INFLUENCE OF INVESTMENT RISK HEDGING ON PERFORMANCE OF REAL ESTATE FIRMS IN MERU COUNTY- KENYA

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DECLARATION AND RECOMENDATION

Declaration

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

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MSFI-3-1218-2/2019

Recommendation

This thesis has been submitted for examination with our approval as university supervisors.

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DEDICATION

To my wife Mercy, and children Victor and Keziah who have been very patient with me as I worked on this thesis.

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ABSTRACT

The real estate investments outperform most asset classes for over a decade and thus attracting many investors. It is one of the sectors contributing greatly to the gross domestic product of many nations. However, risks such as market risk, liquidity risk, leverage risk and interest rate risk may largely affect the performance of real estate firms. These risks affect the real estate investments globally, but Kenya experiences high uncertainty of returns due to market volatility and economic fluctuations. This study aimed to assess the influence of Investment risk hedging on the performance of real estate firms in Meru County. The objectives were to examine the influence of Market risk, interest rate risk, leverage risk and liquidity risk hedging on the performance of the real estate firms. The study adopted three theories, that is; Modern Portfolio Theory, the Market Interest Rates Theory and the Classical Theory of Interest Rates. The descriptive survey design was utilized to collect data using questionnaires. The sample size of 131 officers was arrived at using Krejcie and Morgan. Stratified random sampling method was used to select number of participants in each stratum identified by Krejcie and Morgan formula. The senior managers, financial officers, operations officers, risk officers and sales officers were the units of observation who gave the information required. To test the instruments' reliability and validity 14 questionnaires were pretested at 3 real estate firms in TharakaNithi County using random sampling method to select the participants. SPSS version 23 and Excel were used to examine the data. This study made use of descriptive statistics including frequencies and percentages tables and figures to present the study findings. In addition, inferential statistics such as Regression, and ANOVA were used to present the results. The results indicated that market risk had a significant influence on revenues growth but low influence on ROE, ROA and NOI. Most firms failed to apply financial innovations such as currency swaps and futures to hedge against risk. Interest rate risk hedging had a statistically significant influence on ROE. Hedging strategies such as swaps were very uncommon. Liquidity risk hedging had the highest positive influence NOI and ROE and less influence on ROA. Leverage risk hedging had a significant high positive influence on ROA and revenue growth but and very low influence on ROE. The researcher developed a risk hedging appraisal tool and proposed special, homemade derivatives (Straw belly swaps, and Vanilla futures) for hedging financial risks in real estate in Merucounty, Kenya and developing countries. The study recommended training of real estate firms about financial innovations such as currency swaps and futures to hedge against risk. Maintenance of a well-balanced capital structure as well as diversification was also recommended. A further study on the effectiveness of hedging strategiessuch as straw belly swaps, and Vanilla futures,on real estate firm'sperformance was recommended. It contributed to the existing body of knowledge, the theory and in the practice of Investment risk hedging.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

APA   American Psychological Association.

CIR   Cost Income Ratio

CBK   Central Bank of Kenya

EARB   Estate Agents Registration Board

G.D.P   Gross Domestic Product

GPM   Gross Profit Margin

KNBS   Kenya National Bureau Of Statistics

KPDA   Kenya Property Developers Association

MPT   Modern Portfolio Theory

NOI   Net Operating Income

NACOSTI   National Commission for Science &Technology

NSE   Nairobi Stocks Exchange

ROI   Return on Investment

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Globally, real estate has become a booming sector attracting many investors (Ping & Jalil, 2019). It is predicted by the UN that forwards to the year 2030, at least 60% of Eight point three billion people in the world will live in cities (Glandolini, 2019). The projections predict the need for buildings and housing. Real-estate investments involve adding value to land then renting the properties or selling with the aim of making profits. So, it involves buying properties, holding and renting or selling. It meets one of major three basic human needs of shelter commonly referred as housing (Werede, 2022). Investment means allocating funds to the asset with an expectation to earn returns and appreciation of capital. However, investments involve some level of risks which influence achievement of the investor goals and objectives.

While, real estate investors have a major aim of receiving high returns on their capital invested, financial risk affect the investment performance leading to high uncertainties. Demand and supply side of real estate is affected by many factors which vary depending on the types of real estate. The demand side is affected by factors such as buyer characteristics, interest rate and real incomes while supply side is affected by cost of materials, government policies among others. Since 2000's the real estate investments in Kenya have been on high growth and major cities such as Nairobi have attracted major developments. This growth can be attributed to increasing industrial activity, demand for housing and office spaces. However, financial risk factors largely hamper the growth of the firms that deal with these

investments affecting their ability to achieve their objectives and to make profit (Lenee & Oki, 2017).

Real estate is more than a house for shelter; it includes office spaces, residential houses, hospitals, apartments, industrial plants, supermarkets, five-star hotels among others. Real estate is defined as land and any property above it (Nguyen et al., 2019). It includes Household, corporate, and manufacturing property investment are all types of real estate. With increased business growth and operations, therefore, real estate's has become an essential asset and driver of economic growth (Wahidet al., 2018). It may include commercial real estates, residential real estate, industrial real estate, logistics spaces and shopping malls among others. Many investors are attracted to real estate investments due to their perceived low risk on capital invested unlike investments in other financial instruments such as stocks and bonds (Baum, 2019).

1.1.1 Investment risk hedging

Hedging involves any management strategy meant to reduce or limit risk of loss in financial assets either through management strategies, buying or selling of assets.Investment risk hedging is one core goal of Enterprise risk management. It involves assessing business risk, establishing a team, implementing risk mitigation plan, monitoring and evaluating risk management process and preparing a report to frequently inform management decisions (Septyanto & Nugraha, 2021). Assessment of risk involves identifying possible risk that may affect a firm, their probability or likelihood of occurrence and the influence on the firm performance (Soltanizadeh et

al., 2019). Some risks have high likelihood of occurrence and their consequences are very harmful to a firm's performance. Such risk should be given high priority and mitigation measures implemented. Other risk may have high likelihood of occurrence but have low influence on firm performance. Therefore risk must be classified according to their probability of occurrence and the effects they have on the firm (Shatnawi & Eldaia, 2020). The organization need to identify the right talents, competent and skilled in risk management through careful selection and recruitment process. This team needs to develop and implement a risk mitigation plan. This involves evaluating the risk impact carrying out internal controls, monitoring legal and regulatory frameworks, determining risk mitigation responses as well as preparing and sharing the risk mitigation report (K'Akumu, 2022). Once the plan is ready, the process continues where monitoring and evaluation risk of the management process as well as communicating and reporting to inform decisions (Septyanto & Nugraha, 2021).

Financial risk in real estate may be broadly classified into systematic risk-which is defined as the risk that can be controlled by the firms through proper hedging. The second classification is unsystematic risk that is risks that are caused by the external factors and cannot be controlled directly through hedging efforts(Amoo et al., 2023). Specifically, the risks affecting real estate include credit risk which affects the properties' ability to generate income over its life. The occupancy rates and the tenant's turnover rates are also risk that may affect the level of incomes generated from the properties (Fields, 2017; Immergluck et al., 2020).

Further, liquidity risk is an inherent risk since real estate is an asset class which by nature has high liquidity risk due to inability to easily and readily convert the assets into cash. A firm without adequate cash flow falls into financial distress and operational in-sustainability. This may largely affect the investment performance.

Further, structural risk and regulation risk largely affect the real estate firms (Bianchi et al., 2018). Structural risk involves the way the property has been constructed; that is whether it adhered to the right construction authority regulations (Deng et al., 2018). Also, it may be built in areas that face environmental risk such as water catchment areas which may lead to demolition. In addition, a poorly constructed building can lead high maintenance cost (Han et al., 2021). Secondly, regulation risk also referred to as legislative risk may arise due to poor due-diligence on the land; the government may repossess the property while the legal procedures are on course. This may affect especially the property buyer and the business significantly (K'Akumu, 2022).

Further, asset level risk depends on the asset type or class; for instance residential multifamily houses are considered low risk though they yield low returns compared to hotels which are seasonal in nature which yields high returns some seasons (Block, 2021). It is assumed that the higher the risks of the asset, the higher are its returns. On the other hand, consumer demand for office spaces may be high than that of shopping malls (Mieg, 2022). So, these demand and supply side factors may be explained by asset level as well as the seasonal changes in demand of the housing units. For instance, in December most Hotels are full of tourist thus increasing cash

flow generated unlike in January when they may suffer the "January effect" (Pyhrr , 2019).

Meng et al. (2014) observed that real estate business may be largely affected by market risk. During recessions like that of 2008 the value of the investment went down. For instance, during Covid 19 most office apartments were negatively affected as most people worked from home (Shim et al., 2020). With low occupancy rates, and tenants unable to pay rent or fulfill their lease agreements the businesses are unable to meet their debts obligations when they become due (Martins et al., 2016).

Additionally, High cost of materials may work for or against real estate investments. The level of inflation and economic factors affects the potential customer's disposable income and also interest rates(Pitelli Britto et al., 2021). During inflation a general rise in prices of goods and services means that the cost materials, labor and the other expenses equally goes up(Alcock& Steiner, 2019). These raise the operational cost while slowing down construction of new properties. However, on the other hand; the value of property may rise as rent prices increases. This may affects the occupancy rates (Zhu &Lizieri, 2022).

According to Elile (2019), market risk includes demographics, government regulations, and as interest rate fluctuations. Also a firm which is not able to generate enough cash flows to cover the monthly debt payments is vulnerable to cash-flow risk (Kader et al., 2022). Having problem tenants who don't pay on time is major challenge on cash flows to the firms. Consequently, financial risk may arise as results

of over-leveraging. Leverage involves the use of debts. Use of debts above what the firms asset can cover leads to the firms inability to meet its debts obligations whenever they fall due (Huy et al., 2021).

Further, the viability of property developments in Kenya is challenging to anticipate due to the such risk and uncertainty of returns (Kamweru & Ngui, 2019). However, the good performance of the real estate investment can attract more investors thus causing a paradigm shift in this industry. This study examines the quantitative aspects and qualitative aspects of Investment risk hedging. Market, interest rate, liquidity and Leverage risk hedging were the independent variables being examined. The variables were selectively chosen after thorough review of literature regarding real-estate firm performance globally regionally and locally. The variables chosen were both not fully explored; there were methodological gaps and contextual gaps in other studies that used similar. This therefore necessitated the study of the reviewof these variables to find out how they influenced firm performance in real estate sector. Some of the studies that used some of these variables include (Abdul Jalil & Ali, 2015; Atta Mills et al., 2021; Deng et al., 2018; Deng & Ong, 2020; Endri et al., 2021; Fecht &Wedow, 2014; Luqman Hakim, 2017; Ma'in et al., 2016).

1.1.2 Performance of Real Estate Investments

Real estate firm performance refers to the firm'scapabilityto generate revenues and achieve the investor's strategic goals and objectives. It is composed of operational efficiency, ability to satisfy customers and high occupancy rates (Deng et al., 2019). The financial metrics utilizes the accounting information and include return on

Investments (ROI)-hedging efficiency and return on equity (ROE) among others (Amoo et al., 2023). While non-financial metrics include the innovations, asset demand, value addition and quality.

The main goal of any investor is profit maximization and wealth maximization (Daryanto et al., 2018). Therefore, the shareholders are focused with the revenue growth, (ROE), (ROA) and Net operating Income (NOI). which form the measures of performance in this study (Lausberg et al., 2019). According to Vierra (2020),performance is a parameter of financial success by entrepreneurs in recognition of the initial outlay. He adds that performance is measured by revenue realization that is Net income, assets capitalization apportioned by (ROE) that is arrived at by dividing Net income by equity. Among the other measures of Performance, most investors analyze the viability of their investments using the two (Septyanto&Nugraha, 2021).

According to Atta Mills et al. (2021), the key performance indicator metrics used by real estate agents, include revenue growth, client feedback ratings, sold homes per available inventory, the number of properties advertised and listing to meeting ratio which shows

how effectively the real estate agent is using time to acquire listings (Atta Mills et al., 2021). In this study firm performance is measured using four indicators which are (ROA), (ROE), and Net operating Income (NOI) and revenue growth. According to Qing et al. (2016),a strong real estate agent is expected to absorb the economic shocks and thrive to make a profit amid risk. Further, in case the expected returns exceed the risk in real estate investments then the investors preferdirecting all their

investments to real estate and rather than other investments. This further leads to economic growth (Fabozzi et al., 2022).

Sing (2019) summarizes real estate performance into objective measures and subjective measures. The objective measurements involve using of the accounting information to determine performance while the subjective measures include the manager's perception of the investments performance (Achieng, 2022).However, there are a number of factors that drive real estate investment performance, including location, prices, operational efficiency and hedging efficiency among others(Wilkinson & Sayce, 2020). But these factors vary from country to country. For instance, the ever-increasing population and need for affordable housing in Kenya drives the sector growth, notwithstanding financial risk affecting them (Achieng, 2022).

Despite increased constructions there is a dearth of data on real estate firm performance in Kenya (K'Akumu, 2022). Meru County has witnessed high developments in commercial, residential and industrial properties, but there are no clear indicators of real estate firm performance in Meru County. Measuring real estate firm performance through ROA, ROE, NOI and revenue growth the researcher assessed the Investment risk hedging influence on firm performance in Meru.

1.1.3 Real Estate's Global and Local Overview

Globally real estate has been a major pillar of the economic growth. For instance, in US it contributes to 28% the national economy in Germany, 25%, and 15% in Italy and France respectively (Fecht&Wedow, 2021). In Europe the listed real estate

companies had a market value of above 411million US dollars by2021(Holtermans & Kok, 2019). Real estate is classified into Class A, Class B and Class C. Class A are of high quality, furnished with the most current features, built within major towns and ages between 0-10 years. They provides parking lots have very low or no vacancy rates and demands high rent due their high quality(Mu et al., 2017). While class B ages 10-20 years have a fair appeal are occupied by smaller or local businesses. Class B can be upgraded to class A. Class C are occupied by smaller businesses and are 20 years and above in need of improvements and have high maintenance cost. Class C can be improved to class B through renovations and value addition(Wilkinson & Sayce, 2020).

The best real estate investment alternative in European market is warehouse and office. While in Asia the commercial real estate is largely affected by the interest rate fluctuations and operational inefficiencies which results to liquidity problems(Kotabe & Helsen, 2022). However, Investors engage robust risk mitigation strategies in order thrive during hard times. Further, real estate investments growth in Asia is attributed to growth in retail hotels and entertainment theaters and commercial economic services e.g., hospitals and schools.

Conversely, China's, real estate has been linked with economic growth contributing to at least 16.4% of its Gross domestic product. In 2017 alone there was a total of 13.37 trillion (RMB) Chinese renminbi attributed to real estate transactions (Jun, 2020). In China, real estate was negatively affected by the pandemic where housing prices fluctuated significantly to an 18-month low thus causing lag in constructions

and reduced prices (Li et al., 2016). By 2022, Developed cities like Singapore experienced lower growth due to high material costs driving up the construction cost, while tighter labor laws that increased salaries, decreased supply of labor and therefore delaying construction (Chu & Tsang, 2021).

In India the real estate sector leads after the agricultural sector creating employment opportunities for many people in India (Rudin et al., 2016). The sector was still expected to shoot forwards by 30% and this was linked up with high demand for corporate premises as well as township apartments (Logan & Mammen, 2020). In Africa, the real estate sector was on the rise as explained by the need for industrialization. According to UN center for trade and development-estimates; there were 180 special economic zones (SEZ) which were driving rise in real estate developments.

In South Africa (51) the special economic zones under development drove the development of real estate. Kenya had the highest (61) number of SEZ which attract a lot of real estate investors (UNCTAD, 2022). However, Property markets in African faces numerous challenges including lack of data, low transparency and high-risk features (Olapade&Olaleye, 2018). Despite these challenges, the market reflected a high potential to attract high returns. For instance, Chen (2019) indicated that a 4.9% growth was realized in Tanzania adding up to 4.5% of Its GDP. While in Ghana's property market have been providing attractive investment returns, which were up to 37.2% asserted that in Kampala, the rental trends of commercial property types have been on the increase.

Some of the top companies in Kenya include Fanaka real estate, Centum Real Estate limited, Optiven Limited, Knight Frank Kenya Limited, Villa Care Limited, Saif Real Estate, VAAL Real Estate, Cytonns Investment, Hass Consult Real Estate and Dunhill Consulting Limited (Werede, 2022). In Kenya real estate sector is regulated by government ministries and other subsidiaries such as Kenya properties developer's association (KPDA), and Estate Agents Registration Board (EARB). The former was established in Nairobi in 2006 as the representative body of the residential, commercial and industrial property development sector in Kenya(K'Akumu, 2022). It proactively partners with other stakeholders to ensure that the property development industry not only grows rapidly, but organized and ethical manner (Kenya Property Developers Association[KPDA], 2020). Further, EARB is the regulatory body for estate agency practice in Kenya and was mandated by Estate Agents Act, 1984 Cap 533. It registers estate firms and ensures that practicing agents act within the in a conduct that protect the public (K'Akumu, 2022).

In Kenya all efforts were being directed to curb the global warming effects, the real estate developers were turning to green housing due the higher demand for the buildings that emit zero carbon. This involves using materials that emit less carbon during construction, use of renewable energy, and efficient energy resources(Sohrabi et al., 2020). Kenya's inhabitant persistently grows rapidly, accompanied by an increase in town relocation. According to Juma (2019), the city's working class was quickly growing, and could be attributed to the need for settlement. In Nairobi County alone, constructions accounted for 76.2 billion of expenditure in 2016, a

7.5% increase compared to 2015 (Juma, 2019). Increased developments could be attributed to the rising need residential and business premises (Oundo, 2019). Kamweru (2020) pointed out that Kenya's yearly dwelling requirement is 150,000 pieces, but provision is just 25,000, culminating in a 125,000-unit shortfall. According to the Ministry of Housing Kenya (2019) projections, the housing sector was rising and an increase in the number of units produced between the year 2008 and the year 2030 followed suit. They estimate that about 4.3 million houses will be demanded.

Meru County experienced a tremendous increase in new development which implied the investor confidence in the real estate investment in the region (Gatauwa&Murungi, 2015). However, most reports reviewed fail to show any evidence of the performance of real estate firms as well as risk hedging strategies employed. Although oversupply is a major limitation in some parts of Nairobi, there is no evidence of such risk in Meru County due to paucity of data (Kamweru &Ngui, 2017). Meru County has witnessed several real estate developments of late and they are estimated to significantly increase by 2030. More so, scanty data on real estate firm's performance in Meru County Municipality motivated this investigation.

1.2 ProblemStatement

With high demand for housing and the increasing population 2.3% per annum the real estate firms should yield great returns(World Bank, 2020). However, due to investment risk, the Performance of real estate firms in Meru County is uncertain. This is amid a yearly demand of 250,000 housing units and supply of merely 60,000 (Amoo, 2023). There is dearth of data about performance of real estate firms in

Meru. Low occupancy rates, NPL's, unstable prices &tenants' inability. Proper hedging of investmentrisk could yield great returns on investments.

Real estate projects are capital intensive investments yet sometimes yields low returns due to investment Risk. Risks such as location, vacancy, structural, market volatility, and interest rate risk drives up the operational expenses which reduces the firm's cash flow influencing its performance. Failure to hedge against these investment risks largely affects profitability of these firms.

These investments risks affect the real estate investments globally, but Kenya experiences high uncertainty of returns due to market volatility and economic fluctuations (Ngigi et al., 2019). Despite the calamitous need for affordable offices and houses in Kenya; real estate sector is characterized by land shortages, stagnation of rental prices and sales prices. The rising cost of materials, non-performing loans, oversupply and undersupply of the house units all are indicators of risks (Werede, 2022). The investment risks make real estate firm performance unpredictable. Hedging of these risks could enhance net operating income, equity build-up or capital appreciation.

Oundo (2020) noted that real estate sector has been characterized by unpredictable financial risks leading to poor financial performance and loss of investor confidence. Muiruri (2014) also noted that predictability of real estate's financial performance in Kenya is very uncertain due to economic fluctuations and political uncertainties. While, Gatauwa and Murungi (2015)analysis in Meru County, found that better infrastructure   development improved social amenities, industries, expanded

educational institutions and commercial centers boosted prices. Conversely, Murithi (2017) investigated the determinants of growth of housing project in Nkubu town but failed to determine the risk and they could be managed. No study focused on real estate investment risk in Meru County the level of risk in real estate investment is unknown due to dearth of data a gap this study was set to bridge. Among the studies conducted, they did not show how hedging of investment risks influences the real estate firm performance.

Despite all these challenges with proper investment risk managementthere is potency of the untapped opportunities which motivated the research. The World Bank estimates a housing deficit of 2.0 million housing units where the supply is only 200,000 units annually (World Bank, 2020). Real estate contributes to over 15% of the Kenya's Gross domestic Product, and if these risks are not well managed the country may lose an estimated over $460 million per year of income (Kieti, 2020). The ever-growing population at a rate of 2.3% P.A in Kenya indicates opportunities and need for housing will increase even the more (World Bank, 2020).

1.3General Objective

The aim was to investigate the influence of Investment risk hedging on performance of real estate firms in Meru County.

1.4 Specific Objectives

i. To assess the influence of market risk hedging on performance of real estate firms in Meru County.

ii. To determine the influence of interest rate risk hedging on the performance of real estate firms in Meru County.

iii. To examine the influence of liquidity risk hedging on performance of real estate firms in Meru County.

iv. To establish the influence of leverage risk hedging on performance of real estate firms in Meru County.

1.5 Research Hypothesis

H_{O1}: Market risk hedging has no statistically significant influence on real estate firm performance.

H_{O2}: Interest rate risk hedging has no statistically significant influence on real estate firm performance.

H_{03}: Liquidity risk hedging has no statistically significant influence on real estate firm performance.

H_{O4}: Leverage risk hedging has no statistically significant influence on real estate firm performance.

1.6 Justification of the Study

Meru County is a suitable investment destination given its location and land and agricultural resources endowment. Real estate investments are in line with the county and national development goals. Any real estate developments, for example, five-star hotels, malls, hospitals, commercial and office apartments, and supermarkets are all geared towards the development of an area which is in line with the Kenya Vision 2030 and county government goals. However, investors within the region and those seeking to invest in the region are usually risk-averse.

1.7 Significance

This investigation could add knowledge regarding Investment risk hedging which would enhance informed decision making by the investors, county and national government policy on housing. The recommendations would also be beneficial to the managers of real estate firms, and investors on effective measures of mitigating risk to ensure better performance. The academicians and researchers would benefit from the recommendations for further studies which would contribute to the knowledge to the existing theory and research body. The policy makers would benefit from the findings of this research by making informed decisions on interest rates, cost of materials which affect the real estate sector. Informed investment decisions are likely to facilitate economic activity within the county thus creating employments and boosting the National Gross domestic product. Therefore, this justified the need to conduct the investigation.

1.8 Scope of the Study

The scope indicates the geographical location of the study; sample & target population, the variables studied, and data collection instruments to be utilized. This study focused on firms that deal with residential, commercial and industrial real estate within Meru Municipality. The study population targeted comprised of; managers of the firms, officers and real estate agents. Questionnaires were used to collect primary data; secondary data from the institutions was collected through a schedule while panel data of at least 10 years were used to collect data from Government and corporate sector websites as justified by Murithi, 2018. This study focused on four independent variables. The dependent variable of the study was Real

Estate Firm Performance. The Investment risk hedging was studied to establish whether it affected firm performance.

1.9 Limitations of the Study

This inquiry was limited to the four Investment risk hedging objectives. It is noted that there could be other Investment risk hedging parameters that affect real estate firms' performance. This limitation was however overcome by recommending further studies to be conducted on other key likely Investment risk hedging metrics that could influence firm performance. Also, some few real estate firms in Meru County are run by professionals who may not necessarily have specialized in business, economics or finance majors which are an area of interest. This could have affected the responses to the questions of inquiry. Nevertheless, it was overcome by using simple and closed ended questions and Likert scale questions which guided the respondents on what they were to respond on.

1.10 Delimitation of the Study

The respondents were assured of the benefit that the study would have to the public. This enhanced their willingness to participate and they gave out the information required devoid of bias. Voluntary participation was sought from the participants while reassuring them of confidentiality and security of their sensitive information

1.11 Assumptions of the Study

The study assumed that the information provided by the respondents was true and honest to ensure the validity of the results and findings.

1.12 Operational Definition of Terms

Real Estate   Land only, Residential, commercial buildings ranging from apartments, office spaces, malls, supermarkets, hospitals, Logistics stores among others (Kamweru&Ngui, 2019).

Performance   The ability of the Investors to grow its revenue, have a low cost of maintenance, and be profitable as indicated by ROE, ROA, NOI (Endri et al., 2021).

Market risk   Is a risk that affects the entire market due to changes in prices, economic recessions, exchange rates affecting occupancy rates (Septyanto & Nugraha, 2021).

Estate Agent   Any individual or business that deals with sales, management and renting homes, commercial or residential buildings on behalf of owners(K'Akumu, 2022).

Firm   A business organization, whose main aim is making profit, includes limited companies or partnerships(Septyanto & Nugraha, 2021).

Interest rate risk   Risk of the cost of credit because of increased interest rate, which may lead to commitment of a lot of firm's income to loan payments. This may affect the liquidity of a firm negatively thus affecting performance (Kamweru&Ngui, 2017)

Liquidity risk	Lack of consistent cash flow due to the inability to easily turn assets into cash. This may negatively affect the business due to the firm inability to meet debt obligations when they become due. This may lead to insolvency, bankruptcy, and closure of the firm. Therefore, liquidity risk negatively affects real estate firm performance (Wahidet al., 2018).
Leverage risk	The risk where debt levels rise above 75 percent of owners' equity. High leverage may strain the revenues of an investment in case where a large percent of the revenues is used to pay the principal interest. This may affect the business short-term cost such as maintenance thus affecting performance (Giacomini et al., 2019).
Investment risk hedging	Identifying risk, analyzing, planning, implementing mitigation measures and controlling to reduce risk of loss (Wolski, 2017).
Investment risk	Any financial risk that may lead to a firm incurring losses as a result of failure of the investment to yield the returns expected (Mburugu, 2021).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covers literature previously conducted by researchers with regard to the studies objectives. The chapter covers the theoretical framework, the conceptual framework, a discussion based on the variables of the study and summary of research gaps.

2.2 Theoretical Framework

The study is explained by classical theory of interest rate, Liquidity preference theory The Market Interest Rates and Modern Portfolio Theory.

2.2.1 The Classical Theory of Interest Rates

The classical theory was developed by classical economist Ricardo, J. S. Mill, Marshall and Pigou in the 18th and 19th centuries as indicated by (Toporowski, 2020). The theory was originally known as classical theory and was developed by the classical economist for application in economics, commerce and management. It aimed to determine the rate of interest and it found that savings and investments are the factors causing of the interest rates to fluctuate and get back to the equilibrium point. It compares the supply of savings with the demand for borrowing (Wolski, 2017). It pinpoints that the level of savings and investments are determined by interest rates such that savings increase when the interest rates are high and investments diminishes. This is because high interest rate offers high incentive for

investors. Most would therefore invest in marketable securities such as bonds and treasury bills.

With high level of savings little or nothing is left for real estate investments (Toporowski, 2020). When the savings are greater than investments the rate of interest drops until they reach equilibrium and vice versa, if savings are less than investment the rates increases until the reward for savings encourages increased savings causing the market to again reach equilibrium (Lee et al., 2018). Whenever the interest rates are low investors have no incentive to save and thus this increases the rate of real estate investments. The assumption is that high interest rate encourages savings and discourages investments and vice-versa (Wolski, 2017). Therefore, according to classical theorist savings is an increasing function of interest rates.

In contrast, Keynes (1936) argued that interest is not the only consideration on investment decision, but the returns on investment. The investors only undertake those investments that will give them high returns (Pigou, 1936). This means that the investment options chosen must perform very well. The classical theory of interest is still relevant since it does not only focus on influence of interest rates on savings and investments but also the order of causality. It however , fails to account for factors besides supply and demand that may affect interest rates such as the creation of funds, the importance of income and wealth, and changes in the primary borrowers in an economy (Gordon, 2015).Further, the theory does not show the sensitivity of debt level or leverage of an investor to fluctuations in interest rate. The theory assumes that savings are equal to investments, which may not always be true because what is

saved does not always end up to being what is invested since capital structure differs from firm to firm. For instance other investors finance their assets using leverage (Mundell, 1963). It also assumes that the rates of interest were flexible, there is full employment of resources and that the investors act rationally to maximize economic benefits. It implies that the savers are rewarded high the high rates for postponing their present consumption (Bodie et al., 2019). However, despite the criticism of the theory is very fundamental in understanding movement along interest rates, explaining what causes leverage risk as well as itsgreat effects on liquidity risk. Therefore, the theory underpins the market risk, leverage, and interest rate risk hedging.

This theory applies to this study since very high interest rates as the rewards of capital may discourage investments. The high savers may be more desirable to the lenders which imply that the level of debts increases (Stevenson et al., 2019). The real estate investor risk using high debt and this underpins the leverage risk. High use of debts in the long-term implies cash flow stress which implies liquidity risk. The demand for borrowing underpins the leverage risk, where an investor who uses high debts faces the risk of losses, bankruptcy, and poor returns. In contrast, the real estate investments can act as collateral for mortgage loans. Low interest's rate increases investments and reduces cash flow causing risking liquidity of a firm. However different authors have argued differently on this. For instance, Morri and Jostov (2018) noted that demand and use of debt despite the interest rate may significantly improve performance. Therefore, this theory is relevant to this study considering that most real estate investors use debts to finance their assets. Both savings and

investment affect the leverage since high savers are likely to attract higher levels of debts compared to non-savers (Lizieri et al., 2020).

2.2.2 Liquidity Preference theory

The Liquidity preference theory is a constituent of classical theory of interest rate which was propagated by (Keynes, 1936). The theory posits that investors prefer to hold assets that can be easily converted to cash in order to be able meet their obligation when they become due. Real estate assets like Bonds are long-term securities that may easily expose a firm to financial distress (Loutzenhiser& Mann, 2021). Therefore, the investors prefer liquid asset, over the long-term investments even when the interest rates are favorable. For instance, Bonds are investment options with well-paying interest but due to their long-term maturity period most investors would still prefer to hold liquid assets (Toporowski, 2020).

The theory by Keynes (1936) pointed the three motives of the need for liquidity is transaction, speculative and precautionary. Regarding transaction motive real estate firms need to hold liquid assets to fund the daily operations of the firm, while under precaution ally is to meet the emergencies and unexpected expenses. Speculative motive involves taking opportunity of upcoming investment avenues that can yield the firm high returns(Deng et al., 2019). Therefore, the theory is relevant to this study since real estate assets are illiquid and therefore the firms must hedge the risk with the intention of reducing exposure to financial distress. This theory therefore underpins liquidity risk hedging.

2.2.3 The Market Interest Rates Theory.

Another theory that underpins the objectives of in this research is the theory of interest rate. It was coined by Avlonitis and Indounas (2005) and postulates that fluctuations in interest rate affect the entire market-consumption, investment and overall demand for goods and services. In real estate industry the market risk affects the operational costs, material cost and house prices. Low interest rate means cheaper credit thus increasing the demand for loans leading to increased expenditure and investment with the borrowed money (Ellingsen & Soderstrom, 2001). Easy availability of credit may boost the cash flows of the business and lower the liquidity risk. However, high interest rate on the other side implies high cost of borrowing, lack of liquidity and poor firm performance. Therefore, the changes in interest rate affect the consumption, investment and overall demand for goods and services (Bienert&Brunauer, 2006).

This theory underpins the leverage risk objective since the interest rates charged by the commercial banks influence directly the cost of debt and the risk of paying the loan when it's due. The commercial banks may recover the assets from the struggling customers who are unable to meet their debt obligations implying poor firm performance. Therefore, this theory will guide the study in linking leverage and liquidity risk hedging influence on real estate firm's performance.

The hypothesis relates to this study since a high interest rate may lower the interest for credits and diminishing the degree of venture, which thus essentially influence the stockpile of real estate developments(Panico, 1985). Therefore, it explains both leverage and interest rate risk. The theory underpins the objectives of this study in

the nature that low-interest rates at the borrowing may decrease leverage risk in the short term. Additionally, this theory underpins the market risk, interest rate risk implying that the increased cost of debt is increased by increasing interest rate. A rational real estate investor is willing to borrow from banks that will offer the best rate or competitive interest rate considering the market rate (Lizieri et al., 2020).

2.2.3 Modern Portfolio Theory.

Modern portfolio theory proposed by Markowitz (1952) the theory argues that there is a tradeoff between risk and returns. Investors can therefore diversify their asset portfolio in order to minimize risk while maintaining high returns. The theory has been widely used in stocks and bond market unlike in real estate investments(Fabozzi et al., 2022). The theory is quantitative in nature and uses correlation and variances compute mitigation of risk and maximization of returns. The theory is therefore helping the investor select the portfolio of asset that that increases the expected returns and minimizes risk (Lynn, 1996). The theory assumes that risk and returns have a direct relationship. That diversification of asset invested can maximize returns while minimizing risk, that investors have similar information available to them. And those investors don't take preventable risk.

However this theory is bias to stocks and bonds market and fails to show the theoretical application to other financial assets such as real estate investments (Chen, 2020). However, over the year's most authors have made contributions towards application of MPT not only in institutional real estate investment development but also among individuals? The theory also is quantitative in nature and fails to include the qualitative aspects of investments. However, despite the weaknesses, it is still

relevant in this study since the real estate investor can diversify there their real estate asset by investing in the different classes of real estate diversify and minimize risk. This theory therefore is very relevant in risk control and hedging. The different asset classes include commercial real estate, residential real estate, hotels, and malls. The high-end hotels are high risk but high returns expected but faces seasonal fluctuations due to tourist seasonal arrangements. While malls may be low risk asset class but low returns on the other side. This theory is therefore relevant in laying a basis to understand whether interest rate, market, liquidity and leverage risk can be controlled in order to enhance the performance of the real estate firms. This theory was therefore used to underpin market risk hedging.

2.3 Empirical Review

This section entails the review of the related literature concerning the guiding objectives. The review is arranged into the objectives, methodology, findings conclusion and recommendation of different related research. It also includes the research gaps authors name, year and title of publication.

2.4 Market Risk Hedging

Market risk is the risk emanating from uncertainty of the values of the properties involved (Mieg, 2022). The market risk hedging involves controlling of risk related to market. Market risk hedging was measured through occupancy rates management, Rental price management, Use of futures and Cost management.

Market risk is caused by uncertainties linked to the economy, interest rate inflation and market trends (Septyanto & Nugraha, 2021). Market risk results from volatility of the real estate prices since they keep on changing depending on location, property

type, maintenance. What complicates market risk calculation is that one must have historical data about real estate price movement in order to calculate the beta and alpha. Wolski, (2018) adds that market risk is the un-diversifiable risk that affects the whole industry. According to Benjamin et al. (2017) the risk is divided into diversifiable and non-diversifiable risks. The diversifiable risk also known as systematic risk is specific to real estate Investors (Patel & Olsen, 2018).

Evaluation of the risk and return of investment, therefore, becomes very important before any venture to increase shareholder's wealth and maximize the returns. The risk of financial loss largely affects an investment opportunity and the wealth of its owners. This is found explained by capital asset pricing model (CAPM). The real estate sector has been subject to financial risk thus threatening the loss of investor capital because of poor firm performance (Nguyen et al., 2019). According to Alcock and Steiner (2019), real estate market risk can be controlled by matching assets and liabilities which reduces the effects unexpected price increases on a firm. A number of studies have identified methods of measuring and managing market risk.

In America, Voicu (2015) using a non-probit pricing model explored the influence of market risk on single-family home managed properties. They used the U.S real estate index, which though it has highly comprehensive, it is very complicated to model the results from such data. Their study however, concentrated on portfolio theory and employed alpha and beta to compute risk. Our study however, focused on one asset classes unlike their study, which computed risk in many asset classes involving real estate as one of them (Voicu, 2015). Their study result therefore would be more beneficial investors seeking to understand the best asset mix and portfolio to invest

in. it therefore, failed to explain more about managing market risk and their influence on real estate firm performance.

In Malaysia, Patel and Olsen (2018)carried their study on 32 real estate companies. They aimed to investigate the financial determinant of market risk for these companies. They found out that financial risk is directly related to market risk and leverage risk. However, their financial theory did not clearly explain the connection between market risk hedging and the performance of those organizations. However, their study noted the need for a financial manager to understand the systematic risk to control the parameters that manage it. Further, Meng (2014) examined the risks in spatio-temporal elements of the US real estate market at the state level utilizing the Arbitrary Framework Hypothesis. Their investigation found that market risk affected performance of real estate companies and this study agrees with the finding of Rashed et al. (2017)who noted that the assumptions of the Capital asset pricing model where risk and return are involved; real estate investors are likely to be affected by the unseen circumstances within the market or the economy.

According to Barber et al. (2018), Risk hedging must be dedicated to undertaking frequent research on the variables that determine risk and model an effective model that can be used to reduce risk. Zhang (2018) measures housing value unpredictability by the contingent fluctuation of a Summed-up Auto-Backward Restrictive Heteroscedasticity model under the Versatile Assumptions structure. All these studies were carried in developed countries with different complex methodologies that fail them to be generalized in Kenya and Meru County in specific. Further Kassi et al. (2019) investigated the influence of market risk on

performance of 31 firms listed in Casablanca stocks for a period from 2000 to 2016. They employed return on asset, return on equity and profit margin to assess performance. The level of leverage and book to market ratio were the indicators of market risk in their inquiry. Using OLS, fixed effect and random effect models they found that market risk significantly harm the financial performance of the companies. Higher leverage even worsens the effects compared to book to market ratio and gearing ratios. However, firm's age, size and liquidity have positive effect of financial performance. Debt to income ratio however huts performance. They recommended decision makers and managers to mitigate the market risk through Investment risk hedging techniques such as derivatives and insurance.

According to Li et al. (2016), a market risk for instance could lead to more than $500 billion in losses in an economy. This implies that many sectors including the real estate sector are going to be significantly affected. Scanty literature has been done on market risk on real estate firms though most of what has been done is about the banking sector (Li et al., 2016). The global economic crisis caused by Pandemic resulted to the fluctuations in the financial markets affecting the Gross domestic product in different countries (McKibbin& Fernando, 2020). To curb market risk, it is essential for market players to formulate macro-prudential indicators framework for monitoring financial risk. As result New York Times pointed out that the American government central bank injected a $2 trillion economic rescue package as an economic shock to help households and corporate recover from market risk. It is a hard task to predict future values of real estate with unexpected risks, unpredictable supply, and demand curves. Gomez also notes that access to credit might be

negatively affected by the market risk thus posing liquidity risk to the real estate sector (DeVito & Gomez, 2020). In America, Britain, China, and across the world including Africa which hosts Kenya (McKibbin& Fernando, 2020). With the investor's interest in profit and wealth maximization in mind, this examination tries to explore the connection between market risk and execution performance of real estate in Meru County.

There are few done in Kenya that focuses on Market risk. Among the few available Muiruri(2014) studied Capital Markets focusing on the systematic risk of equity stocks involving real estate in the Nairobi stocks exchange (NSE). Their study sought to find out specific factors affecting real estate stock prices. The systematic risk was examined on 4 sectors of equity stocks specifically. They utilized the Capital Resource Evaluating Model developed by Sharpe in 1964 to demonstrate the market returns. Their examination discovered that a firm positive relationship existed between efficient risk management and financial returns. However, this study utilized beta as the only measure of risk as well and focused on large firms based in Nairobi County. The current study will utilize both objective and subjective measures of market risk.

Further a study by Murunga (2017) carried a descriptive survey assessing financial risk hedging as a remedy to market risk management in Nairobi County . A population of 151 real estate firms and sample of 110 firms was taken to collect data using a questionnaire from the real estate managers. Both inferential and descriptive statistics were used in data analysis. Stata was then used analyze data. It was found that most firms lack adequate financial risk mitigation measures resulting to large

losses among investors. It was recommended application of sound risk hedging to enhance better performance and efficiency within the market. This study however was carried in Nairobi. Therefore, a necessity was found to conduct another study in Meru to infer the consequences of market risk hedging on real estate firms and measures to curb the same. Although there are no clear market risk hedging innovations in Africa, as study by Prelipcean(2020) recommended a special purpose vehicle hedge funds to cover real estate investors against market risk. Further Dabara and Ibrahim(2019) recommended and inflation hedging for real estate investors in Nigeria.

2.5 Interest Rate Risk Hedging

Globally, Risk management has become very essential following global economic crisis of 2008 that caused high financial instability in most institutions. As per Zhu and Lizieri (2022) the interest rate risk emanates from the changes in the degree of financing costs of an asset. This risk is predicted to affect housing prices among many other prices. Interest rate risk in real estate firms is measured through the Interest rate at which mortgage is lend, Debt levels, Risk exposure, debt Repayment and Default risk (Deventer et al., 2019). Interest rate risk hedging is measured using financing cost management, Mortgage risk management, Interest rate swaps, and Debt repayment.

It can be hedged using options, futures, and forward contracts. In Australia Reddy and Wong (2017) investigated the influence of leverage funds distributed in low debt and high debt portfolios to check their sensitivity to interest rates. They found out that long-term loan fees contrarily affected asset returns in real estate companies

(Reddy & Wong, 2017). They uncovered that interest rate risk is a significant determinant of profitability. However, their study was controlled by the global financial crisis, which might have affected some countries in a bigger variance compared to others depending on their economic stabilization ability during the crisis. Their findings can be generalized with care especially in developing countries like Kenya where real estate is highly exposed to market risk (Swanson et al., 2020). Further, the study by Lizieri et al. (2020) in UK and US evaluated the effectiveness of two models TAR and autoregressive model in checking the effect of interest rate risk and performance of real estate firms. Notwithstanding, their examination neglected to show connections between the two systems and their viability if there should be an occurrence of high cost of debt (Lizieri, 2020). Stevenson study in the UK noticed that real estate firms are vulnerable to interest rate risk. This is due its vulnerability to external and internal changes such material cost increases, maintenance cost, and rental prices changes among others. Their outcomes demonstrated that financing cost hazard hurt the performance of such firms (Steveson, 2019). Their outcomes demonstrated that financing cost hurt the performance of real estate firms. Notwithstanding, their investigation concurs with the current examination in utilizing day by day information (Swanson et al., 2020).

 However, this was consistent with the discoveries of paper by Reddy and Wong (2017) that   real estate managers need to take account of interest rate risk since exposure to such risk significantly affects their performance. According to Mueller and Pauley (2020), high volatility in interest rate affect how real estate's investors make decisions since this largely affect their performance. Their study examined the

movement in real estate prices 'effects on interest rate risk. Their study found out insignificant changes in house prices with interest rate movement. However, the study failed to show the short-term effects of interest rate changes on the performance of real estate investment. It also never indicated how the risk can be managed. Similarly, Nittayagasetwat and Buranasiri (2018) used the Cox–Ingersoll–Ross model (CIR model) to test interest rate risk management and influence on the real estate companies performance. The models used failed to increase the explanatory power of Ordinary least squares (OLS). While the study by Nittayagasetwat and Buranasiri (2018) failed to give the direction of the relationship; Kamweru and Ngui (2017) study in Kenya gives the result of a contrast opinion.

Kamweru (2017) studied the influence of loan fees firm profitability Nairobi using a descriptive survey research design. The examination discoveries uncovered that loaning financing costs have a negative and huge relationship with real estate companies in Nairobi. Their examination suggested that the government needs to execute money related approaches that intend to lessen the loan costs to create efficiency in this sector. Like most studies, Wamalwa (2020) sought to examine the influence of interest rate risk management on profitability of commercial banks in Kakamega county. They used census and collected both primary and secondary data which was analyzed by use of SPSS and STATA. They found that managing interest rate risk had a positive relationship on banks performance. Though banking institution differ from real estate operational wise; there results provide a need for inquiry on interest rate risk management among real estate firms. Their

recommendation also provides an essential basis for real estate to effectively manage financial risk for better performance.

Similarly, Odeke and Odongo(2014) study on 9 commercial banks offering asset and project finance had high non-performing loans indicating interest rate risk. This implies that high cost of loans may weaken the financial stability of the real estate firm rendering it bankrupt. They employed DuPont analysis of commercial banks and found of interest rate risk to positively influence bank performance. However, all these studies focused on the investment banks and the results could not be applicable on real estate firms. The examination by Pervan et al. (2020) noticed that credit hazard harms the performance of a firm.

Interest rate is influenced by many factors macro-economic factors of a country. A firm is required to maintain a balanced debt level to reduce the interest rate and generate profits. Mang'ong'o et al. (2018) assert that it is essential to measure credit risk associated with real estate investments. Pervanet al. (2020 noted that loan hazard is expressed as the debt quotient of capitals to overall loan investment. The main fear is that the real estate Investors may fail to fulfill their debt obligations. The interest risk may also have been influenced by economic conditions, and credit risk largely hurt investment Performance. Real estate Investors must be able to identify, specify measure and manage risk to ensure good Performance (Pervanet al., 2019). Thus, there is an inverse connection between credit hazard and performance of real estate firm performance (Lenee& Oki, 2017). Property derivatives though not common have been encouraged by Fabozzi et al. (2020) as the best way of hedging

against interest rate risk. There are therefore many studies that are required in this area of derivatives since it's not very common among real estate firms in Kenya.

2.6 Liquidity Risk Hedging

As indicated by Al Janabi (2021). The Importance of Measuring Liquidity Risk with Smart(2021) Liquidity is the capacity of a firm, organization, or even a person to pay their obligations whenever they fall due. Liquidity risk arises when an individual business, or monetary organization can't meet its transient obligation commitments (Daryanto et al., 2018). Financial liquidity is the easiness of converting assets into cash. The liquidity of an asset may significantly affect the price of real estate. Liquidity risk hedging in this study is indicated by Cash flow management, quality management, Property location and operational cost management. Other important measures include monitoring of monthly revenues, conversion ease, asset location, managing cash flow and property demand (Pitelli Britto et al., 2021).Therefore, liquidity determines both the price and property sales and the turnaround time. Nduku (2015) notes that liquidity can be expressed as a current ratio computed by dividing current liabilities with current asset. The ratio establishes a firm's readiness to settle the debt within one year or when they become due (Kenton, 2020).

A higher liquidity ratio is favorable as it indicates that the firm has enough assets and can meet its debt obligations. Other studied such as Hayes (2020) examined the Cash conversion cycle (CCC) that measured the time it takes for a real estate firm to convert its investments into cash flows. Therefore, it measures turnaround time for the firm to sell its assets and is used to measure the efficiency of a firm. While these measures are precise and quantitative in determining liquidity, they fail to show the

qualitative aspect of liquidity risk. A real estate firm will therefore be considered stable if it has low chances of suffering bankruptcy or financial distress. According to Mang'ong'o et al. (2018), noted that it is a strong indicator of the financial performance of Investors as insufficiency in liquidity is a major cause of poor performance among many institutions. A real estate firm that has a high liquidity ratio can easily pay its liabilities and sustain its common operations.

A few studies that have been carried show positive relationships exist between liquidity hazard management and the performance of a firm. Notwithstanding, different examinations demonstrated negative connections. The examination by Chen (2016) utilizing real-estate firms found that liquidity hazard fundamentally influences land ventures and can't be disregarded. The study however found a negative link between cash flow coverage ratios on lenders profitability. They focused on 43 commercial banks in Kenya though they modeled liquidity risk and performance. However, the study only tested the quantitative indicators of liquidity risk and ignored the qualitative ones.

Further, the investigation by Mugetha (2019) noticed that liquidity affects real estate firm performance. The study noted that liquidity is the major determinant of the financial health of a firm since it enhances the operational effectiveness of a real estate firm. Liquidity provides a reliable supply of cash flow that in turn enhances the future financial sustainability of a firm. According to Akter and Mahmud (2019), deficiency of critical connection in cash flow (estimated as current proportion) and benefit (estimated as return on the resource). Al-Qadi and Khanji (2018) notes that increased liquidity is a cost to many Investors. This is true for real estate Investors

since the cash flow can be reinvested to generate more interest and returns. The opportunity cost of liquidity over financing is the interest that is earned if the liquid asset were invested. Therefore, a shortage of liquidity may force the company to acquire short-term loans or sell some liquid assets, which is also an expense.

The examination by Warrad et al. (2019) considered fifteen banks utilizing the panel technique. They used liquidity ratios to examine the cash flow adequacy. The configuration in cash flow as well as gains was dictated by the utilization of time-series investigation. That implies productivity through return on resources in the financial backers is essentially affected by liquidity through fast proportion. It is clear that most studies including the above-used profitability measures of return such as quick ratios and Return on investments, this, therefore, leaves a gap for other qualitative measures of performance most of which have received less concern or fewer studies done on them (Acerbi& Scandolo, 2018). This study will add more knowledge on indicators of firm performance.

The examination by Irawan and Faturohman (2019) on influence of liquidity on performance tracked down that the coefficient for the liquid resource's proportion is negative and critical. Then again, Kindermanset al. (2019) study discoveries showed that a critical connection among liquidity and performance existed. That implies the exhibition of a venture is essentially influenced by liquidity and the other way around. It is hence significant that an association's future manageability is reliant upon viable administration of both the fluid and liquid resources of the firm (Kindermans et al., 2019). The results revealed that there is a significant influence of

only liquid ratio on (ROA) while insignificant on (ROE) and (ROI); the results also revealed that (ROE) is not significantly affected by three ratios current ratio, quick ratio, and liquid ratio while (ROI) is greatly affected by current ratios, quick ratios, and liquid ratio. The main results of the study explained that each ratio (variable) has a significant effect on the financial positions of enterprises with differing amounts and that along with the liquidity ratios in the first place (Kindermanset al. 2019). The profitability ratios also play an important role in the financial positions of enterprises.

Rashed et al. (2017) observed that Liquidity risk hedging significantly affect performance and investors forced commit their present resources for money to hedge against the risk. On the opposite side, Galletta and Mazzù (2019) note that presentation of a speculation and profit for every offer relationship with liquidity is unimportant. In any case, the examination by Waleed announced a critical connection among liquidity and investor's offer capital, it neglected to show the issue that liquidity hazard could cause to the investors' capital and firm profitability. Interestingly, Khan et al., (2022)studies have demonstrated a positive connection among liquidity and performance. They further noted that the most essential thing is that a firm can easily convert its assets into cash. However, he notes that it is not always plausible to assume that highly performing companies are highly liquidated. The examination affirms that liquidity is a higher priority than profit since it decides the endurance of the firm. The results by Zhang (2018) indicatedan enormous affirmative association between an establishment's cash flow on performance.

Irawan and Faturohman (2019) noted to boost shareholder's wealth; liquidity and usefulness ought to be exchanged – off. Liquidity is basic for the brief – term, the more fluid an affiliation is, and the lower credibility of it being not prepared to meet obligations. Cash flow is basic for an organization's diligence. Alayemiet al. (2018) Study established a weak association among cash flow and efficiency. According to Wahid et al. (2018), Liquidity is also another measure of performance as it is considered to influence the financial performance, deficient liquidity of financial backers is viewed as one of the significant reasons why the business tumble (Panigrahi&Mishra, 2019). The Current Proportion is a marker of an organization's transient liquidity and is estimated by current resource/current liabilities. The study by Enqvistet al. (2019) established a direct association amid liquidity and firm performance. Therefore, liquid Investors tend to be more profitable. There is a tradeoff between holding the liquid asset and investing them to achieve higher returns. Therefore, the opportunity cost of holding the liquid asset is higher than investing them for better returns; then it becomes wise to invest in these assets.

Like most examinations, Zhou andTewari(2019) investigated liquidity hazard in valuing the assurance of real estate returns. Their studies found out house prices were highly sensitive to liquidity risk. However, there is a scarcity of data on liquidity risk on the cross-sectional performance of real estate, especially during hard economic times. During recessions when there are high fluctuations in the market, real estate Investors would need to hold adequate cash reserves as a support to hedge this risk. Along these lines, in such a case there emerges a negative link between liquidity hazard and performance (Ghenimi et al., 2017). As indicated by Panigrahi and

Mishra (2018) satisfactory cash flow and cautious administration of its movement could have a critical effect on the achievement and or failure of a firm. According to Giannotti et al. (2019), the cash flow proportion is extremely fundamental for an organization since it estimates the company's capacity to hold sufficient money to buy from providers with better valuing during the buying cycle, which can enhance the organization's benefit.

A few studies in Kenya have explored liquidity risk as a determinant of financial performance. According to Mang'ong'oet al. (2019) noted that capital is a firm-specific variable that affects Performance. Capital has been defined as funds available for investments in a firm that also act as a cushion in case of a crisis. Capital adequacy ratio (CAR) as observed earlier is used to measure the level of capital available to a firm and is used to evaluate the firm's stability in case of a crisis. Real estate investors with enough capital available tend to perform well financially compared to those with lower levels of capital. Capital enables the Investors to remain stable and resilient for instance in case of a systematic risk event. The study by Mutumira (2019) observed a strong direct link on cash flow and productivity.

Almazari and Alamri (2017) explained capital adequacy in the premise of how a firm can withstand risks and make decisions that maximize shareholder's wealth as well as price the houses in competitive price packages. Funds acts as a cushion mitigating the unexpected risk as well as to create cash flow enabling the venture to manage its immediate obligation. The capital adequacy quotient parameter is used to measure

capital adequacy (Mang'ong'o et al., 2018). The importance of enough capital for Investors' stability and firm establishment amid crisis. The study revealed that capital adequacy significantly affected a real estate firm's performance. An increase in capital leads to better financial performance due to new profitable opportunities that a firm can maximize. Therefore, capital adequacy is a vital element to a firm's financial performance (Almazari&Alamri, 2017). Most real estate Investors rely on banks for loans yet it can be hard for them to access loans due to the high risk involved in such investments (Zhang et al., 2018).

Most studies failed to show liquidity peril hedging parameters and their influence on how a firm performed. The major motive of most investors and creditors are in the ability of the company to produce sustaining a cash flow throughout the year. Lack of liquidity is a major problem for real estate investors (Amoo, 2023). This is because a lack of liquidity is detrimental to firms 'fitness to pay its debts. However, excess cash held can reduce investment opportunities and the returns thereof (Deng, 2020). It is therefore wise to maintain a liquidity level that is efficient enough to ensure a real estate firm performs highly. Therefore, liquidity risk remains a matter of high concern to every firm. The study by Murunga(2017) encouraged operating hedging and finance hedging in reducing liquidity risk among real estate firms while (Mian & Santos, 2018) encouraged refinancing as a tool to ensure firms that remain afloat.

2.7 Leverage Risk Hedging

Leverage has been defined in this study as use of debts in financing the investments (Nguyen et al., 2019). High use of debts compared to equity may be risky to the real estate investment. During investment the real estate investors has projections about the cash inflow from rent or land and property appreciation (Luqman Hakim, 2017). However, due to unexpected risk untimely loan repayments can cause bankruptcy. However proper leverage risk hedging may mean a profitable venture good performance. Leverage risk in real estate is indicated by Debt levels, Capital structure, Leverage decisions, External financing and retained earnings (Zuhroh, 2019). Leverage risk hedging involves; Capital structure management, policy and decision making, use of forwards, managing sources of finance and having a reserve fund.

According to Chen (2020), leverage risk negatively influence firm performance and can be managed by having the right capital structure and adjustment of operating leverage by management to reduce hazardous effect of debt. According to Delfim and Hoesli (2019), leverage is the use of debt to finance a establishment's properties also known as capital structure. The risk arises when high leverage may affect the enterprise's fiscal performance increasing the risk of defaults, losses, and bankruptcy. A firm is described as high leveraged if it has used more debts as its funding source compared to owner's equity (Sharma, 2020). Leverage risk has been classified into operating leverage risk and financial leverage. Operating leverage risk considers the variable and fixed costs of a company, Financial leverage risk is where the use of debt exceeds the holder's capital in a corporation's investment holdings

(Patel &Olsen, 2018). A few studies carried on liquidity risk and financial performance indicates indifferent results.

In Malaysia, Wahid et al. (2018) studied 5 real estate investment companies using secondary data which was obtained from their yearly reports. In words of Wahid et al.(2018) there is inverse association between high debt on performance of real estate. Therefore, it is wise for a firm to determine a manageable level of debt while maximizing performance. Accordingly,Wahidetal. (2018) to prevent a company from being insolvent a firm must apply sound risk hedging strategies. On contrary, He et al. (2016) researches the weight of leverage on corporate efficiency on 1200 listed companies in China, Germany, and Sweden. He observed in China that influence upset firm execution. Whereas he observed that on the two, other countries that debts had a progressive affiliation with enterprise efficiency before the 2008 financial crisis. On the other hand, the study on leverage and performance in 30 companies in the Colombo exchange found a negative relationship. It implies whichever capital composition a firm may employ may not affect Performance indicating that there are other factors that best explain the Performance of investment, unlike its leverage. Following the study by Javed, (2015) in Pakistan where the return on assets and equity were used as measures of performance; a direct relationship was established between leverage and performance.

Another study byPratheepan & Yatiwella, (2016) looked at the effects of debts on enterprises' growth of revenues in Sri-Lankan companies revealed a positive relationship. They added that debt asset ratio, debt-equity ratio, and long-term debt are related to gross profit margin (GPM). While Chunhua and Meiyan (2019)

observed a negative relationship on an investment, leverage, and Performance Al-Qadiand Khan (2018) explored 36 engineering Investors in Pakistan. His study revealed that debt levels brought by a mix of short-term liabilities over complete properties over full obligations have a weighty destructive correlation with the partnership's performance and growth. Conversely, Rahimi, (2016) study examined the effects of leverage on the performance of Tehran companies. They found out an inverse association on debt ratios and performance of the firms, but a direct relationship between asset increase, firm expansion, and firm performance. This implies that for an investment to increase performance it has to decrease its debt ratios. Further Gerlach (2019) paper examined the character that debt plays in the connection with earnings and peril for Estate Investment Trusts where liability ranks were routinely elevated. The study showed that leverage distorts the relationship that it has with returns (Gerlach et al., 2019).

Nguyen et al. (2019) aimed to check the influence of financial leverage on return on asset, return on equity, return on sales and return on capital employed among 58 real estate firms listed in Vietnam's stock exchange. The study used quantitative technique and regression analysis with the help of Eviews software. The results showed that financial leverage had no effect on ROS and ROCE while has negative influence on ROA and positive effect on the ROE. The study exposed that debt has a direct association with leverage risk and idiosyncratic risk. Though their study was important in the determination of house prices it tended not to show how debt levels affected the performance of privately-owned real estate investments (Nguyen et al., 2019).

Similarly, a study by Almazari (2013) had also included firm size and loan exposure as the independent variables noted that the returns of a firm can be better explained by examining capital adequacy measures. Further, Udom (2018) study found that capital adequacy significantly explains a firm Performance indicating that it acted as a buffer to prevent the risk that is not accounted for by the profit realized in a firm. Oyewole et al. (2019) study revealed a direct association between return on Asset and capital adequacy measures employed. He further adds that capital adequacy acts as a simulator of growth in a firm; as more capital above the firm's requirement can be reinvested thus increasing Investor's share. The study by Ayaydin and Karakaya (2014) similarly found a direct perfect relationship between capital and Performance.

Almazari (2013) in contrast was of the view that adequate capital is an essential risk management strategy since it minimizes risk exposure and enhances a firm's competitiveness. It further provides funds that enhance expansion, short-term business needs as well as preventing bankruptcy (Almazari & Alamri, 2017). The study by Mendoza and Rivera (2017) noted the need for Investors to retain adequate capital concerning investors wealth subject to the mortgages they have and their precariousness. They further added that the quality of capital available to a firm explains the bank's profitability.

Zhou and Tewari (2019) agued in support of the pecking order theory that proposes that the majority of investors prefer debt to equity. In case Investors can acquire an affordable source of credit then, it enables them to reduce the cost of debt. It, therefore, concluded that the leverage of a firm significantly influences its

Performance holding factors such as tax constant. A study by Cashman, (2019) revealed that there is a direct association in company's debt ratio and performance. This suggests that as the obligation proportion increments the company efficiency increases in an equivalent proportion. However, this may not work for young real estate companies whose increase in debt ratio would mean high risk. A company that increases its debts to invest in real estate may in the short run suffer liquidity challenges thus failing to meet its debt obligations (Zhou &Tewari, 2019). However, to some investors whose risk appetite is high or companies that have been in existence and have achieved economies of scale; they may not suffer liquidity challenges despite the high debt. This agreed with the study of (Ling, 2022). In contrast, a study by Liu et al.2020 that concentrated on 24 listed real estate companies in Shanghai; found an inverse link between commitment/wealth quotient and returns. According to Karima (2016), real estate boosts the financial market growth and development.

Kaklauskas and Zavadskas (2018) notes that a common way of increasing demand and supply for real estate is through the creation of a structured market to boost growth. This therefore calls for developers to implement leverage that includes long-term loans and common stock. Modigliani Miller and the traditional approach to leverage explain how the firm is to acquire its capital to maximize shareholders' wealth (Liow, 2010). A further view of MM theory finds that the real estate Investors must come up with the right amalgam of commitment and assets accounting for the risk and the benefits of the investment. Therefore, good financial planning is very critical to avoid reactive policies that may render a firm bankrupt.

Studies agree that leverage should be planned in a way that is flexible to risk (Adesina et al., 2015).

In addition, Qing et al. (2016)discovered debt to have an indirect association with growth. If not well addressed such effects expand causing financial problems. If an investor's debt levels are so high, there is fear in the risk of the company becoming bankrupt. Therefore, high debts can also lead to poor performance in a firm. According to Nyawira et al. (2019), the need for capital has a direct association when run with financial performance. Specifically, capital requirement influences the return on assets of a firm as well as return on equity. This implies that as a firm acquires capital its performance increases. Nevertheless, this is only possible if the leveraged funds are well managed to meet the interest requirement operational cost while satisfying the shareholders. This calls for tying the already existing assets into wealth formation to maximize the returns.

The study by Rudin (2019) perceived a reliable link between leverage and fiscal growth. This implies that given certain leverage is also affected by other factors such as corporate leadership and the agency relationships (Ngugi, 2015).   Majorly, leverage risk is highly related to financial performance especially when the economy is performing well or the government policies favor the market in which the real estate firm is operating.   According to Ayaydin and Karakaya (2014),profit and capital composition of an organization goes hand in hand. This implies that as the capital of a firm increases then their earnings increase in equal proportions. However, companies that seem to hold more capital are seen to be inefficient.

However, the study notes that industry-specific factors, such as market structure, the magnitude of rivalry, and the fiscal systems influence operational performance of a firm (Adesina et al., 2015).

Adesina et al. (2015) quoting Bauer, argues that leverage affects Performance negatively. They further add that leverage and gearing levels depend on the firm since some Investors would prefer loans yet they may not qualify for bank loans while other Investors completely do not consider loans since they have enough retained earnings for further investments. Some of the factors affecting leverage risk include the size of the investment, how long has the firm been in operation. It was advised by Lambe, (2021) that the investors should have the right mix of leverage for them to maximize the wealth. He further added that there is a need to consider the expected risk, type of assets the organization holds the degree of growth, housing demand, Tax, lender and credit bureau ratings, and perceived valuation of assets. Olayiwola, (2022)emphasized the importance of cash flow as an important factor affecting investors' operating performance. Javed's (2023) research findings indicated that companies that have a good corporate governance structure and leverage ratios have a high likelihood of healthy financial performance.

2.8 Summary of Research Gaps

Regarding market risk hedging most studies applied OLS fixed effect and random effect models and failed to describe the influence of specific risk hedging effect on Firm performance. While a number of studies were carried pre-Covid 19 which resulted to fluctuations in the market and may fail to identify the global economic crisis caused by Pandemic result to the fluctuations in the financial markets. Studies

in Kenya focused on commercial banks and firms engaged in Nairobi stocks exchange and failed to investigate the influence of Investment risk hedging on firms not engaged in capital markets. A similar study in Nairobi County focused on Real estate managers as the unit of observation. This study involved senior real estate managers, operations managers, financial officers, sales officers, risk managers as well as legal officers.

Regarding Interest rate risk hedging, a contextual gap and methodological gaps is identified since most studies were carried in US and UK as well very developed countries Asia for example Singapore in Malaysia. The interest rate risk in these countries could differ due to macro-economic factors. Others used Cox–Ingersoll–Ross model (CIR model) to test interest rate risk hedging and influence on the real estate companies' performance. These models failed to increase the explanatory power of Ordinary least squares (OLS). Studies in Kenya applied DuPont analysis of commercial banks and found that interest rate risk and bank performances were associated. However, all these studies focused on the investment banks and failed to investigate the real estate firm's performance.

Some researchers studied REITs- real estate investment trust but focused return on Investment, Net interest margins and gross profit most of them ignored net operating income, return on equity and revenue Growth. Most studies did not indicate the specific parameters which influenced firm performance. In Kenya researchers focused on real estate construction firms. The Liquidity risk hedging practices that are applied in real estate firms lacks attention among most researchers. Most Authors

recommended use of property derivatives but did not specify which ones are more appropriate for liquidity risk hedging.

Majority of the studies identified that Leverage risk hedging influence firm performance. However, results differed as many used mixtures of measures of performance such as capital adequacy measures, debt asset ratio, debt-equity ratio and gross profit margin (GPM). Some authors indicated use of debt finance had no effect on (ROS) and (ROCE) while it had negative influence on (ROA) and positive effect on the (ROE). Further investigations were therefore needed. The conclusions and recommendation by these studies indicated the benefits of long-term debts but failed to show how a firm would meet its short-term obligations and achieve operational efficiency through risk management. Others failed to indicate which financial derivatives those were appropriate for mitigating leverage risk among real estate firms.

2.9 Conceptual Framework.

The Figure 2.1 below is the conceptual framework. It showed the dependent and independent variables and their relationships. The outcome variable is on right hand side while outcome variable was on the left-hand side. The outcome variable for this study was performance of real estate firms. While the predictor variables of the study were market risk, interest rate risk, liquidity risk and Leverage risk hedging. The relationship between variables is further explained below.

Figure 2.1

Conceptual Frameworks.

50
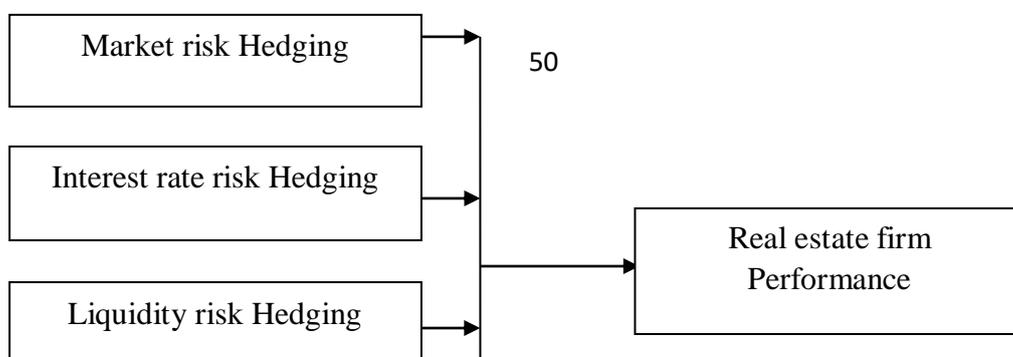
Independent variables   **Dependent Variable**

2.10 Description of Variables in the Conceptual Framework

This section provides the conceptual framework showing how the independent variables relate with the dependent variables. The variables are arranged in the order from market, interest rate, liquidity and Leverage risk hedging in their relation to firm's performance.

Market Risk hedging: General fluctuations that occur in the market due to inflation and economic recessions leads to market risk and affect real estate firm negatively (Chen, 2016). Market risk hedging involves managing the occupancy rate, rental prices, and the cost of building materials and maintenance cost as well as use of futures to hedge the risk. Low occupancy rate may be explained by high property price and may imply poor performance of the real estate firm (Septyanto & Nugraha, 2021). However, people's disposable income level means good to the property owners while rising prices of materials and high maintenance cost may hinder real estate investments. Rental prices are explained by the location of the property. For instance, the commercial real estate located near the towns is likely to attract high-end customers and higher prices. Therefore, they may be highly valued which means

consistent revenue generation. Market risk may also result from exchange rates when some goods and services are being sourced from abroad. These factors may affect the income generation and profitability of the real estate investments (Endri et al., 2021).

Interest rate Risk Hedging: Interest rate risk occurs when the interest rises which drives the cost of the loan and mortgage upwards. High cost of loans discourages purchase of new investments properties or land. High cost of credit also implies commitment of a firm's income to loan payment thus affecting performance (Kamweru&Ngui, 2017). When interest raises the cost of obtaining mortgage rise and the demand for housing fall pushing down property prices. When mortgage rate fall it leads to increased demand for housing and a rise in property prices. High interest rate leads to overall high cost of the project due to cost of labor, material and other expenses and therefore the developer passes the cost to the customers leading to higher housing prices. This may in lower new entrants lowering investments (Xiao, 2016). However, through use of interest rate swaps a firm can hedge against such risk and still remain profitable. The indicators of interest rate risk include the cost of mortgage, timely or untimely debt repayment and the level of debt to the owner's contribution. High cost of loan results from high interest rate and may lead to failure to meet the debt obligations whenever they are due. Therefore, high interest rate and the cost are critical factors influencing performance of the real estate firms. These therefore call for sound interest risk management.

Liquidity risk hedging: It means the risk of exiting the market which is indicated by easiness to sell the real estate assets to convert them into cash. Due to the inability to easily turn assets into cash, there is lack of consistent cash flow, which negatively

affects the business. This further leads to the inability to meet debt obligations when they become due (Daryanto, 2018). This may lead to insolvency, bankruptcy, and closure of the firm. Therefore, liquidity risk negatively affects real estate performance (Wahid et al., 2018). Inability to liquidate the assets of a real estate firm means scaling up the financial costs of a firm and thus failing to meet the short-term financial needs of the firm (Rudin, 2016). However, a flexible plan to convert an asset into cash is a major goal of the financial managers that enables Investors to remain in business in a changing environment. Therefore, a balance must be stroke on Liquidity at a level that is not very high or too low to ensure the good Performance of a firm. A firm does not want to hold or turn its entire asset that can be invested into liquid cash due to the need perform well. Therefore, there is a tradeoff between liquidity and Performance which has been viewed differently by several authors (Khan, 2022). The indicators of liquidity risk hedging are cash flow adequacy, quality management, selected property locations and operational cost management. These factors affect the occupancy rate affecting revenue generation and the performance of real estate.

Leverage risk hedging: The risk is where debt levels rise above 75 percent of owners' equity. High leverage may strain the revenues of an investment in the case where a large percent of the revenues is used to pay the principal and interest. This may affect the business short-term such as maintenance cost thus affecting performance (Giacomini et al., 2019). Magnification of losses happens when an investor uses leverage to trade or purchase larger investments than they could manage therefore increasing chances of losses. Therefore, it is advisable to be

prudent with the use of leverage (Patel &Olsen, 2018). Managing leverage risk is indicated by capital structure management, Leverage decisions, managing sources of finance and having reserve fund. Leverage forms a very essential decision of financial management. It includes the ways of financing a firm considering debt and equity (Adesina et al., 2015). It is important to decide the leverage since it determines the shareholder risk and returns. Real estate owners who use bank loans and other forms of debts are expected oblige with timely payment which increases the risk of liquidation (Wolski, 2017). The financial managers are tasked with solving the puzzles including, funding the investments, viability of the project how, and influence of the leverage on the shareholder's risk and return.

Investment risk hedging: Financial risk is evident in real estate industry as indicated by the statistics that shows stagnated performance of real estate. The Financial risk variables such liquidity risk, leverage risk, interest rate risk, and market risk (Gerlach, 2018). Is hypothesized that hedging of these risks influences the performance of the real estate firms. The financial risk in return affects the returns the investment can make, the earnings by the owners, and the performance of the real estate business. Further, liquidity risk can lead to the inability to meet mortgage loan obligations in cases where the monthly rent is the only source of cash flow (Delfim & Hoesli, 2019). This study seeks to explore the financial risk variables such as Liquidity risk, Leverage risk, interest rate risk, and market risk. These risks are foreseen as the major determinant of efficiency of the properties industry.

2.11 Operational Framework

The variables of the study are operationalized as indicated on the figure 2.2.
Figure 2.2

Operational Framework

Independent Variables   Dependent Variable
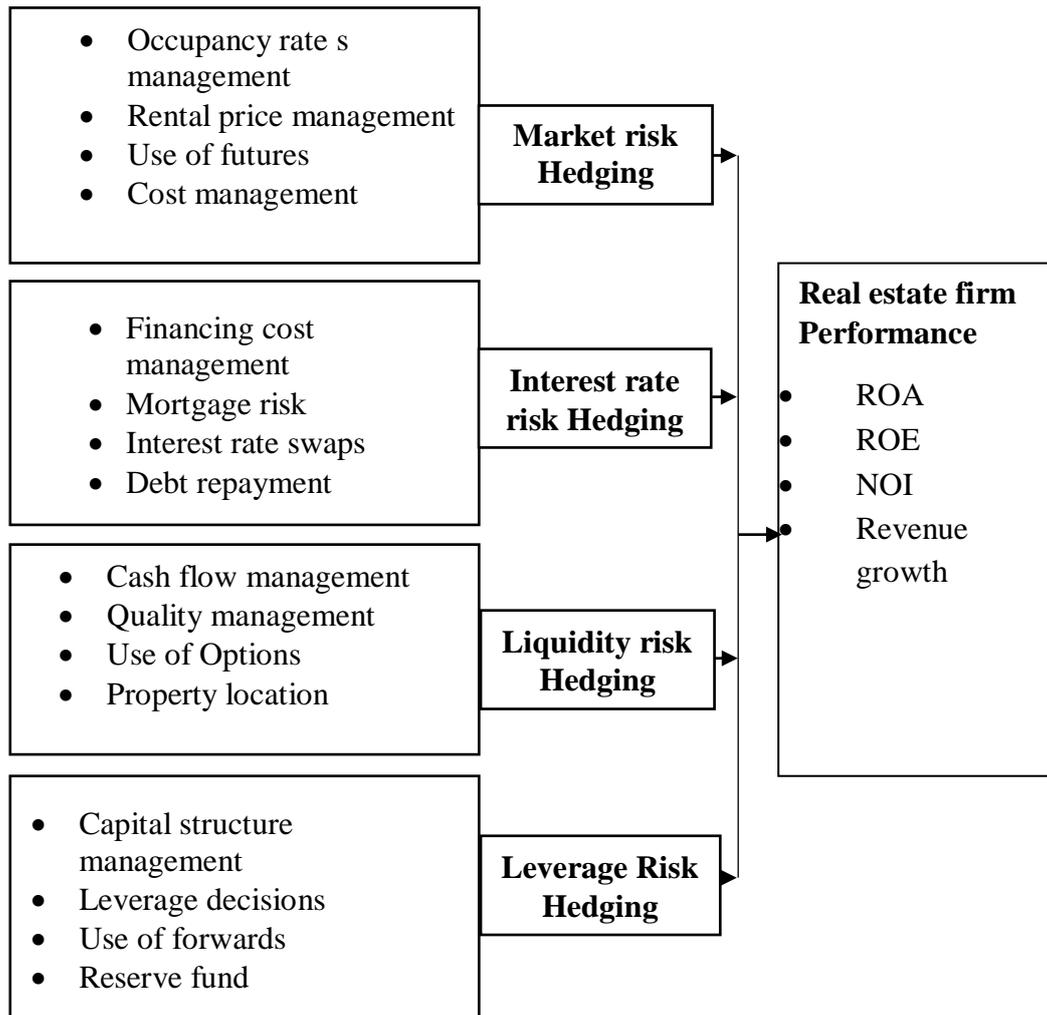
Source: Author, 2023

As indicated on the figure 2.2 the Real Estate Investment performance was the

dependent variable in this study. The real estate investments performance variations

were assessed in terms of return on asset return on equity, net operating income and

revenue growth.   (Atta Mills et al., 2021). Market, interest rate, liquidity and Leverage risk hedging were the independent variables being examined. Some of the studies that used some of these variables include (Abdul Jalil & Ali, 2015; Atta Mills et al., 2021; Deng et al., 2018; Deng & Ong, 2020; Endri et al., 2021; Fecht & Wedow, 2014; Luqman Hakim & SUnardi, 2017; Ma'in et al., 2016). The use of occupancy rates, Rental price and cost management as well as use of futures were used to indicate the market risk management (Carlson &Pressnail, 2018; Wu et al., 2016).

Managing the cost of finance, mortgages and debt payment as well as use swaps were used to indicate interest rate risk hedging (Deventer et al., 2019; Dombret & Goldbach, 2017). Managing Cash flow, Quality , use of options property locations and Operational cost management were the indicators of liquidity risk hedging as adopted form (Abdel Megeid, 2017; Loutzenhiser & Mann, 2021). capital structure management, Leverage decisions, and managing funding sources, use of forwards as well as having reserve funds were used to indicate Leverage risk hedging (Brown & Riddiough, 2023; Ooi et al., 2020).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research methodology of this study. It explains the procedures adopted by the researcher to answer the research hypothesis objectively. In this section the research design, population, sample, sampling procedure, methods of data collection, method of data analysis and the ethical considerationsare described.

3.2 Research Design

The study adopted the descriptive survey research design. This design is meant to describe an existing phenomenon just as it is (Mugenda&Mugenda, 2009).The descriptive research was beneficial to this study since it helped to answer the questions what, when and how. The design was relevant to describe the influence of the market risk, leverage, liquidity and interest rate risk hedging on firm performance. The design enabled the explanation of the characteristics, frequencies, on risk management strategies and firm performance. This enabled clarifying the heart of the problems being investigated in this study. In the survey, the researcher systematically collected data in a standardized form from senior property managers and other officers because they were actively involved in daily operations of the real estate and had sufficient knowledge about financial risk. They were therefore ideal to providing basic information about the problem. This enabled a holistic understanding of financial risk.

The survey involved use of questionnaires which were administered to the real estate senior managers, financial officers, operations managers, risk officers and sales people in the real estate firms in Meru County. It also helped understand the nature of real estate investments in Meru County and give a good foundation for further research (Creswell, 2014). The use of the descriptive approach ensured that the data collected was comprehensive, current, and with depth. This enhanced explaining, describing and validating research findings.

3.3 Location of Study

This study was conducted in MeruMunisparity in Meru County. MeruCounty is in eastern Kenya, around 225 kilometers Northern east of Nairobi. It is the central command of Meru Region, and the 6th biggest metropolitan Community in the country. It covers a space of 6,936 kilometers. It shares it line with 5 different areas: Isiolo region toward the north, Nyeri Region toward the southwest, Tharaka-Nithi toward the southwest and Laikipia toward the west. It is well endowed with land and agricultural resources. The main economic activity is agriculture. There are many education institutions including two universities and a national polytechnic the area is ideal for real estate sector development due to high demand for housing among the residents and visiting non-residents.

3.4 Target Population

According to Mugenda and Mugenda (2009), population targeted refers to all the items upon which the researcher wishes to generalize findings. The target populations of this study comprised of 24 real estate firms registered by (EARB) to operate in Meru County, which were the unit of analysis (Appendix II). The target

informants were 28 senior property management officers, 36 finance officers, 50 operations officers, 42 sales officers, 24 risk officers and 17 legal officers. This totaled to 197 officers who were involved in daily operations and property management, financial planning, and risk management and they were in a better position to give clear information about the financial risk. A total of 197 officers from the 24 real estate firms and Agent's and formed the units of observation. The target population is shown on the Table 3.1.

Table 3.1

Target population

Real estate firm Officers	Respondents	Sample size
Senior Property Management Officers	28	19
Finance officers	36	24
Operations officers	50	33
Sales Officers	42	28
Risk officers	24	16
Legal officers	17	11
Total	**197**	**131**

3.5 Sample size and sampling technique

According to Septyanto and Nugraha (2021)a sample is a smaller group that is actually studied, drawn from a larger population, from which data is collected and analyzed, and inferences are then made on the population. To compute the sample size this study used Krejcie and Morgan table. The sample size was computed as per

the formula.

$$s = \frac{x^2 NP(1 - P)}{d^2(N - 1) + x^2 P(1 - P)}$$

Where S = sample size

X^2 = the table value of chi-square for 1 degree of freedom at the 95% confidence level (3.841).

N= the population size

P= the population proportion (assumed to be 0.50 since this would provide the maximum sample size.

d= degree of accuracy expressed as a proportion (0.05)

$$S = \frac{3.841 * 197 * 0.5(1 - 0.5)}{0.05^2(197 - 1) + 3.841 * 0.5(1 - 0.5)}$$

S=131

After identifying the sample size, the study used simple random sampling methodto administer the instruments on those officers that were present in the office at the time data was being collected to have; 19 Senior Property Management Officers, 24 Finance officers, 33 Operations officers, 28 Sales Officers, 16 Risk officers and 11 Legal officers. The sample of 131 was distributed as per the sample population per each firm the table 3.3. From the 24 real estate firms Stratified sampling method was used where Specific numbers of officers were picked from different stratums. The sampled population was distributed stratified as per the table 3.3.

Table 3.3

Stratified random sampling.

Real Estate Firms	Senior Property Management Officers	Finance Officers	Operation Officers	Sales Officers	Risk Officers	Legal Officers	Total
RYSTON (KE) LTD	1	1	2	1	1	0	**6**
YetuPamoja Investment Co-op Society Ltd	1	2	1	2	1	1	**8**
Ajogi Limited	1	1	1	1	1	0	**5**
Ntara and Associates, Meru	1	1	2	1	0	1	**6**
Pata property	1	1	1	1	0	0	**4**
Mt. Kenya Real Estate Expo	0	1	1	2	1	0	**5**
Pave Point Properties Agency.	1	1	1	1	1	0	**5**
My property Africa	1	1	2	1	0		**5**
Jokir Property Management and Real Estate Company	1	1	2	1	1	0	**6**
Villar Properties	0	1	1	2	0	0	**4**
Restate properties	1	1	1	1	1	0	**5**
Gramer Properties	0	1	2	1	0	1	**5**
Kariuki C M Advocates	0	0	1		0	3	**4**
KiogoraArithi Associates Advocates	1	1	1	1	0	2	**6**
Ringet Properties Ltd	1	1	2	1	1	0	**6**
Ni-lights Consultants	1	1	1	1	0	1	**5**
Housix Agency & Properties	1	1	1	1	1	0	**5**
Pave Point Properties Agency.	1	1	1	2	1	0	**6**
Three Square Properties	1	1	2	1	1	0	**6**
RAKNA Agencies LTD	1	1	2	1	1	0	**6**
Apprise Realtors Ltd, Meru	1	1	2	1	1	0	**6**
Shepfames Enterprise	1	1	1	1	1	0	**5**
Dianah Real Estate Agents	1	1	1	1	1	1	**6**
Evero properties	1	1	1	5	1	0	**6**
Total	**19**	**24**	**33**	**28**	**16**	**11**	**131**

3.6 Research Instruments

Research instruments are the tools used to obtain data for analysis from the participants of a study (Mohamad et al., 2015). A questionnaire designed to be self-administered was used to collect data from the senior management officers, who had experience on investments and risk management. The financial officers, operations officers and sales officers who had experience on financial information of real estate investments, operational dynamics and market changes. This enabled the researcher to get the relevant information about the objectives of the study from all the perspectives within the real estate industry.

The tool comprised of open ended and closed ended questions. The closed ended questions utilized 5 statements tabular Likert scale adopted from (Boparai et al., 2018; Hutchinson & Chyung, 2023). Clear directions were given to lead the respondents in answering the questions about market risk, leverage risk and liquidity risk. The questionnaire was effective to this research since it enabled consistent responses for all the sections of enquiry. The questionnaire is annexed at the end of this document (Appendix VII).

The study also collected data from secondary sources to enable shed more light on market risk, interest rate risk, liquidity risk and leverage risk. The data involved financial information from the firms for the past three years as per the secondary data collection schedule. The secondary data schedule is on the (Appendix IV).

Further the panel data was also collected which assisted in understanding the market tends on interest rate, prices which aided information on market risk, interest rates. The information was obtained from (KNBS), Hass consult and (CBK) websites for

the four quarters of the year 2011 to 2020 that are (Q1, Q2, Q3& Q4). The information collected through website search enabled to analyze trends to compare the changes in the real estate market over time. The secondary data sheets are in the (Appendix V and VI) on the annexes. The procedure involved connecting the computer to the internet and logging in to the relevant websites and searching for the downloads sections and getting the available data on macro-economic indicators.

3.7 Pre-Testing

A pretest is carried out on a small sample to identify possible mistakes, problems or errors in the research instruments which should be corrected before the full-scale survey Taber, (2018). According to Das et al. (2016), a pretest should be 10 percent of the sample projected. Therefore, 13 questionnaires (10%) of the sampled population were administered to three real estate firms in Tharaka-Nithi County. According Murithi, (2018), investment growth rate has been on the rise in Tharaka-Nithi County which could be attributed to rising demand for commercial and residential properties with the growth of institutions. The three firms were selected because they were registered by EARB and they deal with similar scope of business operations though in a different county.

The instruments were distributed to 2 senior property managers, 3 financial officers, 2 sales people, 3 operations officers, 2 risk managers and 1 legal officer using simple random technique. The pretest helped improve the reliability and validity of the instruments. The ambiguous questions were removed from the questionnaire to improve on the instrument before the performance of full-scale research.

3.7. 1 Reliability

Reliability measures the consistency of data collection instruments. According to Golafshan (2003), reliable results are an accurate representation of the total population and can be reproduced under a similar methodology. There are different methods of testing reliability of the study instrument such as test retest, - consistency across time, inter-rater-consistency across different raters and internal consistency. In this study, reliability was tested using Cronbach alpha which ranges from 0- 1(Taber, 2018). The higher the range the higher the measure is considered reliable.

For an instrument to be reliable it must have a minimum Cronbach's of 0.7 (Tavakol& Dennick, 2011).Reliability ensured that there was consistency in the reproduction of the results using the original instrument (Kothari, 2003). The instruments of this study were considered reliable since the results for the 13 pretest instruments in SPSS version 23 yielded a Cronbach's alpha of 0.904. This was above 0.7 and therefore the instruments were deemed reliable to carry out the full-scale research.

3.7.2 Validity

Validity refers to the extent to which an instrument truly measures what it is intended to measure (Golafshani, 2009). Content and criterion validity was considered where under content validity the variables were considered to be varied if they were in general agreement with existing literature (Zohrabi, 2019). Criterion validity was concerned with the extent to which particular variables predicted to other variables (Sullivan, 2011). Criterion- validity of the conceptual framework was determined by examining how market, leverage, liquidity and interest rate risk hedging explained

the performance of real estate firms. This was done using multiple regression was performed to test all the independent variables as the measure of real estate firm performance. The associations were found direct and significant implying that criterion validity was taken care of. Therefore, this study employed both criterion and content validity. Regarding content validity, the researcher frequently met with the supervisors who were very helpful in ensuring that the instruments would measurethe desired intents of this study. The indicators were revised to reflect the variables under study. All these were observed to ensure the reliability of the instruments.

3.8 Data Collection Procedure

The procedure for collecting primary data started by getting clearance after presenting and defending the proposal at the department of Business Administration. This was followed seeking introduction letter (Appendix III) from the Kenya Methodist University department of Postgraduate studies which was followed by application for a research permit from the National Commission of Science, Technology, and Innovation (NACOSTI) (Appendix IV). After getting the permits the researcher administered the questionnaire using drop and pick method to the property management officers, financial officers, operations officers, risk officers and sales people (Appendix II).

This was conducted by the researcher introduction to the senior manager through the introduction letter (Appendix I) who gave permission to collect data from them the other firm officers. The officers were briefed on the purpose as to why the research was being conducted and informed consent was sought from them. After the

informed consent the researcher assured the participants that the information provided would be treated with privacy and with security. The participants were also informed on the purpose for which the data was collected would be academic purpose only.

They were left to fill the questionnaire after which the researcher picked them for analysis within one week. Those who were not able to fill the questionnaires immediately due to busy schedules or were absent from job, a period of two weeks was allowed after which the questionnaires were collected. The managers were very helpful in providing the firms available secondary data that was very useful in analysis. This was guided by Appendix IV Secondary data collection schedule.

The procedure for collecting other secondary data involved getting connected to the internet and searching the panel data from the databases of Kenya national bureau of statistics, Hass consult and central bank of Kenya. The data collected from these websites is annexed on (Appendix V and Appendix VI).

3.9 Data Analysis Presentation

First the collected data was cleaned to clear errors and unnecessary information not relevant to the study variables. The ordinal Likert scale data was entered and coded on a scale of 1-5 where 1 represented strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree. Further it was analyzed by the help of statistical software for social sciences (SPSS version 23). This helped to generate the descriptive statistics and inferential statistics. The Microsoft Excel was used to

generate graphs and charts. The output was presented by the use of descriptive statistics and inferential statistics (Sullivan, 2015).

The diagnostics test of linearity was carried to check the correlation coefficient (R). This helped to reveal whether the model met the assumption of linear regression. Change Inflation Factors (VIF) was, then again, used to decide multi-collinearity, which was another analytic test. The last symptomatic test was to test homoscedasticity utilizing the Levine's test. Examination of fluctuation was utilized to decide the trial of importance. Then the tables and charts were used to presents the information.

The cross tabulations and Multiple regressions were used to examine the influence of Investment risk hedging variables and performance of the real estate firms. The regression model utilized is as follows:

Y = C+ β1X1+ β2X2+ β3X3+ β4X4+E

Where:

Y = Financial performance

βi= Coefficients to be estimated

C= Constant

XI = Market risk hedging

X2 = Interest rate risk hedging

X3 = Liquidity risk hedging

X4 = Leverage risk hedging

67

E=error term.

3.10 Ethical Considerations

The researcher got approval by the Kenya Methodist University to carry out the study. After this a permit from the National commission of science technology and innovation (NACOSTI) was sought before the actual data collection started. Once the approval was received the data collection process started by engaging the participants through informing them about the research goals. The respondents were informed that the purpose of the research was academic only. The researcher also sought informed consent from the participants by issuing an introduction letter and explaining to them what was contained. This followed assuring them of privacy and confidentiality of the information they would give. This letter is annexed on (Appendix I) while the consent note is on (Appendix II). Further, the researcher refrained from soliciting personal information that may undermine the confidentiality of the research (Creswell, 2014). The author was given an introduction letter by the Kenya Methodist University permitting data collection. All the sources of information were cited using APA Seventh edition guidelines.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1Introduction

This chapter contains the results of the data analysis of this study. These results are arranged in form of tables and figures. The results are arranged in order starting from the response rate, reliability test, general information, descriptive statistics response rate, reliability statistics, and the results on the independent and dependent variables.

4.2 Response rate

The study had a target population of 131 and the response rate was 114 (87%) as shown in Table 4.1.

Table 4.1

Response rate

Real estate firm Officers	Sampled	Responses	%
Senior Property Management Officers	19	18	94.7%
Finance officers	24	20	83.%
Operations officers	33	28	84.8%
Sales Officers	28	24	85.7%
Risk officers	16	15	93.7%
Legal officers	11	9	81.8
Total	**131**	**114**	**87.02%**

The table 4.1 indicates the response rate. Out of the 114 questionnaires administered to the real estate investment senior property managers, operation officers, risk officers and sales officers; 20(83), 28(84.8), 24(85.7),15(93.7) and 9(81.8) were returned respectively. The overall response rate was 87% and this response rate was sufficient to conduct the investigation. According to Fincham (2018), a response rate of 97% is sufficient for a descriptive study.Mugenda and Mugenda (2009) noted that 70% was sufficient enough and are good enough, while 60% is good and 50% is adequate for a descriptive survey. A response rate of 87% in this study implies that the results authentically represent the information that would be given the entire population. The higher the response rate the higher the likelihood that the results are representative of the entire population (Taherdoost, 2016).The higher response rate could be explained by pre-contact and follow up. It therefore implied that there was minimal sampling bias and the results highly reflect the whole population.

4.3 Reliability Test

According to Mugenda and Mugenda (2003), sample size of 10% was used for pretesting before the actual data collection 13 questionnaires were pretested at Tharaka-Nithi County. The pretest informants included 3 senior property managers, 3 financial officers 3 operations managers, 2 risk managers1 sales officers and 1 legal officer. The questionnaires were distributed equally using simple random technique to three real estate firms operating in Chuka town. The results were entered into SPSS version 23 where the scale analysis was carried. The results were as on the Table 4.2.

Table 4.2

Reliability test result

Instruments	Cronbach's alpha	No. of items
Market risk Hedging	0.831	13
Interest rate risk Hedging	0.902	13
Liquidity risk Hedging	0.940	13
Leverage risk Hedging	0.942	13

The Table 4.2 shows that the Cronbach's alpha value was 0.904. Following Taber (2018)Cronbach's alpha value ranges between 0 and 1 where 0.7 is a measure at which the questionnaire is deemed reliable. Market risk hedging had a Cronbach's alpha of 0.831, interest rate risk hedging had a Cronbach's alpha of 0.902, liquidity risk hedging had a Cronbach's alpha of 0.94 and leverage risk hedging had a Cronbach's alpha of 0.942. Therefore, a Cronbach's (a=0.904) implied that the instrument was reliable to investigate and inform the research problem of this study. It was fascinating to find that 13 respondents understood the questions and gave clear feedback. This implied that the instrument was reliable and the sampled respondents understood the questions during and actual study. The study by Oundo (2021) posted similar results.

4.4General Information

The general information comprised of classification of the asset types, and the respondent's education level. This information was vital to enable better understanding of this study and is shown in section 4.4.1.

4.4.1 Classification of the Real Estates

The study sough to find out the classification of the real estate investigated. The responses are shown in the Table 4.3.

Table 4.3

Classification of Real Estates

Classification of real estate	Frequency	Percent
Residential real estate	29	25.4
Commercial real estate	68	59.6
Industrial	17	14.9
Total	114	100.0

The real estate was classified into three that is commercial real estate, residential real estates and industrial real estate. There was more commercial real estate 68(59.6%) than the residential real estate 29(25.4%) area of study. However, a few estates 17(14.9%) were for industrial purposes. The respondents revealed that commercial real estate's had higher rental prices than that of residential buildings. However, the demand for residential estates was higher than that of commercial real estate, but respondents did not show which type of real estate classification is preferable for investment. Table 4.4 presents the results.

4.4.2 Respondent Education Level

The study sought to find out the educational background of the respondents. The results are indicated in Table 4.4.

Table 4.4

Education level of the respondent.

	Frequency	Percent
Diploma	30	26.3
Degree	63	55.3
others	21	18.4
Total	114	100.

It was found that most of the respondents 63(55.3%) had a university degree while 30(26.3) had a diploma while 21(18.4%) had other forms of education. This implies that the respondents of this study had sufficient knowledge to provide valid responses for this study.

4.5 Diagnostics tests

The researcher carried out diagnostic test to check if the data collected adhered to the assumptions of the regression analysis. The test carried out included normality test, Multicollinearity test and homogeneity test on variances and presented from section 4.52.

4.5.1 Tests of Multicollinearity

In testing for Multicollinearity, both variance inflation factors (VIF) and tolerance tests were carried out on independent variables. The outcomes are indicated on Table 4.5.

Table 4.5

Tests for VIF and Tolerance

Model	Collinearity VIF	Tolerance
Constant		
Interest rate	4.281	0.334
Market risk	2.372	0.422
Liquidity	2.718	0.368
Leverage	2.763	0.362

Fundamentally a tolerance value that is less than 0.2 is an indicator of Multicollinearity (Perez-Melo&Kibria, 2020). Computation indicated no Multicollinearity existing since tolerance values for all variables were more than 0.2. A VIF value of 10 indicates Multicollinearity, and therefore, the study variables had no Multicollinearity problem. The table 4.4 above indicates the results.

4.5.2 Homogeneity test of variances

Levenes test was used to assess whether there was homogeneity across the independent variables. The P-value for Levenes test must be above 0.05 otherwise homogeneity of variances assumption is disobeyed(Conover et al., 2018).This enables comparisons of distributions of outcomes among the independent variables. The findings are indicated on the Table 4.6.

Table 4.6

Homogeneity test of Variances

Levene Statistic	Levene test	Degree of freedom 1	Degree of freedom 2	Sig.
Interest	3.726	7	107	0.15
Market risk	6.013	7	107	0.16
Liquidity	2.829	5	109	0.21
Leverage	5.384	7	107	0.18

Levene statistic and significant value for interest rate, Market risk, Liquidity and Leverage, were3.726, 6.013, 2.829, 5.384 and 0.15, 0.16, 0.21, 0.18 respectively. The p value for the Levenes text therefore shows that the variables conformed to the assumptions of homogeneity of variances assumptions. This implied that there was no homogeneity problem. These findings were consistent with those of Amoo (2021) who had conducted a similar study in Busia County.

Figure 4.1

Normal PP plot
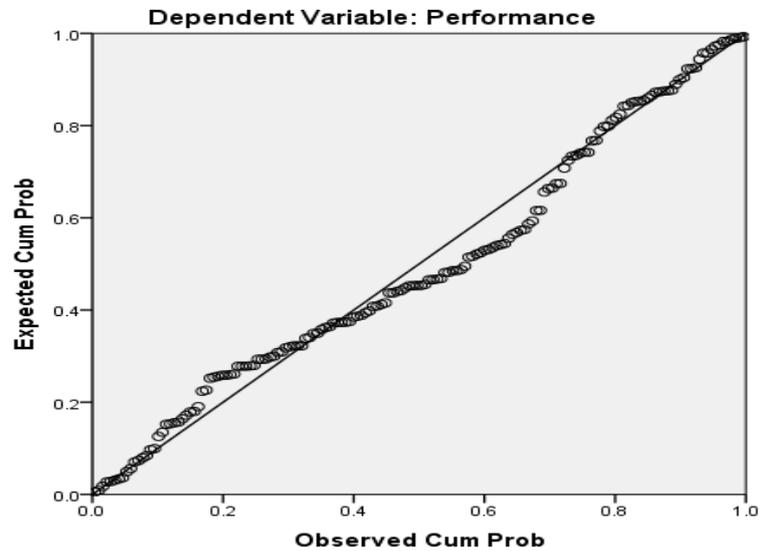
The data is said to be normally distributed if it stays around the diagonal line. However, if the data strays far from the line, then the data is not normally distributed (Srinivasan &Lohith, 2017). Therefore, the pp. plots on figure 4.3 shows the data point were nearing the sloppy line hence indicating that the data was normally distributed. It implied that the responses given were reliable sources of drawing the conclusions for this inquiry having satisfied the linear regression assumption. These findings agreed with those of (Septyanto&Nugraha, 2021).

4.5.4 Linearity test

Linearity test was conducted to check whether the variables were linear. The variables are deemed linear when their deviations significance is greater than 0.05. If

the value significance deviation from Linearity was less than 0.05, then the relationship between independent variables with the dependent was not linear (Vatcheva et al., 2016). The table 4.7 shows the results.

Table 4.7

Linearity test			Sum of Squares	df	Mean Square	F	Sig.
Firm performance	Between Groups	(Combined)	118.697	13	9.131	1.351	.193
		Linearity	49.641	1	49.641	7.345	.008
		Deviation from Linearity	69.056	12	5.755	.851	.598
Market risk	Within Groups		831.332	123	6.759		
	Total		950.029	136			
	Between Groups	(Combined)	70.542	9	7.838	1.132	.345
		Linearity	27.302	1	27.302	3.943	.049
Interest risk		Deviation from Linearity	43.239	8	5.405	.780	.621
	Within Groups		879.488	127	6.925		
	Total		950.029	136			
	Between Groups	(Combined)	121.002	14	8.643	1.272	.234
		Linearity	14.178	1	14.178	2.086	.151
		Deviation from Linearity	106.824	13	8.217	1.209	.281
Liquidity risk	Within Groups		829.028	122	6.795		
	Total		950.029	136			
	Between Groups	(Combined)	175.565	14	12.540	1.975	.025
		Linearity	34.063	1	34.063	5.366	.022
		Deviation from Linearity	141.502	13	10.885	1.715	.066
Leverage risk	Within Groups		774.464	122	6.348		
	Total		950.029	136			

Table 4.7 indicates that market risk deviation from linearity were 0.598; interest riskwas0.621; liquidity risk was 0.281; and leverage risk were 0.066. This shows that all the fourvariables of the study relationship with independent variable was linear since theywereall above0.05.

4.6 Descriptive statistics

This study sought to analyze the relationship between market risk and financial performance of real estate investments in Meru County. This section indicates the descriptive statistics on the influence of market risk, interest rate risk, liquidity risk and leverage risk hedging on real estate firm performance. Table 4.4 below presents the results.

4.6.1 Firm Performance Indicators

The investigator sought to establish the real estate firm's performance for the period from 2018 to 2020. The financial performance indicator on ROA, ROE, NOI and revenue growth data for the period was analyzed and their means derived as indicated on the Table 4.7. This was guided by the schedules indicated on Appendix V, Appendix IV as adopted from successful studies by (Ahmad, 2018; Daryaei & Fattahi, 2020; Endri et al., 2021; Okuta et al., 2022).

Table 4.7

Firm performance

Variable	N	Mean	Standard deviation
ROA	24	3.8	1.92
ROE	24	2.9	1.75
NOI	24	3.4	1.83
Revenue Growth	24	3.2	1.68
Average		**3.33**	**1.80**

The table 4.7 showed that the firm's performance indicators had an average mean of 3.33 and standard deviation of 1.8. Return on asset had the highest mean which could mean that most firms were able to utilize the assets to generate income. This implies that the revaluation of fixed asset value of properties has been increasing over time. Return on equity results showed that most firms weren't performing very well based on the return on equity metric which implied that they rarely raised capital through shares. The overall result indicates that firms had high operating expenses and this affected their performance. These results were inconsistent with those of Mootian (2021) who found that firms in Nairobi County were performing well based on the same metrics. The difference could be explained by the fact that his study was carried out on firms on listed in Nairobi stocks exchange which raised capital through shares. The results agreed with those of (Ndiiri and Kilika, 2021).

4.6.2 Influence of Market Risk Hedging on the Real Estate Firm Performance

Market risk was an independent variable of the study. The respondents were required to indicate their level of agreement with the following statements. The results are described in Table 4.8

Table 4.8

Market risk

Market risk	Strongly Disagree	Disagree	Neutral	Agree	strongly agree	Mean
The firm engages in aggressive marketing to manage occupancy rate for rental space to improve business performance.	21(18%)	19(17%)	9(8%)	28(25%)	37(32%)	**3.35**
The firm sets house prices around the equilibrium rate to manage competition.	2(2%)	6(5%)	1(1%)	45(39%)	60(53%)	**3.76**
This firm applies currency swaps and futures to hedge against rental prices fluctuations.	59(51.8%)	39(34.2%)	14(12%)	2(1.7%)	0(0%)	**2.24**
This firm manages cost when procuring building materials for maintenance and new developments by investors	6(5%)	12(11%)	6(5%)	29(25%)	61(54%)	**3.96**
The cost of properties maintenance in this firm is very high	2(2%)	4(4%)	15(13%)	38(33%)	55(48%)	**3.42**
Average						**3.68**

The findings in Table 4.8 shows that market risk indeed affected real estate firm performanceaverage mean of 3.68. Occupancy rates had a mean of 3.35. Regarding, occupancy rate for rental space, majority of the respondents 37(32%) strongly agreed followed by 28(25%) who agreed. Low occupancy rate could be attributed to high pricing and low business activity for commercial real estate. This implies that

reduction in demand for the buildings negatively affected performance of the real estate investment. The findings were consistent with those of Naz et al. (2023) who found that low occupancy rates largely affected firm performance.

Most firms were setting the property prices around the equilibrium rate to manage competition (Mean=3.76). This would hedge ccompetition due to high supply of the housing units', 60(53%) strongly agreed, while 45(39%) agreed with the other respondents having neutral opinions and a few disagreeing. This reveals that increased supply of new buildings leads to lessening in house prices as an outcome thus significantly affecting revenues realized from real estate business. These results agreed with those ofZhang et al.(2019) who noted that supply and demand side also have mild effects on performance with high supply and low demand negatively affecting real estate performance and vice versa. They recommended provision of valuable and environmentally friendly solutions to increase customer value to manage such risk.

The application of currency swaps and futures to hedge against rental prices fluctuations had a mean of 2.28. It implied that financial innovations for hedging risk were uncommon in Meru County. These results disagreed with those of Fabozzi et al (2020) who found that most firms applied swaps and futures to hedge against risk in America. Regarding the rental prices fluctuations majority of the respondents 59(51.8) strongly disagreed, while 39(34.2) disagreed. This implies financial derivatives are not commonly used among the firms in Meru County to hedge against the market risk. Rental and property prices are dynamic. The results disagreed with those of Fabozzi et al. (2020) who encouraged utilization of derivatives to hedge

against price risk. The difference could be attributed to growth of financial innovations in developed countries where they conducted the investigation. This study revealed that such changes in prices due to market changes that significantly affected performance of the real estate investments. The findings of this study were consistent with those of Kamweru and Ngui (2017) who studied real estates in Nairobi. Their findings indicated that fluctuations in rental prices largely influenced the firms.

Further the regarding management of cost such as building materials purchases most participants 61(54%) of the respondents intensely acknowledged, and 29(25%) accepted. This indicates as the cost of building increases holding other factors constant, it discourages the investors and this stagnation may affect revenue growth in real estate business. Cost control is therefore essential since it affect the net profit of a firm. This finding is in agreement with that of (Patel & Olsen, 2018). Further, cost of building materials increases with inflation and that significantly affect further investments and how real estate investment performs. This study found the need to manage the cost of properties maintenance as well since influence the performance of real estate investments. Majority of the study respondent 67(40.9%) strongly agreed while 49(29.9%) agreed. The high cost of maintenance results from high prices of goods and services. Highly maintained and quality houses are likely to attract high end clients which in turn enable revenue generation The results agreed with those of (Daryaei & Fattahi, 2020).

Further results indicated that the general prices levels were on the rise. This indicates increases in general level of materials which in turn lead to high maintenance costs.

From review of secondary data findings, it was established that 2.7% was the lowest Market risk ever recorded, while 19.2% was highest Market risk ever recorded.

Figure 4. 2

Market risks
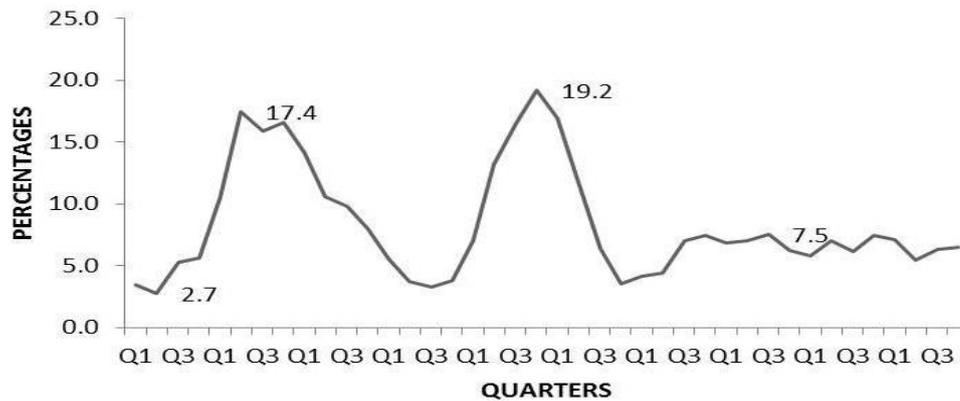
The stunted growth in the sector could be explained by market risk such as rental prices, maintenance cost, occupancy rate and material costs. These indicators agree with the findings of (Endri et al., 2021). The data is available in (Appendix V).

4.62 Model Summary of market risk Hedging

A model summary was conducted to determine the influence of market risk hedging on Real estate firm performance. On the table 4.9 the results are indicated.

Table 4.9

Market risk Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.663a	.557	.543	2.932	1.892

a. Predictors: (Constant), Market risk Hedging

b. Dependent Variable: Firm Performance

The model summary Table 4.9 indicates that market risk hedging had an R=.741 and adjusted R of 0.55. This implies that 55.7% of the variations in real estate firm performance were explained by market risk hedging. A dubbin Watson value of 1.892 indicated a positive correlation existed. These results agreed with those Haran et al. (2020) who noted that market risk hedging largely influence firm performance and can be achieved through diversification since it isn't a firm specific risk.

4.6 3 Analysis of variance on Market Risk Hedging

Analysis of variance was carried to rule out the hypothesis that stated that Market risk hedging had no significant influence on Real estate firm performance. The results indicated on the Table 4.10 presents the information.

Table 4.10

Analysis of Variance

ANOVAª

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	57.966	7	7.246	9.581	.000ᵇ
	Residual	117.223	107	.756		
	Total	175.189	114			

a. Dependent Variable: Real_estate_Firm_Performance
b. Predictors: (Constant), Market risk Hedging

The analysis of variance Table 4.10 indicated that market risk hedging had an F value of 9.581 and a P value of 0.00 (F=9.581, p=0.00). This was consistent with

Soltanizadeh et al., (2019) who found p values of below 0.05. This implies that influence was significant and therefore it led to rejection of the Null hypothesis that market risk had no significant influence on Rea estate firm Performance. Soltanizadeh (2019) found similar results and encouraged diversification strategy to improve ERM.

4.6.3Influence of Interest Rate Risk on Real Estate Investment Performance

This study sought to determine the influence of interest rate risk on the performance of real estate firm. The Table 4.11 describes the results.

Table 4.11

Interest rate risk

Interest rate Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean
This firm manages cost of finance by negotiating with the banks the lending interest rate	8(7%)	6(5.3%)	10(8.7%)	52(45.6%)	38(33.3%)	**3.46**
This firm utilizes interest rate swaps to control risk related to Mortgage interest rates risk	64(56.1%)	34(29.8%)	5(4.4%)	8(7%)	3(2.6%)	**2.01**
This firm repays debt obligations on time from the monthly revenues acquired.	6(5.3%)	8(7%)	11(9.6%)	37(32.5%)	52(45.6%)	**3.89**
This firm has been exposed to default risk many times	22(19.4%)	15(%)	20(17.5%)	33(28.9%)	24(29.8%)	**2.98**
This firm's total debts exceed total owner'scontributions	9(7.9%)	10(8.8%)	12(10.5%)	31(27.2%)	52(45.6%)	**3.84**
Average						**3.77**

The result in the Table 4.11theinterest rate risk hedging largely affected firm performance shows the average (Mean = 3.77). Whether, the firm manages cost of finance by negotiating with the banks the lending the mean was 3.46.Most respondents90 (78.9%) indicated that high interest rate largely affected the firm's performance. It implied that most firms shopped for the best interest on the loans offered to reduce cost of debt. Similarly, the findings of Stevenson et al. (2019) study in the UK real estate companies that alterations in both market and central bank interest rates movement affect performance of such companies. Therefore, this indicates that interest rate risk harms the overall performance of real estate firms. Further a study by Mueller and Pauley (2020) noted that high volatility in interest rate affect how real estate's investors make decisions and recommended prudential management.

Whether the firm utilized interest rate swaps to control risk related to Mortgage interest rates risk had a mean of 2.01. Majority 64(56.1%) strongly disagreed while 34(29.8%) disagreed. It implied that the financial innovations for hedging market risk were not very common. This could mean that there are other risk hedging strategies that were in place. However due to the dynamic nature of real estate there was need for application of methods that could make the investment returns certain. These results disagreed with those of Lenee and Oki (2017) who found that derivatives were being used to tame price risk.

The firm's repayment of the debt obligations had a mean of 3.89. However, a few disagreed. These findings agreed with those of Ma'in et al. (2016) that high rate of interest thus increases the cost of debt incapacitating the firms performance. This

calls for proper management of the levels of debts proper negotiations of interest rates with the bank before acquiring a mortgage. The lending rate that banks apply on the mortgage loans to a high extent affect the real estate investments since the revenues realized from the investments were committed to the payment of the principal and banks interest. This further strained the cash flows realized from the investment. These findings agreed with those of (Kioko, 2020).

The firm's exposure to default risk had a mean of 2.98. Some firms had many times found themselves unable to meet debt obligations whenever they fall due. It implies that their current asset was not sufficient to cover their current liabilities. Majority strongly agreed 24(29.8%) and 33(28.9%) agreed while 22(19.4%) strongly disagreed. This may result due to high or fluctuating loan interest rate which exposes most investors to risk. The investor is expected to repay their short-term debts or long-term debts using the steady income realized from the investments.

According to Swanson et al. (2020), the interest rate risk is the risk that emanates from alterations in the level of interest rate of assets. This risk is predicted to affect housing prices among many other prices. Interest rate risk hedging significantly influenced the firm performance. It implies that lending rates play a critical role in determining how the investment performs. The finding of this agreed with those of Reddy and Wong (2017) who investigated the influence of leverage funds distributed in low debt and high debt portfolios to check their sensitivity to interest rates. They found out those modifications in future interest rates remarkably influenced firm performance negatively. This therefore shows that interest rate risk hedging is a significant determinant of real estate firm performance.

Regarding debts levels over the equity the mean was 3.84. Majority of the respondents 52(45.6%) strongly agreed, while 31(27.2%) agreed. This implies most firms relied on debts to finance projects. These findings agreed with those of (Pandey & Sahu, 2019) who note that use of debts increased agency cost and negatively affected the firm performance. However, Mitra and Naik (2021) found that use of manageable levels of debts had a positive influence on Return on equity which reduces agency cost and improves firms performance. This may be further explained by the years a firm has been operating.

Further the interest rates in this study were measured by the average lending rates on quarterly bases. Highest interest rate to be recorded was at 20.2%, while least being 13.1%. It implies that though the government had set ceilings of interest rates investors were still acquiring debts at very high rates of interest thus hurting firm performance. The real estate firms need to employ interest rate collars and caps to maintain the level of risk related to fluctuations on interest rates on manageable level (Berk,2019). The Figure 4.3 describes the data.

Figure 4. 3

Interest Rates
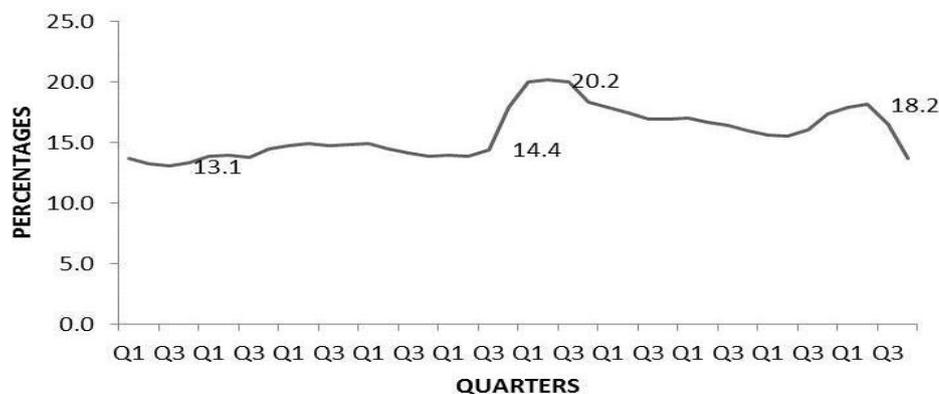
The data is available in (Appendix V).

4.6.4 Model Summary of Interest Rate Risk Hedging

A model summary was run on SPSS to investigate the influence of interest rate risk on firm performance. The results are indicated in Table 4.12

Table 4.12

Model summary on interest rate risk

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.796a	.633	.626	2.959	1.84

a. Predictors: (Constant), Interest rate risk hedging

b. Dependent Variable: Firm Performance

The model summary Table 4.12 shows that interest rate risk hedging had R value of 0.796 and an adjusted R square value of .626. This implies that 62.6 variations in real estate firm performance are explained by interest rate risk hedging. These results were consistent with (Berk, 2019).The dubbin Watson outcomes 1.84 indicated positive correlation.

4.6.5 ANOVA of Interest Risk Hedging

A model summary was carried to assess whether the interest rate risk hedging influenced the real estate firm performance. The results are shown on Table 4.13.

Table 4.13

Analysis of variance on Interest rate risk

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.332	7	6.541	8.253	.000[b]
	Residual	122.857	107	.793		
	Total	175.189	114			

a. Dependent Variable: Firm Performance

b. Interest rate risk hedging

The Table 4.13 ANOVA results indicates that Interest rate risk had F value of F=8.23 and P-value of 0.00 which was below 0.05.Berk (2019) similarly found p values of below 0.05. This indicates that interest rate risk hedging had a significant influence on firm performance. Therefore, the Hypothesis that stated that interest rate risk hedging had no statistically significant influence on real estate firm performance was rejected. This agreed with Berk (2019) who recommended the use of cap, swap, and collar to hedge against interest rate risk.

4.6.6 Liquidity Risk Hedging influence on Real Estate Firm Performance

This study examined the influence of liquidity risk hedging on financial performance of real estate firms in Meru County. The results are indicated on the Table 4.14.

Table 4.14

Liquidity risk

Statements	Strongly disagree	Disagree	Neutral	Agree	strongly Agree	Mean
This firm's monthly revenues generate adequate cash flow to meet our financial obligations	21(18.4%)	19(16.7%)	9(7.9%)	28(24.6%)	37(32.5%)	**2.98**
This firm maintains high quality through regular value addition thus reducing the conversion cycle.	7(6.1%)	18(15.8%)	27(23.7%)	32(28.1%)	30(26.3%)	**3.42**
This firm's assets are strategically located thus easily attracting occupants.	14(12.3%)	7(6.14%)	11(9.65%)	18(15.8%)	64(56.1%)	**3.74**
This firm has always had enough cash to meet short-term obligations when they become due.	13(11.4%)	14(12.3%)	18(24.6%)	28(24.6%)	41(35.9%)	**3.58**
These firms' operational costs per month are very high thus straining the revenues realized.	11(9.6%)	12(10.5%)	6(5.3%)	36(31.6%)	49(42.9%)	**3.65**
This firms uses option contracts to allow customers to buy or sell at particular date therefore firm's liquidity is certain	48(42.1%)	30(26.3%)	30(26.3%)	6(5.3%)	0(0%)	**2.76**
This firms Loan repayment has distressed cash flow thus affecting business performance.	7(6.1%)	6(5.3%)	2(1.8%)	46(40.4%)	53(46.5%)	**3.82**
Average						**3.42**

The findings on Table 4.14 indicated that the average mean was 3.42. Majority of the

respondents agreed liquidity risk greatly influenced firm performance. Loan

92

repayment strained the liquidity levels of most firms with a mean of 3.82. It implies that firms need to hold liquid asset to cover their debts when they fall. This agrees with liquidity preference theory according to (DiBartolomeo et al., 2021) who encouraged firms to hold asset that attracts high dividends payout to enhance liquidity. Use of option contract was uncommon with a mean of 2.76. It implied that majority never utilized innovations such as options to hedge against risk. These results concurred with those of Deng and Ong (2020) who advised firms to utilize financial derivatives to hedge risk.

The quality and location of the asset had a mean of 3.42. Majority of the participants 32(28.1%) while 30(26.3% strongly agreed that its location influenced liquidity risk. This implies that that in the current competitive environment managers must select marketable locations and maintain high quality in order to remain afloat. These results agreed with those of Amoo et al. (2023) observed liquidity risk hedging greatly influenced real estate construction firms performance. It also concurred with Chu et al. (2021)who encouraged firms to diversify in order to thrive during recessions.

Converting the real estate properties into cash take time, however measures taken by management can hedge this risk. Whether a firm maintains high quality through regular value addition to reduce the conversion cycle, it had a mean of 3.42. Most respondents 30(26.3%strongly agreed while 32(28.1%) agreed. Availability of cash flow to meet short term obligations had a mean of 3.58. It implies that many firms strived to ensure they remain afloat by employing such strategies.Similarly, Ahmad, (2019) found a strong direct connection on liquidity and real estate firm performance.

Liquidity risk is firm specific and can be hedged against through proper cash flow management and diversification.

Operational Cost management had a mean of 3.65. High cost of operations reduces cash flow and thus largely affects performance. Following the statement operational cost reduces cash flow and thus largely affects performance, majority of the respondents 49(42.9%) strongly agreed while 36(31.6%) agreed. This implies that in order for investors to have highly performing businesses there is need to minimize the operational cost such maintenance costs to a sustainable level. These finding marry with those of Benedettini and Neely(2019) who noted that firms need to partner with manufacturers who offers best terms in order to minimize liabilities and maintenance cost.

Demand for real estate in this area is very high therefore; firm's liquidity is relatively high had a mean of 3.76. Majority of the officers 48(42.1%) strongly agreed that demand influenced liquidity while 30(26.3%) agreed. High demand may sometimes lead to property price increments. It therefore implies that quality and location of the asset are very essential in management of the investments liquidity since they influence demand. Similarly, Ahmad (2018) noted that firm specific factors can influence demand changing firm's liquidity risk thus bettering performance. With high demand for real estate, it implies that businesses can attract regular cash flow and to pay their liabilities when they fall due, however many firms struggled on this.

The firms' investment's current assets exceed the current liabilities had a mean of 3.74. Majority 64(56.1%) strongly agreed and 18(15.8%) agreed. It implies that assets owned by the firms need to generate earnings able to cover its liabilities

without putting the firm in a financial distress. These findings agreed with those of (Ngoc et al., 2021)who noted that firms need to manage asset over liabilities in order to enhance firm performance.

The statement loan repayment distressed finances thus affecting business performance had a mean of 3.74. Majority 64(56.1%) strongly agreed and 18(15.8%) agreed. With loan repayment it implies that inadequate cash flow reduces the level of cash that would in turn be re-invested. The findings married with Destriwanti (2022) who found that loan distress largely influenced firm's performance. The results revealed that liquidity risk influence real estate firm performance to a very high extent. The result indicated the need to well manage liquidity risk since it influences real estate firm performance.

4.6.7 Model summary for Liquidity Risk Hedging

A model summary was generated to investigate the influence of liquidity risk hedging on firm performance as shown in the Table 4.15.

Table 4.15

Model summary of Liquidity risk hedging

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.783a	.639	.628	2.61439	1.32

a. Predictors: (Constant), Liquidity risk hedging

b. Dependent Variable: Firm Performance

The results on Table 4.15 show that Liquidity risk hedging had R value of 0.78 and R square of 0.628. This implies that 62.8% variations of the firm performance can be attributed to liquidity risk management.   The Durbin wart son value of 1.32 showed a positive correlation between the two variables. These results agreed with those of Amoo et al. (2023) who posted similar findings regarding firms dealing with construction projects in Busia County.

4.6.8 ANOVA for Liquidity Risk Hedging

ANOVA was conducted to verify the hypothesis that stated that Liquidity risk hedging had no significant influence on firm Performance. The Table 4.16 presents the results.

Table 4.16

ANOVA for Liquidity risk hedging

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	164.414	8	20.552	15.590	.000[b]
	Residual	204.336	106	1.318		
	Total	368.750	114			

a. Outcome Variable: Firm Performance

b. Predictors: (Constant), Liquidity risk hedging

The Table 4.16 indicates that the F statistic value was 15.59 and P value of 0.00

which was less than 0.005. This implies that liquidity risk hedging had a significant influence on firm performance. Therefore, the hypothesis was rejected. These were supported by Deng (2020) who investigated liquidity risk and found results whose p values were less than 0.05.

4.6.9 Leverage Risk Hedging Influence on Real Estate Firm Performance

The study sought to find to establish the influence of leverage risk on financial performance of real estate firms in Meru County. The Table 4.17 presents the results

Table 4.17

Leverage risk

Leverage risk	SD=1	D=2	N=3	A= 4	SA=5	Mean
This firm manages capital structure to have a favorable of debts and equity mix.	11(9.6%)	17(14.9%)	13 (11.4%)	27(23.7%)	46(40.4%)	**3.82**
Leverage decisions forms essential components of financial management in this firm.	9(7.9%)	14(12.3%)	21(18.4%)	46(40.4%)	24(21.05%)	**4.02**
Debts contribute highly to capital formation of this firm.	1(.87%)	7(6.1%)	21(18.4%)	45(39.5%)	40(35.1%)	**4.32**
This firm enters into forward contract to purchase or sell an asset at calculated price while at predevelopment or under-development stage.	47(47%)	36(31.6%)	10(8.8%)	8(7.0%)	13(11.4%)	**2.89**
We retain a reserve fund to keep the firm afloat.	37(32.5%)	26(22.8%)	20(17.5%)	18(15.8%)	13(11.4%)	**2.84**

Average	**3.58**

Leverage risk hedging significantly influenced firm's performance average mean was 3.58. Capital structure management had a mean of 3.82, majority of the respondents 46(40.4%) strongly agreed followed by 27(23.7%) who agreed. This implies most firms managed their use of debts to ensure that they are not over-leveraged. These results agreed with those of Nguyen et al. (2019) who noted that most companies were forced to sell at a loss to meet obligations. Managing debts levels has a positive influence on firm performance also as observed by (Ahmed &Siddique, 2019).

Regarding leverage decisions majority 46(40.4%) strongly agreed while 24(21.05%) agreed. This implies that the managers discussed the company asset financing model including short-term and long-term debt to ensure that the firm's liabilities remain at manageable level. These results agreed with those of Ngoc (2021) who noted that capital structure had a negative influence on business performance. They further found that tangible asset had a positive influence on performance. It means real estate firms with tangible asset perform well than those without. However, though tangible assets were not major variables under investigation in this study.

The capital formation of most firms was constituted of debts with the highest mean of 4.32. Majority of the respondents 45(39.5%) strongly agreed while 40(35.1%) agreed. This implies that most firms' utilized borrowed money to buy their own assets which if well managed could lead to better firm performance. These results agreed with those of Mitra and Naik (2021) who found that debt had a negative influence on return on Investment.

The use of forwards was however rare, with a mean of 2.89. Majority 47(47%) strongly disagreed while 36(31.6%) disagreed. It implied that firms probably applied other management strategies to prevent losses. Since derivatives markets are in developmental stages in most African countries most firms may have not utilized them to hedge risk. In 2019 Kenya derivatives market made some progress at NSE, with clearing house and members being set (Muthine, 2021). The fewer uptakes could be explained by lack of awareness. Also, majority lacked reserve fund 37(32.5%) strongly disagreed followed by 26(22.8%. It implies that most firms did not have a reserve fund to keep the firm afloat and therefore had to highly rely on loans to finance the firm's contingent liabilities. Similarly, Chu et al. (2023) found that firms that relied on leverage without reserve funds were at high risk of stock crush risk. They therefore recommended retaining reserve fund to hedge against such risk.

The degree to which an investor is financed by debt or equity determines how far the investor can increase physical assets. The results revealed that high interest rate and other charges on loans increases leverage risk and this significantly affect performance. Over 68.6% of the changes in real estate performance are explained by the leverage. Morri and Jostov, (2019) defines leverage as use of debt to finance a company. However, too much leverage can increase the risk of defaults, losses, and bankruptcy. Wahid et al. (2018) similarly found presence of substantial link amid high debt and the performance of real estate. Thus, it is imperative that real estate firms maintain manageable level of debt while maximizing performance.

Wahid et al. (2018) further noted the need to utilize investment risk hedges in order to prevent a company from being insolvent. Similar to the findings of this study is Priya (2017) added that long-term debt, debt-equity ratio and debt asset ratio are related to firm performance. In contrary to the findings of this study were the findings of Chunhua and Meiyan (2019) who observed a negative relationship on an investment, leverage, and Performance Khan (2020) explored 36 engineering Investors in Pakistan and noted that debt levels brought by a mix of short-term liabilities over total assets and total assets over total debts have a remarkably negative relationship with the company's performance.

On the contrary, Rajkumar (2018) reveals that monetary leverage has a negative correlation with the financial overall performance. In case Investors can acquire an affordable source of credit then, it enables them to reduce the cost of debt. It, therefore, concluded that the leverage of a firm significantly influences its Performance holding factors such as tax into constant. However, having multiple funding sources can lower leverage risk.

Further the secondary data the Average quarterly domestic credit was used to ascertain credit growth rate. Fluctuations on rate of credit growth were detected in period on the review (2010- 2020). Highest credit growth rate was recorded in 4th quarter of 2014, while lowest was recorded in third quarter of 2020. The low uptake of credit could be explained by banks stringent measures to curb systematic risks in the market. The data is available in (Appendix VI).

Figure 4.4

Growth in Credit.
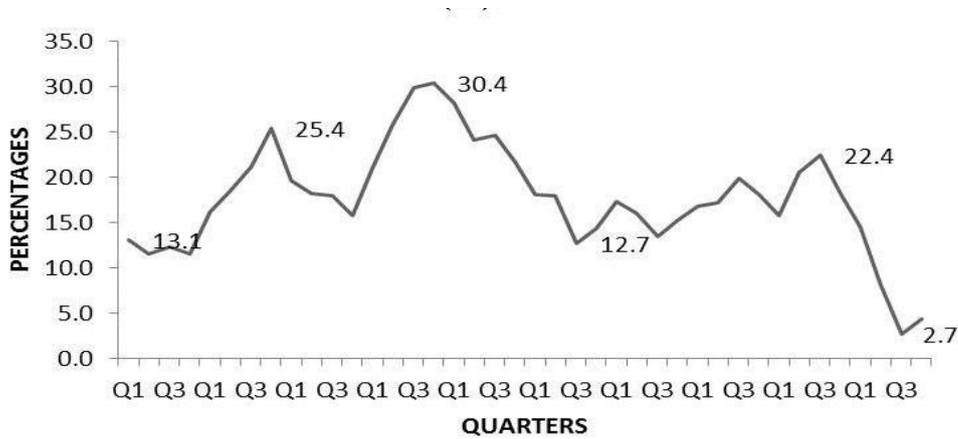
4.6.10 Model Summary for Leverage risk hedging

A model summary was conducted to determine whether Leverage risk hedging had

any influence on firm performance. The Table 4.18 presents the results.

Table 4.18

Model summary for Leverage risk hedging

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.905a	.821	.815	2.883	1.056

a. Predictors: (Constant), Real Estate Mutual Funds Management

b. Dependent Variable: Financial Performance

The results on Table 4.18 indicate that leverage risk hedging had an R value of 0.905

and R-square of 0.815. This implies that 81.5% variations in performance of real

estate firms can be explained by Leverage risk hedging. The dubbin wartson value of

1.056 indicates a positive correlation between the variables. These findings fully concurred with those of Septyanto and Nugraha (2021) who found that debt to equity ratio increased Return on assets and positively influenced the firms value. However, Nguyen et al. (2019) on the contrary noted debt finance had a negative influence on ROA and positive influence on ROE. It implies that managers require apply enterprise risk management in curbing leverage risk by determining specific variables influenced by financial leverage.

4.6. 11 ANOVA for Leverage Risk Hedging

ANOVA was conducted to test the fourth hypothesis that stated that Leverage risk hedging had no significant influence on firm Performance. The results are shown on table 4.19

Table 4.19

ANOVA for Leverage risk hedging

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	82.468	11	7.497	12.290	.000[b]
	Residual	92.721	103	.610		
	Total	175.189	114			

a. Dependent Variable: Firm Performance

b. Predictors: Leverage risk hedging

The results on Table 4.19 indicated that Leverage risk hedging had an F statistic value of 12.29 and significance level was 0.00 which was below 0.05. This implies that Leverage risk hedging had a statistically significant influence on real estate firm performance. There the hypothesis was rejected. These results were partly supported by (H. Chen, 2020) whose study p values agreed and their research which showed that financial leverage had a negative relationship with firm performance while operating leverage positively moderated the relationship. This negative relationship could be attributed to poor Leverage risk hedging. It therefore shows the need for proper Leverage risk hedging to enhance real estate firm performance.

4.7 Descriptive Statistics on Real Estate Firm Performance

The performance of the real estate firms for three past years was an objective conducted by this investigation. The participants were to indicate how they rated performance of their firm as indicated by ROA, ROE, NOI and Revenue generation. They aware to use a scale: 1= Very Low; 2= Low; 3= Neutral; 4= High; 5= Very High. The results are indicated on Table 4.13.

Table 4.20

Firm Performance

Performance measure	Year	Very low F (%)	Low F (%)	Average F (%)	High F (%)	Very High F (%)
ROA	2018	9(37.5)	2(8.3)	2(8.3)	4(16.7)	7(29.2)
	2019	0(0)	1(4.2)	1(4.2)	4(16.7)	18(75)
	2020	0(0)	3(12.5)	3(12.5)	2(8.3)	16(66.7)
ROE	2018	7(29.2)	3(12.5)	2(8.3)	5(20.8)	7(29.2)
	2019	0(0)	1(4.2)	1(4.2)	5(20.8)	17(70.8)
	2020	0(0)	1(4.2)	2(8.3)	10(41.7)	11(45.8)
NOI	2018	8(33.3)	1(4.2)	0(0)	3(12.5)	12(50)
	2019	0(0)	2(8.3)	3(12.5)	4(16.7)	15(62.5)
	2020	0(0)	4(16.7)	5(20.8)	5(20.8)	10(41.7)
Revenue Growth	2018	8(33.3)	5(20.8)	2(8.3)	5(20.8)	4(16.7)
	2019	0(0)	0(0)	4(16.7)	8(33.3)	12(50)
	2020	3(12.5)	6(25)	2(8.3)	5(20.8)	8(33.3)

(N=24 Observations)

The Table 4.13 indicates that most firms return on asset recorded high performance in 2019, and 16(66.7%) in 2020. Most firms 17(70.8%) return on equity was high in 2019 while average performance was recorded average. The performance according to the net operating income 15(62.5) was high in 2019 followed by 2020 at 10(41.7%). The year 2019 recorded the highest Revenue growth compared to 2018

and 2019. The results imply that the overall performance of real estate firms kept on fluctuating in the three years which could be explained by changes in the market and economy and the impact of Covid 19. These results agreed with those of Endri et al. (2021) who found that property and real estate prices keeps on changing and such companies need to understand macroeconomic variables and how such changes occurs in order to manage them and enhance the company's performance.

4.8 Inferential statistics

To test the overall relationship between variables the multiple regression was conducted. The results are indicated below.

4.9 Overall Model Multiple Linear Regression

To evaluate the combined influence of the independent variables on the dependent variable an overall multiple regression was conducted. The findings are presented in the Table 4.15 below.

Table 4.21

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.791[a]	.625	.616	.379

a. Predictors: (Constant), Leverage, Liquidity, Interest rate, Market risk

b. Dependent Variable: Performance

The results of the presented in the Table 4.15 indicate the goodness of fit model with an adjusted R^2 square of 0.625. This means that the four independent variable

market risk, interest rates risk, liquidity risk, and Leverage risk hedging explain 62.5% of variations in real estate firm performance in Meru County. Therefore, the remaining 37.5% could be due to other factors not included in this model. This therefore necessitates a further study using different variables. The model was found significant since and valid to predict real estate performance. These results are supported Septyanto and Nugraha (2021); Shatnawi and Eldaia (2020) who both found that Investment risk hedging had significant positive influence on the real estate firm performance

4.8.2 ANOVA for Investment risk hedging variables

To ascertain the study general of objective that whether Investment risks hedging influence real estate firm performance ANOVA was conducted. The results are described in Table 4.16.

Table 4.22
Analysis of Variance.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38.043	5	9.511	17.362	.000[b]
	Residual	22.787	109	.143		
	Total	60.830	114			

a. Dependent Variable: Performance

b. Predictors: (Constant), Leverage, Liquidity, Interest rate, Market risk

The Table 4.16 shows that the analysis of variances yielded an F statistics value of 17.362 and Significance level of 0.00 which was less than 0.05. The F (5,109) =17.36, p<0.05=0.00) value implies that the combined financial risks significantly

influenced real estate firm performance. The P value indicates that the model was significant predictor of real estate firm performance. This concurred with Deventer et al. (2019) who observed that hedging financial risk with both forwards and futures derivatives had significantly influenced the return on assets, and firm performance. The findings of this study coincided with that of Deventer et al. (2019) who recommended futures, options, forwards and mortgage backed securities as ways of hedging against the investment risk.

4.8.3 Regression Coefficients of Investment risk hedging and Firm Performance

The regression coefficients were conducted to assess the level of individual value influence of real estate firm Performance. The table 4.17 indicates the findings.

Table 4.23

Regression Coefficients

Coefficients

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.198	.203		.973	.332
	Market risk	.039	.078	.045	.495	.621
	Interest rate	.193	.074	.194	2.622	.010
	Liquidity	.312	.099	.304	3.149	.002
	Leverage	.448	.074	.434	6.089	.000

a. Dependent Variable: Performance

From the above Table 4.17 the regression model summary was developed. The regression model was as follows;

$Y = 0.198 + 0.039X1 + 0.193X2 + 0.312X3 + 0.448X4 + e$

Where;

Y=Real estate firm performance

X₁= Leverage risk hedging

X₂= Interest rate risk hedging

X₃= Liquidity risk hedging

X₂= Leverage risk hedging

E=error term

Holding, Market risk, Interest rate risk, Liquidity risk, and Leverage risk hedging constant, real estate performance constantwould be 0.198. The results of this study found that a unit increase or a decrease of Investment risk hedging led to $Y = 0.198 + 0.039X1 + 0.193X2 + 0.312X3 + 0.448X4 + e$ on real estate firm performance.

Leverage risk hedging had greatest 0.48 positive influences on real estate firm performance. According to Septyanto andNugraha (2021), leverage risk hedging had greatest influence on firm value and performance. This was followed by Liquidity risk at 0.312. This result agreed with that of (Amoo et al., 2023b).Interest rate risk followed at 19.3% while market risk hedging had lowest R value of 0.039.Lenee and Oki (2017) encouraged use of financial derivatives in hedging financial risk.

The effort made on market risk hedging, interest rate risk hedging, liquidity risk hedging and leverage risk hedging had significant influence on real estate firm

performance. However, leverage risk and liquidity risk hedging had the greatest influence on firm performance probably because control measures applied were effective. Market risk hedging had the lowest influence on firm performance.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of this study. This study investigated the influence of Investment risk hedging on performance of real estate investments in Meru County. The specific objectives were to assess the influence of market risk, interest rate risk, and liquidity risk and leverage risk hedging on firm performance. The objectives were underpinned on Classical Theory of Interest Rates, Interest Rates and Modern Portfolio Theory. Descriptive survey design was used to gather data from real estate firms. The required information was provided by 114 respondents who included senior management officers, operations officers, and finance officers, risk officers, sales officers and legal officers. The researcher utilized stratification method to select number of participants in each stratum identified by Krejcie and Morgan formula. Data was analyzed through use of frequencies, percentages and means. To draw inferences and conclusions the data were analyzed through multiple regression analysis.

5.2 Summary of the study

The summary of the four main objectives of this study included is presented in this section starting from 5.2.1 to 5.2.4.

5.2.1 Market risk hedging

The influence of market risk hedging on firm performance was assessed. The respondents generally agreed market risk hedging influence real estate firm performance (Mean= 3.68). However, majority of the respondents disagreed that they used available financial innovations to hedge against market risk (Mean =2.24). This implies that though there exist risk hedging innovations such as futures and forwards majority never applied them to manage risk. From the summary model it was observed that market risk hedging had an R=.741 and adjusted R of 0.55. This implied that 55.7% of the variations in real estate firm performance were explained by market risk hedging. While the market risk hedging had an F statistic 9.581 and a P value of 0.00 which was below 0.05. (F=9.581, p=0.00). This implied that influence was significant and therefore the Null hypothesis that market risk had no significant influence on Real estate firm Performance was rejected.

5.2.2   Interest Rate Risk Hedging

The second objective was to examine whether interest rate risk hedging influenced real estate firm performance. Most respondents agreed that interest rates hedging influence real estate firm performance (Mean=3.77). Majority disagreed concerning the use of interest rate swaps (Mean=2.01). It implies that firms lacked knowledge on interest rate swaps hence they were uncommon among them. The model summary for interest rate risk hedging had R value of 0.796 and R square adjusted value was 0.626. This implied that 62.6% of the variations in real estate firm performance were explained by interest rate risk hedging. Interest rate risk had F value of F=8.23 and P-value of 0.00 which was below 0.05. This indicated firm performance was

significantly influenced by interest rate risk hedging. Therefore, the Hypothesis that stated that interest rate risk hedging had no statistically significant influence on real estate firm performance was rejected.

5.2.3 Liquidity Risk Hedging

The third objective of this study was to examine the relationship between liquidity risk hedging and financial performance of real estate investments in Meru County. Most participants agreed that Liquidity risk hedging highly influenced the real estate firm's performance (Mean= 3.42). Loan repayment strained the liquidity levels of most firms with a mean of 3.82. Most respondents disagreed that the monthly revenues generated adequate cash flow to meet the financial obligations whenever the fell due (Mean=2.98). This implied that most firms relied on debts to finance their operations while the cash flows were committed to loan repayments. Use of options was very limited mean=2.76. It perhaps implied that the other management strategies applied by firm to hedge risk were effective. The liquidity risk hedging had R value of 0.78 and R square of 0.628. This implied that 62.8% variations in the real estate firm performance were attributed how well a firm managed liquidity risk.   The F statistic value was 15.59 and P value of 0.00 which was less than 0.05. This implied that liquidity risk hedging had a significant influence on firm performance. Therefore, the hypothesis was rejected.

5.2.4 Leverage Risk Hedging

The influence of leverage risk hedging on performance of real estate firm was examined. Majority of the respondents agreed that leverage risk hedging greatly

influence the real estate firm performance (Mean=3.58). It implies that most firms managed their debt and equity levels to maintain a right mix of capital structure. Though most firms used debts to finance their asset (Mean=4.32) most did not apply the forwards to hedge against leverage risk. Most firms lacked reserve fund to absorb economic shocks (Mean=2.84). This may not have largely affected firm performance at that specific time but would be essential hedge during a crisis. Though most firms managed their capital structure; the results indicated that there are many leverage risk hedging options that have not been exploited by most firms. The leverage risk hedging had an R value of 0.905 and R-square of 0.815. This implies that 81.5% of the changes in performance of real estate firms were explained by Leverage Risk Hedging. Further Leverage risk hedging had an F statistic value of 12.29 and significance level was 0.00 which was below 0.05. This implies that leverage risk hedging had a statistically significant influence on real estate firm performance.

5.3 Conclusions

The conclusions made on market risk hedging are that it had a significant influence on real estate firm performance. Most firms were able to manage occupancy rates, control cost and rental price fluctuations and this had significant influence on revenues growth but low influence on ROE, ROA, and NOI. However, most firms did not apply financial innovations such as currency swaps and futures to hedge against the systematic risk. The low uptake of swaps and futures could be due to low knowledge and awareness on swaps and their benefits in managing risk among the real estate firms in Meru.

The conclusions on interest rate risk indicates the hedging options such as swaps are uncommon in Meru County probably due to lack of financial education on available options to manage interest rate risk. The results indicated that Interest rate risk hedging had a statistically significant influence on ROE and if more robust risk mitigation mechanisms are applied; then firms would perform very highly.

The conclusions made of liquidity risk hedging indicate managing cash flows is very essential elements to ensure that the real estate firms remain afloat. It was concluded that liquidity risk is an inherent in real estate and therefore firms need to maintain high quality through regular value addition, set realistic prices, diversify portfolio and create adequate capital. Liquidity risk hedging had highest positive influence NOI and ROE and less influence on ROA affects real estate firm performance.

The conclusions made on leverage risk indicate that most firms used debt finance to fund their operations and they strive to manage capital structure by having right mix of debts and equity. However, they failed to use financial innovations such interest rate swaps in risk hedging to hedge against risk due to fluctuations in interest rates. Though derivatives are complicated to many, lack of awareness and knowledge on available options could explain the fact that majority never utilized them. Leverage risk hedging significantly influenced ROA and revenue growth but had very low influence on ROE.   Real estate firms should take a keener interest on hedging leverage and liquidity risk hedging since they significantly influence the firm's performance.

The results of this study would significantly contribute theory and knowledge on Investment risk hedging. Use of financial innovations to hedge against risk an area that have low uptake in Kenya. They could inform the investors and the general housing sector in Kenya encouraging use of innovations to improve firm's performance and enhance profitability. This could further significantly contribute to counties and national economic developments since these firms are among the contributors of tax revenue. The researchers and academicians would significantly benefit from the recommendations for further studies in doing more research on the areas. This would continue building the body of knowledge hence expansion of the body.

This study concluded that the risk hedging strategies available are complicated and have low uptake in Meru County and Kenya at Large. This study therefore developed a risk hedging appraisal tool for real estate firms that can be used in Meru County and generalized in other counties in Kenya and the developing countries. The study also proposed special, homemade derivatives (Straw belly swaps, and Vanilla futures) for hedging financial risks in real estate sector that work for Meru County, Kenya and Developing countries.

5.4 Recommendations of the Study

The findings revealed that there was low uptake of financial innovations as swaps and futures. Therefore, the author recommends training of real estate firms about on application financial innovations such as currency swaps and futures to hedge against the market risk. This is likely to more knowledge and awareness and increase uptake of such innovations thus improving the firm's performance. That the ministry of

finance Kenya in corroboration with Kenyan central bank to implement fiscal and monetary policies that reduce cost of building materials to make real estate an attractive sector to the investors.

The author recommends the real estate firms to apply robust cost of credit controls by utilizing swaps to hedge against interest's rate risk since this would significantly influence the return on the owner's equity. That the central banks of Kenya amend caps for interest rate on loans and mortgages to make cost of loan affordable as this will enable achievement of the affordable housing goal. With affordable interest rates and low cost of debt, this can encourage more investors to join the sector leading to growth and development.

The real estate firms to select marketable locations whenever they are making buying decision to ease turnover and sales as well as to attract higher prices during sales in order to improve profit margins. The firm's needs to continuously increase quality of the properties through value addition and frequent maintenance. The firms need to implement cash flow management techniques in order to ensure the firm remains afloat and have the ability to meet the short-term obligation when they fall due. This is because good liquidity risk hedging has a significant influence on net operating income and return on equity. There are also opportunities for Sacco's and microfinance and investment banks to develop short-term loan products tailored for real estate firms to boost their cash flow needs.

The real estate firms need to take a keener interest on management of leverage risk hedging since it significantly influences the firm's performance. Specifically, the

firm's needs to maintain a well-balanced Capital structure that that ensures sustainability and manageability of the cost of debt. Proper leverage decisions need to be made to reduce risk related to leverage and monitoring and evaluating of the sources of project finance. Firms are advised to retain a reserve fund since it acts as cushion during crisis. While making capital structure decisions the investor needs to have the right ratio of equity to debt. The firm needs to diversify and engage insurance firms to hedge against risks.

The prediction by this research challenges the existing paradigms offering a new perspective on the use of special derivatives in hedging liquidity risk in developing countries like Kenya. This research aligns with the Kenyan government vision 2030 and the Housing project agenda and recommends proper hedging of risk to increase the returns on investments. This study provides a platform for a further discussion on pitfalls to avoid and the opportunities available to achieve optimal returns in the real estate sector investments.

5.5 Suggestions for Further Studies.

The author recommends a further study on the effectiveness of financial innovations such as swaps, options, futures, and forward contract in Investment risk hedging among real estate firms in Meru County and other counties in Kenya.

Further study to be done on determinants of liquidity in real estate investment. A further study on the influence of debt-to-equity ratio on ROA and firm value is recommended. An investigation on firm size, leverage, enterprise risk management Enterprise Risk Management and performance of real estate firms in Meru would be beneficial.

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APPENDICES

Appendix I Introduction Letter

Kenneth Mburugu
Kenya Methodist University
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MERU

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0715705533

Dear Sir/ madam,

I am a student at Kenya Methodist University Pursuing Masters of Science in Finance and Investment (MSFI). Am carrying out research of the Influence of Investment risk hedging on performance real estate investments in Meru County of Kenya. You are kindly requested to give your honest and truthful responses to this questionnaire with assurance that the responses shall be treated with confidentiality, anonymity, and privacy. Please note that the results will be used for academic research purpose only and therefore feel free to give your feedback. You are highly appreciated for your time and assistance offered to me.

Yours faithfully,

Kenneth Mburugu

Appendix II: Questionnaire

INSTRUCTION: Please take your time to answer the questions fully and as honestly as possible by putting a tick (√). I assure you that your response will be treated with privacy and confidentiality and results used for academic purposes only.

SECTION A: DEMOGRAPHIC INFORMATION

Instructions

You are requested to fill out your personal information in the spaces below. Please tick only one response.

1. What is the classification of your real estate you manage?

   i. Residential   ( )
   ii. Commercial   ( )
   iii. Industrial   ( )

2. What is your highest level of education?

   i.   Master's   ( )
   ii.   Degree   ( )
   iii. Diploma   ( )
   iv.   Certificate   ( )
   v.   Others (specify)…….….….

SECTION B: MARKET RISK HEDGING AND FIRM PERFORMANCE

3. To what extent do you agree with the following statements? Where 1=Strongly Disagree, 2=Disagree, 3=Neutral, 2=Agree, 1 =Strongly Agree.

Statements	SD 1	D 2	N- 3	A4	SA 5
The firm engages in aggressive marketing to manage occupancy rate for rental space to improve the business performance.					
The firm sets house prices at equilibrium to manage increased housing units supply and increased competition					
This firm applies currency swaps and futures to hedge against rental prices fluctuations.					

This firm manages cost when procuring building materials for maintenance and new developments by investors				
The cost of maintenance in this firm is very high				

What would you recommend to better manage market risk……………………………………………………………………………………
…?

SECTION B: INTEREST RATE RISK HEDGING AND FIRM

PERFORMANCE

4. Have you borrowed a bank loan for individual or group investments?
   Yes ( ) No ( )
5. To what extent does interest rate risk affect performance of real estate investments?   5= Very high extent ( ), 4=High extent ( ), 3=Low extent ( ), 2=Very low extent ( ), 1=Not at all ( )
6. To what extent do you agree with the following statements? 5 Strongly agree, 4 agree, 3 Neutral, 2 Disagree, 1 Strongly Disagree

Statements	SA - 5	A - 4	NS - 3	D- 2	SD- 1
This firm manages cost of finance by negotiating with the banks the lending interest rate to ensure it's affordable.					
This firm utilizes interest rate swaps to control risk related to Mortgage interest rates risk exposition.					
This firm repays debt obligations on time from the monthly revenues acquired.					
This firm ensures that the total debts remain at manageable levels compared to total owner's contributions.					

7. In your opinion, is there a relationship between bank interest rates and the financial performance of your investment?
   a) Yes ( )
   b) No ()
Please explain…………………………………………………………………………………...

SECTION C: LIQUIDITY RISK HEDGING AND FIRM

PERFORMANCE

8. To what extent do you agree with the following statements? 5 Strongly agree, 4 agree, 3 Neutral, 2 Disagree, 1 Strongly Disagree

Statements	SD =1	D = 2	N= 3	A = 4	SA =5
This firms' monthly revenues generate adequate cash flow to meet our financial obligations					
This firm maintains high quality by regularly adding value which reduces the conversion cycle.					
This firm's assets are strategically located thus easily attracting occupants.					
This firm has always had enough cash to meet short-term obligations when they become due.					
This firm' operational costs per month are very high thus straining the revenues realized.					
This firms uses option contracts to allow customers to buy or sell at particular date therefore firm's liquidity is certain					
This firms Loan repayment has distressed cash flow thus affecting business performance.					

9. In your opinion to what is, the extent to which performance of a firm is influenced the level of liquidity. = Very high extent (), four=High extent (), 3v=Low Extent (), two=Very low extent (), one=Not at all ().

SECTION D: LEVERAGE RISK HEDGING AND FIRM

PERFORMANCE.

10. To what extent do you agree with the following statements?

Statements	SD =1	D= 2	N= 3	A= 4	SA =5
This firm manages capital structure to have a favorable debts and equity mix.					
Leverage decisions forms essential components of financial management in this firm.					
Debts contribute highly to capital formation of this firm.					

This firm enters into forward contract to purchase or sell an asset at calculated price while at predevelopment or under-development stage.					
We retain a reserve fund to keep the firm afloat.					

11. To what extent does capital structure affect organizations Performance?
    (a)Very small extent () (b) small extent () (c) medium extent () (d) large extent () (e) very large extent ()

SECTION E: REAL ESTATE FIRM PERFORMANCE

12. Please rate the performance of your firm in the last 3 years, as indicated by ROA, ROE and NOI. Use the scale: 1= Very Low; 2= Low; 3= Neutral; 4= High; 5= Very High.

Performance measure	Year	1	2	3	4	5
ROA	2018					
	2019					
	2020					
ROE	2018					
	2019					
	2020					
NOI	2018					
	2019					
	2020					
Income Generation	2018					
	2019					
	2020					
Revenue Growth	2018					
	2019					
	2020					

Thank you for your time and responses! End.

Appendix IV: Secondary data collection schedule

The secondary data from the real estate firms for the period 2018-2020 was collected using the schedule.

Name of the real estate firm…………………………………………………

Variable	Details	YEARS		
		2018	2019	2020
ROA	Net income before tax			
	Average total assets			
ROE	Net income before tax			
	Total equity capital			
NOI	Gross operating income			
	Gross operating expenses			

Appendix V: Dependent variable measurement

Dependent variable	Measurement	Formula
Firm Performance	Return on asset (ROA)	$= \dfrac{\text{Net income before tax}}{\text{Total assets}}$
	Return on Equity (ROE)	$= \dfrac{\text{Net investment Income}}{\text{shareholders equity}}$
	Net operating Income (NOI)	Gross operating Income $-$ gross operating expenses

Appendix IV: Sample Population.

Real Estate Firms	Senior Property Management Officers	Finance Officers	Operation Officers	Sales Officers	Risk Officers	Legal Officers	Total
RYSTON (KE) LTD	1	1	2	1	1	0	**6**
Yetu Pamoja Investment Co-op Society Ltd	1	2	1	2	1	1	**8**
Ajogi Limited	1	1	1	1	1	0	**5**
Ntara and Associates, Meru	1	1	2	1	0	1	**6**
Pata property	1	1	1	1	0	0	**4**
Mt. Kenya Real Estate Expo	0	1	1	2	1	0	**5**
Pave Point Properties Agency.	1	1	1	1	1	0	**5**
My property Africa	1	1	2	1	0		**5**
Jokir Property Management and Real Estate Company	1	1	2	1	1	0	**6**
Villar Properties	0	1	1	2	0	0	**4**
Restate properties	1	1	1	1	1	0	**5**
Kagundene Properties Ltd	0	1	2	1	0	1	**5**
Kariuki C M Advocates	0	0	1		0	3	**4**
Kiogora Arithi Associates Advocates	1	1	1	1	0	2	**6**
Ringet Properties Ltd	1	1	2	1	1	0	**6**
Wilson P Mburugu Advocates	0	1	1	0	1	2	**5**
Housix Agency & Properties	1	1	1	1	1	0	**5**
Pave Point Properties Agency.	1	1	1	2	1	0	**6**
Three Square Properties	1	1	2	1	1	0	**6**
RAKNA Agencies LTD	1	1	2	1	1	0	**6**
Apprise Realtors Ltd, Meru	1	1	2	1	1	0	**6**
Shepfames Enterprise	1	1	1	1	1	0	**5**
Dianah Real Estate Agents	1	1	1	1	1	1	**6**
Geoland surveys	1	1	1	5	1	0	**6**
Total	**19**	**24**	**33**	**28**	**16**	**11**	**131**

Appendix IV– Target Population

S/N	List of Registered Real Estate Firms and Agents in Meru
1	RYSTON (KE) LTD
2	YetuPamoja Investment Co-op Society Ltd
3	Ajogi Limited
4	Ntara and Associates, Meru
5	Pata property
6	Mt. Kenya Real Estate Expo
7	Pave Point Properties Agency.
8	My property Africa
9	Jokir Property Management and Real Estate Company
10	Villar Properties
11	Restate properties
12	Kagundene Properties Ltd
13	Kariuki C M Advocates
14	KiogoraArithi Associates Advocates
15	Ringet Properties Ltd
16	Wilson P Mburugu Advocates
17	Housix Agency & Properties
18	Pave Point Properties Agency.
19	Three Square Properties
20	RAKNA Agencies LTD
21	Apprise Realtors Ltd, Meru
22	Shepfames Enterprise
23	Dianah Real Estate Agents
24	Geoland surveys

Source :(EARB, 2020)

Appendix V: University Approval

KENYA METHODIST UNIVERSITY

P. O. Box 267 Meru - 60200, Kenya   Fax: 254-64-30162
Tel: 254-064-30301/31229/30367/31171   Email: deanrd@kemu.ac.ke

DIRECTORATE OF POSTGRADUATE STUDIES

May 26, 2021

Commission Secretary,
National Commission for Science, Technology and Innovations,
P.O. Box 30623-00100,
NAIROBI.

Dear sir/ Madam,

RE: KENNETH MBURUGU (MSFI-3-1218-2/2019)

This is to confirm that the above named is a bona fide student of Kenya Methodist University, Department of Business Administration undertaking a Degree of Master of Science in Finance and Investment. He is conducting research on **'The Relationship between Financial Risk and Performance of selected Real Estate Investments in Meru County - Kenya'.**

We confirm that his research proposal has been defended and approved by the University.

In this regard, we are requesting your office to issue a permit to enable him collect data for his research.

Any assistance accorded to him will be appreciated.

Thank you.

Dr. John Muchiri, PHD.
Director Postgraduate Studies
Cc: Dean SBUE
      COD Business Administration
      MBA Co-ordinator
      Supervisors

Appendix VI: NACOSTI Research Licence

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 952416

Date of Issue: 09/June/2021

RESEARCH LICENSE

This is to Certify that Mr.. kenneth Mburugu of Kenya Methodist University, has been licensed to conduct research in Meru on the topic: THE RELATIONSHIP BETWEEN FINANCIAL RISK AND PERFORMANCE OF SELECTED REAL ESTATE INVESTMENTS IN MERU COUNTY- KENYA. for the period ending : 09/June/2022.

License No: NACOSTI/P/21/11003

952416
Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION

Verification QR Code

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

Appendix VII: Secondary Data

The data below represented market risk interest rates and liquidity levels for quarter

1(Q1) to quarter 4(Q4) from 2011 to 2020. The data is explained on page's 67, 68

and page 70 of the fourth chapter.

YEARS	QUARTERS	INDEPENDENTVARIABLES		
		MARKET RISK-RENTAL PRICE CHANGES	INTEREST RATE	LIQUIDITY (Money supply)
		%	%	%
2011	Q1	3.4	13.7	16.7
	Q2	2.7	13.3	15.7
	Q3	5.3	13.1	16.4
	Q4	5.6	13.3	16.8
2012	Q1	10.5	13.9	21.5
	Q2	17.4	14.0	22.3
	Q3	15.9	13.7	17.8
	Q4	16.6	14.4	18.1
2013	Q1	14.1	14.8	11.5
	Q2	10.6	14.9	10.4
	Q3	9.8	14.8	14.8
	Q4	8.0	14.8	14.9
2014	Q1	5.5	14.9	20.6
	Q2	3.7	14.5	24.0
	Q3	3.3	14.2	24.8
	Q4	3.8	13.9	23.2
2015	Q1	7.0	14.0	20.2
	Q2	13.2	13.9	16.9
	Q3	16.5	14.4	18.0
	Q4	19.2	17.9	19.4
2016	Q1	16.9	20.1	15.6
	Q2	11.8	20.2	15.4

Appendix VI: Secondary Data

The data below represented the leverage indicators for quarter 1(Q1) to quarter 4(Q4)

from 2011 to 2020. The data is explained on page's 76 and 77 of the fourth chapter.

YEARS	QUARTERS	LEVERAGE INDICATORS		Real estate Performance
		DEPOSITRATE	MORTAGE LOANSGROWTH RATE	LOGARITHM OF HOUSING UNITS
		%	%	
2011	Q1	4.3	13.1	2.8
	Q2	4.1	11.5	2.9
	Q3	4.3	12.3	2.8
	Q4	4.3	11.5	2.8
2012	Q1	4.4	16.2	2.7
	Q2	4.5	18.4	3.0
	Q3	4.6	21.1	3.0
	Q4	4.8	25.4	1.9
2013	Q1	5.2	19.6	2.8
	Q2	5.2	18.2	2.9
	Q3	5.1	17.9	3.0
	Q4	5.0	15.7	3.1
2014	Q1	4.9	21.0	3.0
	Q2	4.5	25.8	3.1
	Q3	3.7	29.8	3.1
	Q4	3.6	30.4	3.3
2015	Q1	3.4	28.2	3.3
	Q2	3.6	24.1	3.2
	Q3	4.0	24.6	3.2
	Q4	5.9	21.6	3.0
2016	Q1	7.9	18.1	3.2
	Q2	8.5	17.9	3.2
	Q3	7.8	12.7	3.3
	Q4	7.5	14.3	3.3
2017	Q1	4.4	16.2	2.7
	Q2	4.5	18.4	3.0
	Q3	4.6	21.1	3.0
	Q4	4.8	25.4	1.9

149

2018	Q1	6.6	16.8	3.4
	Q2	6.5	17.2	3.5
	Q3	6.6	19.8	3.4
	Q4	6.7	18.0	3.4
2019	Q1	6.7	15.7	3.5
	Q2	6.6	20.5	3.5
	Q3	6.8	22.4	3.5
	Q4	7.7	18.2	3.4
2020	Q1	7.4	14.5	3.4
	Q2	6.7	8.2	3.5
	Q3	6.7	2.7	3.5
	Q4	7.6	4.4	3.5
2018	Q1	6.6	16.8	3.4
	Q2	6.5	17.2	3.5
	Q3	6.6	19.8	3.4
	Q4	6.7	18.0	3.4
2019	Q1	6.7	15.7	3.5
	Q2	6.6	20.5	3.5
	Q3	6.8	22.4	3.5
	Q4	7.7	18.2	3.4
2020	Q1	7.4	14.5	3.4
	Q2	6.7	8.2	3.5
	Q3	6.7	2.7	3.5
	Q4	7.6	4.4	3.5