies on operational efficiency. There existed knowledge gaps on how real estate investment strategies affected operational efficiency and the extent of this relationship. This research therefore sought to establish the effect of real estate investment strategies on operational efficiency of investment firms in Nairobi County and determine the extent of the relationship between the two variables.

The underlying assumption of behavioral finance scholars is that a complex combination of psychological factors influences investment decisions. As opposed to the belief of rational decision-making of investors according to traditional finance theories, behavioral scholars argue that investor behavior is irrational (Chiang et al. 2010; Tekce and Yılmaz 2015). There is consensus among the researchers in the field of economics and finance that it is important to consider psychological, sociological, demographic, and personality factors that may have a profound influence on investment decisions thus affecting performance (Fung and Durand 2014; Zhang and Zheng 2015). As the risk capacity determines the behavior of investors under the conditions of uncertainty, the investment priorities of these individuals influence their attitude of investment. Furthermore, when personality traits help individuals gain access to information from the public domain and change their relationship to risk, it may affect their investment attitude and investment priorities in decision making (De Bortoli et al. 2019).

While the direct relationship between real estate investment strategies and operational efficiency has been examined by previous researchers, exploring the moderating role of behavioral biases has not been studied. On the backdrop of these, behavioral bias was picked as a moderator to the relationship between real estate investment strategies and operational efficiency since all factors such as risk capacity, risk attitude, psychological, sociological and demographic factors all coin down to investor behavior that affects investment priorities and decisions. Operational efficiency is measured as the ratio of inputs which in this case are the real estate investment strategies employed while the output are the returns in terms of rental yield. This study sought to assess the moderating effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi county.

1.1.1 Housing Legal Framework in Kenya

There are a number of regulations the government has passed in regards to housing in order to address the huge housing deficit in Kenya which is estimated by the National Housing Corporation (NHC) to be 2.0 million housing units and growing annually by 200,000 units. The Finance Act increases the amount of rental income that qualifies for Residential Rental income tax to income between Kshs 288,000 and Kshs 15 million per annum. Previously, this was applicable where the annual rental income was between Kshs 144,000 and Kshs 10 million and the Act repealed section 22C of the income tax act thereby abolishing the Registered Home Ownership Savings (HOSP) schemes in Kenya. The other regulation is the tax amendment Act 2020 which saw the amendment of Section 38 of the retirement benefits Act (1997) to allow access of retirement benefits for purposes of purchase of a residential house.

In the draft Retirement Benefits Authority regulations, the amount used shall be the lower of either 40% of the savings, Kshs 7.0 mn or the purchase price the house. The president's directive in November 2019 to make national housing fund regulations(NHFR) contributions voluntary rather than mandatory, the Cabinet Secretary for Housing drafted the new NHDF regulations which were aimed at guiding the institutions full operationalization and the Financial Act 2019 introduced a couple of reforms including Inclusion of Fund Managers or Investment Banks registered under the Capital Markets Act as approved institutions which can hold deposits of a Home Ownership and Savings Plan (HOSP), Stamp duty exemption on the transfer of a house constructed under the affordable housing scheme from the developer to the National Housing Corporation, and Exemption of goods supplied for the direct and exclusive use in the construction of houses under the affordable housing scheme (AHS) from Value Added Tax (VAT).

On the affordable housing front, the Kenyan national government floated to the public, the first lot of 488 completed units at its Park Road low-cost housing project in Nairobi, which have so far been inspected and handed over to the government, with the sale having taken a one-week period. In the FY'2020/21 National Budget, the affordable housing sector was allocated Kshs 6.9 billion, a 34.3% reduction from the Kshs 10.5 billion allocated in 2019/2020. Kenya Mortgage and Refinance Company (KMRC), a Treasury backed lender, announced plans to lend approximately Kshs 37.2 billion to Kenyans earning a maximum of Kshs 150,000 per month and seeking to purchase affordable housing units. The lending began in September with mortgage loans capped at Kshs 4.0 million for those seeking residence within the Nairobi Metropolitan Area (NMA) which also covers Kiambu, Machakos and Kajiado and at Kshs 3.0 million for all other areas outside the NMA (Cytonn, 2019). The government started allocation of the first block of 160 units at the Pangani Estate renewal project.

The Kenyan government has continued to introduce a host of measures to provide a shot in the arm for the real estate sector. United Kingdom Climate Investment (UKCI), a joint venture between the Green Investment Group, a UK-based specialist developer and investor of green infrastructure, and the United Kingdom Government's Department for Business, pledged to invest GBP 30.0 mn (Kshs 3.9 bn) towards affordable green housing in Kenya. Phase I of the Park Road Affordable Housing Project was completed and handed over to the government for public allocation, paving way for phase II which was set to for completion in June 2020 which is still ongoing as of July 2020. The County Government of Nairobi also commenced works on the Pangani Regeneration Project. H.E President Uhuru Kenyatta signed into law the Supplementary Appropriation Bill No. 2 of 2019, which allocated Kshs 7.0 bn towards the affordable housing agenda. This was a 66.7% increment from the Kshs 10.5 bn allocated in Kenya National Budget 2019/20, in support of the affordable housing initiative.

In a bid to ensure the full implementation of the National Housing Development Fund (NHDF), the President officially directed the National Treasury to revise the legal requirement for mandatory contributions of the National Housing Development Fund Levy and make it voluntary, with immediate effect. The government's aim of improving the mortgage market also took shape as the Central Bank of Kenya finally gazette the Mortgage Refinancing Companies regulations. However, KMRC is yet to begin operations as of July 2020(Cytton,2020).

1.2 Statement of the Problem

Despite several interventions by the government to cushion developers, the incoming supply of housing units stands at approximately 50,000 units a year with only two percent of this being for the low income market against an annual demand of 250,000 units. Demand for affordable rentals have been on the rise since 2017, unfortunately, there has been an oversupply of high-end, expensive properties which have remained mostly vacant. There has been a downward trend in the average rental yield from 7.6% in 2017; fell to 7.4% in 2018, then to 7% in 2019 and 4.0% percent in 2020 hence creating a concern on the operational efficiency of real estate firms. Many houses in the high end residential areas are left unoccupied while there has been an insufficient supply of middle to low cost housing. This further affected operational efficiency of real estate firms in Nairobi county leading to financial losses or disposition effects, reduced household income, pay cuts, layoffs and shutting down of firms which cannot continue sustaining their businesses. The relationships of real estate investment strategies and operational efficiency is described by the behavior of the general investor who expects a higher return on higher risk, and vice versa. Most economic and financial theories assume that individuals make investment decisions based on their rationality and consideration of all available facts while others suggest that human beings make decisions and choices based on

irrationality and inconsistency. It was assumed that investment managers were rational and followed standard finance models in decision making but it emerged from literature that investors embraced heuristics in their investment decision making. Researchers did not fully exhaust this area of research with gaps on the relationship of behavioral biases, real estate investment decisions and operational efficiency. On the backdrop of this, the study sought to determine the effect of behavioral biases on the relationship between real estate investment decisions and operational efficiency of real estate investment firms in Nairobi, Kenya.

1.3 Research Objectives

The study's overall objective was to determine the effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of investment firms in Nairobi County, Kenya.

Specifically, the study sought:

a) To establish the effect of behavioral biases on operational efficiency of real estate investment firms in Nairobi County, Kenya.
b) To assess the effect of real estate investment strategies on operational efficiency of real estate investment firms in Nairobi County, Kenya.
c) To analyze the moderation effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County, Kenya.

1.4 Research Hypotheses

The following research hypotheses were tested study:

H_{01}: Behavioral biases have no significant effect on operations of real estate investment firms in Nairobi County, Kenya.

H_{02}: Real estate investment strategies have no significant effect on operational efficiency of real estate investment firms in Nairobi County, Kenya.

H_{03}: Behavioral biases have no significant moderating effect on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County.

1.5. Scope of the Study

Subject, region, and temporal span were reviewed in this section. This study's scope included financial management and subfields, such as behavioral and real estate finance and investments. In Pandey (2006), financial management is a discipline of economics that focuses on guiding and supervising the company's financial activities, including the acquisition and use of cash. There was a significant worry that economic reflections on the marketplace were not employed in establishing policies for practicing finance managers in the late 1930s, despite the wide range of academics working in numerous sub-disciplines of economics.

Financial economics lends concepts, theories, and principles to the field, but it has evolved into a distinct area of study throughout time (Copeland et al.,2005). Financial management's branch, corporate finance, has analyzed corporate financial choices (Pandey, 2006). The study's second defining characteristic was its geographic reach. All of Nairobi City, Kenya's investment businesses were included in the investigation. Data was collected throughout five years from

2017 to 2021 as part of the study's longitudinal scope. Real estate was worst damaged and had a steep downward trend throughout this era, which was why this time frame was chosen.

In terms of variables, the scope has focused on three variables; behavioral biases, real estate investment strategies and operational efficiency. The independent variable is real estate investment strategies, moderator is behavioral biases and the dependent variable id operational efficiency. The aim is to determine the moderating effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency within the real estate firms in Nairobi County.

1.6 Significance of the Study

It was vital to conduct this study since previous studies on the connection between real estate investment methods and financial success produced varied results. Research on the financial success of investment firms had not before linked behavioral biases, real estate investment methods, and financial literacy. In addition, no previous research looked at the moderating effect of behavioral biases on the link between real estate investing methods and financial results.

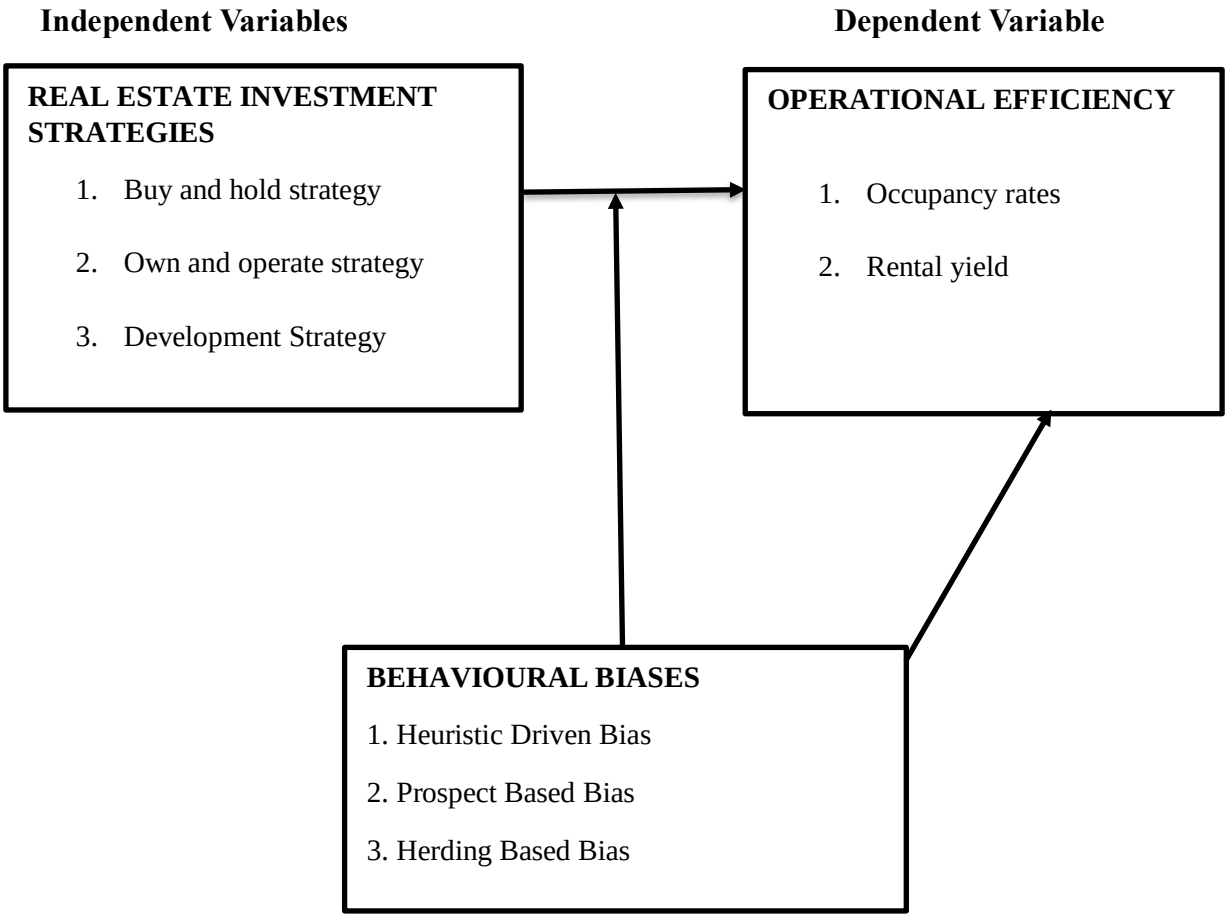
It was possible to integrate effective real estate investment techniques with environmental dynamics to maximize operational efficiency while taking advantage of environmental changes. This study contributed to behavioral and real estate finance theory in two ways: first, it combined real estate investment strategies with financial literacy and behavioral biases and tested the predictions of behavioral finance theory, shareholders' wealth maximization theory, arbitrage pricing, and modern portfolio theories and combined real estate investment strategies with financial literacy and behavioral bias. Correlational research strategy gathered fresh

empirical information on the connection between real estate investment strategies and operational efficiency.

Furthermore, it examined the link between Kenyan real estate investment methods and financial success, this study contributed significantly to academic theoretical debates. Students and scholars in the fields of banking, land economics, and finance will find the study's conclusions to be a valuable resource. Data from this study can be used in future research on this issue for comparison reasons. As a result, investors will have a better foundation for building and growing a profitable real estate portfolio due to our research. It is hoped that the findings of this study would be useful to policymakers and academics in their efforts to regulate the real estate investment business. The outcomes of this study will also be beneficial to investment groups and associations like KAIG, which may determine real estate investment techniques that enhance the operational efficiency of investment groups in Kenya.

Those interested in real estate will benefit greatly from this study because they will learn about the influence of investing methods, financial literacy, and behavioral biases on portfolio performance, which will help them make better investment decisions now and in the future. Managers of financial institutions and advisers will also benefit from the study since they will be able to identify areas where they should focus more on when providing great advice. This study provided insight into the necessity of financial education in all school-based programs to help drive our country's economy for government and policy makers. In addition to providing new insights into behavioral finance and financial management, this research will also help academics and researchers discover new areas of study.

1.7 Conceptual Framework



Source: Adapted from Mbogo, 2016 and K'otieno, (2012)

Figure 1.1: Effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency

To meet the study objectives, modifications were made to the conceptual framework from Mbogo, (2016) and K'otieno, (2012). Mbogo, (2016) used a descriptive study approach to examine the effect of real estate investment strategies on financial performance of investment groups in Kenya and developed a schematic model of the interrelationship between the financial performance as dependent variable and the real estate investment strategies as the independent variable. The study developed three variables under real estate investment

strategies were adapted from Mbogo, (2016) who analyzed three strategies as buy& hold, own& operate and development strategies which this study adapted

K'otieno, (2012) used an exploratory study methodology to investigate the behavioral biases of real estate investors and their investing performance in the real estate sector. As a result, they were relevant to how we conducted our investigation as it developed a set of biases that affect human behavior which this study adapted. However, in contrast to the treatment offered in this framework, real estate investment strategies were regarded as an independent variable while behavioral biases were handled as a moderating variable, based on K'otieno, (2012) thesis.

This study's rebuilt framework had real estate investment strategies as the independent variable that directly impacted operational efficiency, the dependent variable. Behavioral biases were predicted to modify the connection between the independent and the dependent variables thus being the moderator variable. Furthermore, the study introduced operational efficiency as the dependent variable which was measured using rental yield and occupancy rate of investment firms in Nairobi County. The framework above is a visual presentation of the interrelationship between real estate investment strategies and operational efficiency and illustrates how behavioral biases moderates this relationship.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Research on real estate investment techniques, behavioral finance, and operational efficiency was the subject of a literature review. After thoroughly examining the theoretical and empirical literature, a conceptual framework guided the investigation. There was a discussion of the ideas that supported behavioral finance in the first section of the chapter. As a result, a thorough examination of how cognitive and emotional biases influenced individual investors' judgments followed. Operational efficiency and real estate investment decisions were also discussed in the evaluation. A conceptual framework utilized by this study was explained, as well as a research gap that was discovered throughout this investigation.

2.2 Theoretical Literature Review

The theoretical underpinnings and principles of the study were discussed in this review. The study's ideas, concepts, and variables were defined, as well as their dimensions, in this section.

2.2.1 Prospect Theory

In 1979, Princeton University psychology professor Daniel Kahneman and Amos Tversky created prospect theory as a psychologically plausible alternative to the anticipated utility hypothesis. Kahneman (2003) claims that the theory may explain how individuals make decisions when faced with a choice between two risky options. Cognitive psychology was used to explain several verified deviations from neoclassical theory in economic decision making. Decisions are framed and valued regarding possible benefits or losses regarding a given reference point, generally the purchase price. This theory outlines how individuals frame and value decisions including uncertainty. A similar approach to choose is taken by prospect theory

and utility theory, according to Faulkner (2002), who argues that individuals are presumed to consider the expected consequences of their actions while making decisions.

If a shareholder is risk-averse over accomplishments, he should sell a property that is selling at an achievement linked to the purchase price; if he is risk-averse over losses, he should grip on a property trading at a defeat (Kahneman and Tversky, 1979). For the most part, when it comes to risk assessment, the prospect theory points out the evident irregularity in human conduct. To be sure, this does not point to irrationality, but it is necessary to acknowledge the asymmetry of human decision-making; yet, it shows that losses are more heavily weighted than equal amounts of successes. According to this perspective, shareholders would be risk averse when deciding between risk takers and gain seekers when faced with the choice between losses and rewards (Kahneman and Tversky, 1979). Analyses of human behavior by Kahneman and Tversky (1979) uncovered many oddities and paradoxes. If an investor sees an option presented unusually, they may show signs of risk aversion, but when the same choice is presented in a new way, they may show signs of risk-taking behavior.

If investors are offered the choice between obtaining KSHS.1000 with certainty or a 50% possibility of receiving KSHS.3500, they may likely choose to make the Kshs.1000 rather than the unknown chance of earning KSHS.3500. Risk aversion is a common term for this type of thinking. But Kahneman and Tversky found that the same people were confronted with a 100% likelihood loss of KSHS. 1000 vs the 50% chance of zero loss or Kshs.3500 losses, they generally chose the riskier option. This hints at a risk-taker personality. They would have chosen certainty in either the gain or loss scenarios if they had responded logically. If they had chosen a 50% probability of gaining KSh 3500, they would have chosen an equally 50% chance of zero loss or a KSh 3500 loss.

This theory brings into perspective the aspect of behavioral biases and how it affects the rationality of an investor. Analyses of human behavior by Kahneman and Tversky (1979) uncovers many oddities and paradoxes indicating that if an investor sees an option presented unusually, they may show signs of risk aversion therefore losing out of a great investment opportunity which in turn affects returns hence the operational efficiency. Similarly, when the same choice is presented in a new way, investors may show signs of risk-taking behavior without analyzing the costs versus benefits of the investment decision taking and this may also affect operational efficiency. This theory therefor anchored objective one that sought to analyze the effect of behavioral biases on operational efficiency of real estate investment firms in Nairobi County.

2.2.2 Ricardian Rent Theory

The theory by David Friedman works on the assumption that housing construction can only be done on land that is available, and that land availability is fixed, because it's a fixed resource. It also states that land has a derived demand, since the supply of land is fixed. Its demand in this case results from the demand for housing. From the derived demand for land, it can be concluded that the price of land is determined by the interaction between forces of housing demand and supply that bring about an equilibrium price of land. From the theory still, it can be said that the high prices of houses push the prices of land high too, the converse being equally true.

On the other hand, the neoclassical theory states that land is a factor of production which is used as an input and not an output for distribution. The neoclassical theory therefore observes that land can be put into a number of uses, and that a rational producer would only choose to put it into the most productive use (Meen, 2001). This in essence means that builders will

construct housing units whenever they feel it is profitable to do so, otherwise, they opt for other investments that fetch higher returns. Ricardian theory supports the variables of this study to the extent that it illustrates how operational efficiency is enhancing through maximum use of land which is a factor of production. It states that an investor should select real estate investment strategies that maximizes returns given a fixed piece of land thus enhancing efficiency. Objective one seeking to establish the effect of real estate investment strategies on operational efficiency of real estate investment firms in Nairobi County was anchored on this theory.

2.2.3 Shareholders Wealth Maximization Theory

Modern financial theory assumes that a company's sole goal should be to maximize the market value of its stock or the wealth of its owners. It is represented in terms of SW (Shareholders' Wealth) = nxMV (Shareholders' Wealth) (Number of Shares held x Market Value Per Share). To maximize shareholders' wealth, it is obvious from the phrase that the market value per share may be maximized given the number of shares owned. As a result, every business action should aim to maximize the value of the company's portion of the market. Companies should only take on projects with a positive Net Present Value (NPV), meaning that the current value of cash inflows exceeds the present value of cash outflows, if they want to maximize shareholder wealth (Becchetti, 2003).

Because an entrepreneur may be said to produce value for both the firm and society, according to economist J. B. Say (Smith, 2004), an entrepreneur creates value for both the company and society by transferring resources from low- to high-productivity regions. As a widespread belief, shareholders are the true owners of the company, and hence they have the power to influence the company's commercial decisions. According to conventional opinion, shareholder returns should be a primary consideration when making company and investment

choices. Rappaport (1986) believes it should be measured in dividends and share price gains when it comes to corporate strategy. To maximize shareholder value, management should use other techniques to gain a competitive edge.

There are many reasons why a firm's shareholders should be its primary focus, including that stock prices are the most observable by all measures used to determine how well the firm is doing. Rational investors reflect long-term effects of firm decision making. It is through trading in stocks that gains can be realized. There are of course, many who argue that shareholder value maximization is a good goal. Kean (1979) argues that the company's purpose should be to maximize the value of the firm, subject to maximizing the share price," rather than maximize the share price. In 1992, a report produced by Professor Michael Porter and 25 other academics stated that US corporations are too short sighted in their investment decisions. It claims that the US corporate governance structure focuses too much on stock prices and shareholder profits (Ardalan 2003).

Shareholder's wealth maximization theory ascertains the relationship between the study variables, real estate investment strategies and operational efficiency and indicates that shareholder's wealth can only be generated if management's performance exceeds market expectations and portrays the concept of wealth creation as a creative activity that aims to develop a relationship between customer and shareholder wealth. It further brings in the aspect of rationality of an investor by stating that rationality of an investor reflects long-term effects of firm decision making. This theory helped to explain the effect of behavioral biases in terms of investor rationality on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County.

2.2.4 Behavioral Biases

Research conducted by Shefrin (2000) found that investors often make illogical investing choices (Shefrin 2000). Making investment decisions, which plays a significant part in financial planning, is complicated as investors always want to maximize returns as investors who are not always that sensible. An investor has a daunting undertaking when putting together an effective investment portfolio. An investor can achieve higher returns and spread risk by considering a wide range of general criteria when designing a portfolio (Shefrin 2000). In the field of behavioral finance, investors, analysts, and portfolio managers are examined for how various psychological qualities influence their decision-making (Brown & Reilly, 2004). Heuristics are methods that draw on experience and experimentation to help us solve problems or perform better.

According to Raines & Leathers (2011), people use heuristics or rules of thumb to subjectively estimate the risks of different options, which simplifies the more sophisticated jobs of evaluating probability and forecasting values. Many classic financial ideas, such as efficient markets, portfolio theory, and risk-return tradeoff, have been challenged by behavioral finance research. Merton Miller and Franco Modigliani have both worked in finance. Still, their assumptions about rational people seeking to maximize their self-interest are no longer valid owing to a shortage of actual data. To be rational, most financial models assume that people keep their beliefs up to date and make decisions based on the subjective anticipated utility hypothesis.

Razek (2011) study finds that a lack of cognitive resources constrains human problem-solving abilities. Many classic financial ideas, such as efficient markets, portfolio theory, and risk-return tradeoff, have been challenged by behavioral finance research. Due to a lack of empirical

data, Merton Miller's and Franco Modigliani's assumptions about rationality and utility are no longer applicable (De Bondtet al., 2013). Standard financial models are founded on rationality, which indicates that individuals keep their beliefs current and make decisions following the subjective anticipated utility theory. Non-rational investors distort prices, whereas skilled traders' profit from arbitrage possibilities, according to efficient capital market theories. Irrational human emotions and prejudices heavily influence money decisions.

According to Sewell (2005), behavioural finance is the study of how the psychology of financial professionals affects their conduct and, in turn, the markets. Behavioral finance is roughly defined by Schinckus (2011) as how psychology impacts finance and more specifically the influence of individual human preferences and motivations on asset values. According to Singh (2010), information structure and market participant characteristics influence investors' decisions and market results. For example, Rabin (1996) posits that because psychology systematically studies human judgment, behavior and well-being, it may teach us key truths about how human beings vary from traditional economic assumptions. Individual preferences are assumed to be stable, well-defined, and rationally maximized in standard economics. Behavioural finance and economics are terms coined by Belsky and Gilovich (1999). They argue that behavioral economics integrates psychology and economics to explain why and how individuals make irrational decisions whether they invest, save, or borrow money.

An integrated approach to herding offered by Raafat, Chater, and Frith,(2009) described two fundamental issues: the transmission methods between individuals and the patterns of linkages between them. According to the researchers, a wide range of disciplines, from cognitive neuroscience to economics, can benefit from the idea of herding. According to new research, institutional decision-making and investor behavior are both affected by a herd mentality.

Investing in herds is an option in financial planning, according to Gounaris and Prout (2009). Investment choices should never be made in a vacuum. Still, Gounaris & Prout (2009) contend that a healthy dosage of skepticism should be used by financial experts when the herd is heading in a specific way. Non-insiders behave unreasonably when they hear noise, believing it to be knowledge that can offer them an advantage.

In the early 1900s, traditional social scientists studied herding practices. Some of the first critics of human society's "crowd and herd morality" and "herd instinct" were philosophers Sren Kierkegaard and Friedrich Nietzsche. To explain why big groups of individuals act in unison. British physician Wilfred Trotter popularized herd behavior in his book Instincts of Herd in Peace and War (Trotter, 1946). (1914). There are two distinct approaches to understanding why herding happens and how it manifests itself in economics. Non-market herd behavior studies are the first of these strands. Studies by Banerjee and Bikhchandani, Hirshleifer and Welch (1992) reveal that herd behavior can be influenced by private knowledge that isn't made available to the public. People who behave sequentially based on private and public information about the conduct of others may end up picking the socially unfavorable choice in both studies. There are two more sub-strands to this discussion. Recent findings suggest that markets may place an excessive emphasis on public information. With the rapid diffusion of information, the lives of financial market decision makers have grown increasingly complex (Laurens 2006).

A well-known bias in which a person's subjective confidence in his or her judgements is consistently larger than the objective correctness of those judgments, especially when confidence is quite strong, is known as the overconfidence effect by Kahneman (2011). Subjective probabilities can be misjudged in many ways, and overconfidence is only one of them. An overestimation of one's real performance, an overestimation of one's position about

others, and a precision that expresses excessive assurance in the integrity of one's views are three ways that overconfidence has been characterized in the research literature. Most commonly, overconfidence has been investigated by asking people how confident they are in their opinions or replies. The overconfidence effect manifests itself in a propensity to overstate one's position on a metric of judgment or performance. As the name suggests, this aspect of overconfidence is concerned with one's belief in one's abilities, performance, control, or success. Hard activities, difficult things, or the person providing the estimate lacks specific expertise are the most likely candidates for this phenomenon (Kahneman 2011).

According to Hoffrage,(2004), overestimation has been shown in areas other than one's performance. The illusion of control and the planning fallacy are examples of this. It is common for people to believe that they control their lives, but they do not. On the other hand, evidence does not support the idea that individuals routinely exaggerate their level of control; instead, persons who have a great lot of control tend to underestimate their level of control. When individuals overestimate or underestimate how long it will take to complete a task, it is known as the planning fallacy. Long and hard jobs are where it shines the most, whereas easy and short tasks are where it fades away or even reverses. It is unusual for people to have wishful-thinking effects, when they overestimate the possibility of an occurrence because they want it so much. That individuals are more pessimistic defensively before significant events might be because they are trying to avoid the disappointment that follows excessively optimistic predictions by being pessimistic. Excessive faith in one's ability to discern the truth is called over precision.
According to Moore and co-authors (2008), the overconfidence effect manifests itself most prominently in the form of over placement. The term "over placement" refers to comparing your abilities to other people. Better-than-average overconfidence develops when people feel they are superior to others. Assuming that you are better than others is known as self-esteem.

Over-placing happens more frequently when the task at hand is straightforward, and we think we can effectively do it. This theory's self-enhancement is one possible reason. It's been hypothesized by some academics that people believe positive things will happen to them more than terrible things and vice versa. However, others have pointed out that past research focused on common and unusual outcomes, such as owning a home and getting hit by lightning. A portion of previous results of comparative optimism can be attributed to the frequency of events. People believe that they are more likely to live past the age of 70 than other people and are less likely to live past the age of 100 than other people.

Overconfidence in one's ability to choose winners may explain why financial experts maintain actively managed portfolios. When managers conceive of themselves as experts, they overestimate their chances of success (Johnson et al. 2002). An investor's inclination to put all of their eggs in one basket is a sure sign of overconfidence, according to Ritter (2003). Finding stocks that will outperform the market is a challenging endeavour. Low predictability; loud feedback, as a result, stock selection is one of the more overconfident tasks (Berber & Odean, 2001). Portfolio managers, pension funds, and financial experts all have a high degree of self-confidence because they believe they can correctly predict the direction of a stock's value (De Bondt & Thaler, 1994). When investors overestimate their ability to assess the worth of a financial asset, Odean accurately. (1998) proposes models to explain this. These investors overestimate the likelihood that they are more accurate than others in assessing a stock's worth.

Evidence for over-precision can be found when participants are questioned about their confidence in the accuracy of specific items, according to Hoffrage (2004). These item-confidence assessments are the same, and this paradigm cannot discriminate between overestimation and over precision. Even though people overestimate the number of things, they

correctly answered, they do not exaggerate their overall scores. Throughout an exam, they are more confident in their item-confidence assessment than their actual success rate. Perhaps the item-confidence judgements were overestimated due to a lack of systematic underestimation of the accuracy of their reviews. According to Hong et al. (2005), Mutual fund managers are more inclined to acquire equities than other managers in the same city purchase, indicating that the word-of-mouth effect of social contact among money managers influences portfolio selections.

Investors' reluctance to sell assets that have decreased in value and increased chance of selling assets that have increased in value is known as the disposition effect (Shefrin & Statman, 1985). Mental accounting theory and prospect theory can be used to explain this behaviour. Those who have loss aversion try to prevent losses rather than gain. The endowment effect, which argues that individuals place a higher value on something they possess than on something they don't own, is an excellent example of this phenomenon. Investors are more likely to sell their winning investments because they don't want to lose out on the profits they've already achieved. Investors may not get the full benefit of their assets if they sell wins too quickly. As an alternative, some investors hold on to their losses hoping that things will improve. As a result, investors miss out on potential investment possibilities since their funds aren't freed from the lost investment (Pandey, 2018).

While it's fine to hold on to investments that aren't earning money right away, consider the opportunity cost of doing so. It's a shame if you miss out on a great investment opportunity because you're hoping to recoup your losses from your existing investment. Investing should be approached as if one has an imagined "punch card," according to Buffet (2017). When you diversify your portfolio, you must punch a 20-hole punch card every time you do so. Buffett

believes that this would cause investors to rethink their decisions before purchasing. They'd be able to make better selections about investments since they'd have a better grasp on the dangers.Overconfident Investors tend to overestimate the precision of private signals about economic factors' payoffs, resulting in mispricing, which is caused by investors' misinterpretation of information about factor cash flow and an overreaction to news about fundamental factors' payoffs.

Investor overconfidence has two critical effects, according to Shefrin (2000). Investors make incorrect decisions because they don't recognize an unfair edge over the market. This leads to a high number of transactions. Overconfident traders raise their predicted trading volume at the expense of their expected utility, increasing market depth. Because of these overconfident traders, the markets may underreact to information provided by sensible traders. Their overreactions to private signals will become significant if their confidence is restored over time, fixing the issue.

As defined by Pompian (2012), this bias occurs when people use a mental shortcut (also known as a rule of thumb) to estimate the likelihood of an occurrence based on the ease with which such scenarios spring to mind. Results that are simple to remember and comprehend are frequently seen as more probable than those that are more difficult to remember or grasp. As a result, current experiences are easier to recall and locate. According to Qawi (2010), if an incident is more recent and meaningful, it significantly impacts decision-making. As a result, an individual investor may make an investment decision based on advertisements rather than on a comprehensive evaluation of all available possibilities for that particular investment.

There is only good news when the stock market rises; there is only bad news when the market is falling. Another well-known psychological effect is strongly linked to the availability heuristic's recency component: priming. This process occurs unconsciously when one stimulus affects the reaction, modifying information processing and impacting decision-making. When faced with uncertainty, people's utility is derived from changes in wealth, not its absolute value, according to Kahneman and Tversky's (1979) descriptive model of decision making under uncertainty (Barberis & Huang, 2001). People are more upset by the idea of losing money than they are delighted by the same amount of money gained (Barberis and Thaler, 2003). As a result, an individual investor's subsequent loss appears to be more painful than normal, whereas a loss after an earlier gain appears less painful than typical for him (Barberis & Huang, 2001).

Instead of a deal with a more predictable but perhaps lower projected return, an individual investor might accept an uncertain bargain. Instead of risking their money in an investment that may provide great returns and has a significant likelihood of losing value, investors may prefer to place their money in a bank account where they will receive an interest rate of less than one percent (Barberis and Huang, 2001). Because their short-term endeavors are never fruitful, investors with loss aversion avoid investing in long-term plans. They don't take new information into account when estimating the value of their assets, which results in them selling wins too soon or losers too late and ultimately causes them to alter their portfolio's risk-reward profile in a negative direction (Thaler, 1995). Even though risk aversion is a normal investment behaviour, it can lead to poor decisions that have a negative impact on an investor's wealth in the long run (Ritter, 2003).

People feel regret when they realize they didn't make the appropriate choice. After making a mistake, it is a natural reaction to feel remorse. Shefrin (2002) argues that anguish is more than

just the result of a loss; it is tied to a sense of guilt over misfortune. Feelings of regret might sway a person's decisions. Remorseful people aren't big fans of change, so they may take the same route to work every day to avoid the possibility of regretting it later.

Regret theory may explain why investors often succumb to the temptation to sell securities that have lost value and speed up selling those that have gained value. Investors resist selling equities that have fallen in price because they don't want to finalize the mistake they made and suffer the anguish of regret, which is known as the regret bias. They sell the equities that have gained value before falling to avoid remorse. Refusing to sell declining shares while willingly selling growing ones is a common strategy for investors to prevent shame. As a result, investors tend to cling to failing equities longer than they do win ones too quickly (Forgel and Berry, 2006). Psychologists have shown that regret is one of the strongest motivators for making a change. It is possible to adjust one's behavior to escape the sorrow of regret.

Until the second part of the 1900s, many scholars had lost interest in the notion of utilizing psychology in finance. According to conventional wisdom, investors are neither persuaded by their emotions nor misled by the information they receive (Hersh, '2000). Many classic financial ideas, such as efficient markets, portfolio theory, and risk-return tradeoff, have been challenged by behavioral finance research. Due to a lack of empirical data, Merton Miller's and Franco Modigliani's assumptions about rationality and utility are no longer applicable (De Bondtet al., 2013). Standard financial models are founded on rationality, which indicates that individuals keep their beliefs current and make decisions following the subjective anticipated utility theory. In recent years, behavioralists and financial theorists have begun to investigate the subject more thoroughly.

A variety of decision-making behaviours known as biases have been observed in psychological studies, according to Barber & Odean (1999). According to empirical data, investment decisions are influenced by emotions and insights referred to as behavioural biases. Overconfidence, familiarity, and Anchoring bias are examples of how human behaviour affects one's ability to make sound decisions. Further, existing research has not examined how investment decisions and operational efficiency are affected by behavioral biases. Consequently, the connection between behavioral biases is still unknown. This study sought to analyze the effect of behavioral biases on operational efficiency of real estate investment firms in Nairobi County.

2.2.5 Real Estate Investment Strategies

Investment strategies is the determination made by the investors, in case of an individual investment or management where a corporation is involved, as to how, when, where, and how much capital will be spent on investment opportunities (Bhalla, 1982). These decisions are usually supported by decision tools, literacy being one of the necessity, that would help achieve a satisfactory return after performing an investment analysis using the fundamental and technical 6 analyses. The decision to invest is usually followed by research to determine the costs and returns for various options available.

Decision theory is the study of assessment models engaged when making considered choices. In the real estate investment sector there are several models for the pricing and allocation of assets. These models are largely focused on the risk and previous performance of the respective assets. Though, in many cases, the final determination will be a result of factors other than which theoretical models can explain to many decision makers' unawareness (French 2001). Two types of models are usually defined in decision theory literature the descriptive and the

normative. There is a distinctive difference between the models, based on from where they are constructed. The normative type focuses on how decisions should be made, while the descriptive type focuses on how decisions actually are made. If all decisions were to be made as they should be made, there would be no variance between the models. Nevertheless, there is a heavy volume of proof showing that this is not the case (French 2001).

Roberts and Henneberry (2007) provide a normative model of the decision making process of real estate acquisitions based on a composition of normative models proposed in the literature. The model includes ten stages: Goals and decision criteria are formulated for the real estate investment, an investment strategy is then formulated, a search for potential properties in line with the investment strategy is initiated and market conditions such as the economic and political situation as well as the property market at a local and national level are analyzed. The possible properties found in the previous stage are analyzed to determine if there is a fit between the property and the real estate portfolio, predictions on outcomes of the different properties are made to show which property that is expected to provide the highest return at the required level of risk. The alternative properties to invest in are compared to the investment strategy and the decision criteria formulated in the beginning to determine if there are any properties that match the goals of the investment. The characteristics of the investments are put against each other to assess which one best meeting the goals and criteria's stipulated in the strategy. If there is more than one property that passed the previous stage, the decision-maker selects the one that best fits their portfolio (Roberts and Henneberry (2007).

Modern portfolio theory, often referred to today and pioneered by Harry Markowitz in 1959, employs asset allocation models. The theory makes assumptions that all preferences regarding the investment decision are based on financial outcomes alone. So, if some factor besides the financial outcome has an influence on the decision the result will deviate from the model's

predictions (French 2001). The backbone in the process of decision-making is how the investor registers risk. Risk will be extra important to analyze in decision situations under uncertainty (French 2001). In reality, the majority of people are not consistent in how they approach risk. Although investors' intention is to act rational and make informed decisions, behavioral aspects affect the decision process and cause investors to deviate from the normative models (Roberts & Henneberry, 2007).

Quigley, and Shiller (2005) show that variations in real estate prices have had a significant effect on aggregate consumption in the US, in fact more significant than the stock market, even before the recent volatility in the residential market. Reinhart and Rogoff (2009) document this to be the case more universally across a number of countries and over longer time periods. From an economic perspective, understanding what drives real estate values is no less important than understands the pricing dynamics of other asset classes, such as stocks, bonds, commodities, and currencies. The Real Estate Investment strategies are procedures, rules and policies that guides investors in constructing an efficient real estate portfolio. This means therefore that investor's risk-return tradeoff is determined by real estate investment strategy adopted.

Therefore, an investor should plan his investment strategy well before making any real estate investment decisions (Jones, 2009). Fama & French (1992) further argues that investment strategies adopted at market levels, organizational or industry levels should guide inventors in selecting and constructing most efficient investment portfolios. Real estate investment strategy is the decision made by the investors or the top level management concerning the amount of funds that can be utilized or deployed in real estate investment opportunities (Shilling, 2003). Most common form of real estate investment strategies includes the buy and hold strategy,

development strategies and own and operate strategies. Others include flipping strategy commonly known as 'buy low sell high'. The decision on whether to invest or not to invest in real estate is determined by factors such as real estate prices, mortgage interest rates, access to financing, disposable income of investors and risk of investors.

Shefrin (2000) in his study concluded that investors make irrational investment decisions. Investing has a major role in financial planning and investment decision making is a complex process. Investors always act in a manner that maximizes their return and investors are not always so rational. Designing an appropriate portfolio of investment is a very complex task for an investor. There is various investment avenues available in the financial market with varying degree of risk and returns. An investor who designs his portfolio considering various general factors will be able to earn better returns and diversify risk (Shefrin (2000). A report released by United Nations (2015) urban population is expected to grow from 290 million to 600 million by 2021, while the requirement for housing units will grow to 68 million by 2021. At present, India has only about 19 million housing units (United Nations,2015).

In South Africa buy-to-let has been the most common method of investing in property but most investors who bought in recent years have struggled to get decent returns on their investments. A huge misnomer spread by the general media exacerbated by some property experts is that the only method of investing in residential property is buy-to-let which ended up being less profitable and investors started struggling to pay up mortgages. The country is currently venturing into other strategies such as buy and hold and refinance every few years, buy and 'flip'-quickly reselling it in the same market, buy, renovate and sell, rent-to-buy-option to buy on contract in the longer term, alienation of land act -property is transferred into the buyers

name at a later date and on selling contracts -vendor finance where there are deferred loans on the property (Nearl Petersen,2018).

A Buy and hold investment strategy is a real estate investment strategy where a real estate investor holds real estate for long-term, even if there are short-term market fluctuations. This strategy is not a passive strategy since an investor actively selects the securities to invest. These long term strategies include the firm's long-term growth strategy, the quality of its products as well as the firm's relationships with management. There are several buy and hold strategies like investing in turnkey real estate where you buy a move-in ready property, which already has professional property management and also usually has tenants already living in it. So everything is basically taken care of. You simply "turn the key" and have before you a strong investment property (DeBondtet al.,2013).

The vacation rental market is another strategy and it has been very strong recently. Investing in short term rentals is a great rental strategy if you choose the right market at the right time. There is also single family home which is usually used with the traditional long term rental strategy; you invest in a normal house and rent it out to a tenant. Many beginners choose single family homes as a way to get a feel of the real estate investing industry. One rental unit and one tenant keep things simple. A multifamily property is a building with more than one housing unit (2-4 units). They are pricier than a single family home, but because you're renting multiple units to multiple tenants, you'll be generating higher rental income. It's great for strong cash flow and quickly building your investment portfolio. The buy and hold real estate investment strategy isn't just about residential real estate. Investors can also purchase a property used for business purposes like an office building or retail store. However, commercial real estate

investing could be a bit more complex, especially for beginners so research this strategy well (DeBondtet al.,2013).

DeBondt et al., (2013) suggests that to have a solid buy-and-hold investment property, you should be willing to invest some money into upgrading the property like replacing flooring, painting, and performing any other upgrades that may be needed to make the property more appealing for potential tenants. Remember, many real estate investors in a buy-and-hold strategy rent out these properties to tenants in order to earn passive income. Single-family homes are a great property type for implementing a buy-and-hold strategy, but different investors may prefer different property types, such as a duplex or triplex, manufactured homes, multifamily buildings, etc., so read up on these different property types and the advantages and drawbacks of each and determine which sector you would like to invest in. Ultimately, investors should be after an appreciating asset with cash flow.

Cerutti, E. et al. (2017) proposes that investors should plan to hold your buy-and-hold investment property for at least 10 years, and preferably more, but if you are thinking of selling, make sure you consider the following: First the tax breaks: where there are certain tax code advantages to be aware of. For example, investors can use a tax-deferred exchange, meaning investors can sell one property and buy another investment property but avoid paying capital gains taxes. Secondly is your loan term such that if your loan term is ending, it may be the correct time to sell. The third thing is the market i.e. familiarize yourself with the prices of comparable homes on the market. If prices are up and it's a seller's market, consider putting your property up for sale so you don't have to wait until the next cycle. Rising property taxes is also a key consideration. If property taxes are rising in your area, it may make sense to sell your property in order to avoid those higher rates. Stagnating rental income is the other factor

in that investors should consider selling the property if their rental market makes it impractical to raise their rates at a healthy pace. It may make sense to sell your property, too, if you're confident you can reinvest those dollars into a better investment. Keep in mind that when you sell real estate you've held as an investment, the rate at which you're taxed on the profit from it may vary.

Cerutti, E. et al. (2017) state that investors should definitely be aware of what costs they can include in their tax deductions. In order to structure your real estate portfolio between growth and income, you will want to make sure the cash flow generated by your properties is positive hence increasing operational efficiency. Remember, one of the reasons to consider expanding your real estate portfolio is to diversify your risk, so before you pick up another property, do some market research for properties perhaps in another sector or another area. This will help balance your overall portfolio. Investors should consider a buy-and-hold real estate strategy because it is a great strategy to preserve and accumulate net worth.

DeBondtet al.,2013) inputs that buy-and-hold real estate strategy allows the real estate investor to take advantage of appreciation. Generally speaking, real estate should be worth more in the long run than the day you purchased the asset. So, if you're able to hold the asset through various real estate cycles, you can expect that real estate's value to go up. It buy-and-hold real estate strategy also allows investors to take advantage of other tax benefits. Keep in mind that if you decide to sell the asset, you will have to pay capital gain taxes. Cerutti,. et al. (2017) state that investors should know they can use a 1031 exchange to defer paying capital gains taxes and directly use the profits from the sale to purchase another similar property. There are a number of criteria you must check off in order to take advantage of this, so familiarize yourself with these requirements to avoid paying these taxes. But in order to fully gain from

all the benefits of real estate investing, investors will want to make sure to thoroughly perform their due diligence.

Battistiniet al. (2018) states the potential disadvantages in a buy-and-hold real estate strategy. First, real estate is illiquid, meaning investors will not have immediate access to cash for their properties. Second, real estate values are susceptible to fall. In this case, investors can lose their whole investment. Rental income can also drop to zero, depending on market demand for your asset. If your tenant defaults, you'll have to go through the eviction process. To avoid this, investors should target assets in areas of high demand, perform in-depth tenant screening, and buy rent default insurance. Third, owners will be liable to fix any property damages in the asset.

There is more than one way to estimate the market value of a property, but the peer method is the most common because of its simplicity. It consists of comparing the building with others with similar characteristics that have recently been sold in the same sector. It is normally suggested to rely on a sample of at least 4 comparable. Positive or negative adjustments are then applied based on the differences. For example, if your comparable all have a double garage, while your property has only a single garage, it should be revised downward. A professional is obviously better equipped to make these adjustments, but you can still get a good idea of starting with this approach. In its simplest form, the replacement cost technique consists of calculating the land value and the replacement cost of the building and the land. Note that other factors influence the calculation. It is used especially when it is difficult to find comparable like inactive market, special purpose or non-standard building, new construction (Battistiniet al., (2018).

Buying land or Investing in Land In Kenya is not always the right investment in Kenya. If you buy a piece of land with the thought of selling it after a few years, there is no guarantee that its price will only rise with the growing years. Typically, the land economics says something different. As per thumb rule of land economics according to (Battistiniet al. (2018), if you buy a piece of land and its appreciation rate is slower than the rate of inflation, then you are actually making a loss on that investment, even if you sell the land for a profit. Due to inadequate understanding of property market, people end up losing money by purchasing land. This is a huge investment business so a person must be aware of the stats that a location's property market will soon decline and, therefore, avoid buying land there when the only aim of buying land is to earn profit by selling it after a few years (Battistiniet al. (2018).

In Kenya, homes priced between Kshs. 2 million to 9 Million that target the low class had least activity between 2015 to date since the high prices dampened the hopes of many aspiring home owners due to financial struggles, pay cuts and layoffs. However, there has been increased interest with the middle class where houses are priced between Kshss. 10Million to Kshs. 20Million since most potential buyers in this segment have access to mortgage financing. Middle upper class with properties priced between Kshss.20Million to Kshss.50Milliom has been moderately inactive with few inquiries (Cytton 2017).

Development strategy is where the investor constructs on property or land for sale or for rental purposes. The buyer opts to develop the real estate property instead of renting it out or buying and holding for speculation. Evaluating real estate developments has become a complex science that demands in-depth knowledge of market trends; realistic assessment of a project's physical, market, financial, and political feasibility; and an understanding of investment risks and rewards. Rental properties can provide regular income while maximizing available capital

through leverage. Moreover, many associated expenses are tax-deductible, and any losses can offset gains in other investments. However, financing costs for developments are still high despite the market being undersupplied especially in housing for the lower segment of the market. The high financing costs associated with real estate development and the undersupply of housing has proven to be a challenge towards the further advancement of this sector (Shellah, 2007).

Investors may develop apartments for rent, homes for sale, student hostels, warehouses or go downs office spaces and any other building for long-term income purposes. Serviced apartments whose key aim is to offer hotel like services in the form of allowing clients to rent apartments units are becoming a trend in Nairobi. For the first time in a long time in Kenya, prices for houses in satellite towns dropped on an annual basis. This is because of the poor economy in the country which has caused property seekers to adopt a wait and see mentality before investing in real estate. With many units remaining vacant, landlords and developers were forced to reduce their prices to be in line with the ongoing trend to avoid the risk of losing business. Ruaka has seen a significant 40% drop in house prices over the past 3 years from an average of Kshs 50,000 in 2017 to the Kshs 35,000 in 2020. This is coupled up with the shift in demand from houses which was the case 7-8 years ago to the current boom of apartments.

Smart buildings can change the real estate industry in various ways (Cytonn,(2018). Developers should embrace the idea of creating sustainable, smart spaces that consume less energy like the Tatu City which generates renewable energy to serve homes and other surrounding buildings. They should include more automation processes in their buildings and use technology to help reduce the carbon footprint. Solar energy can power buildings during the sunny season which will save electricity costs and take advantage of natural light. One

major challenge with constructing smart buildings is the cost implications. It is an expensive process and requires expertise which is not easy to find in Kenya. This means that because of the high construction costs, buyers will pay high prices to cover up for the developer costs (Cytonn,(2018).

In terms of trade, high standard of living and increased consumer demand are contributing to the opening of modern shops and shopping malls built on the Western model. In recent years, in cities of Kenya such as Mombasa, Kisumu and Nairobi have seen the opening of modern shopping centers, and the development of building sites ever larger markets would be expected. Indeed, demand in this area is permanent, fueled by major international brands as well as by South African chains seeking to expand beyond their borders. Technology is changing how real estate agents and developers are doing business. More and more real estate firms are embracing technology in 2020 by advertising their property on property portals such as BuyRentKenya. Looking at the statistics from DataReportal on the number of internet users, 22.86 million is a huge number to not take advantage of. Go where your customers are: online. Developers and landlords are now using smart tactics to get tenants. Some are giving discount offers, providing serviced offices which mean lower operational costs to the tenants. Other companies are allowing tenants to pay rent for one month in cash and two months as a bank guarantee as opposed to the requirement of paying 3 month's rent upfront(Cytonn,(2018).

A significant decline in supply of low to middle income housing is spotted in the Government's plan. As per statistics, development of a million units of public rental housing is required over the next five years. This sector is undersupplied because margins remain extremely thin. If the government creates the relevant incentives to widen this margin, Low income housing could be a boom market for 2018. Demand for affordable rentals is on the rise. Unfortunately, there

is an oversupply of high-end, expensive properties which are mostly vacant in places such as Kilimani, Lavington, Westlands and Kileleshwa. Developers and estate agents should focus on providing rentals for the middle-income earners. Affordable rentals will continue to rise in places such as Ruaka, Lower Kabete, Roysambu and other locations further away from the city centre. The global economy is witnessing changes from the coronavirus pandemic. The economy is getting weaker which means investors could end up buying because of a drop in real estate prices. Small and medium-sized businesses might have to lay off staff to stay afloat which will affect their financial capacity (Vaal Real estate, (2019).

According to a report by Vaal Real Estate, serviced apartments registered a 72% occupancy rate as compared to 52% occupancy rate for traditional hotels. This has led to high end serviced apartments and five star hotels based residences in regional hubs in Nairobi which in the last 5yaers from 2016 has doubled with approximately 4,582 units in supply as of 2018. The increase is attributed to their preference by multinationals who host their employees and want extended stay options. The demand by foreign increased the uptake of serviced apartment currently to 80% from 72% in 2018 which is attribute space of rooms which is about 67meters square inches while traditional hotels is about 35 meters square inches. (Vaal Real Estate, (2019). The report identifies Kileleshwa and Kilimani as regions that offer the highest returns attributed to a more vibrant market and planning regulations that permit high densities. Others are Westlands supplying 37% because of its social amenities, business opportunities and entertainment followed by city Centre at 9% and Upperhill at 6% (Vaal Real estate,(2019).

High population growth and the increased demand fo higher education has seen the increase in demand for Student housing. Universities have therefore expanded their campuses rendering them incapable of providing accommodation to a majority of their students. Kenya and other

African countries spend between 5.5% to 13.9% of their GDP on education yet student accommodation accounts for 40% of the country's housing shortage. In Kenya 31 universities can only accommodate 25% of their students. This has provided an opportunity to private developers who have been constructing hostels near universities to house students who can't find suitable housing within their campuses. Accorn group holdings is the first to offer branded private student accommodation on large-scale offering study room, gym and wi-fi. Several campuses are exploring the option of o public private partnerships model in which the developer builds a hostel then operates it for about 20years to recover their investment cost before handing it over to the university(Cytonn,(2018).

However, the demand for office spaces in Nairobi's commercial hub fell at an eight-year low in 2019. The supply for office spaces in has continued albeit developers scramble to attract a declining number of prospective buyers. Property trends in Africa show that an oversupply of office blocks have seen the average monthly cost of prime leasing space decline by 20% since 2014. According to Cytonn Nairobi Metropolitan commercial office report, demand for office space stood at 300,000 square feet from 3 Million Square feet in 2018 while available supply in the same period stood at 6.7 million square feet leaving an oversupply of 6.4 meter square feet. Developers have remained active despite an oversupply in commercial office markets that have cut down rental growth. This follows increased supply with completions growing at a 5-year annual growth rate of 52.6% from 201 million square feet in 2012 to 7.4 million square feet in 2016.The increased supply is limiting the performance with occupancy rates and yields declining as rent and price experience slower growth rates. a large amount of vacant spaces have now forced landlords to reduce their rents as well as ease lease terms (Cytonn,(2018).

Theoretical literature states various intentions and reasons for investments and how investors decide when creating their portfolios. Cerutti, E. et al. (2017) state that investors should definitely be aware of what costs they can include in their tax deductions and order to structure the real estate portfolio between growth and income, you will want to make sure the cash flow generated by your properties is positive hence increasing operational efficiency as one of the reasons to consider expanding real estate portfolio is to diversify risk. Modern portfolio theory, often referred to today and pioneered by Harry Markowitz in 1959, however employed asset allocation models. The theory makes assumptions that all preferences regarding the investment decision are based on financial outcomes alone. So, if some factor besides the financial outcome has an influence on the decision the result will deviate from the model's predictions (French 2001).

2.2.6 Operational Efficiency

Operational Efficiency is what occurs when the right combination of people, process, and technology come together to enhance the productivity and value of any business operation, while driving down the cost of routine operations to a desired level. The end result is that resources previously needed to manage operational tasks can be redirected to new, high value initiatives that bring additional capabilities to the organization. Ensynch operational efficiency yet a dimension of the usefulness of the ratio analysis, relevant from the management's viewpoint, are that it highlights the level of competence & effectiveness in the management and asset utilization. The various activity ratios measure this kind of operational efficiency. In fact, the solvency of an organization dependent upon the sales revenues generated by its assets utilization - total as well as its components. Activity ratios include those ratios, which highlight upon to activity and operational efficiency of the business firm (Murugan, (2008).

Operational efficiency refers to the profitable, efficient and judicious use of resources financial available to an organization in perfect consonance with clearly laid-down financial policies relating to the operation. In order to examine the efficiency and profitableness in making use of resources as well as the wisdom and farsightedness in observing the financial policies laid down in this regard, certain ratios are being used and they are collectively called as Activity Ratios or Performance Ratios. It is significant to note that these ratios are always expressed as turnover. All ratios coming into this category are calculated with reference to sales or cost of sales and are expressed in number of times, i.e., rate of turning over or rotation. The following ratios can be calculated to judge the operational efficiency of an organization or the effectiveness of assets utilization (Koli et al (2011).

The occupancy rate is an important indicator for each building and it contributes to the overall real estate value, which maybe the most important parameter of any building. Realizing a building is a rather expensive process, the result is usually measured in the achieved market price. The real estate value incorporates many different aspects of a property, but they always sum up into a single price, which can be realized on the market. However, this price and thus the real estate value is a very uncertain variable. Since the market and business laws apply for it, it depends on many external factors like macro- and micro-economic situation, unemployment rate, inflation and so on. Occupancy rate and real estate value correlate because these figures give a forecast of potential future cash flows to the investors.

Stavros Zenios and Andreas Soteriou(1997), develops a broad structure for combining strategic benchmarking with efficiency benchmarking of the services offered by bank branches. In particular, the service-profit chain is cast as a cascade of efficiency benchmarking models. Three models-based on Data Envelopment Analysis (DEA) are developed in order to apparatus

the structure in the practical setting of a bank's branches: an operational efficiency mode, a quality efficiency model and a profitability efficiency model. The utilization of the models is illustrated via data for the branches of a commercial Bank. Empirical outcomes indicate that superior insights can be obtained by analyzing operations, service quality, and profitability simultaneously than the information obtained from benchmarking studies of these three dimensions separately.

Several relationships are investigated between operational efficiency & profitability and between operational efficiency & service quality. According to S.P. Gupta (2001), the return on capital employed is used to study the operational efficiency of the business. It shows the overall earning capacity of the capital employed. As such, it may be used to examine the managerial efficiency. Again, the impact of changes in sales, costs and capital employed on the return may be examined through this technique. According to Pandey (2002), Return on Net Assets or Return on Capital Employed is the measure of an organization's operating performance. It indicates an organization's earning power. It is a product of the asset turnover gross profit margin and operating leverage.

Jawarlal (2004) states that Return on Capital employed ratio measures profitability in relation to the total capital employed in a business enterprise. The terms invested capital, capital funds and total capital may be used interchangeably. It is a useful ratio when comparing the overall performances of companies, particular in their capital structure. Ravi M. Kishore (2006) states that assets management ratios signify how effectively an organization employs its resources and the pace in which various accounts are converted into sales or cash. These ratios are also called as 'activity ratios. Activity ratios measure how effectively the organization's resources are used by making comparison of sales level with assets like inventories, debtors, fixed assets etc.

According to Khan and Jain (2007), the Return on Assets ratio is a central measure of the overall profitability and operational efficiency of an organization. It shows the interaction of profitability and activity ratios. It implies that the performance of an organization can be improved either by generating more sales volume per rupee of investment or by increasing the profit margin per rupee of sales. Investing time and effort to learn about issues that impact households' capacity to govern their spending, savings, and income efficiently and effectively is how people gain financial knowledge during their lives, according to Delavande, Rohwedder and Willis (2008). Everyday tasks such as budgeting, paying bills, using a credit card and maintaining a bank account need understanding of money. In addition, they need to know how to pursue long-term goals, such as housing, access to enough finances in retirement, and their children's education.

2.3 Empirical Literature Review

The results of an empirical review were used to advance the work of other researchers in relevant fields. The comparisons made by the study helped to identify the gaps. Several investigations shed light on this subject. Many studies were undertaken by either examining the links between the variables or testing the individual aspects of the variables in situations outside of developing countries.

2.3.1 Behavioral Biases and Operational efficiency

Salzman & Zwinkels (2013) analysed the effect of property market inefficiencies from a behavioural perspective in the UK. They explained this from two perspectives; the importance of housing and the different stakeholders within the market property. The review of corporate shareholders and household showed that cognitive biases such as over-confidence and over-optimism can clarify divergences from rationality. This study also found that emotions, as well as behaviour, 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 method of normative. Salzman & Zwinkels (2013) also found out that the nonfinancial consumer perspective in the housing market highlights emotional attachment and residential mobility towards houses. This study by Salzman & Zwinkels (2013) contributes to the literature by pointing out the potential behavioural biases in real estate investments. However, the study did not contribute to the relevance of financial knowledge in investment decisions. Similarly, this study was carried out in a developed real estate market and a developed economy.

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

Bashir et al. (2013) also reported that males are usually more overconfident than females whilst making non-financial and financial decisions. Research conducted by Pompian (2012) revealed the existence of illogical financial judgments resulting from cognitive errors and/or emotional biases in the decision-making process known as behavioral biases in financial and economics. Research on behavioural finance has emerged due to the growing interest in biases induced by incorrect cognitive thinking or emotions impacting individual financial results.

Although this research concluded that no significant relationship existed between gender and overconfidence, from the section of respondents used, most of them were subject to the delusion of bias of control. There is a weak negative association between overconfidence bias and control illusion among respondents. Few respondents were exposed to confirmation bias, and there is a weak negative association between the bias of overconfidence and bias of proof. The majority of the respondents were exposed to a bias of familiarity and there exists a weak negative association between the bias of overconfidence and bias of understanding. Respondents were told to a bias of loss aversion when decisions concern job or investment-related activities and not exposed to a bias of loss aversion when the decision affects grade in the examination. There was a weak positive association between loss aversion and overconfidence bias. However, this research does not consider the respondents' predisposition to finance knowledge that would impact their decision-making.

Bilgehan (2014) studied psychological biases and capital structure decisions. He analyzed different cognitive and emotional biases among them, loss aversion, optimism, overconfidence and anchoring, and their effect on finance decisions. He described irrational bosses as bosses whose decisions are affected by their behavioural characteristics. Bilgehan (2014) found that managers are frequently influenced by their behavioural factors and behavioural biases in the decision-making process. Bilgehan also found that overconfidence bias is extra subjected

compared to others among all the behavioural tendencies. Overconfident managers think that their organizations are valued in the value of the market and value the debt risk lover as compared to equity. Such a situation results in their level of debt is higher than the rational bosses. Overconfident managers approximate the investment projects cost undervalued and approximate the projects value overvalued. Through extensive analysis, this research contributes by ascertaining the impact of psychological biases on decision-making. Secondly, this research also points out the most prevalent decision-making biases. However, the study does not state the significance of financial knowledge on decision-making and how it impacts the effects of behavioural biases.

Glaeser (2013) carried out an empirical analysis on 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 irrationally when making real estate investments. Studying the housing convulsions 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 paid high fees with optimistic expectations with the support of the credit market. Through extensive literature review, Glaeser (2013) found that the optimistic projections fail to materialize due to the investor's inability to forecast and emotional expectations. The study contributes by ascertaining the psychological factors for real estate speculation. However, the study did not examine the different behavioural characteristics that investors and potential investors portrayed while investing in real estate.

Njenga (2018) studies the effect of behavioural bias on real estate prices in Kiambu, Kenya. The objective of this study was to evaluate the impact of behavioural bias on real estate prices in Kenya. Based on previous studies, the aspects were expected to affect real estate prices in Kenya positively. The study findings indicate a significant positive relationship between the factors under research and real estate prices in Kenya. Some conclusions can be made about the study from the research findings and the answers to the research questions. The behavioural bias calls for serious concern in any business investment, which is why this study turned a beam light on the subject matter. From the study's findings, it was revealed that behavioural biases influence real estate prices in Kenya. Thus, the study concludes that behavioural biases influence real estate prices in Kenya.

Muhhamad (2017) studied the Impact of Behavioural Biases on Long Term Financial Decisions and Corporate Performance: An Evidence from Non-Financial Sector of Pakistan**.** The study explored the relationship between behavioral biases and the long term financial decisions and corporate performance with the sample of 85 CFO, CEO and financial managers of non-financial firms listed in PSE (Pakistan Stock Exchange). It investigated how behavioural biases can affect long-term financial decisions and corporate performance and how they mediate the relationship between behavioural preferences and corporate performance. Loss aversion has an insignificant relationship with capital structure. The mediation role of the long term financial decision on the relationship of loss aversion and corporate performance is also not significant.

A study on the impacts of Mental Accounting on Sales Decisions of Stock owners in Tehran Stockholders conducted by (Bilal et al., 2013) showed that investors cluster sales of wins over different days and sales of losses on the same day. The study also showed that the loss or gain

on the transaction is the way to the decision method for the sale of stock by investors. The decisions made by the individual investors are in line with the mental accounting principles. The study also showed that individual investors put together all the losses and separate the profits.

Gepp and Kumar (2008) incorporated the time "bias "factor into the classic business failure prediction model. Using Altman's (1968) and Ohlson's (1980) models to a matched sample of failed and non-failed firms from the 1980s, they found that the predictive accuracy of Altman's model declined when applied against the 1980'sdata. The findings explained the importance of incorporating the time factor in the traditional failure prediction models. Studies of the calibration of subjective probabilities find that people tend to overestimate the precision of their knowledge. Such overconfidence has been observed in many professional fields such as investment banking and management.

Brahmana et al. (2012) conceptually built a framework that linked psychological biases such as attention bias, heuristic bias, regret bias and cognitive bias to individual investor decisions. Chandra & Sharma (2010) undertook a study within the geographical area of Delhi and National Capital Region to identify the significant psychological biases that influence the individual investors' behaviour and that, in return, may drive a momentum effect in stock returns. Their study found that the individual investors" behaviour is caused by some psychological factors such as conservatism, under-confidence, opportunism, representativeness and informational inferiority complex. However, Alghalith et al. (2012) empirically tested dominant theories and assumptions in behavioral finance, using standard and poor's' 500 index data. Their findings suggested that differences in psychological biases did not determine their investment preferences.

Fischer & Gerhardt (2007) carried out scientific research on individual investor's decision making subtleties and presented essential behavioral factors that affect the investor, which include: Fear- most people display the fear of losing their money, Love-many people "fall in love with" some shares if they earned money and retain these shares for a long time, despite various changes in markets, Greed- it manifests that greedy people can by heavily priced shares or buy large quantities of the same shares without proper calculations, Optimism- optimistic people often too much go into the market without a logical reason. This becomes a Market correction or even collapse of the market outcome. K,,Otieno (2012) in a study of investor psychology on investment decision making at Nairobi Securities Exchange established that although investors tend to put clear the objectives of their investment to steer investment decisions to ensure that they get returns from their investments, psychological processes also influence the kind of an investment an individual would want to engage in.

Chandra (2008) explored the impact of behavioural factors and investors' psychology on their decision–making and examined the relationship between investors' attitudes towards risk and behavioural decision-making. The researcher finds that unlike the classical finance theory suggests, individual investors do not always make rational investment decisions. Investment decision-making is influenced primarily by behavioural factors like greed and fear, Cognitive Dissonance, heuristics, Mental accounting, anchoring. These behavioural factors must be considered as risk factors while making investment decisions.

Studies in which participants are asked to identify the precision of their knowledge by defining a 90% confidence interval around estimations of specific numbers provide the most significant evidence of over-precision. If people were calibrated correctly, 90% of the time, their confidence intervals would contain the correct answer. People's confidence intervals are

typically too narrow, suggesting that they think their information is more accurate than possibly the most known better-than-average example of this. 93% of American drivers rate themselves as better than the median, according to Svenson (1981). After Garrison Keillor's fictitious town where all the youngsters are above average, the Lake Wobegon effect was coined to describe how often school districts say their pupils surpass national averages. Numerous more instances of over placement have been identified as well. Although this effect was demonstrated by Kruger (1999), it was found to be restricted to "simple" jobs where success was joint or where participants felt competent. Even when a task is challenging, people assume they are worse than others.

Shafran et al. (2009) experimentally examined the behaviour of investors when buying and selling stocks. In a series of experiments, subjects were asked to allocate a given endowment among six assets. The results suggested no disposition effect. However, Fogel & Berry (2006) surveyed individual investors. He found that more respondents reported regretting holding onto a losing stock too long than selling a winning stock too soon, confirming the disposition effect. Mittal & Vyas (2010) also investigated how salaried and business class investors differ in their investment decisions and their tendency to fall prey to some commonly exhibited behavioural biases. The research was based on a sample survey of 428 investors from the city of Indore. The study indicated that business class investors were more prone to cognitive biases. In contrast, salaried class investors are more prone to biases which are the outgrowth of framing effect and prospects theory.

Njenga (2018) studies the effect of behavioural bias on real estate prices in Kiambu. The study findings indicate a significant positive relationship between the factors under study and real estate prices in Kenya and conclude that behavioural biases influence real estate prices in

Kenya. However, the study by Muhhamad (2017) on the Impact of Behavioural Biases on Long Term Financial Decisions and Corporate Performance, which explored the relationship among behavioural biases and the long term financial decisions and corporate performance, contradicts Njenga's findings and concludes that behavioural biases have an insignificant relationship with capital structure and mediation role of the long term financial decision on the relationship of loss aversion and corporate performance is also not significant.

As much as Njenga (2018) concluded that behavioural biases affect real estate prices, he did not report how the overall economic performance was involved and the price comparisons with the current market prices, nor did he specify the bias which affected the prices and to what extent. Besides these, an individual is also influenced by external factors such as level of engagement and spouse effect, which had not been explored earlier. Studies had also not been carried out on the impact of behavioural biases on operational efficiency and the general analysis of firms' operational efficiency about behavioural finance much as Muhhamad,(2017) focussed on the effects of behavioural biases on long-term financial decisions corporate performance. This study therefore sought to establish the effect of real estate investment strategies on operational efficiency of real estate investment firms in Nairobi County.

Researchers do not fully understand the link between behavioral biases, real estate investment decisions and operational efficiency which is still open research. The backbone in the process of decision-making is how the investor registers risk. Risk will be extra important to analyze in decision situations under uncertainty. Individual investors' investing choices are influenced by heuristics such as overconfidence, anchoring, and herd behavior (French 2001). Most economic and financial theories assume that individuals make investment decisions based on their rationality and consideration of all available facts (De Bondt et al.,2013).

However, according to Bernstein (1996), there is evidence to suggest that human beings make decisions and choices based on irrationality, inconsistency and ineptitude when confronted with ambiguity. These findings indicate mixed results on the relationship between behavioral biases and operational efficiency of real estate investment firms. Furthermore, there is no standard set of biases that have been identified that majorly affect decision making and operational efficiency hence the knowledge gaps in this area of research. There exists a study gap on whether behavioral biases have a positive or negative effect on operational efficiency and to what extent and this study sought to determine this by analyzing the effect of behavioral biases on operational efficiency of real estate firms in Nairobi county.

2.3.2 Real estate investment strategies and operational efficiency

According to Mbogo (2016), investment techniques implemented by investment groups have a significant impact on the financial success of investment groups in the Kenyan market. According to findings from the study, all three investment methods have a substantial inter-relationship. As used by investment groups, they may still impact the financial performance of investment groups. According to the research, investment groups primarily adopted purchase and hold and own and operate strategies. As a result, most groups relied on the first two methods to establish themselves over time since they lacked the competence to implement a development strategy.

Real estate investors are also motivated by periodic capital gains, inflation protection, and social recognition, according to Lamont (2005). He concludes that property investors frequently assume that their property will have enough market demand to cover their expenditures via the rent they earn. Furthermore, they want to sell the property after some time.

In most real estate investments, a sophisticated decision-making process with clearly defined desired results is expected.

Marete (2011) concluded that the location of a real estate property and the effect of estate agents on the price were the most critical factors in determining real estate property prices in Kiambu municipality in Kenya. In this analysis, he found that, unlike other markets, prices in the real estate market are driven by a distinct set of dynamics. Individuals buy (or sell) in concert with noise trader models, according to Riaga (2008), who used databases of over 680,000 retail investor transactions at the Nairobi Securities Exchange between 2005 and 2007. His findings support the idea that investor sentiment plays a role in forming stock returns.

A study of investor psychology at Nairobi Securities Exchange by K'Otieno (2012) found that although investors tend to put their investment goals in writing to guide investment decisions, psychological processes also influence the type of investment a person would have to want to make. The behavioural finance theory was used to examine the impact of financial information on the investing decisions of Kenyan retail investors. It was shown that the classic Efficient Market Hypothesis (EMH) was inadequate to explain investor behaviour in the financial markets.

With a focus on Nairobi, Miregi and Obere (2014) looked at the impact of market fundamentals on property prices in Kenya. Using a VAR model, the researchers refute popular misconceptions about current real estate market values. The dependent variable was property prices, whereas the independent variables were stock prices, interest rates, building costs, and inflation. To determine whether or not market essential determinants impacted property prices in Kenya, the study found a tendency that was not supported, at least by the variables analyzed.

According to Geltner's study on investment choices, the buy and keep and rent approach of real estate investing is no longer recommended. Using the own and rent plan provides investors with a higher monthly cash flow and lower property upkeep and repair costs. Finally, buyers are increasingly choosing to invest in its development instead rather than renting or purchasing and retaining a property for speculation. This method, however, has long-term advantages that may not be immediately apparent.

According to a recent World Bank survey, about 4% of Africa's wealthiest individuals have chosen to look for a home in Kenya. Costs of land and homes in the city's satellite towns rose 1.4% overall and 2.4% in the same period; however, rental prices only increased by 1%. With a growth rate of 0.2%, satellite towns have outperformed Nairobi's wealthiest neighbourhoods, demonstrating that satellite towns are the best area to invest for return on investment in the land sector. After the United Kingdom and the United States, Kenya is the third most popular location for real estate developments. Five hundred private bankers and financial advisors representing 50,000 clients with a combined worth of $3 trillion were surveyed in the poll. Despite a predicted 0.9 percent decline in the cost of residential real estate in 2017, interest in this market is on the upswing. After a difficult political climate, Kenya's largest residential market has regained its lustre (World Bank, 2017). (2017).

Cytton Investments (2018) reported that critical commercial completions decreased by 65.1 percent to 1.5 million square feet. The study identified Thika Road, Mombasa Road, and the CBD as "bottoming markets" because of their cheap pricing, little demand, and large numbers of vacant offices. In 2018, Thika and Mombasa roads saw 6.7% and 5.8% rental yields, respectively. As a result of the oversupply and lack of demand for new tenants in Westlands, Parklands Kilimani and Upperhill, the research found that these three markets are in decline.

According to the results, the best-performing Nairobi markets were Gigiri and Karen. As a result of increased demand from businesses due to the availability of high-quality premises and reasonably enough infrastructure networks, regional yields were 10.5 percent and 9.2 percent, respectively, in 2017. Grade B offices, defined as those with 50,000-100,000 square feet of floor area, have comparable characteristics to those found in grade A offices but give a higher rental return of 7.9 percent. Rental yields of 7.9 percent for serviced apartments, convenient for small businesses, such as flexible leases and lower start-up costs, have retained their appeal. In a study to examine the financial strengths and weaknesses of Indian public sector pharmaceutical enterprises, Bhunia et al. (2011) concluded that investments with a greater return on investment (ROI) ratio are more lucrative than investments with a lower return on investment (ROI). It is more likely that investors would abandon a venture when the return on investment is either too low or too damaging for their liking (ROI). Figure A demonstrates that the company's return on investment is higher than the industry standard. This translates into more money for the owners and investors of pharmaceutical companies. The coefficient of variation for RDPL's return on investment ratio is 32.51 percent, which is lower than the total coefficient of variation for the industry, which is 15.51 percent. The return-on-investment percentage of the company has a coefficient of variation of 12.00 percent, but the coefficient of variation of the industry as a whole is 15.51 percent. If the return-on-investment ratio swings less than the market average, it is a sign of prudent or effective wealth management.

Marete (2011) found out that the key determinants of real estate property prices in Kiambu Municipality in Kenya were location of a real estate property and estate agents influence on the prices. In this study, he concluded that, prices for real estate market are dictated by a different set of forces unlike other markets where price are determined by forces of demand and supply. According to Makena (2012) in her study of determinants of residential real estate prices in

Nairobi she suggests that the level of money in supply and information gave a better predictor of the real estate market on 29 real estate prices. Brueggeman and Fisher (2005) identified real estate investment strategies as one of the driving factors in performance among other factors.

Marete (2011) found out that the key determinants of real estate property prices in Kiambu Municipality in Kenya, Miregi and Obere (2014) looked at the impact of market fundamentals on property prices in Kenya and Makena (2012) studied determinants of residential real estate prices .Jumbale (2012) sought to determine if there exist a relationship between house prices and real estate financing by financial institutions in Kenya and Mbogo (2016) studied then effect of real estate investment strategies on Financial performance of investment groups in Kenya. These studies have majorly looked at price and performance and not focused on the aspect of a firm's operational efficiency. Therefore, empirical studies focused on the establishing the relationships between real estate investment strategies and other factors like price and financial performance but no studies have been done to determine the effect of real estate investment strategies on operational efficiency. There existed knowledge gaps on how real estate investment strategies affected operational efficiency and the extent of this relationship. This research therefore sought to establish the effect of real estate investment strategies on operational efficiency of investment firms in Nairobi County and determine the extent of the relationship between the two variables.

2.3.4 Moderating effect of Behavioral biases on the relationship between Real Estate Investment Strategies and Operational Efficiency

Investment decisions are crucial for managing the present needs and future goals, and individuals and families spend a considerable amount of time and resources in financial planning (Baker et al. 2021; Barber and Odean 2013; Nadeem et al. 2020), and a plethora of

research has been documented about the importance of such decisions (Aydemir and Aren 2017; Aydin and Selcuk 2019; Saurabh and Nandan 2018) The literature on the portfolio of choices and risk attitudes has been exhaustive (Barasinska et al. 2012; Heo et al. 2021; Kapteyn and Teppa 2011; Kimball et al. 2008; Riley and Chow 1992). For the last two decades, researchers in behavioral finance have been studying how the cognitive thinking process of individuals affects their investment decisions: saving, spending, borrowing, lending, and short term versus long term investments (Belsky and Gilovich 1999).

There is growing consensus among the researchers in psychology, economics, and finance that investors behave irrationally and do not follow rational decision-making processes, thus resulting in making monumental mistakes in their decisions (Dam 2017), and some researchers documented there are significant differences in the behavior of investors (Riitsalu and Murakas 2019; Wood and Zaickowsky 2004). Often these differences depend on the personality of individuals, socio-economic background, risk tolerance, risk-seeking, and risk-avoidance and risk capacity, and hence researchers focus on studying these variables (Bhoj 2019; Kansal and Singh 2013; Shtudiner 2018). The financial tsunami that engulfed the world sometime between 2007–2008, the researchers have switched their gears from traditional finance where investors' decisions are rational to argue that decisions are irrational most of the time.

The underlying assumption of behavioral finance scholars is that a complex combination of psychological factors influences investment decisions. As opposed to the belief of rational decision-making of investors according to traditional finance theories, behavioral scholars argue that investor behavior is irrational (Chiang et al. 2010; Tekce and Yılmaz 2015). There is consensus among the researchers in the field of economics and finance that it is important to consider psychological, sociological, demographic, and personality factors that may have a profound influence on investment decisions thus affecting performance (Fung and Durand

2014; Zhang and Zheng 2015). As the risk capacity determines the behavior of investors under the conditions of uncertainty, the investment priorities of these individuals influence their attitude of investment. Furthermore, when personality traits help individuals gain access to information from the public domain and change their relationship to risk, it may affect their investment attitude and investment priorities in decision making (De Bortoli et al. 2019).

A study by Hoffman et al. (2010) examines how investors' investing intentions and techniques impact the portfolios they choose and their results. This study's results are based on data from a representative sample of customers at the Netherlands' largest online broker. Investors who depend on fundamental analysis beat those who rely on technical analysis because they have greater ambitions and turnover, take more risks, and are more overconfident. Most property investors feel that capital expansion is the best technique for earning from real estate, according to Baxter &King (1999). The only way to develop money in real estate is to double your asset holdings every seven to 10 years. It was shown in their research that human beings are reasonable and that contemporary economic model are founded on the notion that most investors aim to avoid risk and maximize rewards. To construct a compelling portfolio, investors weigh the risks and rewards of various investment possibilities. Investors need to build a well-diversified portfolio to guarantee that the risk is evenly distributed. As a result, investors are more concerned with risk than rewards when making investment decisions.

According to a Forbes (2017) study on real estate trends, the most common strategy in the United States is to acquire property in burgeoning areas like Park Slope, Red Hook, the South Bronx, and Washington Heights, hang onto it until it appreciates, and then sell it for a profit later on. Due to the increasing demand for these areas, the property's value climbed by 20% annually, and the investor decided to sell at this point. For the past two decades, real estate has

been regarded as the safest investment choice in India, a country where property prices continue to rise daily. As the urban population increases, this is the most preferred approach for economic development.

There was clear evidence that investors follow the "1/n" allocation rule regardless of the stock-bond mix of the available alternatives, according to Benartzi and Thaler (2001). In a subsequent study, Professors Barber and Odean used data from a US retail brokerage to evaluate this hypothesis. Even while US tax laws encourage investors to avoid locking in gains for as long as possible, they discovered that investors were 50 percent more inclined to sell a winning position than a losing position. They also found that investors' returns were damaged by selling wins and holding losers. Overconfidence, availability, representativeness, anchoring, gamblers fallacy, loss aversion, regret avoidance, and mental accounting are among the behavioural biases that affect institutional investors on the Nairobi Stock Exchange, according to Waweru, Munyoki, and Uliana (2008).

The Italian central bank used neural networks to identify troubled companies, according to Altman and Eberhart (1994). They discovered that the categorization of neural networks was highly close to discriminant analysis using over 1,000 sampled enterprises with ten financial parameters as independent variables. It was shown that when compared to more traditional statistical methods, the neural network was not dominating. This model was developed by Campbell (2008) to forecast the likelihood of bankruptcy reorganization for closely owned businesses. Hypotheses were developed using six variables, and five of them proved to help discriminate between closely held companies and those that were liquidated. A firm's size, asset profitability, secured creditors, free assets, and the number of under-secured secured creditors were all considered. 78.5 the prediction model accurately categorised the percent of the

sampled companies. An expert opinion on the possibility of debtor rehabilitation is formed using this model as a decision aid.

According to a study done by downtown researchers Mayer and Genesove (2001), loss aversion drives seller behaviour in the home market. They found that owners of condominiums suffer only minor losses, charge higher asking prices (between 25 and 35 percent of the expected sale price and the original purchase price), sell their properties for higher prices (between 3 and 18 percent of the expected sale price), and have a lower sale risk than other sellers. Owner-occupiers saw a twofold increase in list prices compared to investors, although these differences persisted for both. Their findings may explain a positive price-volume connection in the Boston real estate market, which are compatible with prospect theory. They said that people who bought at the pinnacle of the market placed their properties for sale at a premium of 25% to 35% over fair market value to minimize the regret effect. Their properties remained on the market longer than those of sellers who had just acquired and had more reasonable asking prices because of this. Rational action might be strayed from when a person's private knowledge is corroborated by an independent, objective external market source.

It has been shown that developers get over-confident and that their over-confidence leads to over-building in the research of Wang, Zhoa, Chan, and Chau. These acts cause excessive volatility in the real estate market. It was shown that investors in the property market use mental accounting and misleading reference points while switching from holding an investment in real estate in isolation to holding the asset as part of a mixed-asset portfolio, according to Seiler et al. (2012). A study of mental accounting and erroneous reference points by Seller and Seilcr (2010) indicated that investors use breaking points to reference mental accounting.

As Bokhari and Geltner (2010) discovered in their study of commercial real estate market data on loss aversion and anchoring, experienced investors and more significant, more sophisticated investment institutions exhibit at least as much risk-averse behaviour. Speculative price bubbles in the real estate market are impossible if they are not accompanied by behavioural elements, according to Brezezicka and Winsniewski (2014) in a study of the price bubble in real estate. It was concluded that if the real estate market (REM) had no behavioural characteristics, there would be no bubble in the housing market's price. According to findings from behavioural science, the study was done in the context of a worldwide economic crisis. Nevertheless, researchers demonstrated that the typical financial models used by market practitioners failed to account for market anomalies because of market inefficiencies. A reasonable assumption was that managers of unit trusts adhered rigorously to and follow established financial models when making decisions. Individual and even institutional investors, according to research, relied too heavily on heuristics or rules of thumb when making investing decisions. Individual investors' investing choices were influenced by heuristics such as overconfidence, anchoring, and herd behavior.

Baker & Nofsinger (2010), Fama (1998), Subrahmanyan (2007) and Razek (2011) noted an apparent lack of consensus among financial scholars concerning the validity of behavioural finance theory. This lack of consensus suggests that behavioural finance as a concept is still open for debate. While Fama (1997), Subrahmanyan (2007) and Thaler (2005) pointed out that a plethora of research has been conducted in the secondary markets. There is little evidence of studies on the impact of individual financial behavior on operational efficiency concerning the Kenyan market. Researchers did not fully understand the link between behavioral biases, real estate investment strategies and operational efficiency.

Biases in investment decisions and performance have been the sole subjects of research and there is shortage of research on the impact of behavioral biases on real estate investing methods. However, little research had been done on this subject with studies being carried out on the primary relationships between the variables and not on the moderation effect. Empirical studies have not been carried out to determine the moderation effect of the variables and their effect on operational efficiency thus this study sought to analyze these relationships with behavioral biases being the moderator to the relationship between real estate investment strategies and operational efficiency. This study contributed to the knowledge gaps by assessing the moderation effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County.

While the direct relationship between real estate investment strategies and operational efficiency has been examined by previous researchers, exploring the moderating role of behavioral biases has not been studied. On the backdrop of these, behavioral bias was picked as a moderator to the relationship between real estate investment strategies and operational efficiency since all factors such as risk capacity, risk attitude, psychological, sociological and demographic factors all coin down to investor behavior that affects investment priorities and decisions. Operational efficiency is measured as the ratio of inputs which in this case are the real estate investment strategies employed while the output are the returns in terms of rental yield. This study sought to assess the moderating effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi county.

2.3.3 Operational Efficiency

A study by Shao and Wang (2013) examined the illogical behaviour of supervisors in the workplace. The researcher aims to determine what causes managers' impossible conduct while making capital investment decisions and whether or not it can be overcome. Using questionnaires and hypothesis testing, the researchers identify the irrational behaviour that managers exhibit in the decision-making process of corporate capital investment; they then classify the irrational behaviour by the steps in the decision-making process; and they summarize the real reasons for each irrational behaviour based on the experiential findings. Using heuristics to estimate cash flow in a company is common because managers lack a clear frame of reference, and hence psychological and cognitive biases are present in heuristics.

According to the study's findings, the leading cause of illogical conduct in discount rate establishment is a lack of monetary literacy. Psychological considerations and cognitive biases come into play since most managers are baffled by the cost of capital notion. According to the study's findings, cognitive biases impact managers' behavior while making decisions. Individuals learn from their prior experiences, which means that their future decisions may be influenced by their past experiences. As an investor gains more knowledge, they should expect better returns. According to Nicolosi et al. (2008), investors' confidence in their capacity to make logical judgments grows as their level of expertise rises. For example, Gervais and Odean (2001) and Daniel et al. (1998) argue that the trading abilities of individuals who receive more precise private signals about the returns of future surplus stock appear to be more advanced since the increased sign accuracy improves their ability of selection and as a result, trades' subsequent returns.

Research by Cytton,2020) indicated a reduced demand of commercial spaces brought about by the ongoing COVID-19 pandemic as businesses restructured their operations hence scaled down while other organizations adopted the work from home strategies thus led to reduced demand for physical office spaces. This was attributed to exit by some local and international retailers, shift in focus to e-commerce by some retailers, reduced consumer spending attributed to the tough economic environment, and, the current existing oversupply in the retail sector of 2.0 mn SQFT in the Kenyan retail market and 3.1 mn SQFT in the Nairobi Metropolitan Area; Mixed-Use Developments performed better than their respective single-use themes in 2020, recording average rental yields of 7.1%, 0.3% points higher than the respective single use retail, commercial office and residential themes with 6.8%. retail, offices and residential spaces in MUDs recorded rental yields of 7.8%, 7.3% and 6.2%, respectively, compared to the single-use average of 7.5%, 7.2%, and 5.6%, respectively.

Serviced apartments recorded subdued performance in 2020 with the average rental yields declining by 3.6% points to 4.0% in 2020 from 7.6% in 2019, attributed to the COVID-19 pandemic which resulted in reduced demand for hospitality facilities and services given the overreliance on tourism and Meetings, Incentives, Conferences, and Exhibitions (MICE).

It further identified Kileleshwa and Kilimani as regions with the highest returns attributed to a vibrant market and planning regulations that permit high densities. Others are Westlands supplying 37% because of its social amenities, business opportunities and entertainment followed by city Centre at 9% and Upperhill at 6% (Vaal Real estate, 2019). Nairobi's business district saw an eight-year slump in demand for office space in 2019. Developers are scrambling to attract fewer purchasers, while the supply of office space has continued to grow rapidly. Due to an excess of office buildings in Africa, premium lease space has seen its average monthly

cost drop by 20 percent since 2014. At the end of 2018, office space demand was estimated at 300,000 square feet from 3 million square feet of available supply. At the same time, there was 6.7 million square feet of available supply, leaving a surplus of 6.4 square meters.

The residential sector recorded a decline in performance with average rental yields dropping marginally by 0.5% points, attributable to a decline in occupancy rates which reduced by 3.0% points on average, from 84.0% in 2017, to 81.0% in 2018, attributable to increased stock in the market against minimal uptake. During the year, apartments performed better than detached units, with average annual uptake of 26.6% compared to detached units' 20.5%, and average returns of 11.4%, compared to detached units returns of 8.9%, stated Wacu Mbugua, an assistant research analyst at Cytonn. We attribute the growth in demand for apartments to their affordability especially as loans remain out of reach for a majority of aspiring homebuyers.

Return on investment (ROI) for all properties was 5.7 percent for the previous year, according to the NCREIF study. Appreciation returns were also 11.1 percent. Wall Street Journal statistics from the Federal Reserve and Real Capital Analytics indicated that from 2001 to 2007, office and apartment cap rates fell by around 10 percent each and by approximately 8 percent each. For example, Stuyvesant Town and Peter Cooper Village apartment complexes in New York City were sold at a cap rate of 3.1 percent based on excessively optimistic projections during the peak of the real estate boom in 2006 and 2007. With low-interest rates, many projects were leveraged to increase equity returns, which resulted in negative cash flows and issues refinancing. Because of the economic crisis, cap rates on U.S. commercial real estate have increased: in December 2009. They were 8.8% for office buildings in core business districts and 7.36% for residential buildings(NCREIF, 2009a, 2009b).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section showed how the study was done. It showed how the whole research paradigm and design was used to do the analysis. In this section, we talked about how we were going to do our research, what we were going to study, how we got our data, and how we presented it. We also discussed how the model used in the study was used as a diagnostic tool.

3.2 Research Philosophy

Having a research philosophy means having a set of rules for how data about a particular thing should be gathered, looked at, and used. According to Galliers, there are two main types of research philosophies: positivist (sometimes called scientific) and interpretive (anti-positivist), which are both types of research (1991). Phenomena can be observed and described from an objective point of view without interfering with them (Levin, 1988).

This study used the positivist research paradigm (Koshy, 2010; Cooper and Schindler, 2011), in employing numerical explanations of results from hypotheses that were evaluated empirically in this study (Koshy, 2010; McMillan & Schumacher, 2010) and was based on four main ideas. The first was that only things measured and seen can be called knowledge (phenomenalism). The second one was that the goal of a theory was to make assumptions that could be tested so that law explanations could be judged (deductivism) (Saunders, Lewis and Thornhill, 2007; Hargrove, 2004) Three other elements were considered (inductivism) as far as how information was gained. The study stressed that science should not be conducted based on value as the last point and this was accomplished (objectivism).

3.3 Research Design

Literature identifies two extreme viewpoints in research methodology, that is, quantitative approach and qualitative approach (Burell&Morgan, 1979). Researchers favoring quantitative approach assert that there is similarity between social and natural phenomena therefore same methods can be used to study phenomena thus they favor positivistic quantitative methodology. Survey design is viewed as the most appropriate where the aim is to determine existence and extent of a problem (Nachmias &Nachmias, 2008).

Quantitative positivism led this research since it was an investigation based on testing a theory composed of variables measured in numbers. It examined using statistical processes to discover whether the predicted generalizations of the theory maintained were accurate. It sought to apply logical reasoning to research so that precision and objectivity replaces experience and intuition as a means of investigating a problem. Consequently, high regard was placed in identifying casual relationships amongst variables (Cresswell, 2003).

Correlational research design was used to acquire relevant data in order to engage a correlational and analytical approach (Nachmias and Nachmias, 2008). The study was to establish whether or not there was a link between the measurable variables using the correlational technique consistent with previous studies by Mugenda (2003) and Cooper and Schindler (2007). (2003). This approach facilitated the development of a broad based understanding rather that a study of individual firms on the moderating effect of behavioural biases on the relationship between real estate investment strategies and operational efficiency.

3.4 Study Area

The study area will be Nairobi City, the capital of Kenya. Nairobi County is one of the 47 counties in the Republic of Kenya. It borders Kiambu County to the North and West, Kajiado to the South and Machakos to the East. Among the three neighboring counties, Kiambu County shares the longest boundary with Nairobi County. The County has a total area of 696.1 Km2 and is located between longitudes 360 45' East and latitudes 10 18' South. It lies at an altitude of 1,798 meters above sea level (Nairobi County Integrated Plan, (2014). It is a commercial and industrial hub. The city and its surrounding area form the Nairobi County. The city was founded as a railway camp in 1899 and currently surrounded by several expanding villa suburbs on the outskirts, the urban city center is home of thousands of Kenyan businesses and headquarters of over 100 major international companies and organizations (GoK, (2009).

3.5 Target Population

While the Kenya Association of Investment Organizations (KAIG) believes that there are over 500,000 investment groups in the nation, most of them are not officially registered. Based on the information provided by the Kenya Association of Investment Groups (KAIG), the study included 260 real estate investment firms in Nairobi City, Kenya that were fully engaged in real estate investment activities, with an emphasis on residential, commercial, and private property investors in Nairobi and its environs.

3.6 Sampling Frame and Sampling Procedure

The sample frame consisted of all the 260 registered real estate that had been certified by the Kenya Association of Investment Groups (KAIG) to focus on residential, commercial, and private property investors in Nairobi and its surrounding areas alone. A census sampling approach was necessary to attain a certain precision and raise the accuracy with the same

sample size (Meller, 2001). Furthermore, census sampling technique was chosen because the units of the study were concentrated in Nairobi county thus accessible and not restraining in terms of cost, time and other resources (Saunders et.al, 2007). Since 10% of the population was pre tested, 26 real estate investment firms were employed for piloting, the sample size reduced to 234 real estate investment firms. Respondents consisted of operations managers selected purposively from each of the real estate firms participating in the study.

3.7 Data Collection Instruments

This section discussed the types of data collected and the reliability and validity of the study instrument.

3.7.1 Data Type

The study made use of primary data sources and the preliminary data was obtained through the use of a semi-structured questionnaires. The researcher administered the surveys using the "drop and pick later" technique of distribution. The questionnaires were distributed to each of the 231 investment businesses participating in the study.

3.7.2 Reliability of the Research Instrument

Reliability refers to the amount to which an experiment, test, or other measuring process provides the same findings on several occasions. The Cronbach's alpha method was used to assess the reliability of the research instrument (Cronbach, 1951). It was recommended by Sekaran (2001) that alpha values for each variable under research should not be less than 0.7 to be judged trustworthy in the assertions made in the instruments.

Before the main study, pilot study was carried out on 10.0% of the study sample size and pre-test method was used to test the reliability of the research instrument. As per literature, the

study consisted of variables and they're respectively; Buy and Hold Strategy (Independent Variable), Own and Operate Strategy (Independent Variable), Development Strategy (Independent Variable), Heuristic Driven Bias (Independent Variable), Herding Based Bias (Independent Variable), Prospect Based bias (Independent Variable), Rental yield (Dependent Variable) and Occupancy rates (Dependent Variable).

In this context, the following breakdowns indicated Cronbach Alpha values for each variable and displayed justifiable reliability results to continue analysis. All the variables showed Cronbach Alpha values of above 0.7 which indicated acceptable consistency.

Table 3.1: Reliability Statistics

Variable	Cronbach's Alpha	No. of Items
Buy and Hold Strategy	.782	6
Own and Operate Strategy	.721	5
Development Strategy	.934	6
Heuristic Driven Bias	.874	6
Herding Based Bias	.940	8
Prospect Based bias	.916	6
Rental Yield	.932	9
Occupancy Rate	.853	6

3.7.3 Validity of the Research Instrument

Through an analyst's evaluation, the legitimacy of a face may be determined (Bolliger and Inam, 2012; Aila, 2014). According to Aila (2014), it is critical to illustrate the measures relevance, consistency, and ideas for improvement on a qualitative level. It is possible to verify the validity of a study's content by doing a literature review/search (Zikmund et al., 2010) and relying on expert/analyst judgments and review suggestions (Bolliger and Inam, 2012). Experts in the field of research methodologies, real estate practitioners, and academics in finance were

used to ensure the validity of the data gathering tools. In addition, a pilot study to improve the instruments' validity was conducted. One-tenth of the entire population, or 26 people, participated in the pilot, as recommended by Mugenda and Mugenda (1999).

The final study did not include these 26 people who participated in the pilot. Evidence from the sources were examined to establish a logical argument for the themes and data sources were triangulated. The study's validity was bolstered if the articles were derived from a convergence of several data sources or views from study participants. Validity based on criteria refers to how well a test result matches up with one or more external standards, generally as a function of how closely they correlate (Trochim, 2006; Drost, 2011). To determine criterion-related validity, correlation analysis was necessary. As a result, data that may be connected must be gathered and examined to look for patterns (2015). To determine the validity of the criterion, data that could be correlated and examined for convergence and divergence validity was used.

3.8 Data Analysis and Presentation

The information gathered was examined using descriptive and inferential statistics. As part of the summary and analysis, descriptive statistics was utilized to quantify dispersion and central tendency and hierarchical multiple regression analysis in cases when means and averages were not available. In this study, hierarchical multiple regression analysis was employed to determine the connection between the variables (Marsh et al., 2011). Multiple and hierarchical regression analysis were used to determine the moderating effect of behavioural biases on the relationship between real estate investment strategies and operational efficiency of investment firms in Nairobi County, Kenya by employing the models described below.

The first multiple regression model below was adopted to analyze the effect of behavioral biases on operational efficiency of investment firms in Nairobi County;

$$\boldsymbol{Y = \beta_0 + \beta_1 Z_{1i} + \beta_2 Z_{2i} + \beta_3 Z_{3i} + \in}$$ ……..……*Equation 3.1*

Where:

Y= Operational Efficiency(Dependent)

$\boldsymbol{Z_1}$= Heuristic driven biases(Moderator)

$\boldsymbol{Z_2}$= Prospect based bias(Moderator)

$\boldsymbol{Z_3}$= Herding based bias(moderator)

∈= Error term

i = Unit of analysis

The second multiple regression model below was adopted to establish the effect of real estate investment strategies on operational efficiency of real estate investment firms in Nairobi County.

$$\boldsymbol{Y = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \in}$$ ……*Equation 3. 2*

Where:

Y = Operational Efficiency (Dependent)

X_1= Buy and Hold strategy(Independent)

X_2= Own and Operate strategy(Independent)

X_3= Development strategy(Independent)

∈ = Error term

i = Unit of analysis

The hierarchical multiple regression model below was adopted to assess the moderation effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of investment firms in Nairobi County;

$$\boldsymbol{Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 Z_i + \beta_3 XZ_{3i} + \in}\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textit{Equation 3.3}$$

Where:

Y= Operational Efficiency (Dependent)

X = Real estate investment strategies (Independent)

Z= Behavioral biases(Moderator)

XZ=Interaction term

$\in$= Error term

i = Unit of analysis

3.9 Diagnostics of Hierarchical Multiple Regression Model

Because the criteria of normality, homogeneity of variances, linearity, and correlation of errors were all to be satisfied for hierarchical multiple regression analysis to be performed, these assumptions were evaluated first.

3.9.1 Testing for Normality

The degree of normality was determined by skewness and kurtosis indices. Skewness is a measure of symmetry, or more precisely, the lack of symmetry. A distribution, or data set, is symmetric if it looks the same to the left and right of the center point. Kurtosis is a measure of whether the data are heavy-tailed or light-tailed relative to a normal distribution. (Tabachnick and Fidell, 2001). If skewness value is between -0.5 and 0.5, the distribution of the value is

almost symmetrical, -1 and -0.5, the data is negatively skewed, and if it is between 0.5 to 1, the data is positively skewed. If the skewness is lower than -1 (negatively skewed) or greater than 1 (positively skewed), the data is highly skewed. Consequently, the expected value of kurtosis is 3. This is observed in a symmetric distribution. A kurtosis greater than three will indicate Positive Kurtosis. In this case, the value of kurtosis will range from 1 to infinity. Further, a kurtosis less than three will mean a negative kurtosis. The range of values for a negative kurtosis is from -2 to infinity. The greater the value of kurtosis, the higher the peak (Field, 2005).

Table 3.2: Testing for Normality

Variables	Items	Kurtosis	Skewness
Real estate Investment Strategies(RIS)	RIS 1	2.7633	0.4217
	RIS 2	2.2952	-0.5003
	RIS 3	-3.1655	-0.0262
	RIS 4	-3.5715	0.3374
Behavioral Biases(BB)	BB 1	1.9356	-0.3232
	BB 2	2.1022	-0.1632
	BB 3	2.4161	0.4217
	BB 4	-3.3259	0.4235
Operational efficiency(OE)	OE 1	2.3117	0.1244
	OE 2	2.4493	-0.4124

The above results showed that critical values of Kurtosis ranged from between -3.1655 to 2.7633 which was within range of 3 thus indicating a normal distribution. Critical values of skewness on the other hand ranged between -0.0262 to 0.5003 that was within the -0.5 to 0.5 and indicated a symmetrical distribution. Therefore, all the values of kurtosis and skewness fell within the acceptable range an indication that the data of the study were normally distributed.

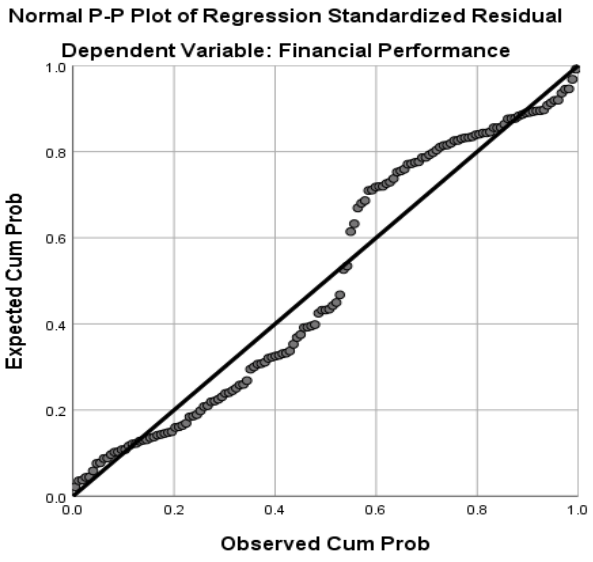
3.9.2 Linearity Test

Linear regression analysis is performed to assess if one or more manipulator variables explain the dependent variable. When linearity exists, it means that each increase by one unit in an explanatory variable leads to a similar increase in the outcome variable (Field, 2013). The linearity test is contingent on five assumptions; multivariate, normality, no or little multicollinearity, linear relationship, no auto-correlation, and homoscedasticity.

The linear bond between the variables was experimented using Pearson's correlation coefficient as recommended by Field (2009). Correlation can either be positive or negative where a positive correlation indicates an increase in one variable results in a rise in the other variable while a negative correlation denotes a reversed association where a surge in one variable results in a decline in the other and zero indicates there is no correlation (Field, 2013).

Research by Wanjiru et al. (2019) conducted a linearity test, and this study echoed the same test as indicated on figure 3.1. The results show a normal probability meaning that the probability points were all scattered close to the plot.

Figure 3.1: Plot of Regression Standardization Residual



3.9.3 Autocorrelation Test

Autocorrelation refers to the non-independence of error terms and leads to invalid confidence intervals and significance tests (Field, 2013). Durbin-Watson (DW) test was used for autocorrelation in the residual of the model. Scores ranging from -1.5 to 2.5 indicated the absence of autocorrelation between error terms (Garson, 2012). Any violation of the assumption of no autocorrelation was corrected by expanding the confidence interval. The study by Kinyua et al. (2015) used the same threshold, and this study adopted the same.

Table 3.3: Autocorrelation Test

Model	Durbin-Watson
1	
2	1.020

a. Predictors: (Constant), Real Estate Investment Strategies

b. Predictors: (Constant), Real Estate Investment Strategies, Behavioral Biases

c. Dependent Variable: Operational Efficiency

3.9.4 Multicollinearity Test

Multicollinearity is the existence of linear correlation among variables leading to parameter estimation problems (Hair et al.,2014). This test assumes there is no multicollinearity, multiple regression assumes no correlation in the explanatory variables. Perfect multicollinearity exists if the link between two exposure variables in a regression model is equal to 1 or -1 even though the correlation coefficient between any two predictor variables normally lies between 1 and -1. Variance Inflation Factor (VIF) was used to test the multicollinearity among variables. VIF gauged the implications of multicollinearity among the regression model variables. Multicollinearity reduces reliability as it increases the standard error of coefficients (Kim,

2019). A VIF value greater than 10 and a tolerance lesser than 0.1 validates the presence of multicollinearity (Hair et al., 2014). This study used this threshold. Field (2009) recommended correlation coefficients greater than or equal to 0.9 be corrected. The research ensured that careful consideration was done before the inclusion of any two variables with a correlation coefficient of 0.7 or more as postulated by Tabachnick and Fidell (1996)

Table 3.4: Multicollinearity results

Model		Multicollinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Real Estate Investment Strategies	.931	1.074
2	(Constant)		
	Real Estate Investment Strategies	.895	1.117
	Behavioral Biases	.164	6.105

The Tolerance for each variable is greater than 0.1 and the Variance Inflation Factors are all less than 10 and this validated the presence of multicollinearity amongst the variables.

3.9.5 Heteroscedasticity Test

An unequal variance of the error terms across observations; the violation of homoscedasticity, is called heteroscedasticity (Williams, 2015). This test assumes that heteroscedasticity exists when the error term size varies across values of an exposure variable. The repercussions of going against the assumption of homoscedasticity come down to a matter of degree, rising as heteroscedasticity rises. Williams (2015) argued that regression is suboptimal in the presence of heteroscedasticity because the examination outputs similar weights in all observations while in actual sense the observations having increased disturbance variance contain minimal information than observations having lesser disturbance variance. Heteroscedasticity further expedites prejudiced standard errors, consequently the danger of prejudiced inferences (Machado & Silva, 2013).

Table 3.5: Variance inflation factor (VIF) Results for Heteroscedasticity

VIF Statistics

Variable	Levene Statistic
Buy and Hold Strategy	1.733
Own and Operate Strategy	0.004
Development Strategy	0.154
Heuristic Driven Bias	1.121
Herding Based Bias	1.936
Prospect Based bias	0.669
Operational efficiency	1.055

The study gave out in rejecting the null hypothesis that homoscedasticity existed in the data and allow more advanced inspection using the regression model. The study results showed that the assumption was achieved and further analysis using the regression model could be conducted.

3.10 Ethical Considerations

Maseno University's Ethics Review Committee (MUERC) was consulted before the researcher may do fieldwork. A citation system based on the American Psychological Association (APA) was used throughout the study to ensure no plagiarism was committed. The researcher's privacy and independence in delivering questionnaires was considered throughout data collecting process. A written consent form was provided to all persons engaged in the data collecting process before any data was gathered. Participants were informed of the study's goal, what their participation was to entail, how the confidentiality of their information was ensured, and how their data was maintained and utilized in the long term when they signed the consent form. As part of the informed consent procedure, participants were made aware that their participation was entirely optional and they could stop the study at any time.

Numbering questionnaires instead of participants' names ensured that the research participants' identities remained anonymous even if their names were gathered during fieldwork to validate the survey. As a result, the numbers on the surveys were utilized as identifiers instead of the individuals' real names for entering data. By administering and collecting surveys one-on-one with respondents, top managers were unable to evaluate the results and profile middle level managers based on their differing viewpoints on the firm. Phones were turned off during one-on-one interviews with the researcher to make no recordings for nefarious purposes.

As for the results of the study, the researcher concluded on the best ways to enhance its operational efficiency and the best locations to invest its resources. Top company executives may use intimidation to sway employees' thoughts or information if they believe it conflicts with their regulations, discussed in detail. On the other hand, the researcher guaranteed the respondents' privacy by ensuring that their identities were not revealed. The researcher began collecting data only after the subject agreed to participate in the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter provided results and discussions dependent on the collected and analyzed data. It consists of all tested analytics using Statistics package for social sciences. The study attempted to attest to all previous literature in a tested statistical form, consequently provided concrete evidence based on survey study conducted. The discourse on the discoveries was contingent on theoretical and empirical literature reviewed. This chapter comprises the response rate, respondent demographic characteristics, and descriptive statistics on every specific study variable, diagnostic tests, and regression analysis results and discussions.

4.2 Analysis of response rate

This section illustrated the number of questionnaires administered and those that were filled and returned. Table 4.1 presents the response rate of the questionnaires.

Table 4.1: Summary of distributed and returned questionnaires

Response	n	Percentage (%)
Questionnaires returned	231	98%
Questionnaires not returned	3	2%
Total	**234**	**100%**

The quantity of questionnaires issued out was 234 of which 231 were filled and returned while 7 were not returned. This depicted a response rate of 98% which satisfied the requirements needed for reporting and analysis as stated by Mugenda and Mugenda (2003) which argued that a 50% response rate satisfied reporting requirements. The response rate was on that account

considered adequate for drawing inferences and making conclusions this as stated by Brown and Onsman (2012) who observed that values greater than 0.5 reflect acceptable sampling adequacy. On the other hand, values below 0.5 require the acquisition of more information or rethinking the variables to incorporate in the study. The operations managers were the representative respondents of each of the 231 firms.

4.3 Descriptive Analysis of the characteristics of Respondents

This broke down the characteristics and attributes of respondents who took part in the study, gender, working duration, and position held in the organization are presented below. A summary of the feedback dependent on the sample mean and sample standard deviation for the research variables incorporated in the study were presented and discussed.

The study aimed to ascertain the distribution of the respondents according to gender, working duration, and position held in the organization. The results were summarized in Table 4.2 below

Table 4.2: Characteristics of sample respondents

Response		**n**	**Percentage (%)**
Gender	Male	164	70.9%
	Female	67	29.1%
Age	20-29	99	43.3%
	30-39	92	40.4%
	Over 40	36	16.3%
Education	Secondary	8	3.6%
	College	72	31.2%
	University	150	65.2%
Years of work	0 - 5	104	44.7%
	5 – 10	92	39.7%
	>11	36	15.6%
Total		**231**	**100%**

Source: Field Data, 2022

Figure 4.2 shows gender-wise distribution characteristics of the study participants revealed that most of the study participants were male (70.9%). The least statistics were observed for female (29.1%). It further showed that age wise distribution characteristics of the study participants. Most of the study participants were between 20-29 years of age (43.3%), followed by those between 30-39 years of age (40.4%). The least statistics was observed for participants with over 40 years old (16.3%). Education wise distribution characteristics of the study participants. Most of the study participants had university education (64.3%), followed by those with college education (31.2%). The least statistics was observed for participants with secondary education (3.6%). On how long the study participants have been with their respective firms. Most of the study participants have been with their respective firms for less than 5 years (44.7%), followed by those who have been there for between 5-10 years (39.7%). Those who have stayed for 11 years and more comprised the minority with 15.6%. The above statistics indicate that majority of the respondents were very young (20-29) years with little experience of less than 5 years. This affected the performance tracking and future predictions due of the high employee turnover given that most respondents did not have the historical data of the firms.

4.4 Descriptive Statistics of the Research Variables

The study adopted Real Estate investment strategies with buy and hold, own and operate, and development Strategies as sub constructs. The other construct was Financial literacy with financial knowledge financial behavior and financial attitude as sub constructs. The third variable was Behavioral biases with heuristic driven bias, herding based bias and prospect based bias as sub constructs. Financial performance was the dependent variable while behavioral bias was the moderator variable. Real estate investment strategies was the independent variables. Detailed descriptive statistics are presented and discussed below.

4.4.1 Descriptive results of Behavioural biases on Operational efficiency

The study further sought to analyze the influence of behavioral biases on financial performance of real estate investment firms in Nairobi County Kenya. The sub constructs included Heuristic driven biases, herding based bias and prospect based bias and these were investigated and respondents were required to indicate their level of agreement on various queries regarding heuristic driven biases on a scale of 1-5 where 1 = Strongly disagree, 2 = Disagree, 3 = moderately agree, 4 = agree and 5 = Strongly agree. On herding based bias and prospect based biases the researcher investigated the extent of biases on investment decisions on a scale of 1-5 where 1 = Not at all, 2 = Little extent, 3 = Moderate extent, 4 = A large extent and 5 = A very large extent. The researcher investigated the various elements of real estate investment strategies and the results of the investigation are presented in Table 4.8 below.

Table 4.3: Heuristic driven biases

Statement	Minimum	Maximum	Mean	Std. Deviation
I believe that my skills and knowledge of stock market can help me to outperform the market.	1.00	5.00	3.5887	1.07618
I am normally able to anticipate the end of good or poor.	1.00	5.00	3.5929	1.09591
I believe that my skills and knowledge of the real estate market are sufficient to make sound investment decisions.	1.00	5.00	3.6809	1.04416
I have the over-reaction to price changes of real estate.	1.00	5.00	3.0567	1.31352
Market information is important for my real estate investment.	1.00	5.00	3.5177	1.07970
Lack of market information hinder me from making sound investment decision	1.00	5.00	3.5532	1.11756
Average	1.00	5.00	4.0000	1.00000

Source: (Field Data, 2022)

The mean above indicated that the respondents agreed with most of the questions on the Likert scale with a mean above 3. The results imply that heuristic driven biases are important as it is linked to the good operational efficiency of the real estate investment firms. Respondents strongly agreed that the factors affecting behavioral biases include heuristic driven bias influenced operational efficiency of real estate investment firms in Nairobi county.

Table 4.4: Herding based bias

Statement	Minimum	Maximum	Mean	Std. Deviation
Other investors' decisions of choosing stock types have impact on the firm's investment decisions.	1.00	5.00	3.6879	1.09632
Other investors' decisions of the stock volume have impact on our investment decisions.	1.00	5.00	3.6312	1.08504
Other investors' decisions of buying and selling stocks impacts on my investment decisions.	1.00	5.00	3.0780	1.38909
I usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market.	1.00	5.00	3.5390	1.12452
The investment firm treats each element of my investment portfolio separately.	1.00	5.00	3.5816	1.08993
To what extent do you use news events when investing in the real estate market?	1.00	5.00	3.7092	1.09244
I consider carefully the price changes of real estate that I intend to invest in	1.00	5.00	3.6454	1.14102
Average	1.00	5.00	4.0000	1.00000

Source:(Field Data, 2022)

The mean above indicated that the respondents agreed with most of the questions on the Likert scale. This was presented by a mean of above 3 implying that herding based biases are linked operational efficiency of the real estate investment firms. Respondents strongly agreed that herding based biases was one of the behavioral biases that affected operational efficiency of real estate investment firms in Nairobi County.

Table 4.5: Prospect based biases

Statement	Minimum	Maximum	Mean	Std. Deviation
There is segregation of assets in terms of their value in your firm	1.00	5.00	3.6879	1.09632
Decision to buy or sell is based on the return value of an investment portfolio	1.00	5.00	3.6312	1.08504
Your firm keep assets whose value have dropped	1.00	5.00	3.0780	1.38909
The firm sells assets that have gained value.	1.00	5.00	3.5390	1.12452
I dislike losing significantly more than I enjoy winning	1.00	5.00	3.5816	1.08993
Given two equal investment choices, one having possible gains and the other possible losses I would choose the one with possible gains	1.00	5.00	3.7092	1.09244
Average	1.00	5.00	4.0000	1.00000

Source: (Field Data, 2022)

Table 4.5 indicates a mean above 3 meaning that the respondents agreed with most of the questions on the Likert scale as relevant to the connection between prospect based biases and operational efficiency. The findings in tables above show that the mean value of respondents was higher than 3 indicating that the respondents agreed with most of the questions on the Likert scale. This implies that behavioral biases are important for it is linked to the good operational efficiency of the real estate investment firms. Respondents agreed that the factors affecting operational including heuristic based bias, herding based and prospect based bias affected operational efficiency.

4.4.2 Descriptive results of Real estate investment strategies on Operational Efficiency

The study aimed to establish the influence of real estate investment strategies on financial performance of real estate firms in Nairobi County, Kenya. Accordingly, respondents were

required to indicate their level of agreement on various queries regarding real estate investment strategies on a scale of 1-5 where 1 = Strongly disagree, 2 = Disagree, 3 = moderately agree, 4 = agree and 5 = Strongly agree. The researcher investigated the various elements of real estate investment strategies and the results of the investigation are presented in Table 4.3 below.

Table 4.6: Buy and Hold strategy

Statement	Minimum	Maximum	Mean	Std. Deviation
The investment firm has invested heavily in the real estate projects for the last five years	1.00	5.00	3.6631	1.11273
The investment firm invests in projects that are undeveloped waiting for them to appreciate before they are developed	1.00	5.00	3.5199	1.16966
The investment firm invests in projects that are undeveloped waiting for them to appreciate before they are developed	1.00	5.00	3.7353	1.19944
The investment firm invests even in the least valuable projects with the view of waiting for them to appreciate after a stipulated period of time	1.00	5.00	3.5688	1.09075
Price of real estate project influences financial decisions of your investment firms' budgets	1.00	5.00	3.6326	1.03106
The cost of capital for real estate investment in your investment firm is influenced by the financial policy of your investment firm	1.00	5.00	3.7177	.98668
Average	1.00	5.00	4.00	1.00000

Source: (Field Data, 2022)

The findings in Table 4.3 designate that the mean of the respondents was above 3 signifying that the respondents agreed with most of the questions on the Likert scale. The findings imply that buy and hold strategy is an important real estate investment strategy and can be linked to the good operational efficiency of the real estate investment firms.

Table 4.7: Own and Operate Strategy

Statement	Minimum	Maximum	Mean	Std. Deviation
Availability of resources determine your decision of to invest through own and operate strategy	1.00	5.00	3.2199	1.06966
Investing through own and operate strategy has increased the portfolio of your Investment firm in the last five years	1.00	5.00	3.3333	1.15676
The returns of your investment firm has been greatly increased by the decision to invest through own and operate strategy in the last five years	1.00	5.00	3.3688	1.02408
The performance of a the project influences your firm's decision to invest in it	1.00	5.00	3.4326	1.06439
The types of properties the firm invests in determines your decision to own and operate	1.00	5.00	3.5177	.98997
Average	1.00	5.00	3.0000	1.0000

Source: (Field Data, 2022)

Table 4.8 indicates a mean above 3 meaning that the respondents agreed with most of the questions on the Likert scale and that own and operate was a relevant strategy in determining operational efficiency. Therefore, it was relevant to the connection between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County.

Table 4.8: Development Strategy

Statement	Minimum	Maximum	Mean	Std. Deviation
The firm considers the cost of development and how it influences investment policy of your investment	1.00	5.00	3.5957	1.20700
The capital growth potential of a particular real estate project influences the investment decisions of investments projects of your investment groups	1.00	5.00	3.6596	1.17004
The choice to invest in a residential or commercial real estate project is determined by the capacity to develop the project.	1.00	5.00	3.6312	1.16748
The revenues of your company has been greatly influenced by the policy of investing in projects that are developed by the investment firm	1.00	5.00	3.3050	1.35722
The real estate project developed by your investment firm have increased the portfolio of your Investment group in the last five years	1.00	5.00	3.4681	1.23955
The location of the investment project influences the development strategies of your investment group	1.00	5.00	3.5887	1.14686
Average	1.00	5.00	4.00	1.00000

Source: Field Data, 2022

The tables above indicated means of above 3 which signified that the respondents agreed with most of the questions on the Likert scale hence development strategy being relevant to the determination of the effect of real estate investment strategies on operational efficiency. The findings in the above tables implied that the real estate investment strategies were important in determining operational efficiency and have attributes that affect the dependent variables.

4.4.3 Descriptive results on Operational Efficiency

Operational efficiency was the dependant variable in this study and had two sub constructs, rental yield and occupancy rate. The researcher sought to determine the effect of the dependent variable real estate investment startegy and the moderator variable behavioural biases on operational efficiency. Accordingly, respondents were required to indicate their level of agreement on various queries regarding rental yield and occupancy rate on a true or false basis.

The researcher investigated the various elements of operational efficiency and the results of the investigation are presented in Table 4.9 below.

Table 4.9: Descriptive results on Operational Efficiency

	Minimum	Maximum	Mean	Std. Deviation
When an investor diversifies his investments, the risk of losing money decreases.	1.00	3.00	2.9871	.14655
If market efficiency is considered weak technical analysis would have little or no value.	1.00	3.00	2.9914	.13131
If an investment earns 10% per year, your money will be doubled after seven years.	1.00	3.00	2.9914	.13131
If interest rate rises, the asset prices fall.	1.00	3.00	2.9828	.18529
With compound interest you earn interest on your interest as well as on your principal.	1.00	3.00	2.9828	.18529
If you invest in the firm's real estate investment, you own part of the company	1.00	3.00	2.9871	.14655
Real estate pays a guaranteed rate of return.	1.00	3.00	2.9914	.13131
Real estate investments always provide higher returns than bonds or money market investments.	1.00	3.00	2.9914	.13131
Beta measures how responsive or sensitive an investment is to market movements.	1.00	3.00	2.9871	.14655
Occupancy rate and rental yield are the most important measures of a company's overall efficiency.	1.00	3.00	2.9914	.13131
Occupancy rate and rental yield are the most important measures of a company's overall efficiency.	1.00	3.00	2.9871	.14655
Government policies on taxes and interest rates affect real estate performance	1.00	3.00	2.9914	.13131
Real estate asset prices are affected by inflation	1.00	3.00	2.9871	.14655
Investing in a real estate that holds a diversified portfolio of assets protects your investment against market decline.	1.00	3.00	2.9871	.14655
The public joint real estate company has to publish its quarter financial statements 30 days from the end of the quarter.	1.00	3.00	2.9828	.18529

Table 4.9 indicates a mean above 2 meaning that the respondents agreed with most of the questions on the Likert scale in determining operational efficiency. Therefore, rental yield and occupancy rates were good indicators to measure operational efficiency.

4.5 Behavioral Biases and Operational Efficiency

The first objective of the study was to establish the extent of application of behavioral biases in the operational efficiency of real estate investment firms in Nairobi County, Kenya. The study analyzed three constructs under behavioral biases; heuristic driven biases, herding based biases and prospect based biases. To actualize this objective, correlation analysis was conducted and the results illustrated on table 4.9 below.

Table 4.10: Correlation Analysis

		Heuristic Driven Bias	Herding Based Bias	Prospect Based bias
Operational Efficiency	Pearson Correlation	.349**	.307	.319**
	Sig. (2-tailed)	.000	.284	.000
	N	231	231	231

The study established a significant positive correlation between two biases; Heuristic Driven and prospect based and the dependent variable operational efficiency at ($r=.349$, $p<0.001$) and ($r=.319$, $p<0.001$) respectively. The results in table 4.10 means that an increase in heuristic driven and prospect based biases cause a similar increase in operational efficiency. Any variation in size of the two biases causes a similar variation in operational efficiency. These findings established that the effect of behavioral biases on real estate investment firms' operational efficiency was positive and statistically significant. This means that a variation in behavioral biases causes a similar variation in operational efficiency. Herding based biases is however insignificant to operational efficiency at ($r=.307$, $p=.284$) meaning that the results do not cause any effect on operational efficiency.

Table 4.11: Regression Analysis

Regression analysis was constructed to identify impact of the independent variables on the dependent variables since correlation statistics simply indicated a clear relationship;. Table 4.10 shows the results of the regression analysis.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.508[a]	.258	.248	1.31154

a. Predictors: (Constant), Heuristic Driven Bias, Herding Based Bias, Prospect Based bias,

The results presented in table 4.11 indicate that R^2 for the model is R^2=0.258(adjusted R^2=0.248; R change=0.258) which implies that 25.8% variability in operational efficiency is caused by behavioral biases. This means that behavioral biases causes a 25.8% increase in operational efficiency of real estate investment firms. However, behavioral biases do not interpret much of the variability in operational efficiency since the R^2 less than 50% but Jim, (2022) states that studies that attempt to predict human behavior generally have R-squared values less than 50% since people are hard to predict. Low R-squared does not negate the importance of any significant variables. Even with a low R-squared, statistically significant P-values continue to identify relationships and coefficients have the same interpretation (Jim, (2022). The results indicated that 25.8% of variation in operational efficiency is caused by heuristic driven and prospect based biases meaning that operational efficiency increases by 25.8% if heuristic and prospect biases are increased and not herding based bias since it has an insignificant correlation to operational efficiency.

Table 4.12: ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	136.552	3	45.517	26.462	.000[b]
	Residual	392.190	228	1.720		
	Total	528.743	231			

a. Dependent Variable: Operational efficiency
b. Predictors: (Constant), Heuristic Driven Bias, Herding Based Bias, Prospect Based bias

The results on table 4.12 indicated a mean square is 1.720 and F statistic of 26.462 showing that the model accurately predicts the response therefore as per ANOVA values, the model is accepted. The total variance explained by the model as a whole was R^2=25.8% adjusted R^2 24.8%, F (3,231) =26.462, p<0.001 meaning that data fits better in the model indicating that the model accurately predicts response.

Table 4.13: Co-efficient results

Coefficients				
Unstandardized Coefficients		Standardized Coefficients		
B	Std. Error	Beta	t	Sig.
-1.581	.520		-3.040	.003
.616	.107	.338	5.739	.000
-1.132	.920	-.654	-1.231	.284
1.618	.909	.949	1.781	.000

a. Dependent Variable: Operational Efficiency

Therefore, equation 3.3 can be depicted as equation 4.3(with standard error in parenthesis).

$$\text{Operational Efficiency} = \underset{(.520)}{-.1581} + \underset{(.107)}{.616}\,Heuristic - \underset{(.920)}{1.132}\,Herding + \underset{(.909)}{1.618}\,Prospect \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad 4.3$$

Coefficients are illustrated on table 4.13 which indicates that there is a positively significant relationship between operational efficiency and heuristic driven and prospect based biases at (B=0.616; p<0.000) and (B=1.618; p<0.000) indicating that a unit change in operational efficiency will be caused by heuristic driven and prospect based biases. This means that an increase in the two biases causes a similar increase in operational efficiency thus as heuristic and prospect biases increase, operational efficiency also increases by a similar proportion.

Herding based biases on the other hand has a negative and an insignificant relationship with operational efficiency at (B=-1.132; p<0.284) therefore there was no statistical evidence that a change in herding biases would cause any change in operational efficiency hence a unit change in herding based biases negatively affects operational efficiency. This means that as herding based bias increases, operational efficiency decreases at the same rate or level and if the biases decreases, operational efficiency increases by the same rate.

H_{01}: Behavioral biases have no significant effect on operational efficiency of real estate investment firms in Nairobi County, Kenya.

Coefficients illustrated on table 4.13 shows that behavioral biases have a positive and significant relationship to operational efficiency at (B=0.616; p=0.000) and (B=1.618; p=0.000) for heuristic driven and prospect based biases respectively. Therefore, behavioral biases have a significant relationship with operational efficiency hence this study rejects that null hypothesis which stated that behavioral biases have no significant effect on operational efficiency and accepts that alternate hypothesis that indeed behavioral biases have a significant effect on operational efficiency.

These results are supported by Salzman & Zwinkels (2013) who analyzed the effect of property market inefficiencies from a behavioral perspective in the UK. They explained this from two perspectives; the importance of housing and the different stakeholders within the market property. The review of corporate shareholders and household showed that cognitive biases such as 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 making in the market of real estate either as an investor or if 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 method of normative.

The results above are also consistent with the study by Njenga ,(2018) who studied the effect of behavioral bias on real estate prices in Kiambu and the study findings indicated that there was a significant positive relationship between the factors under study and real estate prices in Kenya and concludes that behavioral biases influence real estate prices in Kenya. Njenga,(2018) results further indicated a low R squared of 19.5% which is below the cut off of 49.5% that is also similar to this study's R squared of 25.8%. Jim, (2022) stated that studies that attempt to predict human behavior generally have R-squared values less than 50% since human behavior is usually difficult to predict further supporting the findings of this study. Even with a low R-squared, statistically significant P-values continue to identify relationships and coefficients have the same interpretation (Jim, (2022).

Herding based biases on the other hand has a negative and an insignificant relationship with operational efficiency at (B=-1.132; $p<0.284$). This is contradicted studies by Bokhari and Geltner (2010) who discovered in their study of commercial real estate market data on loss aversion and anchoring, experienced investors and more significant, more sophisticated investment institutions exhibit at least as much risk-averse behavior. Therefore, the results above bring new knowledge to academia that there is no statistical evidence that herding based biases influence operational efficiency indicated by a negative insignificant relationship.

4.6 Real Estate Investment Strategies and Operational efficiency

The second objective of the study was to establish the effect of real estate investment strategies on operational efficiency of real estate firms in Nairobi county. Real estate investment strategy had three constructs; buy and hold, own and operate and development strategies. To actualize this objective, correlation analysis was conducted and the results illustrated on table 4.14 below.

Table 4.14: Correlation results

Correlations

		Buy and Hold Strategy	Own and Operate Strategy	Development Strategy
Operational Efficiency	Pearson Correlation	.634**	.602**	.395**
	Sig. (2-tailed)	.040	.000	.000
	N	231	231	231

The findings of the study indicated that the independent variables have a partially significant correlation with the dependent variable. Buy and hold strategy, own and operate and development strategies are positively correlated to operational efficiency and significant at ($r=0.634$, $p<0.05$) ;($r=.602$, $p< .001$) and ($r=395$, $p<0.001$) respectively. Social scientists accept any probability below 0.05 indicative of genuine effect. This means that there is less than 0.05 chance that the correlation co-efficient occurred by chance in a sample of 231 firms. This indicates a positively significant correlation between real estate investment strategies and operational efficiency. These findings established that the impact of real estate investment strategies on real estate investment firms' operational efficiency was statistically significant. In terms of operational efficiency determination, the results in table 4.14 means that an increase in any of the strategies buy and hold, own and operate and development strategies causes a similar increase in operational efficiency therefore an increase or decrease in real estate investment strategies leads to an increase or decrease in operational efficiency by the same proportion.

Table 4.15: Regression analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.776[a]	.603	.597	.95995

a. Predictors: (Constant), Buy and Hold, Own and Operate, Development strategy

As correlation statistics indicate clear relationship; multiple regression analysis is constructed to identify impact on dependent variable on from all variables. Correlation co-efficients say nothing about which variable causes the other to change therefore regression analysis was run since the co-efficient of determination(R^2) is a superior measure compared to correlation coefficient(r) as it indicates the amount of variability in one variable that is explained by the other.

The results were presented in table 4.15 which indicated that R^2 for the model is 0.603, adjusted R^2=0.597 and change of R^2=0.603 an indication that real estate investment strategies account for 60.3% variability in operational efficiency. This means that 60.3% change in operational efficiency is caused by each of the predictor variables of real estate investment strategies; buy and hold strategy, own and operate strategy and development strategy while 39.7% will be explained by other factors. The interpretation of this is that real estate investment strategies leads to a 60.3% increase or decrease in operational efficiency of real estate investment firms.

Table 4.16 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	318.642	3	106.214	115.262	.000[b]
	Residual	210.101	228	.921		
	Total	**528.743**	**231**			

a. Dependent Variable: Operational efficiency

b. Predictors: (Constant): Buy and Hold, Own and Operate, Development

Table 4.16 results indicate a mean square is 0.921 and F statistic of 115.262 showing that the model accurately predicts the response. The level of significance is at $p<0.001$ indicating high level of significance therefore as per ANOVA values, the model it is accepted. The total variance explained by the model as a whole was R^2=25.8% adjusted R^2 60.3%, F (3,231) =11.262, P= (0.001) meaning that the data fit better in the model hence the regression model accurately predicts response.

Table 4.17: Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.459	.419		3.483	.001
	Buy and Hold	.952	.100	.473	9.484	.040
	Own and Operate	1.613	.101	.829	16.003	.000
	Development	.304	.078	.172	3.909	.000

a. Dependent Variable: Operational Efficiency

Therefore, equation 3.2 can be depicted as equation 4.1(with standard error in parenthesis).

Operational efficiency = $1.459 + .952_{Buy\&Hold} + 1.613_{Own\&Operate} + .304_{Development}$ …… 4.1

(.419) (.100) (.101) (.078)

The unstandardized results indicate that all the variables under real estate investment strategies; Buy and hold, own and operate and development strategies are positively and significantly related to operational efficiency at (B=1.459, p<0.05) and (B=0.952, p<0.005) and (B=1.613, p<0.005) respectively. These findings implied that real estate investment strategies had a statistically significant effect on real estate investment firm's operational efficiency.

H_{02}: Real estate investment strategies have no significant effect on operational efficiency of real estate investment firms in Nairobi County, Kenya.

The Co-efficient results illustrated on table 4.17 shows a positive and significant relationship between real estate investment strategies and operational efficiency. This means an increase or decrease in buy and hold, own and operate or development strategies causes operational efficiency to increase or decrease with a similar proportion. Therefore, these results reject the null hypothesis which stated that real estate investment strategies have no significant effect on operational efficiency of real estate firms in Nairobi county Kenya and accepts the alternate hypotheses that real estate investment strategies have a significant effect on operational efficiency of real estate investment firms in Nairobi County.

The findings of this study was supported by Mbogo, (2016) who examined the effect of real estate investment strategies on financial performance of investment groups in Kenya. According to Mbogo, (2016), investment techniques implemented by investment groups have a significant impact on the financial success of investment groups in the Kenyan market. According to findings from the study, all three investment methods buy and hold, own and operate and development strategies have a substantial inter-relationship. As used by investment groups, they may still impact the financial performance of investment groups. According to the research, investment groups primarily adopted purchase and hold and own and operate

strategies. As a result, most groups relied on the first two methods to establish themselves over time since they lacked the competence to implement a development strategy.

Corgel &DeRoos, (1999) established that there was indeed a relationship between real estate investment strategies and operational efficiency. However, the extent of this relationship had not been studied which this study determined and the findings were that 60.3% increase or decrease in operational efficiency was caused by real estate investment strategies. On the investment strategies, a study by Geltner, (2014) on investment choices indicates that the buy and keep and rent approach of real estate investing is no longer recommended which contradicts the findings of this study since buy and hold had a significant effect on operational efficiency. He however supports that own and operate increases operational efficiency and as indicated in this study's findings, own and operate affects operational efficiency by 82.5%, the highest amongst all the three strategies. Geltner, (2014) states that using the own and rent plan provides investors with a higher monthly cash flow and lower property upkeep and repair costs.

This study therefore states that real estate investment strategies positively and significantly affects operational efficiency by 60.3% therefore to increase operational efficiency, an investor must increase real estate investment strategies by 60.3%. On the same note, investment managers need to focus more on own and operate strategy most as it affects operational efficiency most as compared to the other strategies.

4.7 Moderating effect of behavioral bias on the relationship between real estate investment strategies and operational efficiency

The study sought to examine the moderating effect of behavioral bias on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County, Kenya.

Table 4.18: Hierarchical regression analysis

The table 4.18 below showed the summary of the effects of the regression models on the dependent, independent and moderator variables.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.520[a]	.271	.264	1.29765
2	.602[b]	.362	.346	1.22135
3	.651[c]	.424	.408	1.16379

a. Predictors: (Constant), Real Estate Investment Strategies

b. Predictors: (Constant), Real Estate Investment Strategies, Behavioral biases

c. Predictors: (Constant), Real Estate Investment Strategies, Behavioral biases, Interaction term between behavioral biases and real estate investment strategies

Results in table 4.18 indicate that the moderating effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency is significant. Model 1 which takes in only the independent variable real estate investment strategies accounts only for 27.1% of the variation in operational efficiency (R^2=0.271) compared to the second model which introduces the moderator variable behavioral biases and accounts for 36.2% of variation in Operational efficiency (R^2=0.362). Compared with the two models which only encompasses the control variable, predictor variable and the moderator variable, the addition of the interaction term in the full model significantly increases the R^2 to 42.4% (increase in R^2=6.2%).

This means that 27.1% of the variance in dependent variable (Operational efficiency) was explained by the independent variables (Real Estate Investment Strategies). When the moderator variable behavioral biases were introduced, R square value indicated that 36.2% of the variance in dependent variable (Operational efficiency) was explained by the independent variables real estate investment strategies and the moderator variable behavioral biases. Interaction term between behavioral biases and real estate investment strategies caused R Square to change further indicating that when moderating real estate investment strategies (Independent variable), 6.2% variance in operational efficiency was explained by behavioral biases (Moderator variable). Field, (2005) analysis of moderating effect states that any increase of R^2 equal to or greater than 0.05 or 5% indicates moderation effect. This result above therefore indicated that behavioral biases has a moderating effect on the relationship between real estate investment strategies, operational efficiency.

However, behavioral biases reduced the explanatory power of real estate investment strategies on operational efficiency from R^2=0.603 as indicated in table 4.14 to R^2=0.271 as indicated in table 4.18 hence reduces the correlation between real estate investment strategies and operational efficiency. This means that behavioral biases as a moderator diminishes or reduces the relationship between real estate investment strategies and operational efficiency of real estate investment firms. Therefore, as moderation effect of behavioral biases increases, the strength of the effect of real estate investment strategies on operational efficiency reduces and vice versa.

Table 4.19: Analysis of variance

The following are further evidence on the moderator impact analysis based on hierarchical regression analysis.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	116.661	1	116.661	65.113	.000[b]
	Residual	412.082	230	1.792		
	Total	528.743	231			
2	Regression	173.472	2	86.736	55.908	.000[c]
	Residual	355.270	229	1.551		
	Total	528.743	231			
3	Regression	209.140	3	69.713	49.733	.000[d]
	Residual	319.602	228	1.402		
	Total	528.743	231			

a. Dependent Variable: Operational efficiency
b. Predictors: (Constant), Real Estate Investment Strategies
c. Predictors: (Constant), Real Estate Investment Strategies, Behavioral Biases
d. Predictors: (Constant), Real Estate Investment Strategies, Behavioral Biases, Interaction term between behavioral biases and real estate investment strategies

The results on table 4.19 indicated that models accurately predicts the response therefore as per ANOVA values, the model it is accepted. The total variance explained by the first model as a whole was 27.1% adjusted R^2 =26.4%, F (3, 231) =65.113, $p<0.001$ indicating that the independent variable real estate investment strategies were positively and significantly related to operational efficiency. The results indicate that 27.1% of variance in operational efficiency is explained by the model when real estate investment strategies are increased by 27.1%. Model two results explains a total variance of R^2=36.2% adjusted R^2=34.6%, F (3,231) =55.908, p=0.001 meaning that when the moderator variable is introduced, there is a positive and significant relationship between the independent variable, moderator and dependent variable. Therefore, 36.2% increase in operational efficiency is explained by introduction of a moderator variable to the predictor variables.

Finally, for model 3, total variance explained by the first model as a whole was 42.4% adjusted R^2=40.8%, F (3,231) =49.733, p<0.001 indicating a positive and significant relationship between all the variables with introduction of the interaction term. This means that there is a moderating effect of behavioral biases on the relationship between independent variables; real estate investment strategies and the dependent variable operational efficiency thus rejecting null hypothesis H03 that behavioral biases has no significant moderating effect on the relationship between real estate investment strategies and operational efficiency.

Table 4.20: Co-efficients

The table below showed coefficients of the three models as indicated.

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1.937	.579		-3.346	.001
	Real Estate Investment Strategies	1.253	.155	.470	8.069	.000
2	(Constant)	-3.680	.611		-6.024	.000
	Real Estate Investment Strategies	.927	.154	.347	6.010	.000
	Behavioral Biases	.754	.125	.350	6.051	.000
3	(Constant)	7.566	2.304		3.284	.001
	Real Estate Investment Strategies	2.216	.640	.831	3.462	.001
	Behavioral Biases	2.227	.603	1.034	3.695	.000
	Interaction term between behavioral biases and real estate investment strategies	.824	.163	2.124	5.044	.000

a. Dependent Variable: Operational efficiency

Therefore, equation 3.4 can be depicted as equation 4.3(with standard error in parenthesis).

Operational efficiency= 7.566 + 2.216 $_{REIS}$ + 2.227 $_{BB}$ + .824 $_{interaction.}$ …… *4.4*

(2.304) (.604) (.603) (.163)

H_{03}: Behavioral biases has no significant moderating effect on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County.

Coefficients illustrated on table 4.20 indicates that in model 1, dependent variable real estate investment strategies had a positive and significant relationship to operational efficiency at (B=1.253; p=0.001) indicating that a unit change in the independent variable will cause and increase in operational efficiency. In model 2, real estate investment strategies and the moderator variable behavioral biases have a positive and significant relationship to operational efficiency at (B=0.927; p=0.000) and (B=0.754; p=0.000) respectively. Model 3 indicated a positive and significant relationship of the interaction term between behavioral biases and real estate investment.

The underlying assumption of behavioral finance scholars is that a complex combination of psychological factors influences investment decisions. As opposed to the belief of rational decision-making of investors according to traditional finance theories, behavioral scholars argue that investor behavior is irrational (Chiang et al. 2010; Tekce and Yılmaz 2015). There is consensus among the researchers in the field of economics and finance that it is important to consider psychological, sociological, demographic, and personality factors that may have a profound influence on investment decisions thus affecting performance (Fung and Durand 2014; Zhang and Zheng 2015). The results of this study has brought in an aspect of moderation and brings in new knowledge that the moderation effect of behavioral biases on operational efficiency reduces the effect of real estate investment strategies on operational efficiency. Behavioral biases diminish the strength of the relationship or correlation between real estate investment strategies and operational efficienncy of real estate investment firms.

Baker & Nofsinger (2010), Fama, (1998), Subrahmanyan, (2007) and Razek, (2011) noted an apparent lack of consensus among financial scholars concerning the validity of behavioural finance theory. This lack of consensus suggests that behavioural finance as a concept is still open for debate. While Fama, (1997), Subrahmanyan, (2007) and Thaler, (2005) pointed out that a plethora of research has been conducted in the secondary markets, there is little evidence of studies on the impact of individual financial behavior on investment decisions. Empirical studies have been carried out on primary relationships between the variables but not the moderating effects of any of the variables on the other variables. Model 3 indicated a positive and significant relationship of the interaction term between behavioral biases and real estate investment at (B=0.824; p=0.000). These findings implied that there is a positive and significant moderating effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County, Kenya. The findings therefore rejected the null hypotheses which stated that behavioral biases have no significant moderating effect on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County. The results of this study brings new knowledge to existing literature that behavioral biases indeed have a moderating effect on the relationship between real estate investment strategies and operational efficiency of investment firms.

4.8 Combined effect of all the variables

Hypotheses were tested for all the variables using the unstandardized co-efficient as illustrated in table 4.21 since in the initial results some variables gave insignificant results. Therefore, to determine the combined effect of the independent variable and the moderator on the dependent variable, the unstandardized co-efficient were used.

Table 4.21: Co-efficient combining all the variables

Coefficients[a]

Combined effect	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	7.566	2.304		3.284	.001
Behavioral Biases	2.227	.603	1.034	3.695	.000
Real Estate Investment Strategies	2.216	.640	.831	3.462	.001
Interaction term between behavioral biases and real estate investment strategies	.82`4	.163	2.124	5.044	.000

a. Dependent Variable: Operational efficiency

The results on table 4.21 indicates a positive and significant relationship between behavioral biases and operational efficiency at (B=2.227; p=0.000). This means that when behavioral biases is increased or decreased, operational efficiency increases or decreases with the same proportion. This indicated that behavioral biases have a significant effect on operational efficiency of real estate firms in Nairobi County. Therefore, the study findings rejected the null hypotheses which stated that behavioral biases have no significant effect on operational efficiency of real estate investment firms in Nairobi county thus accepting the alternate hypothesis.

The Coefficients illustrated further indicates that the independent variable real estate investment strategies have a positive and significant relationship to operational efficiency at (B=2.216; p=0.000) indicating that a unit change in the real estate investment strategies will cause and increase or decrease in operational efficiency. Hence, real estate investment strategies have a significant effect on operational efficiency of investment firms, therefore the study rejected the null hypothesis which stated that real estate investment strategies had no significant relationship to operational efficiency of real estate investment strategies in Nairobi, Kenya.

The introduction of the interaction term confirms the significant moderating effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of real estate investment firms at (B=0.824; p=0.000). The study findings therefore rejected the null hypothesis that stated that behavioral biases have no significant moderating effect on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter sums up the study in line with the study objectives. It includes a conclusion on each of the objectives with a short commentary on the study's contribution to knowledge. The researcher recommends areas related to the study requiring further investigation.

5.2 Summary

Kenya’s housing market is cooling rapidly amidst falling demand caused by constrained credit access, coupled with the continued oversupply of high-end residential developments. Due to a lack of finance and glut of high-end residential buildings, Kenya's housing market begun to decline significantly. There was a 3.4% drop in the price of residential homes in 2019 in contrast to an 8.1% growth in 2018. To put this into perspective, prices for single-family homes dropped by 7% last year after rising by 8.8% in 2018, while prices for semi-detached homes increased by just under 6%, a decrease from an increase of 11.8% in 2018, while prices for apartment buildings fell by 1.7% last year after rising by 1.3% in 2018. While the average yearly rental yield in Kenya peaked in 2017 at 7.6%, it has since fallen to 7.4% in 2018, dropping to 7% in 2019, and finally to 6.1% in 2020.

On the backdrop of this, the study aimed at establishing the influence of real estate investment strategies, behavioral biases on operational efficiency of 231 real estate investment firms in Nairobi County, Kenya. Specifically, it established the influence of real estate investment strategies on operational efficiency of real estate investment firms in Nairobi County, determined the influence of behavioral biases on operational efficiency of real estate investment firms in Nairobi County and assessed the moderation effect of behavioral biases on

the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County.

The research was anchored on various theories with an emphasis on behavioral finance, maximizing shareholders' wealth, and contemporary portfolio theories as the foundation of the subject and related with the four constructs focused on by the research. A census sampling technique was used. Semi-structured questionnaires were self-administered to collect quantitative and qualitative data. Inferential and descriptive statistics were employed in order to test the hypothesis at a 0.05 level of significance.

The findings revealed that real estate investment strategy had statistical significance to operational efficiency as the variables own and operate, buy and hold and development strategies positively and statistically significantly affected operational efficiency of real estate investment firms. Behavioral biases had a positive and significant relationship to operational efficiency of investment firms with herding based biases being the only variable that had a negative and insignificant relationship to operational efficiency. The study further revealed that Behavioral biases have a moderating effect on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi Kenya however this moderation diminishes the relationship between real estate investment strategies and operational efficiency.

5.3 Conclusion

Behavioral biases positively contribute to 27.1% of operational efficiency therefore should not be ignored by investment managers. It further emerged that real estate investment strategies contribute to 60.3% of operational efficiency hence an integral part of any firm that wants to maximize its operational efficiency. Behavioral biases also had a positive significant moderation effect on operational efficiency therefore managers ought to embrace it as it implements its policies. However, the moderation effect of behavioral biases diminishes the strength of the relationship between real estate investment strategies and operational efficiency.

5.4 Contribution of the Study to Knowledge

The main objective of the study was to determine the effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency. The first objective was to establish the effect of behavioral biases on operational efficiency and the findings indicated that behavioral biases has a positive and significant relationship to operational efficiency of investment firms in Nairobi county and it contributes 27.1% increase or decrease in operational efficiency. On the various set of biases, heuristic and prospect based biases had a positive and significant relationship to operational efficiency while herding based bias had a negative insignificant relationship to operational efficiency. This knowledge will help investment managers to recognize the contribution of behavioral biases in their day to day operations as it indeed affects their operational efficacy.

The second objective was to assess the effect of real estate investment strategies on operational efficiency as there existed a knowledge gap on the aspect of operational efficiency which had earlier not been studied in relation to investment strategies. The findings indicated that real estate investment strategies had a positive and significant effect on operational efficiency and

contributed to 60.3% increase or decrease in operational efficiency of real estate investment firms in Nairobi county. On the type of strategies, it emerged that Own and operate real estate strategy was most volatile to operational efficiency since an increase in own and operate strategy influenced operational efficiency by 83% which was the highest margin compared to the other strategies. These results will help investors to channel their investments to own and operate real estate strategy as opposed to the other strategies as benefits include increased monthly cash flow and there are significantly reduced repairs and maintenance required on the property as stated by Geltner, (2014) on the advantages of own and operate.

This study further analyzed the moderation effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County and the findings revealed that behavioral biases had a significant moderating effect on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County, Kenya. This contributes to knowledge that indeed behavioral biases moderate the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County. It further brought in new knowledge that the moderation effect of behavioral biases reduced the strength of the relationship between real estate investment strategies and operational efficiency of real estate investment firms. This will caution investors and managers against irrational behavior caused by behavioral biases since it decreases the contribution of their investment strategies on operational efficiency by a great margin.

5.5 Recommendations for Policy and Practice

Based on the findings of the study, a myriad of policy options for adoption and practical implementation by real estate investment firms and other organizations operating in Kenya are recommended since the environment within which organizations operate is riskier, volatile, uncertain, complex and ambiguous.

Behavioral biases significantly affect operational efficiency of investment firms and contributes to 27.1% of operational efficiency according to results of this study's first objective. Investment managers should consider the contribution of behavioral biases to the operational efficiency of their firms since they are positively and significantly related to operational efficiency. This means that behavioral biases positively affects operational efficiency of investment firms. Stakeholders within various firms should ensure that they are well equipped with accurate knowledge about the real estate trends so as to take cognizance of the contribution of behavioral biases on the operational efficiency. Investors should therefore be ready to face such unforeseen economic crunches by bracing themselves with information on the employment trends within their environment and balance their clientele in terms of the security of their incomes and industry stability.

Results of objective two of this study further indicated that real estate investment strategies have a significant effect on operational efficiency and contributes to 60.3% variability in operational efficiency. This means that they increase operational efficiency by 60.3% making real estate investment strategies major drives to operational efficiency of investment firms. Investment managers should map out their investment strategies well so as to select strategies that will maximize their returns hence enhancing their operational efficiency. Real estate industry has over the years evolved with the introduction of customized housing, innovative

business lines like Airbnb, student hostels and warehouses which are opportunities that have not been tapped. Thus, the firm's strategic intelligence cohort should proactively integrate strategic innovation and move away from the old ways of developing real estate for rental purposes since the study revealed that own and operate is the strongest driver of operational efficiency.

Furthermore, from the findings of objective three of the study it emerged that behavioral biases have a positive significant effect on the relationship between real estate investment strategies and operational efficiency. This means that behavioral biases improves the relationship between real estate investment strategies and operational efficiency of investment firms. In the backdrop of this, investors need to invest based on accurate data and not decision making based on rules of thumb derived from personal experience, trial and error or plain experiments. Before making any real estate investment selections, an investor should thoroughly map out his or her investing strategy. Inventors should follow investing techniques set by market, organizational, or industry levels to pick and develop the most efficient portfolio. Buy and hold is a strategy most investors apply forgetting the effect of inflation and other micro and macro-economic factors like price changes and depreciation since they have an assumption that real estate always appreciates. Instead own and operate works since Airbnb is an advanced opportunity which earns most investors quick returns that are far more than monthly rent.

5.6 Suggestions for Further Study

The study aimed at establishing the effect behavioral biases on the relationship between real estate investment strategies and behavioral biases on operational efficiency of 231 real estate investment firms in Nairobi County, Kenya. Specifically, it established the effect of real estate investment strategies on operational efficiency of real estate investment firms in Nairobi

County, analyzed the influence of behavioral biases on operational efficiency of real estate investment firms in Nairobi County and assessed the moderation effect of behavioral biases on the relationship between real estate investment strategies and operational efficiency of real estate investment firms in Nairobi County. Behavioral bias was the moderating variable therefore other moderating variables can be used to assess the relationship between strategic real estate investment strategies and operational efficiency. Besides, the current research did not factor the effects of covid 19 that emerged during the study period on the relationship between the variables therefore further research should be carried out to analyze the extent to which the pandemic affected the study variables in relation to operational efficiency.

In addition, the current study was cross-sectional and thus, to enrich the study, there is a need for a longitudinal study. Future studies can be conducted based on the lagged and same period current operational efficiency aspects to bring about an in-depth understanding of the effect of investment strategies and behavioral biases concepts on operational efficiency. Behavioral biases reduces the strength of the link between real estate investment strategies and operational success, but there is a void in the understanding how to deal with these biases in terms of eliminating them to remove their effect. There is also a shortage of research on the impact of behavioral biases on real estate investing methods. When an organization's choice must be decided by a committee or by a group of managers, behavioral biasedness impacts group decision making and future studies should be carried how to determine how to manage such situations.

5.7 Limitations of the study

When making investment decisions in a company, managers were a times biased in their responses. This was the first drawback of this study. Historical data about the companies was not easy to access because the biggest percentage of respondents consisted of very young people aged between 20-29 years with very little experience (0-5 years). The accuracy of the replies and the financial literacy of decision-makers within the companies was the second restriction. Validity and reliability testing helped to lessen it. The research region was large hence crossing it needed heavy resources, some of which were inadequate at various points over the study period causing delays in its completion.

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APPENDICES

Appendix I: Questionnaire

I am PhD accounting and Finance student at Maseno University and currently undertaking a study on the analysis of real estate investment strategies, financial literacy, behavioral biases and performance of registered investment groups in Nairobi county, Kenya. The questionnaire is made up five sections that should take only a moment of your time. I assure you that all the information you give will be kept confidential and solely for the purpose of this study. Thank you.

SECTION ONE: BACKGROUND INFORMATION

1. Gender.

    a. Male ( )

    b. Female ( )

2. Age

    a. 20-29 ( )

    b. 30-39 ( )

    c. Over 40 ( )

3. Highest level of education

    a. Secondary education ( )

    b. College education ( )

    c. University ( )

SECTION TWO: BEHAVIOURAL BIASES

4(a). How does your organization settle on a unanimous investment decision?

    i) Majority rule

    ii) Final decision is done by the C.E.O

    iii) Objective data resulting from financial analysis

iv) Based on previous trends

v) Based on previous performance

(b). Which other methods apart from the ones stated above does the firm use in its investment decisions?

……

……

……

5. a) Please tick the numeric value corresponding to your personal opinion for each statement in relation to risk aversion. Use the following Likert scale. Strongly disagree=1, disagree=2, moderately agree =3, Agree=4, strongly agree=5.

Heuristic Driven Bias	**1**	**2**	**3**	**4**	**5**
I believe that my skills and knowledge of stock market can help me to outperform the market.					
I am normally able to anticipate the end of good or poor.					
I believe that my skills and knowledge of the real estate market are sufficient to make sound investment decisions.					
I have the over-reaction to price changes of real estate.					
Market information is important for my real estate investment.					
Lack of market information hinder me from making sound investment decision					

b). To what extent does the following influence the revenues and expenditures of your Investment firm? Please tick as appropriate in the corresponding box? Use a scale of 1- 5,

where 1 = Not at all, 2 = Little extent, 3 = Moderate extent, 4 = To a large extent and 5 = A very large extent

Herding Based Bias	**1**	**2**	**3**	**4**	**5**
To what extent do you use the opinions of other real estate agents/experts to assess performance of the real estate market?					
Other investors' decisions of choosing stock types have impact on the firm's investment decisions.					
Other investors' decisions of the stock volume have impact on our investment decisions.					
Other investors' decisions of buying and selling stocks impacts on my investment decisions.					
I usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market.					
The investment firm treats each element of my investment portfolio separately.					
To what extent do you use news events when investing in the real estate market?					
I consider carefully the price changes of real estate that I intend to invest in					

c). To what extent does the following influence the revenues and expenditures of your Investment firm? Please tick as appropriate in the corresponding box? Use a scale of 1- 5, where 1 = Not at all, 2 = Little extent, 3 = Moderate extent, 4 = To a large extent and 5 = A very large extent

Prospect Based bias	**1**	**2**	**3**	**4**	**5**
There is segregation of assets in terms of their value in your firm					
Decision to buy or sell is based on the return value of an investment portfolio					
Your firm keep assets whose value have dropped					
The firm sells assets that have gained value.					
I dislike losing significantly more than I enjoy winning					
Given two equal investment choices, one having possible gains and the other possible losses I would choose the one with possible gains					

SECTION THREE: REAL ESTATE INVESTMENT STRATEGIES

6. What is the objective of your real estate investment?

a. To achieve capital appreciation ( )

b. To receive income generation ( )

c. To have growth in income ( )

d. To have stability of principal ( )

e. To have tax shelter ( )

7. Which of these three strategies best describe your firm? Please tick as appropriate in the corresponding box? Use a scale of 1- 5, where 1 = Not at all, 2 = Little extent, 3 = Moderate extent, 4 = To a large extent and 5 = A very large extent

Strategy	**Description**	**1**	**2**	**3**	4	5
Buy and Hold	The firm buys real estate property with the intention of holding it for speculation for a future profit.					
Own and Rent	The firm buys leases or develops real estate property with the intention of renting it out at a fee.					
Development	The firm constructs on property or land with the intention of selling or renting it out					

8. Assuming you find yourselves trying the three or any two combinations, which of them would be preferred?

a) Buy and Hold + Own and operate ☐

b) Buy and Hold + Development ☐

c) Own and operate+ Development ☐

9. What proportion of income is attributed to the following?

i). Buy and Hold strategy

0 -20%

21 – 40% ☐

41 - 60% ☐

61 - 80% ☐

81 - 100% ☐

ii). Own and Rent strategy

0 -20%

21 – 40% ☐

41 - 60% ☐

61 - 80% ☐

81 - 100% ☐

iii). Development Strategy

0 -20%

21 – 40% ☐

41 - 60% ☐

61 - 80% ☐

81 - 100% ☐

10.a) To what extent do the following influence the revenues and expenditures of your Investment firm? Please tick as appropriate in the corresponding box? Use a scale of 1- 5, where 1 = Not at all, 2 = little extent, 3 = Moderate extent, 4 = To a large extent and 5 = A very large extent

Buy and Hold Strategy	**1**	**2**	**3**	**4**	**5**
The investment firm has invested heavily in the real estate projects for the last five years					

The investment firm invests in projects that are undeveloped waiting for them to appreciate before they are developed					
The investment firm invests in projects that are undeveloped waiting for them to appreciate before they are developed					
The investment firm invests even in the least valuable projects with the view of waiting for them to appreciate after a stipulated period of time					
Price of real estate project influences financial decisions of your investment firms' budgets					
The cost of capital for real estate investment in your investment firm is influenced by the financial policy of your investment firm					

b). To what extent does the following influence the revenues and expenditures of your Investment firm? Please tick as appropriate in the corresponding box? Use a scale of 1- 5, where 1 = Not at all, 2 = Little extent, 3 = Moderate extent, 4 = To a large extent and 5 = A very large extent

Own and Operate Strategy	**1**	**2**	**3**	**4**	**5**
Availability of resources determine your decision of to invest through own and operate strategy					
Investing through own and operate strategy has increased the portfolio of your Investment firm in the last five years					
The returns of your investment firm has been greatly increased by the decision to invest through own and operate strategy in the last five years					

The performance of a the project influences your firm's decision to invest in it					
The types of properties the firm invests in determines your decision to own and operate					

c). To what extent does the following influence the financial operations of your Investment firm? Please tick as appropriate in the corresponding box? Use a scale of 1-5, where 1 = Not at all, 2 = Little extent, 3 = Moderate extent, 4 = To a large extent and 5 = A very large extent

Development Strategy	**1**	**2**	**3**	**4**	**5**
The firm considers the cost of development and how it influences investment policy of your investment					
The capital growth potential of a particular real estate project influences the investment decisions of investments projects of your investment groups					
The choice to invest in a residential or commercial real estate project is determined by the capacity to develop the project.					
The revenues of your company has been greatly influenced by the policy of investing in projects that are developed by the investment firm					
The real estate project developed by your investment firm have increased the portfolio of your Investment group in the last five years					
The location of the investment project influences the development strategies of your investment group					

SECTION THREE: OPERATIONAL EFFICIENCY

11. a) Does the organization measure operational efficiency of its operations?

YES ☐ NO ☐

b) How does the firm analyze operational efficiency?

- Occupancy Rate ☐
- Rental Yield ☐

12. For each of the following statements, circle the correct answer from the available choices.

Statement	**True**	**False**	**Don't Know**
When an investor diversifies his investments, the risk of losing money decreases.			
If market efficiency is considered weak technical analysis would have little or no value.			
If an investment earns 10% per year, your money will be doubled after seven years.			
If interest rate rises, the asset prices fall.			
With compound interest you earn interest on your interest as well as on your principal.			
If you invest in the firm's real estate investment, you own part of the company			

Real estate pays a guaranteed rate of return.			
Real estate investments always provide higher returns than bonds or money market investments.			
Beta measures how responsive or sensitive an investment is to market movements.			
Occupancy rate and rental yield are the most important measures of a company's overall efficiency.			
Government policies on taxes and interest rates affect real estate performance			
Real estate asset prices are affected by inflation			
Investing in a real estate that holds a diversified portfolio of assets protects your investment against market decline.			
The public joint real estate company has to publish its quarter financial statements 30 days from the end of the quarter.			

SECTION 4: BEHAVIOURAL BIASES, REAL ESTATE INVESTMENT STRATEGIES AND OPERATIONAL EFFICIENCY

13. How does the firm's management reach a consensus of the type of investments to undertake?

- ☐ Financial analysis of its future returns
- ☐ Popularity of the investment
- ☐ Management intuition
- ☐ Investment cost analysis
- ☐ Risk-return trade off

14. Please indicate the organization's operations data over the following years:

Operational Efficiency indicators	**Year**				
	2017	**2018**	**2019**	**2020**	**2021**
Occupancy Rate					
Rental Yield					

15. Please tick the choice (box) that best describes yourself on the scale by indicating whether you: Strongly disagrees (1), Disagree (2), Not sure (3), Agree (4) and Strongly agree(5)

Statement	**1**	**2**	**3**	**4**	**5**
My past history influences my present investment decisions					
I am holding to my investment because selling them would be painful to me since I would incur loss					
When it comes to trusting people, I can usually rely on my gut feelings					
Thinking hard and for a long time about something gives me little satisfaction					
I was informed about all the fundamentals of the company that I am confident in making my investments					
I intend to sell my investments immediately it goes back to the acquisition price					
The previous profits generated from similar investments by the company made it very attractive to me to invest in it					
The last investment was more of a bad luck than it was my own poor judgments					
I am holding to my investments because I know the prices will revert soon					

Appendix II: List of Registered Real Estate Firms in Nairobi County, Kenya

1. Milligan International Ltd
2. Advent Valuers Limited
3. Villa Care Limited
4. Messrs Swatz Developers Ltd
5. Eackelberg & Co. Limited
6. Knight Frank Limited
7. Lynex Holdings Limited
8. ADN Advisory Valuers
9. Asembo H. Washington Olima
10. Dennis Ayub Mwakugu
11. Milligan International Ltd
12. Silverrock Limited
13. Sema Estate Agents
14. JB Martins Limited
15. Chabrin Agencies Limited
16. Axis Real Estate Limited
17. Regent Management Limited
18. Knight Frank Limited
19. Ehsani Hamed
20. Hass Consult Limited
21. Broll Kenya Limited
22. Mamuka Valuers Limited
23. Valuerline Consulting Limited

24. Reighman Consult Limited
25. Signature Africa Property Consult Ltd
26. Pinnacle Valuers Limited Nairobi
27. Gamar Investments
28. Neema Management Ltd
29. Colburns Holdings Ltd
30. Gatana Moses Muchiri
31. Gimco Ltd
32. Josekinyaga Ent Limited
33. Gathumbi & Associates
34. Cog Consultants Limited
35. Rubyland Limited
36. Sparrow Property Consulting Ltd
37. Savannah Consulting Ltd
38. Vema Franc Ltd
39. Neo Westend Valuers
40. Vidmerk Ltd
41. Neema Management Ltd
42. Mamuka Valuers Limited
43. Masterways Properties Ltd
44. Capstan Kenya Limited
45. Masterways Properties Ltd
46. Value Zone Ltd
47. Axis Real Estate
48. Guinnesse Estate Agents Ltd

49. Haron Shake Rashid

50. Legend Valuers

51. Ark Consultant Limited

52. Horeria & Company

53. Paragan Properties

54. Real Appraisal Limited

55. Venture Properties

56. Realken International Limited

57. International Valuers(K)Ltd

58. Valentine First Ventures (K) Ltd

59. Wakama Estate Agencies

60. Urban Properties Consultants & Development Ltd

61. Tysons Limited

62. Terestam Management

63. Amazon Valuers Limited

64. Llyoyd Masika Limited

65. Penina and Pamxie Valuers

66. Crystal Valuers Limited

67. Paradise Home & Properties

68. Bageine Karanja Mbuu Limited

69. Ena Property Consultant Limited

70. Steam Plant Limited United Shelter

71. Precision Valuers

72. Masterways Properties Limited

73. Regent Valuers

74. Kaunda Peter Juma

75. Chapter Property Consultants Limited

76. Mahale Estate Limited

77. Mencia Management Limited

78. Keriasek & Co. Limited

79. Amazon Valuers Limited

80. Kiarie Matheri Joseph

81. Kenya Railways Corporation

82. Regent Valuers Limited

83. Kahuthia Kibui & Co.

84. Crystal Valuers Limited

85. Allied Valuers Limited

86. Premier Valuers Limited

87. Kenneth Miranga Kinuthia

88. Kinyua Koech Limited

89. Knight Frank Limited

90. Kiptoo Vincent Kibet

91. Karagu and Mwangi Limited

92. Regal Real Estate Consultants

93. Cornerstone International Limited

94. Premier Valuers Limited

95. Kithaka W. Bernard

96. Broll Kenya Limited

97. Morgan Wright Limited

98. Integet Ltd

99. Langata Link Ltd
100. Real AppraisalNairobi
101. Landmark Realtors Ltd
102. Vidmerk Ltd
103. Nw Realite Ltd
104. Lustman & Company Limited
105. Danco Ltd.
106. Acumen Valuers
107. Sortmaster Investment Ltd
108. Njihia Muoka Rashid Co. Ltd
109. Matubia Anne K.Nairobi
110. Prudential Valuer Ltd
111. Rroswald & Co Ltd
112. Kenya Reinsurance
113. Heritage Property Consultant
114. Verity Management Ltd
115. Green Gain Consultant Ltd
116. Citiscape Valuer
117. Fineland Ltd
118. Ebony Estate Agents
119. Migwi Charles Kanai
120. Kenallen Investment Ltd
121. Mitito Joseh Ouma
122. Perl Urban Property Consultants
123. Gimara Enterprises Limited

124. Venmic Consultants Ltd
125. Paragon Property Valuers Ltd
126. Mumuka Valuers (Management) Ltd
127. Kengen
128. Sububia Ltd
129. Value Zone Limited
130. Gimco Ltd
131. Royal Valuers Ltd
132. Aricpoint Properties Ltd
133. Muigai Commercial Agency
134. Fortcom Consult Ltd
135. Muigai Commercial Agency
136. Rubyland Ltd
137. Muiruri Hezekiah Gitu
138. Topmark Valuers Limited
139. Muitu & Company Limited
140. Value Consult Limited
141. Crystal Valuers Ltd
142. Premiier Valuers Ltd
143. Alltop Investment Ltd
144. Munubi Salome Ludenyi
145. Njihia Muoka Rashid Co. Ltd
146. Premiier Valuers Ltd
147. Alliance Realtor Ltd
148. AIG Kenya

149. Ark Consultant Ltd
150. Paragon Property Consultants
151. Acumen Valuers Limited
152. Vera Properties Limited
153. Pinacle Valuers Limited
154. James k. Mururu
155. Berget Property Investment
156. Muthee Hezron Wainaina
157. Mutua Pius Kinyua
158. Kenya Electricity Transmission Co.
159. Alliance Realtors Limited
160. Kiragu & Mwangi Ltd
161. Mwangi Winfred Njeri
162. Joseph B.K Mwaniki
163. Mansions Valuers
164. PDM(Kenya) Ltd
165. Ndurungi Real Estate
166. Pinnacles Properties Ltd
167. Seb Estates Limited
168. Gigi and company limited
169. Ngotho Property Consultant Ltd
170. Pinnacle Valuer Ltd
171. Crystal Valuers Ltd
172. Bluehills Real Estates
173. Metropolis Property Ltd

174. Nishani Management
175. Guardian Properties Ltd
176. Liberty Real Estate Limited
177. Metrocosmos Limited
178. Hayer One Group
179. Homescope Properties Limited
180. Pam Golding Properties Kenya
181. Ryden International Limited
182. Homes Universal
183. Fanaka Real Estate
184. AMG Realtors
185. Ndurungi Real Estate
186. Zoom Real Estate Agencies
187. Seb Estates Limited
188. Ngotho Property Consultant
189. Bluehills Real Estates
190. Metropolis Property Ltd
191. Nishani Management
192. Guardian Properties Ltd
193. Kenval Realtor Ltd
194. Njoka & Njoka Services Ltd
195. Homesplus Realtor Limited Vera Properties Limited
196. Sundown Valuers Box
197. Traca Management Services Limited
198. Liberty Real Estate Limited

199. Metrocosmos Liimited
200. Zenith (Management) Valuers Limited
201. Value Zone Limited
202. Centenary Valuers Limited
203. Tygon Ltd
204. Homelands Holding
205. Add Property Consultants
206. Ark Consultant Ltd
207. Axis Real Estate
208. Kenya Railways
209. CMT Realtor Ltd
210. Metrocosmo Limited
211. National Housing Corporation
212. Mudas Property Services Ltd
213. Guinnesse Development & Housing Company Ltd
214. Roack Consult Limited
215. Peakscale Limited
216. Equity Estate Ltd
217. Kenya Reinsurance Corporation
218. Roma Valuers Environmental & Property Consultants
219. Darima Properties (K) Limited
220. Maestro Properties Limited
221. Kenstate Valuers
222. Sedco Consultants Limited
223. Real Management Services (2002) Limited

224. Gig and Creations Limited
225. Syagga & Associates
226. Legend Valuers & Estates
227. Laptrust Limited
228. Property Trends
229. Kenstate Valuers
230. Petrum Valuers
231. Landmark Realtors Ltd
232. Property Wise
233. Broll Property Kenya
234. Sundown Valuers & Realtors Ltd

Appendix III: Raw Data

RY2017	RY2018	RY2019	RY2020	RY2021	OR2017	OR2018	OR2019	OR2020	OR2021
0.28	0.31	0.43	0.28	0.29	0.11	0.12	0.13	0.15	0.10
0.32	0.33	0.37	0.37	0.00	0.13	0.21	0.18	0.13	0.11
0.00	0.02	0.02	0.02	0.15	0.70	0.30	0.30	0.30	0.16
0.00	0.00	0.00	0.00	0.29	0.10	0.10	0.11	0.10	0.12
0.23	0.23	0.24	0.17	0.14	0.11	0.11	0.12	0.12	0.12
0.15	0.13	0.13	0.15	0.29	0.10	0.13	0.13	0.15	0.08
0.16	0.19	0.25	0.29	0.15	0.10	0.11	0.09	0.09	0.10
0.15	0.21	0.25	0.28	0.07	0.11	0.11	0.11	0.11	0.11
0.14	0.14	0.15	0.12	0.29	0.15	0.15	0.16	0.18	0.16
0.32	0.33	0.37	0.37	0.20	0.10	0.09	0.10	0.13	0.12
0.15	0.21	0.25	0.28	0.17	0.05	0.08	0.04	0.07	0.12
0.32	0.33	0.37	0.37	0.29	0.11	0.12	0.13	0.15	0.08
0.15	0.21	0.28	0.13	0.13	0.08	0.07	0.05	0.09	0.10
0.15	0.17	0.15	0.15	0.07	0.15	0.17	0.18	0.17	0.11
0.06	0.08	0.07	0.06	0.14	0.11	0.12	0.13	0.15	0.16
0.15	0.21	0.25	0.28	0.05	0.10	0.10	0.11	0.11	0.10
0.11	0.11	0.15	0.16	0.05	0.10	0.10	0.11	0.11	0.11
0.09	0.09	0.13	0.15	0.04	0.10	0.15	0.30	0.47	0.10
0.15	0.17	0.18	0.19	0.05	0.06	0.06	0.05	0.08	0.11
0.32	0.33	0.37	0.37	0.11	0.14	0.15	0.15	0.11	0.16
0.18	0.20	0.14	0.16	0.12	0.08	0.07	0.08	0.11	0.12
0.06	0.04	0.09	0.12	0.09	0.11	0.10	0.09	0.47	0.12
0.15	0.17	0.18	0.19	0.01	0.02	0.02	0.03	0.08	0.08
0.16	0.17	0.19	0.18	0.21	0.31	0.30	0.31	0.32	0.10

0.16	0.19	0.21	0.20	0.13	0.17	0.17	0.20	0.25	0.11
0.32	0.33	0.37	0.37	0.10	0.10	0.10	0.10	0.11	0.16
0.11	0.12	0.12	0.12	0.11	0.12	0.13	0.15	0.47	0.10
0.17	0.17	0.13	0.16	0.09	0.11	0.10	0.09	0.08	0.11
0.06	0.08	0.07	0.06	0.05	0.06	0.06	0.08	0.11	0.16
0.14	0.14	0.15	0.12	0.11	0.14	0.15	0.15	0.11	0.12
0.14	0.17	0.13	0.09	0.29	0.11	0.12	0.13	0.47	0.12
0.07	0.05	0.07	0.08	0.00	0.13	0.21	0.18	0.08	0.10
0.28	0.31	0.42	0.28	0.15	0.70	0.30	0.30	0.32	0.16
0.28	0.31	0.42	0.28	0.29	0.10	0.10	0.11	0.25	0.12
0.06	0.08	0.07	0.06	0.14	0.11	0.11	0.12	0.11	0.12
0.14	0.17	0.13	0.09	0.29	0.10	0.13	0.13	0.15	0.08
0.28	0.31	0.43	0.28	0.29	0.11	0.12	0.13	0.15	0.10
0.32	0.33	0.37	0.37	0.00	0.13	0.21	0.18	0.13	0.11
0.00	0.02	0.02	0.02	0.15	0.70	0.30	0.30	0.30	0.16
0.00	0.00	0.00	0.00	0.29	0.10	0.10	0.11	0.10	0.12
0.23	0.23	0.24	0.17	0.14	0.11	0.11	0.12	0.12	0.12
0.15	0.13	0.13	0.15	0.29	0.10	0.13	0.13	0.15	0.08
0.16	0.19	0.25	0.29	0.15	0.10	0.11	0.09	0.09	0.10
0.15	0.21	0.25	0.28	0.07	0.11	0.11	0.11	0.11	0.11
0.14	0.14	0.15	0.12	0.29	0.15	0.15	0.16	0.18	0.16
0.32	0.33	0.37	0.37	0.20	0.10	0.09	0.10	0.13	0.12
0.15	0.21	0.25	0.28	0.17	0.05	0.08	0.04	0.07	0.12
0.32	0.33	0.37	0.37	0.29	0.11	0.12	0.13	0.15	0.08
0.15	0.21	0.28	0.13	0.13	0.08	0.07	0.05	0.09	0.10
0.15	0.17	0.15	0.15	0.07	0.15	0.17	0.18	0.17	0.11
0.06	0.08	0.07	0.06	0.14	0.11	0.12	0.13	0.15	0.16

0.15	0.21	0.25	0.28	0.05	0.10	0.10	0.11	0.11	0.10
0.11	0.11	0.15	0.16	0.05	0.10	0.10	0.11	0.11	0.11
0.09	0.09	0.13	0.15	0.04	0.10	0.15	0.30	0.47	0.16
0.15	0.17	0.18	0.19	0.05	0.06	0.06	0.05	0.47	0.10
0.32	0.33	0.37	0.37	0.11	0.14	0.15	0.15	0.08	0.11
0.18	0.20	0.14	0.16	0.12	0.08	0.07	0.08	0.11	0.16
0.06	0.04	0.09	0.12	0.09	0.11	0.10	0.09	0.11	0.12
0.15	0.17	0.18	0.19	0.01	0.02	0.02	0.03	0.47	0.12
0.16	0.17	0.19	0.18	0.21	0.31	0.30	0.31	0.08	0.08
0.16	0.19	0.21	0.20	0.13	0.17	0.17	0.20	0.32	0.10
0.32	0.33	0.37	0.37	0.10	0.10	0.10	0.10	0.25	0.11
0.11	0.12	0.12	0.12	0.11	0.12	0.13	0.15	0.11	0.16
0.17	0.17	0.13	0.16	0.09	0.11	0.10	0.09	0.10	0.10
0.06	0.08	0.07	0.06	0.05	0.06	0.06	0.08	0.47	0.11
0.14	0.14	0.15	0.12	0.11	0.14	0.15	0.15	0.08	0.16
0.14	0.17	0.13	0.09	0.29	0.11	0.12	0.13	0.11	0.12
0.07	0.05	0.07	0.08	0.00	0.13	0.21	0.18	0.11	0.12
0.28	0.31	0.42	0.28	0.15	0.70	0.20	0.30	0.47	0.10
0.28	0.31	0.42	0.28	0.29	0.10	0.10	0.11	0.08	0.12
0.06	0.08	0.07	0.06	0.14	0.11	0.11	0.12	0.32	0.12
0.14	0.17	0.13	0.09	0.29	0.10	0.13	0.13	0.25	0.08
0.28	0.31	0.43	0.28	0.29	0.11	0.12	0.13	0.11	0.10
0.32	0.33	0.37	0.37	0.00	0.13	0.21	0.18	0.13	0.11
0.00	0.02	0.02	0.02	0.15	0.70	0.30	0.30	0.40	0.16
0.00	0.00	0.00	0.00	0.29	0.10	0.10	0.11	0.10	0.12
0.23	0.23	0.24	0.17	0.14	0.11	0.11	0.12	0.12	0.12
0.15	0.13	0.13	0.15	0.29	0.10	0.13	0.13	0.15	0.08

0.16	0.19	0.25	0.29	0.15	0.10	0.11	0.09	0.09	0.10
0.15	0.21	0.25	0.28	0.07	0.11	0.11	0.11	0.11	0.11
0.14	0.14	0.15	0.12	0.29	0.15	0.15	0.16	0.18	0.16
0.32	0.33	0.37	0.37	0.20	0.10	0.09	0.10	0.13	0.12
0.15	0.21	0.25	0.28	0.17	0.05	0.08	0.04	0.07	0.12
0.32	0.33	0.37	0.37	0.29	0.11	0.12	0.13	0.15	0.08
0.15	0.21	0.28	0.13	0.13	0.08	0.07	0.05	0.09	0.10
0.15	0.17	0.15	0.15	0.07	0.15	0.17	0.18	0.17	0.11
0.06	0.08	0.07	0.06	0.14	0.11	0.12	0.13	0.15	0.16
0.15	0.21	0.25	0.28	0.05	0.10	0.10	0.11	0.11	0.10
0.11	0.11	0.15	0.16	0.05	0.10	0.10	0.11	0.11	0.11
0.09	0.09	0.13	0.15	0.04	0.10	0.15	0.30	0.47	0.16
0.15	0.17	0.18	0.19	0.05	0.06	0.06	0.05	0.08	0.12
0.32	0.33	0.37	0.37	0.11	0.14	0.15	0.15	0.10	0.12
0.18	0.20	0.14	0.16	0.12	0.08	0.07	0.08	0.04	0.10
0.06	0.04	0.09	0.12	0.09	0.11	0.10	0.09	0.32	0.11
0.15	0.17	0.18	0.19	0.01	0.02	0.02	0.03	0.25	0.16
0.16	0.17	0.19	0.18	0.21	0.31	0.30	0.31	0.11	0.12
0.16	0.19	0.21	0.20	0.13	0.17	0.17	0.20	0.25	0.12
0.32	0.33	0.37	0.37	0.10	0.10	0.10	0.10	0.11	0.08
0.11	0.12	0.12	0.12	0.11	0.12	0.13	0.15	0.10	0.10
0.17	0.17	0.13	0.16	0.09	0.11	0.10	0.09	0.04	0.11
0.06	0.08	0.07	0.06	0.05	0.06	0.06	0.08	0.32	0.16
0.14	0.14	0.15	0.12	0.11	0.14	0.15	0.15	0.25	0.10
0.28	0.31	0.43	0.28	0.29	0.11	0.12	0.13	0.11	0.10
0.32	0.33	0.37	0.37	0.00	0.13	0.21	0.18	0.13	0.11
0.00	0.02	0.02	0.02	0.15	0.70	0.40	0.50	0.40	0.16

0.00	0.00	0.00	0.00	0.29	0.10	0.10	0.11	0.10	0.12
0.23	0.23	0.24	0.17	0.14	0.11	0.11	0.12	0.12	0.12
0.15	0.13	0.13	0.15	0.29	0.10	0.13	0.13	0.15	0.08
0.16	0.19	0.25	0.29	0.15	0.10	0.11	0.09	0.09	0.10
0.15	0.21	0.25	0.28	0.07	0.11	0.11	0.11	0.11	0.11
0.14	0.14	0.15	0.12	0.29	0.15	0.15	0.16	0.18	0.16
0.32	0.33	0.37	0.37	0.20	0.10	0.09	0.10	0.13	0.10
0.15	0.21	0.25	0.28	0.17	0.05	0.08	0.04	0.07	0.11
0.32	0.33	0.37	0.37	0.29	0.11	0.12	0.13	0.15	0.16
0.15	0.21	0.28	0.13	0.13	0.08	0.07	0.05	0.09	0.12
0.15	0.17	0.15	0.15	0.07	0.15	0.17	0.18	0.17	0.12
0.06	0.08	0.07	0.06	0.14	0.11	0.12	0.13	0.15	0.10
0.15	0.21	0.25	0.28	0.05	0.10	0.10	0.11	0.11	0.11
0.11	0.11	0.15	0.16	0.05	0.10	0.10	0.11	0.11	0.16
0.09	0.28	0.13	0.15	0.04	0.10	0.15	0.30	0.47	0.10
0.15	0.32	0.18	0.19	0.05	0.06	0.06	0.05	0.10	0.11
0.32	0.00	0.37	0.37	0.11	0.14	0.15	0.15	0.04	0.16
0.18	0.00	0.14	0.16	0.12	0.08	0.07	0.08	0.32	0.12
0.06	0.23	0.09	0.12	0.09	0.11	0.10	0.09	0.25	0.12
0.15	0.15	0.18	0.19	0.01	0.02	0.02	0.03	0.11	0.08
0.16	0.16	0.19	0.18	0.21	0.31	0.30	0.31	0.32	0.10
0.16	0.15	0.21	0.20	0.13	0.17	0.17	0.20	0.25	0.11
0.32	0.14	0.37	0.37	0.10	0.10	0.10	0.10	0.11	0.16
0.11	0.32	0.12	0.12	0.11	0.12	0.13	0.15	0.10	0.12
0.17	0.15	0.13	0.16	0.09	0.11	0.10	0.09	0.04	0.12
0.06	0.32	0.07	0.06	0.05	0.06	0.06	0.08	0.32	0.08
0.14	0.15	0.15	0.12	0.11	0.14	0.15	0.15	0.25	0.47

0.16	0.15	0.43	0.28	0.29	0.11	0.12	0.13	0.11	0.08
0.32	0.06	0.37	0.37	0.00	0.13	0.21	0.18	0.13	0.11
0.11	0.15	0.02	0.02	0.15	0.70	0.30	0.30	0.30	0.11
0.17	0.11	0.43	0.28	0.29	0.11	0.12	0.13	0.15	0.47
0.06	0.09	0.37	0.37	0.00	0.13	0.21	0.18	0.13	0.08
0.14	0.15	0.02	0.02	0.15	0.70	0.30	0.30	0.30	0.32
0.14	0.32	0.00	0.00	0.29	0.10	0.10	0.11	0.10	0.25
0.07	0.18	0.24	0.17	0.14	0.11	0.11	0.12	0.12	0.11
0.28	0.06	0.13	0.15	0.29	0.10	0.13	0.13	0.15	0.08

Raw Data

Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7a**	**Q7b**	**Q7c**
1.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	2.00	2.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	2.00	2.00	3.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	3.00	5.00	5.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	4.00	4.00	4.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	2.00	2.00
2.00	1.00	3.00	2.00	1.00	Operations Manager	1.00	3.00	2.00
1.00	1.00	2.00	1.00	1.00	Operations Manager	2.00	3.00	2.00
2.00	2.00	3.00	1.00	1.00	Operations Manager	3.00	4.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	4.00	4.00	#NULL!
1.00	3.00	3.00	1.00	3.00	Operations Manager	4.00	3.00	3.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	1.00	5.00	#NULL!
1.00	2.00	3.00	1.00	1.00	Operations Manager	1.00	1.00	1.00
1.00	3.00	3.00	1.00	3.00	Operations Manager	3.00	4.00	4.00

2.00	3.00	3.00	1.00	3.00	Operations Manager	4.00	4.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	5.00	4.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	2.00	4.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	2.00	4.00	4.00
1.00	2.00	2.00	1.00	1.00	Operations Manager	1.00	1.00	1.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	4.00	3.00	3.00
2.00	1.00	2.00	1.00	3.00	Operations Manager	5.00	4.00	4.00
1.00	1.00	2.00	2.00	1.00	Operations Manager	3.00	3.00	3.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	3.00	3.00	3.00
1.00	1.00	3.00	11.00	1.00	Operations Manager	4.00	4.00	4.00
1.00	1.00	1.00	1.00	2.00	Operations Manager	5.00	4.00	4.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	4.00	2.00	2.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	4.00	4.00	3.00
1.00	1.00	3.00	1.00	2.00	Operations Manager	5.00	5.00	5.00
1.00	3.00	2.00	2.00	3.00	Operations Manager	4.00	4.00	3.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	3.00	3.00
1.00	1.00	2.00	2.00	1.00	Operations Manager	4.00	4.00	4.00
1.00	2.00	3.00	1.00	3.00	Operations Manager	5.00	3.00	3.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	3.00	3.00	3.00
1.00	1.00	2.00	1.00	3.00	Operations Manager	3.00	3.00	3.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	4.00	5.00	5.00
2.00	1.00	2.00	11.00	1.00	Operations Manager	5.00	4.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	2.00	3.00
2.00	2.00	2.00	1.00	2.00	Operations Manager	4.00	4.00	4.00

1.00	1.00	3.00	1.00	1.00	Operations Manager	5.00	4.00	4.00
1.00	3.00	3.00	1.00	3.00	Operations Manager	5.00	4.00	4.00
1.00	1.00	3.00	1.00	2.00	Operations Manager	5.00	3.00	3.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	5.00	4.00	4.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	5.00	4.00	4.00
1.00	3.00	3.00	1.00	3.00	Operations Manager	3.00	4.00	4.00
22.00	1.00	2.00	1.00	1.00	Operations Manager	5.00	4.00	4.00
1.00	1.00	1.00	1.00	1.00	Operations Manager	4.00	4.00	4.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	4.00	5.00	5.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	4.00	4.00	4.00
1.00	33.00	3.00	1.00	3.00	Operations Manager	4.00	4.00	4.00
2.00	2.00	3.00	1.00	2.00	Operations Manager	3.00	5.00	5.00
1.00	3.00	3.00	1.00	3.00	Operations Manager	3.00	2.00	2.00
2.00	2.00	2.00	1.00	1.00	Operations Manager	3.00	3.00	3.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	4.00	3.00
2.00	2.00	2.00	1.00	2.00	Operations Manager	4.00	5.00	5.00
1.00	1.00	3.00	1.00	2.00	Operations Manager	4.00	5.00	5.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	5.00	5.00	5.00
1.00	2.00	3.00	1.00	1.00	Operations Manager	4.00	4.00	4.00
1.00	1.00	2.00	1.00	1.00	Operations Manager	4.00	4.00	3.00
2.00	2.00	3.00	1.00	2.00	Operations Manager	5.00	4.00	4.00
1.00	3.00	3.00	11.00	3.00	Operations Manager	4.00	5.00	5.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	4.00	3.00	3.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	4.00	4.00	4.00

1.00	1.00	3.00	1.00	1.00	Operations Manager	5.00	5.00	4.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	5.00	5.00
1.00	3.00	3.00	2.00	3.00	Operations Manager	5.00	1.00	2.00
11.00	2.00	2.00	1.00	1.00	Operations Manager	3.00	4.00	#NULL!
2.00	2.00	3.00	1.00	2.00	Operations Manager	5.00	3.00	3.00
11.00	3.00	3.00	1.00	2.00	Operations Manager	4.00	4.00	4.00
1.00	2.00	2.00	1.00	1.00	Operations Manager	2.00	3.00	3.00
1.00	3.00	3.00	1.00	3.00	Operations Manager	3.00	5.00	5.00
2.00	2.00	2.00	1.00	2.00	Operations Manager	3.00	5.00	5.00
1.00	3.00	3.00	1.00	2.00	Operations Manager	2.00	4.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	4.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	4.00	5.00	5.00
1.00	2.00	1.00	11.00	1.00	Operations Manager	3.00	4.00	3.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	#NULL!	#NULL!	#NULL!
1.00	1.00	3.00	1.00	1.00	Operations Manager	2.00	2.00	1.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	4.00	5.00	5.00
1.00	1.00	1.00	1.00	1.00	Operations Manager	4.00	4.00	5.00
2.00	2.00	3.00	1.00	2.00	Operations Manager	4.00	4.00	4.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	4.00	5.00	4.00
1.00	2.00	3.00	1.00	3.00	Operations Manager	5.00	5.00	4.00
2.00	1.00	2.00	1.00	1.00	Operations Manager	4.00	5.00	5.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	4.00	4.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	3.00	3.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	2.00	3.00	2.00

2.00	3.00	2.00	1.00	2.00	Operations Manager	5.00	4.00	4.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	5.00	3.00	5.00
1.00	1.00	2.00	1.00	1.00	Operations Manager	2.00	3.00	2.00
1.00	2.00	22.00	1.00	2.00	Operations Manager	4.00	5.00	5.00
1.00	2.00	2.00	1.00	1.00	Operations Manager	4.00	2.00	2.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	5.00	5.00	2.00
1.00	2.00	3.00	1.00	1.00	Operations Manager	4.00	4.00	4.00
2.00	3.00	3.00	1.00	3.00	Operations Manager	5.00	4.00	4.00
2.00	1.00	2.00	1.00	2.00	Operations Manager	4.00	5.00	5.00
2.00	2.00	3.00	1.00	2.00	Operations Manager	5.00	1.00	3.00
1.00	3.00	3.00	1.00	3.00	Operations Manager	5.00	4.00	4.00
1.00	33.00	2.00	1.00	2.00	Operations Manager	5.00	5.00	4.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	2.00	4.00	4.00
1.00	2.00	3.00	1.00	3.00	Operations Manager	5.00	4.00	4.00
1.00	2.00	2.00	1.00	1.00	Operations Manager	3.00	3.00	3.00
1.00	3.00	3.00	1.00	2.00	Operations Manager	3.00	5.00	5.00
2.00	1.00	2.00	1.00	1.00	Operations Manager	3.00	4.00	4.00
2.00	2.00	3.00	1.00	1.00	Operations Manager	4.00	3.00	3.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	5.00	4.00	4.00
1.00	22.00	3.00	1.00	3.00	Operations Manager	4.00	4.00	3.00
1.00	3.00	3.00	1.00	2.00	Operations Manager	4.00	3.00	3.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	4.00	4.00	4.00
2.00	1.00	1.00	1.00	1.00	Operations Manager	3.00	4.00	4.00
1.00	1.00	3.00	1.00	2.00	Operations Manager	4.00	4.00	3.00

1.00	3.00	3.00	1.00	2.00	Operations Manager	3.00	2.00	2.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	2.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	4.00	4.00	4.00
2.00	1.00	2.00	1.00	2.00	Operations Manager	4.00	5.00	5.00
2.00	2.00	3.00	1.00	1.00	Operations Manager	4.00	4.00	4.00
1.00	3.00	2.00	1.00	2.00	Operations Manager	3.00	3.00	3.00
2.00	1.00	3.00	1.00	3.00	Operations Manager	5.00	1.00	#NULL!
1.00	2.00	3.00	1.00	2.00	Operations Manager	3.00	4.00	4.00
2.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	2.00	4.00
1.00	2.00	2.00	1.00	1.00	Operations Manager	3.00	44.00	1.00
1.00	2.00	3.00	11.00	2.00	Operations Manager	3.00	3.00	3.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	4.00	4.00	4.00
2.00	1.00	2.00	1.00	1.00	Operations Manager	5.00	3.00	3.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	3.00	4.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	1.00	5.00	5.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	3.00	2.00	2.00
1.00	2.00	3.00	1.00	3.00	Operations Manager	5.00	5.00	5.00
1.00	1.00	2.00	1.00	1.00	Operations Manager	4.00	4.00	4.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	4.00	4.00	4.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	5.00	4.00	4.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	5.00	4.00	3.00
1.00	3.00	3.00	1.00	2.00	Operations Manager	5.00	4.00	4.00
1.00	3.00	3.00	1.00	3.00	Operations Manager	4.00	4.00	4.00
2.00	1.00	3.00	1.00	2.00	Operations Manager	3.00	4.00	4.00

1.00	2.00	2.00	1.00	1.00	Operations Manager	2.00	4.00	3.00
1.00	2.00	3.00	1.00	2.00	Operations Manager	3.00	4.00	4.00
2.00	1.00	3.00	1.00	2.00	Operations Manager	4.00	4.00	4.00
2.00	2.00	3.00	1.00	2.00	Operations Manager	5.00	4.00	4.00
1.00	1.00	3.00	1.00	1.00	Operations Manager	3.00	3.00	4.00
1.00	2.00	2.00	1.00	2.00	Operations Manager	4.00	4.00	4.00
2.00	2.00	3.00	1.00	2.00	Operations Manager	3.00	2.00	2.00
2.00	1.00	3.00	1.00	2.00	Operations Manager	3.00	3.00	3.00

Raw Data

Q8a	Q8b	Q8c	Q8d	Q8e	Q8f	Q9a	Q9b	Q9c	Q9d
1.00	2.00	5.00	4.00	4.00	5.00	5.00	5.00	5.00	3.00
3.00	3.00	4.00	3.00	4.00	4.00	5.00	5.00	5.00	5.00
4.00	4.00	3.00	3.00	4.00	4.00	4.00	4.00	2.00	3.00
3.00	4.00	4.00	5.00	5.00	5.00	4.00	4.00	3.00	3.00
3.00	4.00	5.00	4.00	5.00	5.00	3.00	3.00	5.00	2.00
3.00	5.00	2.00	1.00	4.00	5.00	5.00	4.00	2.00	1.00
5.00	5.00	5.00	5.00	5.00	5.00	2.00	3.00	4.00	4.00
3.00	4.00	5.00	5.00	3.00	5.00	5.00	5.00	4.00	4.00
#NULL!	5.00	1.00	3.00	4.00	5.00	5.00	5.00	5.00	5.00
4.00	2.00	4.00	2.00	5.00	2.00	4.00	2.00	4.00	5.00
5.00	4.00	3.00	3.00	5.00	5.00	5.00	5.00	5.00	5.00
2.00	4.00	4.00	1.00	2.00	5.00	3.00	5.00	4.00	5.00
4.00	4.00	3.00	4.00	4.00	5.00	5.00	5.00	4.00	4.00
4.00	4.00	4.00	3.00	3.00	4.00	4.00	4.00	3.00	4.00

3.00	2.00	4.00	5.00	2.00	4.00	5.00	2.00	4.00	3.00
2.00	2.00	2.00	3.00	3.00	3.00	5.00	5.00	5.00	5.00
4.00	4.00	5.00	4.00	5.00	5.00	4.00	5.00	5.00	5.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4.00	4.00	5.00	5.00	4.00	4.00	4.00	4.00	3.00	3.00
4.00	4.00	3.00	3.00	4.00	5.00	5.00	5.00	4.00	5.00
3.00	4.00	3.00	5.00	3.00	5.00	5.00	4.00	5.00	4.00
2.00	2.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00
2.00	3.00	2.00	2.00	3.00	5.00	3.00	4.00	5.00	5.00
2.00	2.00	1.00	2.00	3.00	5.00	5.00	5.00	4.00	4.00
3.00	5.00	2.00	4.00	2.00	4.00	3.00	5.00	2.00	4.00
3.00	5.00	3.00	3.00	4.00	5.00	3.00	4.00	3.00	5.00
3.00	3.00	3.00	3.00	3.00	4.00	3.00	4.00	3.00	5.00
3.00	4.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	5.00
4.00	4.00	4.00	2.00	4.00	5.00	4.00	5.00	5.00	5.00
2.00	4.00	4.00	3.00	4.00	4.00	3.00	4.00	4.00	4.00
4.00	4.00	4.00	5.00	5.00	3.00	3.00	4.00	4.00	2.00
3.00	3.00	4.00	4.00	3.00	3.00	4.00	4.00	3.00	3.00
3.00	3.00	4.00	3.00	4.00	3.00	4.00	4.00	5.00	4.00
4.00	4.00	3.00	3.00	4.00	5.00	5.00	5.00	4.00	4.00
3.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
2.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	3.00	5.00
4.00	5.00	5.00	5.00	5.00	5.00	5.00	4.00	5.00	5.00
2.00	3.00	3.00	2.00	3.00	5.00	3.00	5.00	2.00	4.00
3.00	5.00	3.00	2.00	5.00	3.00	4.00	2.00	4.00	5.00
5.00	4.00	5.00	3.00	4.00	5.00	1.00	5.00	3.00	5.00

3.00	4.00	5.00	5.00	5.00	5.00	3.00	3.00	3.00	2.00
4.00	4.00	4.00	5.00	5.00	4.00	4.00	4.00	4.00	5.00
3.00	3.00	3.00	3.00	3.00	3.00	5.00	5.00	5.00	5.00
4.00	4.00	4.00	5.00	5.00	5.00	4.00	4.00	5.00	5.00
5.00	5.00	5.00	5.00	5.00	5.00	4.00	4.00	5.00	4.00
4.00	3.00	5.00	5.00	4.00	4.00	4.00	3.00	5.00	4.00
5.00	5.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	5.00
4.00	4.00	2.00	5.00	5.00	1.00	4.00	4.00	2.00	2.00
4.00	4.00	5.00	4.00	5.00	4.00	5.00	4.00	5.00	5.00
3.00	3.00	3.00	3.00	4.00	5.00	4.00	4.00	4.00	5.00
4.00	3.00	4.00	3.00	5.00	5.00	5.00	4.00	5.00	2.00
4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	5.00
3.00	3.00	4.00	3.00	4.00	4.00	4.00	4.00	2.00	5.00
3.00	3.00	3.00	3.00	4.00	5.00	5.00	5.00	5.00	5.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	5.00
3.00	1.00	5.00	2.00	1.00	5.00	5.00	3.00	1.00	5.00
5.00	5.00	5.00	2.00	2.00	4.00	1.00	2.00	5.00	5.00
3.00	2.00	4.00	2.00	5.00	5.00	5.00	5.00	5.00	5.00
3.00	3.00	4.00	5.00	3.00	4.00	4.00	4.00	5.00	4.00
3.00	3.00	3.00	4.00	3.00	5.00	5.00	5.00	5.00	2.00
3.00	3.00	3.00	4.00	5.00	5.00	5.00	5.00	5.00	2.00
4.00	4.00	3.00	4.00	4.00	4.00	4.00	3.00	3.00	4.00
5.00	5.00	3.00	1.00	5.00	5.00	5.00	5.00	5.00	3.00
4.00	4.00	5.00	2.00	4.00	3.00	3.00	3.00	5.00	5.00
2.00	3.00	3.00	3.00	5.00	3.00	5.00	5.00	4.00	5.00
4.00	3.00	4.00	2.00	4.00	4.00	4.00	4.00	5.00	5.00
3.00	4.00	3.00	3.00	5.00	5.00	4.00	5.00	5.00	5.00

3.00	4.00	5.00	4.00	5.00	5.00	5.00	4.00	5.00	5.00
4.00	4.00	5.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00
2.00	3.00	3.00	2.00	3.00	5.00	2.00	2.00	2.00	3.00
3.00	4.00	4.00	4.00	4.00	5.00	3.00	4.00	4.00	5.00
4.00	5.00	5.00	3.00	5.00	5.00	4.00	5.00	5.00	5.00
3.00	3.00	3.00	3.00	4.00	4.00	3.00	3.00	3.00	3.00
#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!
4.00	5.00	4.00	5.00	4.00	5.00	4.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	5.00	4.00	4.00	5.00	5.00
5.00	5.00	4.00	4.00	5.00	2.00	4.00	4.00	5.00	5.00
5.00	5.00	4.00	4.00	5.00	3.00	3.00	4.00	4.00	5.00
4.00	4.00	4.00	5.00	5.00	5.00	4.00	4.00	5.00	5.00
5.00	4.00	4.00	3.00	4.00	5.00	3.00	4.00	5.00	4.00
4.00	3.00	4.00	5.00	3.00	5.00	3.00	3.00	4.00	5.00
4.00	3.00	4.00	4.00	4.00	4.00	3.00	4.00	5.00	5.00
3.00	3.00	3.00	2.00	2.00	5.00	5.00	5.00	5.00	2.00
2.00	3.00	2.00	3.00	2.00	3.00	4.00	4.00	4.00	4.00
4.00	5.00	5.00	4.00	4.00	5.00	4.00	4.00	5.00	5.00
4.00	4.00	4.00	4.00	4.00	4.00	3.00	3.00	3.00	3.00
4.00	4.00	5.00	3.00	2.00	4.00	5.00	4.00	4.00	5.00
4.00	4.00	5.00	4.00	5.00	5.00	4.00	4.00	5.00	4.00
4.00	4.00	5.00	4.00	5.00	4.00	5.00	4.00	5.00	5.00
3.00	4.00	4.00	2.00	3.00	2.00	2.00	2.00	#NULL!	5.00
2.00	3.00	3.00	2.00	3.00	4.00	3.00	4.00	5.00	4.00
4.00	4.00	3.00	5.00	5.00	2.00	3.00	3.00	4.00	5.00

4.00	4.00	3.00	4.00	4.00	5.00	5.00	5.00	4.00	4.00
2.00	2.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00
4.00	4.00	5.00	4.00	5.00	5.00	4.00	5.00	5.00	5.00
5.00	4.00	4.00	5.00	2.00	2.00	4.00	4.00	5.00	5.00
2.00	3.00	3.00	2.00	3.00	5.00	2.00	2.00	2.00	3.00
4.00	4.00	3.00	4.00	4.00	4.00	4.00	3.00	4.00	5.00
4.00	4.00	4.00	4.00	3.00	5.00	3.00	5.00	4.00	5.00
5.00	5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	4.00
5.00	4.00	4.00	2.00	4.00	4.00	3.00	4.00	4.00	4.00
3.00	3.00	4.00	3.00	4.00	5.00	4.00	5.00	4.00	3.00
4.00	4.00	4.00	3.00	4.00	5.00	5.00	5.00	4.00	4.00
3.00	3.00	4.00	3.00	4.00	3.00	5.00	5.00	5.00	5.00
5.00	5.00	4.00	4.00	3.00	4.00	2.00	2.00	4.00	5.00
5.00	4.00	4.00	4.00	4.00	5.00	3.00	5.00	4.00	5.00
2.00	2.00	4.00	4.00	5.00	4.00	5.00	5.00	2.00	5.00
3.00	5.00	3.00	3.00	4.00	5.00	5.00	4.00	3.00	5.00
4.00	4.00	5.00	4.00	5.00	4.00	5.00	4.00	5.00	5.00
4.00	5.00	2.00	4.00	2.00	5.00	5.00	5.00	4.00	5.00
4.00	4.00	4.00	4.00	5.00	5.00	4.00	5.00	5.00	5.00
4.00	4.00	3.00	4.00	4.00	4.00	4.00	3.00	3.00	5.00
4.00	5.00	5.00	4.00	5.00	4.00	3.00	4.00	5.00	5.00
3.00	3.00	3.00	3.00	4.00	5.00	4.00	4.00	4.00	5.00
4.00	4.00	5.00	5.00	5.00	5.00	5.00	4.00	4.00	4.00
3.00	4.00	5.00	5.00	4.00	5.00	5.00	5.00	4.00	4.00
4.00	5.00	2.00	4.00	2.00	5.00	5.00	5.00	4.00	5.00
4.00	4.00	4.00	4.00	1.00	1.00	4.00	4.00	4.00	4.00
4.00	3.00	4.00	4.00	3.00	4.00	4.00	4.00	5.00	5.00

5.00	5.00	4.00	4.00	5.00	3.00	5.00	5.00	3.00	5.00
4.00	5.00	5.00	3.00	5.00	5.00	4.00	5.00	5.00	5.00
3.00	4.00	4.00	4.00	4.00	5.00	3.00	4.00	4.00	5.00
5.00	4.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00
4.00	4.00	5.00	4.00	5.00	4.00	5.00	4.00	5.00	5.00
4.00	4.00	3.00	3.00	5.00	5.00	4.00	4.00	5.00	3.00
3.00	5.00	5.00	4.00	4.00	5.00	5.00	5.00	4.00	5.00
4.00	4.00	3.00	3.00	5.00	3.00	4.00	4.00	5.00	5.00
4.00	4.00	4.00	3.00	2.00	3.00	3.00	4.00	4.00	5.00
4.00	4.00	5.00	4.00	5.00	4.00	5.00	4.00	5.00	5.00
3.00	3.00	4.00	5.00	2.00	5.00	5.00	5.00	3.00	3.00
4.00	4.00	3.00	4.00	3.00	4.00	4.00	4.00	5.00	5.00
5.00	4.00	4.00	2.00	4.00	4.00	4.00	5.00	5.00	5.00
3.00	3.00	3.00	3.00	2.00	2.00	5.00	4.00	5.00	5.00
3.00	4.00	5.00	5.00	3.00	5.00	5.00	5.00	4.00	4.00
4.00	4.00	3.00	3.00	4.00	4.00	5.00	5.00	3.00	3.00
4.00	4.00	4.00	3.00	2.00	3.00	3.00	4.00	4.00	5.00
3.00	3.00	2.00	3.00	2.00	3.00	5.00	5.00	5.00	5.00
4.00	4.00	4.00	4.00	4.00	5.00	3.00	5.00	5.00	5.00
3.00	4.00	2.00	5.00	2.00	4.00	4.00	2.00	4.00	5.00
3.00	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00

Raw Data

Q10a 1	Q10a 2	Q10a 3	Q10a 4	Q10a5	Q10a 6	Q10b1	Q10b2	Q10b3	Q10b4	Q10b5
3.00	4.00	4.00	5.00	5.00	5.00	4.00	4.00	4.00	5.00	5.00
2.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	3.00	5.00	3.00

3.00	3.00	3.00	4.00	4.00	5.00	2.00	4.00	5.00	3.00	1.00
3.00	4.00	4.00	4.00	3.00	4.00	5.00	5.00	5.00	4.00	4.00
3.00	2.00	1.00	2.00	4.00	5.00	5.00	3.00	5.00	4.00	5.00
1.00	2.00	2.00	3.00	5.00	4.00	4.00	1.00	2.00	3.00	1.00
2.00	3.00	3.00	2.00	3.00	3.00	1.00	2.00	3.00	3.00	3.00
3.00	3.00	2.00	2.00	#NULL!	5.00	3.00	3.00	4.00	3.00	2.00
1.00	1.00	1.00	2.00	4.00	4.00	2.00	1.00	4.00	4.00	4.00
3.00	5.00	2.00	4.00	2.00	4.00	1.00	1.00	1.00	2.00	3.00
5.00	4.00	4.00	5.00	4.00	5.00	4.00	3.00	4.00	4.00	5.00
2.00	2.00	2.00	1.00	1.00	5.00	4.00	4.00	4.00	3.00	4.00
4.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	3.00	3.00	4.00
3.00	3.00	4.00	4.00	3.00	2.00	4.00	4.00	2.00	3.00	3.00
1.00	1.00	1.00	1.00	5.00	4.00	2.00	1.00	3.00	1.00	3.00
2.00	2.00	3.00	2.00	3.00	2.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	4.00	2.00	5.00	5.00	4.00	3.00	5.00	2.00	4.00
4.00	4.00	4.00	5.00	4.00	5.00	2.00	2.00	4.00	4.00	5.00
3.00	3.00	4.00	1.00	1.00	3.00	3.00	3.00	#NULL!	4.00	3.00
4.00	5.00	4.00	4.00	4.00	5.00	#NULL!	5.00	4.00	5.00	4.00
5.00	4.00	3.00	4.00	3.00	3.00	4.00	2.00	4.00	3.00	#NULL
2.00	2.00	2.00	2.00	2.00	3.00	3.00	5.00	3.00	4.00	3.00
3.00	2.00	3.00	3.00	4.00	3.00	5.00	5.00	5.00	3.00	4.00
3.00	3.00	4.00	4.00	3.00	1.00	4.00	5.00	5.00	4.00	#NULL!
1.00	1.00	1.00	2.00	5.00	3.00	2.00	1.00	2.00	1.00	3.00
3.00	3.00	3.00	2.00	4.00	4.00	3.00	4.00	4.00	2.00	4.00
3.00	3.00	2.00	3.00	2.00	3.00	5.00	3.00	5.00	3.00	3.00

4.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	5.00	3.00	5.00
3.00	3.00	3.00	2.00	4.00	4.00	2.00	4.00	4.00	2.00	3.00
3.00	2.00	3.00	3.00	4.00	4.00	5.00	2.00	2.00	5.00	5.00
4.00	3.00	3.00	4.00	5.00	4.00	4.00	3.00	4.00	4.00	4.00
3.00	3.00	2.00	2.00	3.00	4.00	4.00	3.00	4.00	3.00	4.00
2.00	2.00	2.00	3.00	2.00	5.00	4.00	5.00	5.00	5.00	#NULL!
3.00	3.00	3.00	4.00	4.00	3.00	2.00	3.00	3.00	4.00	4.00
4.00	3.00	4.00	3.00	4.00	4.00	3.00	2.00	3.00	3.00	3.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	2.00
3.00	3.00	4.00	3.00	4.00	4.00	5.00	4.00	4.00	4.00	5.00
4.00	4.00	3.00	4.00	5.00	5.00	4.00	5.00	4.00	4.00	5.00
1.00	2.00	3.00	3.00	4.00	2.00	4.00	3.00	3.00	3.00	4.00
5.00	3.00	5.00	4.00	2.00	5.00	5.00	3.00	4.00	4.00	3.00
2.00	5.00	5.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	2.00
2.00	3.00	2.00	3.00	2.00	3.00	4.00	4.00	5.00	5.00	1.00
3.00	3.00	3.00	4.00	4.00	3.00	5.00	4.00	4.00	4.00	4.00
4.00	4.00	5.00	3.00	2.00	5.00	2.00	3.00	4.00	3.00	5.00
4.00	4.00	3.00	3.00	2.00	4.00	3.00	4.00	4.00	3.00	4.00
3.00	2.00	3.00	2.00	4.00	4.00	3.00	4.00	5.00	5.00	3.00
3.00	4.00	5.00	4.00	4.00	4.00	4.00	4.00	3.00	5.00	5.00
3.00	3.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	4.00	4.00
3.00	3.00	2.00	4.00	3.00	5.00	4.00	4.00	4.00	3.00	3.00
3.00	3.00	3.00	2.00	5.00	5.00	4.00	2.00	4.00	2.00	5.00
3.00	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	5.00
2.00	2.00	2.00	1.00	4.00	4.00	4.00	5.00	5.00	1.00	5.00
3.00	3.00	4.00	4.00	3.00	2.00	2.00	4.00	4.00	3.00	3.00
3.00	3.00	4.00	4.00	3.00	5.00	5.00	5.00	5.00	4.00	5.00
1.00	2.00	2.00	3.00	4.00	3.00	5.00	5.00	5.00	4.00	4.00

3.00	2.00	3.00	2.00	5.00	4.00	2.00	4.00	4.00	2.00	4.00
1.00	1.00	2.00	1.00	5.00	5.00	1.00	5.00	5.00	1.00	5.00
3.00	3.00	4.00	2.00	3.00	4.00	1.00	2.00	2.00	4.00	4.00
4.00	5.00	3.00	2.00	3.00	4.00	3.00	3.00	4.00	4.00	4.00
3.00	4.00	4.00	3.00	4.00	4.00	5.00	3.00	3.00	4.00	4.00
2.00	2.00	2.00	3.00	4.00	4.00	4.00	4.00	2.00	5.00	2.00
2.00	2.00	3.00	3.00	3.00	4.00	4.00	4.00	5.00	1.00	5.00
2.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	2.00	3.00
1.00	4.00	1.00	5.00	5.00	5.00	5.00	4.00	5.00	2.00	5.00
4.00	4.00	3.00	3.00	2.00	5.00	3.00	3.00	4.00	3.00	4.00
3.00	2.00	3.00	4.00	3.00	4.00	2.00	3.00	4.00	3.00	5.00
4.00	4.00	4.00	4.00	5.00	5.00	4.00	3.00	5.00	4.00	3.00
3.00	3.00	3.00	2.00	4.00	4.00	3.00	5.00	5.00	2.00	4.00
3.00	3.00	4.00	3.00	2.00	5.00	3.00	5.00	3.00	4.00	3.00
3.00	4.00	4.00	3.00	3.00	4.00	4.00	4.00	3.00	3.00	3.00
1.00	1.00	3.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	4.00
3.00	3.00	4.00	3.00	3.00	4.00	4.00	4.00	3.00	4.00	4.00
3.00	5.00	5.00	4.00	3.00	5.00	4.00	4.00	5.00	5.00	5.00
3.00	2.00	3.00	2.00	5.00	5.00	5.00	3.00	4.00	3.00	4.00
#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!	#NULL!
3.00	3.00	2.00	3.00	4.00	4.00	2.00	3.00	2.00	4.00	3.00
3.00	2.00	3.00	3.00	4.00	4.00	3.00	4.00	5.00	3.00	5.00
2.00	2.00	3.00	3.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00
4.00	4.00	4.00	3.00	3.00	4.00	4.00	4.00	5.00	5.00	5.00
4.00	4.00	3.00	3.00	4.00	4.00	3.00	4.00	4.00	3.00	4.00
3.00	2.00	2.00	4.00	4.00	3.00	4.00	4.00	4.00	3.00	5.00
3.00	2.00	4.00	3.00	2.00	4.00	1.00	2.00	3.00	2.00	2.00
3.00	3.00	4.00	3.00	4.00	4.00	4.00	3.00	5.00	3.00	3.00
2.00	3.00	2.00	2.00	2.00	2.00	3.00	4.00	3.00	3.00	3.00

2.00	2.00	2.00	2.00	2.00	2.00	2.00	4.00	5.00	3.00	4.00
2.00	2.00	3.00	3.00	3.00	3.00	5.00	5.00	4.00	4.00	3.00
2.00	2.00	2.00	3.00	4.00	3.00	5.00	5.00	5.00	1.00	5.00
2.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
3.00	2.00	3.00	2.00	4.00	4.00	3.00	4.00	5.00	3.00	5.00
3.00	3.00	3.00	2.00	3.00	4.00	3.00	4.00	3.00	5.00	3.00
2.00	2.00	2.00	1.00	3.00	3.00	4.00	5.00	5.00	2.00	5.00
2.00	2.00	3.00	3.00	4.00	4.00	5.00	4.00	4.00	4.00	4.00
3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	#NULL!	4.00
3.00	3.00	4.00	3.00	2.00	2.00	3.00	3.00	4.00	2.00	4.00
3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00
4.00	4.00	4.00	3.00	5.00	5.00	4.00	3.00	5.00	2.00	4.00
3.00	4.00	4.00	3.00	4.00	4.00	4.00	3.00	3.00	4.00	4.00
1.00	1.00	3.00	3.00	4.00	3.00	3.00	3.00	2.00	3.00	3.00
4.00	3.00	3.00	4.00	2.00	3.00	2.00	3.00	3.00	3.00	4.00
3.00	3.00	3.00	2.00	4.00	4.00	2.00	4.00	4.00	2.00	4.00
4.00	5.00	5.00	3.00	5.00	5.00	4.00	4.00	4.00	3.00	5.00
3.00	3.00	3.00	3.00	4.00	4.00	4.00	5.00	3.00	4.00	3.00
2.00	2.00	2.00	3.00	3.00	4.00	3.00	4.00	4.00	3.00	5.00
3.00	3.00	4.00	3.00	4.00	4.00	5.00	4.00	4.00	4.00	5.00
2.00	2.00	2.00	2.00	4.00	4.00	4.00	4.00	3.00	4.00	3.00
3.00	4.00	4.00	3.00	5.00	2.00	2.00	2.00	4.00	2.00	4.00
3.00	4.00	4.00	2.00	4.00	4.00	2.00	4.00	5.00	2.00	4.00
4.00	4.00	2.00	4.00	5.00	5.00	2.00	4.00	4.00	3.00	3.00
3.00	3.00	3.00	2.00	4.00	4.00	3.00	4.00	2.00	4.00	3.00
3.00	3.00	3.00	2.00	3.00	4.00	4.00	2.00	3.00	2.00	4.00
4.00	2.00	2.00	1.00	4.00	4.00	5.00	4.00	5.00	3.00	3.00
4.00	4.00	4.00	2.00	4.00	4.00	3.00	4.00	4.00	2.00	3.00
2.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	4.00	5.00	2.00

4.00	3.00	3.00	2.00	4.00	4.00	3.00	#NULL!	4.00	3.00	5.00
3.00	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	5.00
2.00	1.00	2.00	2.00	4.00	4.00	5.00	4.00	4.00	5.00	5.00
3.00	3.00	4.00	3.00	3.00	4.00	3.00	3.00	4.00	3.00	4.00
5.00	4.00	4.00	1.00	5.00	5.00	5.00	4.00	5.00	3.00	3.00
1.00	1.00	1.00	1.00	4.00	4.00	1.00	2.00	4.00	4.00	4.00
2.00	2.00	2.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00	3.00
3.00	4.00	4.00	3.00	4.00	4.00	2.00	3.00	3.00	4.00	4.00
4.00	4.00	4.00	5.00	5.00	5.00	#NULL	#NULL!	#NULL	#NULL!	#NULL
3.00	3.00	4.00	3.00	3.00	4.00	4.00	4.00	3.00	4.00	4.00
3.00	4.00	2.00	3.00	4.00	5.00	4.00	3.00	4.00	3.00	5.00
3.00	3.00	3.00	2.00	3.00	4.00	4.00	2.00	3.00	2.00	2.00
4.00	3.00	3.00	3.00	4.00	4.00	2.00	3.00	3.00	3.00	4.00
33.00	3.00	3.00	4.00	3.00	4.00	4.00	5.00	4.00	4.00	3.00
3.00	3.00	3.00	4.00	4.00	4.00	5.00	5.00	3.00	3.00	4.00
3.00	3.00	3.00	4.00	4.00	3.00	4.00	3.00	5.00	5.00	3.00
3.00	3.00	3.00	2.00	3.00	4.00	5.00	2.00	3.00	2.00	5.00
3.00	3.00	4.00	4.00	3.00	3.00	2.00	2.00	3.00	4.00	4.00
4.00	4.00	5.00	2.00	4.00	4.00	1.00	2.00	3.00	3.00	5.00
3.00	3.00	3.00	3.00	4.00	5.00	4.00	3.00	5.00	4.00	3.00
2.00	2.00	2.00	1.00	2.00	4.00	4.00	4.00	4.00	1.00	3.00
3.00	3.00	4.00	3.00	3.00	4.00	3.00	3.00	4.00	3.00	4.00
3.00	3.00	2.00	4.00	4.00	4.00	3.00	4.00	4.00	5.00	4.00
3.00	3.00	3.00	4.00	4.00	3.00	4.00	3.00	5.00	5.00	3.00
2.00	2.00	2.00	2.00	4.00	4.00	4.00	4.00	5.00	1.00	4.00
3.00	3.00	3.00	2.00	4.00	4.00	2.00	4.00	4.00	3.00	4.00
1.00	1.00	1.00	1.00	4.00	3.00	2.00	1.00	4.00	2.00	3.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00

Appendix IV: MUERC Approval to Collect Data

MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

Tel: +254 057 351 622 Ext: 3050
Fax: +254 057 351 221

Private Bag – 40105, Maseno, Kenya
Email: muerc-secretariate@maseno.ac.ke

REF: MSU/DRPI/MUERC/01045/22 **Date**: 5th May, 2022

TO: Olivia Adhiambo Achieng
PHD/BE/00028/2017
Department of Accounting and Finance
School of Business and Economics
Maseno University
P. O. Box, Private Bag, Maseno, Kenya

Dear Madam,

RE: Influence of Real Estate Investment Strategies, Financial Literacy and Behavioral Biases on Financial Performance of Registered Real Estate Investment Firms in Nairobi County, Kenya

This is to inform you that **Maseno University Ethics Review Committee (MUERC)** has reviewed and approved your above research proposal. Your application approval number is MUERC/01045/22.The approval period is 5th May, 2022 – 4th May, 2023.

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by Maseno University Ethics Review Committee (MUERC).
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to Maseno University Ethics Review Committee (MUERC) within 24 hours of notification.
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to Maseno University Ethics Review Committee (MUERC) within 24 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to Maseno University Ethics Review Committee (MUERC).

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

Yours sincerely

MASENO UNIVERSITY ETHICS REVIEW COMMITTEE 05 MAY 2022

Prof. Philip O. Owuor, PhD, FAAS, FKNAS
Chairman, MUERC

MASENO UNIVERSITY IS ISO 9001: 2015 CERTIFIED