FINANCIAL LITERACY, FINANCIAL SOPHISTICATION, INSTITUTIONAL FACTORS AND PERCEIVED RETIREMENT SAVING ADEQUACY AMONG PUBLIC UNIVERSITY EMPLOYEES IN KENYA

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DECLARATION

By the Candidate

I hereby declare that this thesis is my own work and to the best of my knowledge and has not been submitted by any person for the award of a degree in any other institution of higher learning.

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DEDICATION

I dedicate this work to my cherished family, whose unwavering support has been truly invaluable. To my beloved husband, Ezekiel Kibet Ayabei, and our children Stephanie, Joy, and Shalom. To my wonderful parents, Dr. and Mrs. Arusei, my father in-law and mother in-law Patrick Kiplagat and Esther Ayabei. To my siblings Dorcas, Christine, Joel, Joshua and Emma; Janet, Debby, Marion, Millicent and Victor.

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ABSTRACT

Sustaining adequate retirement savings has received increased attention as a result of ageing population across the globe and an increase in retirement poverty which stands at 56% in Kenya. Perceived retirement saving adequacy is a measure of whether current retirement savings are adequate for a comfortable retirement and should be classified as priority in ensuring financial security at old age. Financial literacy has been singled out as a major determinant of perceived retirement saving adequacy however the results are inconclusive. Furthermore, studies indicate that financially literate individuals may be more financially sophisticated and therefore tend to make rational financial decisions. There is also a stream of literature that institutional factor (IF) affect retirement savings. The general objective of this study is to determine the mediation and moderation of financial sophistication and institutional factors on relationship between financial literacy and perceived retirement savings adequacy. The specific objectives are to determine the direct effects of financial literacy and financial sophistication on perceived retirement saving adequacy, to find out the effect of financial sophistication on relationship between financial literacy and perceived retirement savings adequacy among public university employees in Kenya, to examine the moderating effects of institutional factors on the relationship between financial sophistication and perceived retirement savings adequacy. Finally, to assess the mediated moderation of financial sophistication and institutional factors on the relationship between financial literacy and perceived retirement saving adequacy. The study employed expectancy theory, prospect theory and symbolic interaction theory. The study adopted explanatory research design and was anchored on a positivist paradigm. The study used primary data from public university employees in Kenya. Questionnaires were used to collect data. The research targeted 17,320 employees and a sample of 390 was selected. Stratified systematic random sampling was used to arrive at the respondents. Both descriptive and inferential statistics were used to analyze data. Multiple regressions were used. Moderation mediation was tested using process macro at 95% confidence level. The results showed a positive relationship between FL and PRSA (β=.664, p<000), FL and FS (β=.8064, p<.000), FS and PRSA (β=.686, p<.000), IS and PRSA (β=2.498, p=<.000). Institutional factors being a moderator buffered the relationship between financial literacy and retirement savings adequacy and the results were (β=-.549, p=<.000), R-sq0.6678. Further, financial sophisticated mediated the link between financial literacy and retirement savings adequacy (β=.554) was significant and the lower limit confidence interval (bootLLCI) was a positive (.4356) while the upper limit confidence interval (bootULCI) was (.6795) .The moderated mediation was also significant and negative (β=-.-4423), (bootLLCI) at -.5234 and (bootULCI) was -.3607.Based on the findings, financial literacy, financial sophistications and institutional factors have a significant effect on perceived retirement savings adequacy among public university employees in Kenya. The finding of the study improves theory application of expectancy theory and prospect theory .The findings of the study also suggest that financial literacy and sophistication should be intensified by both Government institutions and private investors to improve knowledge and skills on financial matters which in turn will create awareness about retirement savings and will ultimately ensure that retirement funding is achieved. The study is also beneficial to policy makers in ensuring institutions handling pensions and retirement savings are trust worthy so that institutional failures are minimized and retirement savings adequacy can be achieved. Further research can be done in actual retirement savings since the study focused on the subjective assessment of retirement savings.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIS:	Accounting Information System
ALP:	American Life Panel
ARBS:	Association of Retirement Benefits Schemes
DNB:	De Neder Landsche Bank
HRS:	Health and Retirement Study
IPOS:	Institute for Pension Supervisors
IPP:	Individual Prison Plan
IRR:	Income replacement Ratio
IT:	Information Technology
OECD:	Organization for Economic Cooperation and Development
PFA:	Professional Financial Advice
RPA:	Retirement Planning Activities
RTA:	Retirement Benefit Authority
SFC:	Survey of Consumer Finances
SHIW:	Survey on Household Income and Wealth
SMEs:	Small and Medium Enterprises
UK:	United Kingdom
US:	United States

DEFINITION OF TERMS

Financial Sophistication – A form of human capital that improves a household’s ability to make more effective financial decisions Huston *et al.* (2012).

Financial Literacy – It is a series of processes or activities that increase the knowledge, confidence and skill of consumers and the wider community so that they can manage finances better (Financial Services Authority, 2013).

Perceived Retirement Savings Adequacy -An individual's expectation of whether current retirement savings are adequate or inadequate for a comfortable retirement (Schie, 2012).it also refers to extent to which individual consider their savings to be adequate for their retirement (Hershey, 2010)**.**

Institutions- These are clusters of norms with strong but variable mechanisms of support and enforcement that regulate and sustain an important area of social life Rueschemeyer (2009). Effective institutions influence at the individual as well as the collective level-beliefs, normative commitments and preferences, Kerlin (2012).

Retirement Planning Activities – These involve several behaviors that stimulate knowledge about investments, and consequently, savings practices. Among these behaviors, are: searching for information, participating in lectures about the subject, and attending a retirement planning program (Stawski *et al.*, 2007).

Retirement is defined as the act of leaving employment after an individual has worked for a substantial period of time, (Mo, 2013).

Retirement Savings - According to Organization for Economic Co-operation and Development (2008), the term “retirement savings” is used to describe “other non-pension retirement products such as insurance, personal savings.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter describes the study's background information, problem statement, objectives, hypotheses, their significance, and scope.

1.2 Background Information

There is widespread concern that the majority of employees are not effectively preparing for retirement, and an aging population in many developing nations makes the problem worse (Reyers, 2018). This concern is exacerbated by the fact that many emerging nations have younger populations. It is anticipated that by the year 2050, more than 80 percent of the world's population aged 60 and older will call emerging countries home. It's possible that developed countries are facing a less severe problem with their aging populations right now. According to projections made by the United Nations (2015), the proportion of the African population that is older over 60 years is expected to nearly triple between now and 2050. It is projected that the considerable increase in the world's population of people who are old will lead to an increase in the number of older people living in poverty if suitable steps are not done to improve the income support available to retirees. According to Abels and Guven (2016), there is a window of opportunity to design and execute reforms to the pension system in the coming decades, while dependency ratios are dropping and before the impact of an aging population on the economy. This window of opportunity exists when dependency ratios are declining. It is designed to affect an individual's perceived opportunities and financial management practice (Kemp, Rosentahal, and Denton, 2005; Chou *et al*., 2015). Perceived retirement savings adequacy measures the extent to which pre-retirees believe they have adequately saved for retirement. It measures the extent to which pre-retirees believe they have adequately prepared for retirement. According to Yu's research from 2015, perceived retirement savings adequacy is connected with asset growth as well as real saving rate increase. Prior research has shown that an individual's perceived retirement savings adequacy is influenced by issues of financial literacy and an individual's psychological framework, as well as social and institutional contexts can impact an individual's ability to develop and later implement a retirement savings plan (Fisher *et al.,* 2016; Reyers 2018). Additionally, research has shown that an individual's ability to develop and later implement a retirement savings plan is impacted by social and institutional contexts. According to Dalen *et al.* (2010), perceived savings adequacy is also a result of an individual's evaluation that compares anticipated retirement income to the level of income necessary to live comfortably in retirement. Other studies define it as an individual's perception of whether his or her current retirement savings are sufficient or insufficient for a comfortable retirement (Schie, 2012). Therefore, perceived retirement saving adequacy measures the belief that one has about their retirement savings. This belief is shaped by the efforts that one has put to ensure they have a comfortable retirement. Many studies on retirement savings focus on actual savings while others on perceptions of the already existing retirees but this study examined the perceptions of pre retirees who in this case are public university employees. The aim of this study was to find out how public university staffs feel about retirement savings adequacy and raise awareness about retirement and in the long run boost confidence about their preparation.

Due to cultural and traditional systems of old age support by the working population and lack of financial knowledge on retirement savings options, most African nations practice limited retirement saving. (Odundo, 2003), which is further supported by the fact that in 2009, only 15% of employed Kenyans had some form of pension plan. According to Onduko *et al.* (2015), less than 5% of Kenya's total population contributes to the social security fund. According to the Retirement Benefits Authority (RBA, 2009), only 21% of the working population participate in pension plans. Moreover, annuities resulting from pension savings are frequently inadequate in monetary terms to meet retirement requirements (Raichura, 2008), (Walaba, 2014), and (Chebii, 2017), thereby increasing the likelihood of old age poverty.

Majority of economists agree that a conceptual benchmark is a measure for adequate retirement saving is an amount that will, along with other sources of retirement income, allow a single household to maintain its usual pre-retirement standard of living across the retirement period. (Croy *et al.*, 2010; Hershey *et al.*, 2007). A good perception to retirement savings results from individuals putting into consideration their retirement financial life and either invest or save to ensure one is able to sustain their bills and maintain their livelihoods throughout their retirement phase. A retiree's financial security in retirement is almost proportional to an individual's quality of life after retirement (Taylor *et al.*, 2007; Wang *et al.*, 2010).In order to have financial security upon retirement an adequate amount of financial resources must be available (Li *et al*, 1996) .The financial implications that come with retirement and the end of active paid work and also the health implications that come with aging, makes retirement savings adequacy is a critical concern(Huston 2010). Although perceived retirement savings adequacy measures a belief, there is an overall growing recognition that subjective assessments of retirement preparedness are as important as retirement studies on actual savings since perceptions may the ability to drive decisions and behavior (Joo & Pauwels, 2002; SegelKarpas & Werner, 2014; Van

Dalen *et al*., 2010).Perceived retirement saving adequacy accrues some benefits since it's easier to estimate than to project adequacy because in most cases estimated adequacy requires more detailed information and a complex computation process, perceived retirement saving adequacy measures an individual assessment of retirement readiness,(Lee, Kim & Hanna,2023) .

Xiao *et al.* (2014) found that financial literacy is one of the most essential factors in achieving a successful adult life, as it has a significant impact on an individual's financial management attitudes as well as their outlook on life in general. According to Lusardi and Mitchell (2014), financial literacy is the capacity to comprehend fundamental economic information and make informed decisions regarding financial planning and capital accumulation.

Financial literacy may influence how individuals save and invest their money in the future. It may also have an impact on the financial products and services individuals select and, ultimately, on how they accumulate wealth. Many other definitions of financial literacy have been proposed. According to the Organization for Economic Cooperation and Development (OECD, 2005), financial literacy is largely concerned with the amount of financial knowledge a group of people possesses regarding financial products and services, as well as how workers ultimately manage and grow their financial resources. Financial knowledge may influence the capacity to make informed and rational financial choices and decisions in full recognition of the most significant risks and opportunities, as well as the general knowledge of where to seek assistance and enhance one's overall financial wellbeing. Worthington (2005) defines it as the capacity to make prudent financial decisions regarding the use and management of personal funds. In conclusion, and for the purposes of this study, financial literacy remains an individual's familiarity with fundamental financial matters.

Multiple studies have found significant correlations between financial literacy and the perception of adequate retirement savings. According to Reyers (2018), financial literacy is positively associated with adequate retirement savings. Anantanasuwong (2019) examined the relationship between financial literacy and adequate retirement savings. The researcher also found a correlation between financial literacy and a more accurate perception of one's exponential development, which stimulates retirement savings. Other research on the effect of financial literacy on retirement savings has produced contradictory findings. According to Willis (2008), financial literacy may not be sufficient to make informed judgments or sound financial decisions. According to Crossan (2011), financial literacy played a minor role in retirement planning.

Financial sophistication is described as the form of human capital that improves a household’s ability to make more effective financial decisions. Greater financial human capital empowers households with the ability to more effectively build and transfer resources and maximize utility throughout a lifetime, Huston *et al*, (2012). Most financially sophisticated workers are likely to plan for their retirement, (Lusardi and Mitchell 2014), have net worth higher than their contemporaries (Van Rooij *et al.,* 2012), invest in assets that have higher returns (Van Rooij *et al.*, 2011), are more likely to acquire stocks (Lusardi & Mitchell, 2007), and are also not likely to go for high cost borrowing instruments (Lusardi and Tufano 2009). Many researchers in finance have attributed difference in financial behavior in individuals or households to variation in financial sophistication levels. An investor’s ability to avoid making investment mistakes has also been defined as financial sophistication (Calvet *et al.,*

2007) and is a determinant in making sound financial decisions (Huston *et al*, 2012). Other authors also use the term advanced financial literacy to refer to financial sophistication. Van Rooij *et al*. (2011) in his study developed basic and advanced financial literacy questionnaire in survey in the Netherlands and indicated that majority of the respondents had basic financial knowledge on issues like inflation, interest compounding and the time value of money which he referred to as basic financial literacy. He also found that majority of the respondents lacked financial knowledge on advanced financial literacy issues like the association between interest rates and bond prices. That study's results indicated a significant association between the financial literacy index and stock market participation. Van Rooij *et al.* (2011) also found that individuals who possess advanced financial literacy tend to plan for their retirement. In conclusion; financial sophistication can be viewed as ability to make prudent and efficient financial decisions that result in well calculated investment decisions, savings and actual wealth accumulation.

According to studies, financially savvy individuals are more likely to make prudent financial decisions, such as borrowing decisions. Hogarth and Hilgert (2002) discovered that 81% of respondents correctly answered mortgage-related questions and 65% correctly answered credit card-related questions. In another study, Lusardi *et al.* (2009) found that Americans' ability to grasp and comprehend interest compounding and other debt-related concepts was low and that individuals with less debt literacy incur higher transaction fees and are more likely to choose high-cost borrowing options. Moore (2003) also discovered that individuals with less financial knowledge were more likely to hold high-cost mortgages. In addition, Lusardi and Mitchell (2011) concluded that a lack of financial sophistication was one of the most significant causes of retirement plan failure. Additionally, Calvet *et al*. (2007) found that financially affluent Swedish households make more rational and efficient investment decisions, but are also risk takers. Numerous researchers in the field of retirement savings have discovered a correlation between financial sophistication and retirees' financial security.Guliman & Onesimo,(2017) noted that the recent complexities in the financial world require more than just basic knowledge of numeracy and money.

Additionally, Huston *et al.* (2012) hypothesizes that consumers with a high level of financial sophistication are typically better equipped to navigate complex financial markets and to achieve positive financial outcomes. Kimball and Shumway (2007), developed a financial sophistication index based on equity ownership, risk tolerance, investment timing, and portfolio diversification using principal components analysis. Variables included willingness to tolerate some investment risks, whether the respondent of the study revolved more than 50% of their credit card limit, stock ownership, and the SCF interviewer's evaluation of the respondent's knowledge of personal finance. Financial sophistication is different from financial literacy, (Righter, 2017) in that individuals that are considered financially sophisticated possess more financial experience and record less financial mistakes or blunders, (Kyoung& Hanna, 2015).Righter (2017), further noted that an individual may be financially literate but may miss to be financially sophisticated because basic knowledge of financial matters may not necessarily result in prudent financial decision making practices.

There have been both domestic and international studies of retirement savings. Lusardi *et al.* (2014) investigated the relationship between financial literacy and financial sophistication among the elderly in the United States. Kim and Hannon

(2013) analyzed the financial sophistication of US households' retirement readiness. Nguyen et al. (2019) investigated the impact of both financial literacy and pension knowledge on the retirement investment decision of Vietnamese employees. Aluodi *et al.* (2017) implied that financial literacy had no significant effect on retirement readiness among Kenyan actuarial employees. In other words, a person's financial literacy and fitness for retirement may be impacted by factors such as their working environment (Tan *et al.,* 2019). Onduko *et al.* (2015) conducted an analysis of the determinants of retirement planning in Kenya and concluded that financial literacy, income, and level of education had a significant impact on retirement planning. Thuku (2013) examined the effect of retirement preparation on satisfaction in retirement in Nyeri County, Kenya, and discovered that retirement preparation has a significant effect.

Kim and Hanna (2013) examined the relationship between financial sophistication and projected retirement sufficiency. They analyzed the 2010 Survey of Consumer Finances (SCF) dataset and found that households with college education were more likely to have adequate retirement income than those with less than a high school diploma. In addition, households that utilize a financial planner are more likely to have adequate retirement savings than households that do not. Niazi and Malik (2019) examined the moderating effect of socio-demographics, risk propensity, and investment diversity on financial sophistication. The researchers discovered that financial sophistication moderates the relationship between socio-demographics, risk propensity, and investment decision-making significantly. Some studies have also used the terms financial literacy and financial sophistication interchangeably; however, for the purposes of this study, financial literacy refers to basic financial knowledge and financial sophistication will refer to the ability to make prudent financial decisions, thereby avoiding financial errors. Financial literacy will continue to refer to an individual's knowledge of financial products and services, while financial sophistication will emphasize an individual's ability to make prudent financial decisions. Financial literacy is measured by one's grasp of financial matters whereas sophistication checks for financial experience and decision making. Therefore, one can be financially literate but that does not mean that they are sophisticated, since sophistication is measured by one's ability to make rational and efficient financial decisions.

According to Borsh-Supan (2009), the retirement system is significantly influenced by institutional variables. Effective institutional settings have an effect on the beliefs, normative commitments, and preferences of individuals and groups at their most fundamental level. Kerlin,(2012). According to Chou *et al.* (2013), people's perceptions of their ability to save for retirement may be influenced by institutional factors like the availability of social security. According to Hyde, Dixon, and Drover (2007), employees who trust in their government or employers to offer social safety or pension benefits at an advanced age may find that these benefits better than their individual private retirement funds. Because it enables workers to shift their obligations for roles that they themselves feel they do not possess sufficient competence to fulfill, trust has the potential to minimize complexity in a system. (Hyde *et al*, 2007). The majority of the time, financial contracts are trust heavy contracts (Guiso *et al.*, 2004), and the level of confidence in the financial sector, which in this instance refers to the pensions industry, is what determines the quality of the connections that exist between customers and the companies that provide financial services to them. The amount of trust that workers have in their financial intermediaries or in the institutions that administer retirement savings and pensions in general is the single most important factor that should be considered when determining whether or not a person's retirement savings are enough. According to Hyde *et al.* (2007), people who put their faith in the government to adequately protect their retirement income have a higher level of assurance regarding the adequateness and accessibility of the money they receive from their pensions. The government in most cases is a provider of public pensions, and is also a guardian of the public interest, supervising and regulating the pension industry and the financial sector, (Van Dalen, 2010). Previous studies indicate that Dutch people feel more confident about their government's ability to manage their future retirement incomes and therefore report better perceptions about the adequacy of their retirement savings (Hershey *et al.*, 2010). In a comparative study between American and Dutch workers, results posted a significant association between the general trust in banks and insurance companies to manage pension income and perceived retirement savings adequacy (Van Dalen *et al.,* 2010). Appropriate regulatory and supervisory framework, prudent oversight and a record of very few or no bankruptcies or bank failures are all elements of an institutional setting that generates trust, Hershey, (2012). Fornero *et al*. (2010) found that institutional framework provides efficient ways for diversification not only through public pensions but also through regulation and general supervision of the pensions market. There are three pillars of financial support over retirement in Kenya. First is state supported public pension scheme called the National Social Security fund (NSSF), employer sponsored occupational pension schemes and lastly personal savings accumulation in banks and insurance companies. In conclusion, higher levels of trust in the existing pension institutions can be associated with more retirement savings and therefore better perceptions about retirement savings adequacy. Therefore, the institutional setting within which workers are under is bound to affect retirement savings and in turn will affect perceptions about retirement savings.

Financial literacy has been previously reported to have a positive association with perceived retirement saving adequacy. There is similarly strong economic association between financial sophistication and planning for retirement. However, Lusardi (2011) noted that basic financial literacy may not be a factor in predicting planning for retirement and therefore literacy alone may not be sufficient in making proper financial decisions and may not result retirement preparedness and subsequently retirement confidence. Willis (2010) also indicated that financial literacy may not be sufficient to make informed judgment and good financial decisions. Therefore, in as much as financial literacy improves ones knowledge in financial matters, financial sophistication is also required in making prudent and rational financial decisions. It also means one can be financially literate but may not be financially sophisticated. Financial literacy may not assure sound financial decisions, and that’s the reason many financial literacy programs require reexamination to assess their impact, relevance, and modes of delivery (Estelami 2009; Lyons *et al.*, 2006).

Because of the correlation between financial sophistication and the capacity to make cautious decisions, the vast majority of authors define financial sophistication as the capacity of an individual to avoid making costly financial errors. Therefore, for the sake of this study, financial literacy will continue to refer to a fundamental understanding of various financial topics, whereas financial sophistication will refer to an individual's capacity to make sound financial decisions. Institutional considerations are relevant to all three components of the system that provides financial support for retirement. First, there must be a level of faith in the state, not only because it is the only source of income for retirees, but also because it serves as the primary protector of the general public interest and the primary regulator of the pension and insurance industries. According to Van Dalen *et al.* (2010), there needs to be trust in private financial intermediaries such as banks and insurance companies that offer a variety of savings options. Secondly, there needs to be trust in an employer's unique institutions that handle pensions. Finally, there needs to be trust in private financial intermediaries that handle an individual's personal savings. Therefore, the level of trust an individual has in organizations that handle pensions influences the individual's pension savings, which in turn affects the individual's opinion on the adequacy of their retirement savings and is, as a result, a moderating variable in this instance. Individual pension insititutions are available at public universities. These institutions collect the pension contributions that workers pay into them and then return those funds to workers once they reach retirement age. If workers have faith in their employers' pension plans, they will have a more positive attitude toward retirement savings and will be more inclined to increase the amount they put away.

The provision of pensions was identified as a key pillar in Kenya's vision 2030, which is a strategy plan to achieve significant economic milestones by the year 2030. This was done with the intention of enabling faster economic growth and a quicker development of the financial markets that are already in place. In the end, the population must have been enabled to make wise and reasonable financial decisions, which will, in turn, minimize the old age poverty. This is because the population will be empowered to make financial decisions for their own interests, both in the short term and in the long term (Kefela, 2010). The growth of the financial sector in Kenya paves the way for excellent opportunities, but it also increases the likelihood that members of the general public will make poor choices with their money if efforts to improve financial literacy and sophistication are not stepped up. This will prevent members of the general public from being able to plan for and put money away for their retirement. In addition, there is a need in the financial industry to assess the impact of financial intermediaries on perceived retirement saving adequacy. These are referred to as institutional factors in this study.

1.2.1 Universities in Kenya

The higher education landscape in Kenya has undergone significant changes due to the recent liberalization of the higher education sector. This liberalization has led to the entry of numerous players into the sector, resulting in a dynamic and chaotic environment. Education is widely recognized as a foundation for economic prosperity, social advancement, and political progress across cultures. The World Bank's research in 1998 highlighted that investments in education can contribute to economic growth, increased productivity, and reduced social inequality.

In response to the changing dynamics of the labor market and the growing aspirations of the youth population, there has been a growing demand for higher education in Kenya. The government has taken steps to address this demand by elevating public university colleges to full-fledged universities and upgrading medium-level colleges to university colleges. This expansion has been particularly prominent in rural areas, where many of these newly promoted institutions are located.

The government's decision to provide free elementary and secondary education has also led to a need for accommodating a larger number of students at the university level. As a result, more postsecondary institutions have been upgraded to university colleges. This expansion has been accompanied by a rise in the number of private educational institutions.

The growth of universities in Kenya has been particularly notable in recent years. For example, in 2013 alone, 14 university colleges were transformed into full-fledged universities, marking a significant increase in the number of universities. This expansion aims to cater to the rising demand for higher education due to a growing number of high school graduates seeking better opportunities through university studies.

However, the rush to accommodate this demand has not been without challenges. In some instances, the rapid expansion of learning institutions has led to issues such as inadequate facilities and a shortage of experienced lecturers. This has raised concerns about the erosion of the quality of education.

In the context of retirement planning for university staff, it's noteworthy that universities in Kenya have defined contribution plans for their employees. These plans involve deducting a portion of the employee's salary and having the employer contribute a matching amount to cater for retirement. Additionally, remittances are made to the National Social Security Fund (NSSF) for retirement benefits. However, there is a concern about the adequacy of retirement benefits, as the pension amounts may be considerably lower than the salaries earned during the working phase. This concern is reflected in the high level of old age poverty in Kenya, which stands at 56%.

Overall, the expansion of universities and higher education opportunities in Kenya is a response to the changing educational landscape and growing demand. However, challenges related to quality and retirement benefits underscore the complexity of managing these developments.

This study seeks to find out the perception of retirement saving adequacy of pre-retirees who in this case are university staff working in public universities. This study seeks to find out the belief that potential retirees have about the adequacy of their retirement savings and through this elicit reactions on what can be done to improve retirement security. Public universities have in the recent past experienced a myriad of challenges ranging from non-remittance of pension deductions and other statutories due to financial difficulties, inadequate funding from government. There is also little or no participation in retirement seminars and trainings despite being the institutions of higher learning which ideally should be a place of continuous learning. This only increases levels of retirement poverty amongst retired public university employees. Its commonly perceived that government officers have more stable income than those working in private sector, but results have shown different statistics highlighting lack of financial management among government officers,(Tan 2019) thus the need to study the perception of pre-retirees on the adequacy of their retirement savings. Public university staffs also work the longest for instance the average retirement age for lecturers in 65 years yet most of them depend on pension incomes to sustain their livelihoods through the retirement period.

1.3 Statement of the Problem

According to Schie (2012), the term "perceived retirement savings adequacy" refers to an individual's belief that the retirement funds they have accumulated would be sufficient for a retirement that may be characterized as comfortable. According to research conducted by Le Grand *et al.* (2017), individuals do not feel as though they have sufficient self-assurance regarding their retirement funds, despite the fact that there are numerous public and private pension choices available to provide a comfortable retirement. Even in cases where pensions systems are structured, there is a significant disparity in retirement security reported due to the major differences between defined benefit plans and defined contribution plans, with the majority of sponsors preferring defined contribution plans to shield themselves from investment risk (Taylor et al,2007; Porteba *et al.*, 2007).

A significant portion of the working population is currently living longer in retirement, and it is possible that retirement benefits may continue to decrease as a result of rising prices across the board, particularly rising medical costs. According to an estimate provided by the Institute for Pension Supervisors (IOPS) (2015), the retirement poverty rates are as follows: 30.6% of people in Ireland, 26.9% of people in Australia, 23.6% of people in the United States of America, 22% of people in Japan, 10.3% of people in the United Kingdom, 9.9% of people in Germany, 8.8% of people in France, and 56% of people in Kenya and may be worse in other developing countries. This indicates that saving for retirement is extremely important and ought to be regarded as a priority, and that effective management of one's personal retirement savings is a prerequisite for ensuring financial security in old age (Musembi, 2018). Again, the problem is that the majority of Kenyan workers retire with only 20% of their pre-retirement income, which is very little and can hardly support them upon retirement now that there is a change in social culture where parents may no longer rely on their working children to support them in old age (Kiptanui, 2017). It has been previously identified that inadequate pre-retirement financial planning and inadequate retirement savings are major contributors to the creation and promotion of major economic problems in the majority of developed nations, and it is possible that the situation is even direr in developing nations (Hershey & Mowen, 2000).

Previous studies indicate a positive relationship between financial literacy and retirement planning: with the ability to have adequate income for retirement being an important consideration in predicting the quality of life after retirement (Lusardi & Mitchell, 2011); (Hershey, Jacobs-Lawson, & Austin, 2013); (Githui & Ngare, 2014). Some studies have reported little or no association between financial literacy and retirement savings (Willis, 2008; Crossan, 2011). Therefore financial literacy in some cases miss to lead to prudent financial decisions and that's the reason why financial literacy programs reexamination to assess their modes of delivery, impact and relevance, (Estelami 2009; Lyons et al., 2006).Borden et al,92008) noted that financial literacy was not significantly associated with effective financial behavior or risky financial behavior.Other studies suggest that financially sophisticated workers have more experience and tend to make fewer financial mistakes (Kyoung and Hanna, 2015). Financial sophistication is described as a form of human capital that may improves a household's ability to make effective financial decisions, (Huston *et al*, 2012).Therefore financial literacy may lead to financial sophistication since financial knowledge can improve one's decision making abilities. Calvet *et al* (2007) found that financially sophisticated individuals in Sweden made more efficient investment decisions and therefore were more confident about their retirement's savings.

Institutional factors play an important role in shaping retirement (Borsh-Supan, 2009). Rational individuals may miss to accumulate retirement resources efficiently if they participate in poorly designed pension schemes or if they lack proper financial instruments for accumulation, (Fornero *et al.*, 2010). Therefore, institutional settings within which workers find themselves play a crucial role in shaping their savings and investment behavior. Effective institutional framework may influence at the individual and collectively, basic beliefs, commitments and preferences Kerlin (2012).

The perception of one's retirement savings ultimately comes down to the trust levels individuals have in their financial intermediaries, or in the financial institutions that govern their retirement savings. Workers who place their trust in the government to provide their retirement income protection tend to believe that their pension benefits from the government will be sufficient and available (Hyde *et al.,* 2007). Other institutions tasked with managing pensions are banks and insurance companies and also an institutions' pension scheme. The government is not only a provider of public pensions but also the main guardian of the public interest, not only regulating the pension industry but also financial sector in general, (Van Dalen, 2010). Therefore, the quality of institutions that manage pensions is bound to affect savings behavior and subsequently perceptions on the adequacy of retirement savings (Chou,*et al*,2015,Guiso,2004,Coile, *et al* 2002).

Extensive studies on perceived retirement savings have been done mostly in developed nations (Bucher-Koenen &Lusardi, 2011, Chou *et al*, 2015, Franca, *et al*, 2018) literature and data on retirement saving adequacy in developing countries is limited. Most studies on retirement in the Kenyan context (Agunga 2017, Aluodi *et al*, 2017, Gathira *et al,* 2018, and Gitari 2012) have not captured the effects of financial literacy, financial sophistication, institutional factors and perceived retirement savings adequacy. Previous studies have also focused on actual retirement savings but the study under review puts an emphasis on the subjective part of retirement savings that is perceived retirement saving adequacy. Therefore the study sought to find out the mediated moderation effect of financial sophistication and institutional factors on the relationship between financial literacy and perceived retirement savings adequacy among public university employees in Kenya.

1.4 General Objective

To assess the mediated moderation effect of financial sophistication and institutional factors on the relationship between financial literacy and perceived retirement saving adequacy among public university employees in Kenya

1.4.1 Specific Objectives

1. To determine the effect of financial literacy on perceived retirement saving adequacy among public university employees in Kenya.
2. To assess the effect of financial literacy on financial sophistication among public university employees in Kenya.
3. To find out the effect of financial sophistication on perceived retirement saving adequacy among public university employees in Kenya
4. To examine the effect of institutional factors on perceived retirement saving adequacy among public university employees in Kenya.
5. To establish the mediating effects of financial sophistication on the relationship between financial literacy and perceived retirement saving adequacy among university public employees in Kenya.
6. To examine the moderating effects of institutional factors on the relationship between financial sophistication and perceived retirement saving adequacy among public university employees in

Kenya.

7. To assess the moderating effect of institutional factors on the indirect relationship between financial literacy and perceived retirement saving adequacy via financial sophistication among public university employees in Kenya.

1.5 Research Hypotheses

$\boldsymbol{H_{01}}$ **:** Financial literacy has no significant effect on perceived retirement saving adequacy among public university employees in Kenya.

$\boldsymbol{H_{02}}$ **:** Financial literacy does not affect financial sophistication among public university employees in Kenya.

$\boldsymbol{H_{03}}$ **:** Financial sophistication does not have significant effect on perceived retirement saving adequacy among public university employees in Kenya.

$\boldsymbol{H_{04}}$ **:** There is no significant effect of institutional factors on perceived retirement saving adequacy among public university employees in Kenya.

$\boldsymbol{H_{05}}$ **:** Financial sophistication does not mediate on the relationship between financial literacy and perceived retirement saving adequacy among public university employees in Kenya.

$\boldsymbol{H_{06}}$ **:** There is no significant moderating effect of institutional factors on the relationship between financial sophistication and perceived retirement saving adequacy among public university employees in Kenya.

$\boldsymbol{H_{07}}$ **:** Institutional factors do not moderate the indirect relationship between financial literacy and perceived retirement saving adequacy via financial sophistication among public university employees in Kenya.

1.6 Scope of the study

The study was carried out from May to July 2022. The target population was employees of public universities in Nairobi Metropolitan area, Kenya namely University of Nairobi, Kenyatta University, Jomo Kenyatta University of Science and Technology and Technical University of Kenya. The target area of Nairobi Metropolitan area was selected due to the high number of public universities within the area. The study focused on financial literacy, financial sophistication, institutional factors and perceived retirement saving adequacy among public university employees in Kenya.

1.7 Significance of the Study

To potential retirees who in this case are public university employees**,** the study findings will benefit workers by highlighting the importance of financial literacy, institutional factors and financial sophistication regarding perceived retirement savings adequacy. The findings of the study will create awareness about prudent financial management practices such as retirement savings, financial budgeting, prudent cash flow management, credit management and asset accumulation since perceptions influence behavior. These financial practices will reduce their stress due to poor financial behaviors (Zhan *et al.*, 2006) and ultimately improve their perceptions about their retirement savings.

To employers who in this case are public universities in Kenya, the findings in this study cause them to see the need to roll out workplace financial education to enhance financial literacy which may in effect enhance their worker efforts to engage in retirement plans and save for retirement. Financial illiteracy has been found to result to poor management of finances and in other cases can cause low employee productivity. The employers through the findings of this study will ensure that the pension schemes under them are managed better so as earn the trust of pensioners are ultimately improve the saving culture within their institutions.

To the Government and policy makers, the study findings may provide insights to the government and its policy role especially in the Treasury and in the impact of financial literacy on long-term retirement planning and the Retirement benefits Authority by helping them identify training needs of Kenyans. The Ministry of Education and higher education may put emphasis on the need for making financial education a part of the school curriculum. The results of the study may inform the current ongoing financial sector reforms in the country including financial literacy training and awareness of pension products and services. Again, the government as the main regulator of pensions industry can establish regulations of voluntary deductions for employers to improve total retirement balances.

To academicians, the findings of the study may contribute to the already existing body of knowledge on financial literacy, financial sophistication, institutional factors and perceived retirement saving adequacy in Kenya. Other studies may be done by prospective researchers in sectors of the economy and in other regions of the country.

Pension Schemes and their management: the knowledge on financial planning activities for retirement may be important for financial educators and counselors in providing sound advice on retirement preparedness and which in turn may improve funding adequacy for retirees and the overall social security in the economy. The pension schemes may also through the study’s findings put emphasis on being well regulated and executing their role of managing pensions better.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This second chapter of this study reviews literature related to the study, focusing generally on financial literacy, financial sophistication, institutional factors and perceived retirement savings adequacy. This chapter focused on the past studies and analysis related articles and publications about the variables under study.

2.2 Conceptual Review

This section provides deep description of the concepts. It discusses the concept under review being.

2.2.1 Concept of Perceived Retirement Savings Adequacy

Choosing how much money to put away for retirement ranks among the most consequential choices a person can make in their lifetime. Nevertheless, Tang *et al.* (2013) found that a significant number of people do not adequately save for their retirement. Research on whether or not workers believe they are adequately prepared for retirement is an important piece of the retirement adequacy puzzle since the cases workers perceive themselves to be adequately prepared for result in particular actions. Further discussion of this topic may be found in Andersen *et al.* (2015) theory of symbolic interaction, which proposes that individuals' behaviors are driven more by what they believe or how they feel than by what can be demonstrated to be objectively true.

Perceived retirement savings adequacy examines the extent to which individuals believe they have saved enough for retirement and influences their perceptions of opportunities and constraints in their financial management practices (Kemp, Rosentahal and Denton, 2005). Perceived savings adequacy is also defined as an individual's expectations regarding the sufficiency of their current retirement resources for a modest retirement (Schie *et al.,* 2012). According to Hershey *et al.* (2010), perceived financial preparedness for retirement is the belief that retirement savings will adequately support life in retirement. Perceived financial preparedness has received considerable attention because it is regarded as equally essential as actual retirement savings. This is due to the fact that perceived financial preparedness can influence both the timing of retirement and subsequent financial behavior (Segel-Karpas & Werner, 2014). Kemp *et al.* (2005) define retirement as the point at which a person ceases formal employment and is able to support himself through alternative means such as investments, pension plans, etc. (Luccarella, 2016). According to Petkoska and Earl (2009), retirement is also defined as the time when a person gives up his or her primary occupation and begins receiving pensions from public or private sources. It signifies a significant life transition for a great number of employees (Denton & Spencer, 2009). The beginning of 2000s has seen the subjective economic well-being gaining substantial interest and recognition among policymakers and researchers. The main reason for this development is basically the rising awareness of objective measures' inability to reflect people's financial experiences comprehensively (Helliwell et al., 2017; Kwan & Walsh, 2018). Perceived income adequacy has recently become a central subjective measure of economic well-being and ultimately been often used also in recent studies on the economic well-being (Gildner et al., 2019; Žiković, 2020,This measure captures an individual's perceived balance between available retirement income and one's ability to make ends meet at the basic household level. Among the strengths of perceived income adequacy is its ability to enable the actual comparison between various households and different countries,(Palomaki et al,2023) The perception of the adequacy of retirement savings may be influenced by additional factors, like past financial experiences and the stage within the life course (Baldini et al., 2017). Perceived retirement saving adequacy has several benefits since it's much simpler to estimate than project adequacy of retirement adequacy which requires more detailed and more complex computation processes. Perceived retirement saving adequacy exhibits an individual's subjective measurement and assessment of their retirement readiness (Lee, Kim Hanna, 2023)

Previously, perceived savings sufficiency was measured using a data set designed to elicit individuals' subjective perceptions of the construct. Van Dalen *et al.* (2010) also established that retirement saving adequacy may be the result of a person's evaluation and comparison of his or her anticipated retirement income with the expected retirement income level necessary to live modestly. According to Binswanger and Schunk (2012), the majority of employees may have a general understanding of the pension benefits necessary for a comfortable retirement. Researchers have measured retirement savings adequacy using an individual's best approximation of their expected retirement income replacement rate, assessing workers' perceptions of retirement savings adequacy as a significant extension of previous research, which relied on objective measures of retirement savings. Engen *et al.* (1999) and Scholz *et al.* (2006) used the difference between actual pension income and a benchmark income standard to measure the adequacy of one's savings. (Han *et al.*, 2019) Retirement preparedness can be defined as a lifetime project that seeks to maintain the person's consumption and standard of living at a similar level to what they had before retirement. A sufficient income upon retirement is essential for ensuring that retirees can live adequately (Vanderhei, 2014). The future financial security of retirees is contingent upon their current retirement income and provident fund accumulation during their working years.

People who fail to plan for their retirement are more likely to have higher levels of preretirement anxiety, poorer adjustment to their retirement phase, and a lower sense of overall pleasure in retirement (Principi *et al.,* 2020; Beehr & Bennett, 2015). Previous research has shown that employees who plan for their retirement are more likely to report lower levels of preretirement anxiety and better adjustment to their retirement phase. Studies have also shown that perceptions of retirement savings adequacy are affected not only by issues of financial literacy, social factors, and a worker's psychological characteristics, but also by psychological and institutional factors that can influence one's capacity and willingness to formulate and implement a savings plan (Adams & Rau 2011). This is because psychological and institutional factors can influence one's perceptions of one's own capacity and willingness to formulate and implement a savings plan. A person's mental inclination to save determines how much money they will have saved for retirement. There is evidence that a favorable correlation exists between retirement savings planning and practice and psychological aspects. These psychological factors include having a clear retirement objective, having a future time perspective, and having a certain amount of financial understanding. Establishing clear retirement financial objectives is an important step toward achieving retirement goal clarity. According to Hershey et al. (2010), it has a favorable association with both the practice of saving for retirement and the perception of having adequate funds.

Knowledge of finances is an essential and cognitive component that affects one's ability to save for retirement. According to Banks and Oldfield (2010), employees who have a high level of financial understanding may have a higher likelihood of planning, saving, and ultimately having a higher level of perceived adequacy. According to *Hershey et al*. (2010), social influences from friends and spouses can also play a role in influencing decisions to plan for retirement through the social norms that they give. It has also been shown that the timing of retirement for a person's spouse and their colleagues is, in the majority of situations, a significant factor in determining when that person would retire Eismann *et al.,* (2017)). It has also been hypothesized that an individual's perspective of the significance of retirement savings may be influenced by the early socialization they receive from their parents (Hershey et al., 2010).

There is a possibility that institutional variables are also connected with adequate retirement savings. According to Hyde et al.'s research from 2007, workers who are more likely to place their trust in their government to adequately secure their retirement income also tend to have a greater degree of confidence that they will have sufficient assets accessible to them once they reach retirement age. The government is responsible for providing public pensions, serving as the primary watchdog of the general public interest, and acting as the supervisor of the pension industry. Other research has indicated that younger populations are more likely to have greater levels of perceived retirement savings adequacy if they have confidence in their government's ability to manage their future retirement (Hershey *et al.,* 2010). This is because younger populations are more likely to be more optimistic about their government's ability to manage their future retirement.

There are limitations to perceived retirement sufficiency: an individual's perceptions may not reflect actuality. Binswanger & Schunk (2012) found that individuals who appear to have a reasonable understanding of what an adequate retirement income entails are more likely to plan for retirement. Studies found that the majority of people's self-assessments on their retirement funds were roughly equal to the objective truth of their retirement preparedness. On the other hand, one-third of working people falsely believed that they were adequately ready for retirement while, in reality and from an objective standpoint, they were not. According to Kim and Hanna (2015), this shows that there may be gaps between people's perceptions and the actuality of the situation, which may result in individuals failing to effectively prepare.

Previous studies (Brown & Graf, 2013; Boisclair *et al.*, 2017) have investigated the connection between a person's level of financial literacy and the amount of money they have saved for retirement. According to the findings of these studies, those who have a strong understanding of personal finance have a greater chance of having a prosperous retirement planning experience. The authors Boisclair et al. (2017), Fong *et al.* (2021), Gallego-Losada *et al.* (2022), Gathergood (2012), Lusardi and Mitchelli (2007), Mustafa and Islam (2021), and Niu *et al.* (2020) discovered a correlation between financial literacy and the modest distribution of financial resources to support themselves and their families during old age. Netherlands (Alessie *et al.*, 2011) and Italy (Fornero & Monticone, 2011) also published findings that were very similar to what we found. Planning for retirement might feel like an uphill battle because to the myriad of important considerations that must be made, including consumption planning, a solid comprehension of compound interest rates, portfolio diversification, and risk management. Therefore, in the absence of adequate financial literacy, an individual can regard it as a difficult effort, underrate the benefits of doing so, and wind up not taking any significant action at all. Stango and Zinman (2009) offered additional evidence in support of this contention by demonstrating that persons who are unable to correctly calculate interest rates have a tendency to underestimate the compound interest rate over the long run as well as the future value of investments. In addition, they discovered that households that borrowed more money eventually saved less money and wound up with a less amount of wealth overall. In conclusion, it has been demonstrated that financial literacy has a two-fold effect on the ability to save for retirement. Financially literate people are able to recognize the advantages of saving money and investing it, and they also have a greater capacity to choose investments that are in the best interest of their financial situation.

Individuals' decisions to save for retirement can also influenced by social members of their network (spouse, colleagues and friends) who in most cases provide social norms in regards to one's right course of action. Although, it has been noted that in most cases retirement decisions are a household affair, and among the older adults, support from one's spouse on the issue of retirement increases the chances of an early exit from the workforce (Van Dalen *et al.,* 2010). Influences from one's spouse may also be clear as with retirement savings' decisions. A good example is that one's spouse may encourage the other spouse to engage in financial programs for retirement savings in order to get a modest living standard at old age.

According to Duflo and Saez (2002), coworkers have a significant amount of weight in determining whether or not an employee would save money. It was therefore hypothesized that the greater the level of support for retirement savings from friends, spouses, and coworkers, the greater the likelihood that workers will save; consequently, this would increase the likelihood that attitudes regarding retirement savings. The early parental socialization of children is another example of a social mechanism that influences workers to conserve money. Bernheim *et al.* (2001) referenced to the fact that those who were pushed to save money when they were children ended up saving more money as adults compared to their peers who did not receive similar encouragement to save money. In addition, a study that was conducted not too long ago by Webley and Nyhus (2013) suggested that one component of economic socialization, which may involve talking money concerns with parents, has an influence on a child's economic behavior, which in turn has an influence on the economic behavior of the child when they are an adult.

According to Mueller *et al.* (2014), institutional structures in most instances either legitimate or constrain the behavior of enterprises and individuals. As a result, institutions have the potential to either define or even restrict the options that are available to firms and individuals. As a result, institutions are responsible for the creation of an environment in which a group of individuals can function. Neo-institutional theory (Meyer & Rowan, 1977; Scott, 2001) suggests that public and private institutions can have an effect on the actions of private households and businesses, which in turn can have an effect on the resource endowments both inside and outside of the firm. People who save aside money with the intention of using it in the future need to have faith in a system that will perform the role of insurance, safeguarding their monetary interests over the course of time. Van Dalen et al (2010). In this particular study, the researcher focused their attention on the ways in which financial literacy, financial sophistication, and institutional factors all influence an individual's perception of their adequate level of savings.

2.2.2 Concept of Institutional Factors

Institutional settings are clusters of norms that have strong mechanisms to support and enforce regulations that preserve an essential part of social life, as established by Rueschemeyer (2009). According to Mueller *et al.* (2014), formal institutional arrangements can either legitimate or constrain the behavior of individuals and organizations. Because of this, institutions may sometimes define and sometimes limit a set of choices that enterprises and individuals possess at a certain time. As a result, institutions produce an atmosphere in which groups can function successfully. They have the ability to motivate folks toward specific behavior. According to neo-institutional theory (Meyer & Rowan, 1977; Scott, 2001), both formal and informal institutions have the potential to influence the actions of enterprises and individual households, in addition to the resource endowments that are present both inside and outside of a corporation. Institutional design also involves a legislative program design and a regulatory requirement that aim to characterize the operation of institutions, and consequently represent the underlying ideals, which may include choice, equality, or citizenship. An in-depth investigation into the circumstances that could either foster or stifle the realization of particular goals that are in line with these principles (Goodin *et al.,* 1999). The institutional design of the pension system has an effect on future financial resources. According to Fisher et al. (2006), major institutional drivers of early retirement should include the pension system's generosity as well as its actuarial neutrality. Institutional factors are basically the three pillars of retirement funding namely: public pension schemes, employer sponsored pension schemes and personal savings in banks and insurance companies.

People who make provisions for their retirement have, in most circumstances, placed their faith in a financial system that would perform the job of insurance by safeguarding pensions over the course of their lives. Van Dalen *et al.* (2010). According to Fornero et al. (2010), rational workers may accumulate their wealth in an ineffective manner if they take part in pension schemes that are poorly organized and if they are unable to access appropriate financial instruments for the purpose of asset accumulation.

According to Ring's postulates (2005), trust may play a role by functioning as a mechanism to overcome the imbalance between low levels of consumer knowledge and the ever-increasing complexity of financial products and services, and pensions in particular. Ring hypothesizes that this imbalance may be caused by the ever-increasing complexity of pensions. The author goes on to emphasize that this does not necessarily mean that the financial risks that are associated with financial investments have been eliminated; rather, individuals are now able to believe in the expertise and services provided by financial institutions. (Ring, 2005,). Households and businesses on their own are deeply rooted in the social, legal, cultural, and political environments in which they operate. These behaviors, internal structures, and techniques are all reflections and responses to norms and customs that already exist in the larger environment. Powell, (2007).

Previous research has demonstrated a favorable link between institutional characteristics and a person's perception of their ability to adequately save for retirement. According to Fischer *et al.* (2006), pension programs that provide generous retirement benefits may induce early departure from formal work. Trust and involvement in the stock market were the subjects of research conducted by Guiso *et al.* (2008), who investigated the connection between the two factors. The database was compiled using the results of the DNB (Dutch National Bank) Household Survey, and a representative sample of 1,943 households was chosen. According to the findings, there is a favorable connection between trust and direct participation in the stock market.

The other existence of a positive correlation was established between trust and investment in stock from a cross-country study that was conducted by Pasini and Georgarakos (2009). This study employed data from 10 different European nations. Taylor-Goodby (2005), conducted research on the extent to which people in the UK have trust pensions. The author relied on a series of questions on trust in private pensions and the state that were included in the British Social Attitudes (BSA) survey as well as a focus group research that was commissioned in 2004 on expectations, attitudes, and ideas about retirement planning. Both of these sources of material were quite useful. According to the findings of the aforementioned analysis, there is a healthy amount of faith in both private and public pensions. There were substantial disparities that appeared depending on the socio-demographic aspects of the respondents: low levels of trust were strong among the middle-class, more educated persons and women, as contrasted to older working-class, less educated groups who were more likely to invest their confidence in both forms of pension. The material that was supplied by the focus group was intricate and thorough, demonstrating that there is a substantial gap between the groups that belong to the working class and the middle class. Those in the first group typically rely more heavily on the state pension. They did not have faith in the government, yet they believe they had a low level of financial awareness, trust, and retirement preparation. When entering into financial contracts, Guiso *et al.* (2004) used the amount of regional social capital as a proxy for the level of trust. There is a connection between trust and retirement planning, but this does not take into account how much money is being saved for retirement or who is in charge of the management of these financial resources. Johan et al. (2013) alluded to the fact that individuals and any other significant actors, including governmental agencies, employers, and non-governmental organizations, are provided with basic sets of constraints that have the potential to regulate and affect the timing of retirement. This is where the decision-making process for retirement always takes place, according to Johan *et al.* (2013). They include age, health, gender, one's economic status and future economic prospects, one's unique organizational characteristics such as institutional characteristics, mainly the structure of the labor market, environmental factors, welfare state models, and how the pension system is constructed, as well as employer attitudes toward older workers.

There are three pillars of financial support over retirement. The first pillar state supported public pension scheme, the second is employer sponsored occupational pension schemes and the third is personal savings accumulation in banks and insurance companies. The main state supported public pension scheme in Kenya is the National Social Security Fund (NSSF). NSSF was formulated in 1965 and it was through an Act of Parliament. It initially operated within Ministry of Labor as a department until 1987 when the fund was transformed into a state corporation with management through a board of trustees (NSSF Act, 2013).The Act established became a mandatory national pension scheme whose objective was provision of financial benefits to Kenyans upon retirement.

The NSSF Act of 2013 later transformed to a pension scheme to from a provident firm where Kenyans with income contribute an agreed percentage of their gross earnings and this becomes the compensation in the event of death, permanent disability, assistance to one's needy dependents in case of death and periodic life pension upon retirement. According to NSSF Act, statutory contribution is set at 12 % of employees pay, 6% contributed by the employee and 6% by the employer (NSSF, Act 2013).

The second pillar of retirement support is employer's unique sponsored occupational pension schemes. These are pension schemes that established by different employers to cater for retirement needs of their employees. In this case, deductions are done at source and remitted to the pension schemes that then hold the money until disbursement is done upon retirement. Institutional pension schemes are overseen by the Retirement Benefits Authority (RBA). RBA Act of 2020 stipulates the objectives and functions of RBA which includes regulating and providing an oversight role in the management and establishment of pension schemes, protecting members' interests and sponsors of the pensions benefits sector and promoting the development of the pensions benefits sector and advising the treasury on any matters affecting retirement benefits sector. Therefore, the RBA is therefore tasked with the responsibility of providing oversight to the activities of pension schemes in an attempt to protect pensioners' interests.

The third pillar of financial support is personal savings accumulations that are kept in banks and insurance companies. Financial institutions like banks and insurance companies act as main financial intermediaries that are tasked with the duty of keeping retirement savings in safe custody. Commercial banks are regulated by Central Bank of Kenya (CBK) while insurance companies are regulated by Insurance Regulatory Authority (IRA). Dulebohn (2007) states that higher education employees in most countries participate in their university-sponsored defined contribution pension plans and therefore place the investment decision responsibility upon them. Public universities in our country have university's pension's management units which are tasked with the sole responsibility of collecting employees' pensions and remitting them to retirees upon retirement. The management of these unique pension schemes is determined by the employees who vote for the board of directors periodically.

2.2.3 Concept of Financial Sophistication

The place of financial sophistication has recently become an important area in the study of household finance. Financial sophistication has been defined as the household's ability to avoid making financial mistakes, researchers in finance have become interested in financial sophistication (Calvet *et al.,* 2009). Financial sophistication enables participants avoid financial blunders when engaging investment decisions, (Calvet, Campell & Sondini, 2009).

The term "financial sophistication" should not be confused with "financial literacy" due to the fact that workers who are deemed sophisticated have more financial expertise and are likely to make fewer financial mistakes (Kim & Hanna, 2015). Some authors mean the same thing when they talk about financial sophistication as they do when they mean advanced financial literacy. The majority of people who have an advanced level of financial literacy are likely to have a greater grasp of finances, which can lead to the building of wealth and the making of wise investment decisions (Akben, 2021). Kim and Hanna (2015) conducted a study in the United States of America in which they hinted that certain demographic groups, such as females, show lower levels of financial sophistication. According to Salleh (2022), financial sophistication is required since more financial knowledge is likely to drive individuals to improved decision-making, which in turn encourages individuals to actively participate in legitimate financial markets (Brahmana *et al.,* 2012; Rooij *et al.,* 2011; Sang *et al.,* 2018). It is possible that this may foster improved levels of financial literacy in both public and private sector personnel, which will assist in the process of making appropriate and rewarding financial decisions that will lead to savings that are adequate for retirement.

Smith et al, (2011) noted that financial literacy was measured by inquiring about consumers' knowledge on financial matters while financial sophistication examined consumers past financial decision making which may serve their long term interests.

Estalami (2014) did a study on ethnographic study of consumer financial sophistication on 271 informants between the years 2008 to 2012.The observations were subjected to content analysis procedures. Some of the questions included: following other peoples decisions about investments instead of thinking for oneself, spending too much, considering transaction fees for financial transactions, not saving for retirement, continuing to use the same financial service provider despite poor service. The study results indicated that most of the consumers made financial errors when making their financial decisions.

Data from the Health and Retirement Study (HRS), as published by Lusardi *et al.* (2009), imply that the majority of consumers may not even have a knowledge of stock and bond pricing, investing fees, risk diversification, and portfolio choice. This is the conclusion that can be drawn from the findings of the study. Those that participate in the financial markets and have a greater level of financial intelligence are better equipped to negotiate the complexity of those markets, and they are also likely to have better financial success as a result of their participation. People who are considered to have a higher level of financial sophistication are more likely to make plans for their retirement (Lusardi and Mitchell, 2007), more likely to invest in stocks (van Rooij *et al.*, 2007), and also more likely to make use of low-cost financial instruments (Lusardi and Tufano, 2009). [The references for these studies can be found in Lusardi and Mitchell, as well as in Lusardi and Mitchell].

Kyrychenko and Shum (2009); Stango and Zinman (2009) stated that education has been employed as a proxy in the measuring of financial sophistication. According to Calvet et al.'s research (2009), there is a significant and favorable correlation between a person's level of education and the sophistication of their financial situation. In addition to education, other factors such as gender, age, job type, planning horizon, usage of financial advice, and purchasing behavior connected to investments have been investigated in relation to one's level of financial sophistication (Dow, 2009). These factors have been found to be associated with one's level of financial sophistication. The concepts of stock ownership, risk tolerance, investment timing, and portfolio diversification were incorporated into Kimball and Shumway's (2007) creation of a sophistication index. According to research conducted by Agarwal *et al.* (2009), the elderly and the young were shown to have the lowest levels of financial awareness as well as the highest rates of making financial mistakes.

According to Calvet *et al.* (2009) research, households with lower levels of education are more likely to hold losing stock and more likely to sell winning stocks than households with higher levels of education. According to Bilas et al. (2010) and Kim, Kyoung and Hanna (2015), individuals who have a higher level of financial sophistication have lower levels of financial inertia, which means that they are better able to make sound decisions regarding their finances. According to Jappelli and

Padula (2013), households that have higher levels of financial acumen are more likely to have a portfolio that includes stock investments. According to Stango and Zinman (2009), a person's likelihood of amassing wealth is inversely proportional to the level of financial sophistication they possess.

There is a possibility that the Financial Sophistication measure included in the Survey of Consumer Finance does not provide an accurate measurement of financial sophistication. The majority of authors have traditionally relied on three stand-ins for financial savvy: education level, frequency of use of professional financial planning services, and an adequate comprehension of the questions asked by the SCF survey. In research on financial sophistication, the use of education as a proxy has gained widespread acceptance. Education was employed as a construct for financial sophistication in Kyrychenko and Shum (2009), Stango and Zinman (2009), and Kim & Hanna (2015).

Researchers in the field of household finance, such as Hauff et al., 2020), and Clark et al., (2017), discovered that persons who have a greater understanding of their financial situation are more inclined to plan for their retirement. The research that had been done prior to this focused on the connection between having a high level of financial acumen and having a plan for retirement. This was done under the assumption that having a retirement plan is an indicator of actual saving behavior. For instance, Lusardi and Mitchell (2007) found that respondents who were classified as planners had higher levels of wealth upon retirement and also demonstrated better levels of financial sophistication than respondents who were not classified as planners.

In addition, researchers discovered comparable research topics while looking at data from other countries. Using data from the De Nederlandsche Bank (DNB) Household Survey, Van Rooij *et al.* (2011) investigated the connection between a person's level of financial literacy and their preparation for retirement in the Netherlands. Fornero and Monticone (2011) utilized the 2006 and 2008 waves from the Bank of Italy Survey on Household Income and Wealth (SHIW), where an empirical analysis was conducted on the participation in pension plan and how workers contributed in addition to how the respondents were allocated retirement portfolios.

2.2.4 Concept of Financial Literacy

Financial education has been expanding in more industrialized countries as a response to the increasing complexity of the global economy and the fact that Africa is now recognized to be a part of the global community (Monyoncho, 2010). According to Agnew *et al.* (2007), FSD (2009), and Lusardi *et al.* (2010), the idea of "financial literacy" plays a key influence in influencing saving practices and real member involvement in retirement schemes, as well as in effectively lowering debt and developing and managing wealth. A fundamental requirement for the functioning of the economy as a whole is education pertaining to financial problems. Those who have a higher degree of financial literacy are more likely to have a culture that places a premium on saves, in contrast to those who have a lower level of financial literacy who have a lower level of financial literacy. According to FinEd (2011), having a higher level of financial literacy is positively connected with having a higher level of savings, which is anticipated to have a favourable impact on investment levels as well as overall economic growth. In addition, having a higher level of saves is favorably correlated with having a higher level of financial literacy. Consumers may profit from improved financial literacy by receiving a better education and being given more power over their financial decision-making as a result of expanded financial literacy programs. This is one way in which consumers may reap the rewards of increased financial literacy. (Mwangi & Kihiu, 2012).

According to the OECD (2005), financial literacy is defined as the ability of investors and consumers to understand financial concepts, products or services and the capacity to be confident about how to handle financial opportunities and risks, as well as the ability to make informed financial choices and know where to get help, all of which will ultimately improve their financial well-being (Miller *et al.,* 2009). Additionally, the Financial Services Department (FSD, 2009) defines it as an individual's capacity to make personal financial decisions and judgements that may contribute to immediate as well as long-term financial security. This definition of financial capability can be found in the article "Financial Capability." This definition describes a person's capacity to manage their finances. If a population is financially literate, then they are more likely to make decisions based on factual knowledge and may be more likely to take appropriate measures about financial concerns that influence their wealth and wellness, according to the assertions of certain writers. The requirements for financial literacy may change over time or in response to the ever-changing financial needs. This is due to the nature of the financial goods or services that are supplied in private pensions, which are complicated, long-term, and have social coverage (OECD, 2008). As a result, financial literacy requirements are particularly significant in private pensions.

Worthington, (2005), found financial literacy being one’s ability to make informed judgments and to make effective financial decisions regarding management and use of money. Remund (2010) also defined it as a measure of basic understanding major financial concepts. Financial literacy of individuals cane pin pointed if one has the financial knowledge necessarily make informed financial decisions regarding retirement planning. Several authors have suggested that a population that is viewed as being financially literate can make informed decisions and take appropriate actions on matters affecting their financial wealth and well-being. Agnew & Szykman, (2011), maintained that financial literacy may enable individuals build their financial skills and may give them the necessary confidence to make decisions in regard to their pension schemes. Gitari (2012) posited that financial knowledge on retirement savings and plans is needed if effective long term financial decisions that will be relevant to retirement and pension funds is to be achieved.

Financial literacy was further defined by Lusardi and Mitchell (2011) as the knowledge of important core financial concepts as well as the capacity to perform simple financial computations. According to the OECD (2016), "financial literacy" is a multifaceted notion that encompasses various fundamental aspects of financial knowledge, attitudes, and behavior. According to Skagerlund *et al*. (2018), this skill is also connected with the fundamental capacity to process and comprehend fundamental numerical concepts, quantitative estimations, probabilities, and ratios. Financial literacy may have a significant correlation with fundamental numeracy (Skagerlund *et al.*, 2018), but the correlation between financial literacy and other categories of cognition, such as episodic memory, is substantially weaker (Smith et al., 2010). Studies that looked at the link between financial literacy and accumulated wealth or other indicators of well-being typically concluded that financial literacy is just as important as cognition and education in influencing financial outcomes (Banks and Oldfield, 2007). This was found in the studies that looked at the association between financial literacy and acquired wealth. There are significant variances in the level of financial literacy across adult populations in a variety of nations, as has been observed (van Rooij *et al.*, 2012, OECD, 2017, Lusardi and Mitchell, 2011, Klapper et al., 2015; Lusardi and Mitchell, 2011; Klapper *et al.,* 2015).

Greenspan (2002) suggested that financial literacy could assist teach the essential financial knowledge in individuals, which is important to build and launch savings, household budgets, and implement strategic decisions about investments. According to Mwangi and Kihiu (2012), the use of financial knowledge can assist households in meeting their financial commitments through the allocation of resources and the implementation of sound planning in order to reach economic maximum value. According to Agnew and Szykman (2011), having knowledge of finances may make it possible for individuals to develop their financial skills and instills in them the confidence to make financial decisions regarding their retirement plans. According to Gitari (2012), it is essential to have financial knowledge regarding retirement savings and plans to save in order to make efficient long term financial decisions relating to pension funds.

Hilgert *et al.* (2003) found that previous research has indicated effects of financial literacy to financial outcomes that can be observed through excellent investment practices and saves. These effects can be observed through good investment practices and savings. Mullock and Turcotte (2012) came to the conclusion that persons who are financially educated are likely to have a higher level of assurance regarding their retirement plans. This is due to the fact that financially literate people understand how to save money and will do so in preparation for their golden years. However, there are some authors who have suggested that people who are financially illiterate may still plan for retirement in some instances even though they are financially illiterate (Lusardi *et al.,* 2010, Sang *et al.,* 2014). As a consequence, a person's level of financial literacy could influence the decisions they make regarding their investments, finances, and retirement planning (Lusardi & Mitchell, 2008; Van Rooij *et al.,* 2011). According to research by Van Rooji *et al.* (2011) and Lusardi and Mitchell (2007), the majority of people who lack financial understanding have unfavorable outcomes as a result of the financial decisions they make. These individuals may also be less inclined to engage in retirement planning and may be more likely to end up with low wealth levels as they approach retirement. A number of scholars have conducted additional research and come to the conclusion that the impacts of financial literacy and retirement planning are inconclusive. According to the findings of Crossan (2011), financial literacy only played a marginal part in the process of retirement planning.

There have been efforts made to construct several metrics for measuring financial literacy. In order to determine one's level of financial literacy, Hilgert et al. (2003) devised a series of questions to which the respondent may either select yes or no. They also found a correlation between financial literacy and effective management of one's financial resources. Lusardi and Mitchell (2007) devised a series of three questions with the purpose of determining the level of general comprehension of interest rates, inflation, and risk. That group of questions, which examined genuine knowledge as opposed to financial experience or decision-making abilities. Hung *et al.* (2009) extended the measure, further defined and verified the set of questions, and found that it was internally consistent. They also discovered that it suggested a good test-retest reliability and stability over time. Almenberg and Save-Soderbergh (2011) used questions very similar to these to investigate the level of financial literacy in

Sweden. On the other hand, Klapper and Panos (2011) used these very same questions to evaluate the level of financial literacy in Russia. These questions have been included in a number of other financial studies carried out all over the world. This approach was also taken by Cole *et al.* (2009) for determining the levels of literacy in India and Indonesia.

According to prior research conducted by Van Rooij, Lusardi, and Alessie (2011), the primary reason for the difficulties that households experience when it comes to investing and saving money is a lack of fundamental knowledge regarding monetary matters. Empirical research has shown that having a basic understanding of finance has a positive impact on one's ability to manage money and their economic knowledge while making financial decisions. For instance, Lusardi and Mitchell (2009, 2011, 2013, 2014, and 2017) have continually researched the impact of economic ideas on retirement planning. The results have indicated that there is a favorable association between fundamental financial abilities and knowledge and retirement planning. A better level of financial literacy may likely add to the overall financial well-being of persons following retirement, as another conclusion drawn from the study found.

According to Nyoro and Otieno (2016), having a favorable attitude toward retirement is positively associated with having financial understanding of retirement. People who have a self-perception that they are more knowledgeable than their peers regarding financial planning are more inclined to make preparations for their retirement, according to another research that found this to be the case. Training and intervention programs aimed to increase financial awareness may boost financial preparation by strengthening retirement planning efforts, according to an analysis conducted by Kim, Garret, and their colleagues (2005), who looked at the findings of earlier studies. According to Taylor and Doverspike (2003), retirement education increases employees' financial understanding as well as their actions in respect to retirement preparation. This, in turn, leads to improvements in employees' attitudes toward retirement as well as retirement planning.

According to Clark and d'Ambrosio (2003), retirement seminars do have an effect on attendees' views and behaviors regarding retirement. In addition, they discovered that attendance at seminars had a beneficial influence on an individual's plans for retirement as well as their methods of retirement savings. The researchers Krajnak *et al.* (2008) came to the conclusion that informal financial preparation had a large and favorable effect on financial expectations, and that formal retirement education seminars that focused on financial management significantly affected predicted retirement satisfaction. According to the findings of Gustman, Steinmeier, and Tabatabai (2010), there may not be any connection between fundamental cognitive skills (numeracy) and financial awareness of retirement plans and Social Security. In conclusion, financial literacy refers to having a fundamental understanding of financial topics as well as the products and services available in the financial sector. It should be noted that some of the measures are suitable in some countries. For instance, some developing countries may not have a well-functioning stock market, which would make it difficult to measure financial literacy through knowledge of stock markets. The majority of studies use different measures to determine levels of financial literacy; however, it should be noted that some of the measures are suitable in some countries.

2.3 Theoretical Review

The study under review was guided by theories that were previously have been forwarded and that have called for more research on the subject matter over the years. These theories include Victor vrooms' expectancy theory of motivation, Prospect theory, life cycle theory, symbolic interaction theory and neo institutional theory.

2.3.1 Victor Vroom's Expectancy Theory of Motivation

Prior research has identified motivation as a critical component in individual behavior, serving as a crucial driver. The development of this concept is credited to Tolman (1932) and Lewin (1938), who established the theory linking perception to conduct. Further contributions came from Vroom (1964) and Samuelson (1967), who conducted additional research on the model. Their work provided a theoretical foundation for characterizing the influences that motivate human behavior as a function of expectation, instrumentality, and valence or utility.

The concept of expectation, in its fundamental form, refers to the anticipation or possibility that specific behaviors will lead to particular outcomes. This underscores the idea that performance relies on the effort invested. The connection between performance and reward, indicating that outcomes are determined by performance, is referred to as instrumentality. The significance or value an individual places on a perceived outcome is known as valence or utility. According to these theories, people are inspired by things that can lead to desirable outcomes that can be effectively achieved (Mandel & Klein, 2007).

Enhancing one's level of financial literacy can significantly improve a person's ability to make important decisions about their finances, which can greatly impact their quality of life. Ensuring sufficient pension savings to meet retirement demands is one of the most significant goals in an individual's life and a crucial outcome to strive for. Therefore, based on this theory, individuals would engage in financial literacy programs driven by their expectations of the program and the anticipated rewards of the outcomes (Mandel & Klein, 2007). In other words, people will enroll in programs and participate in retirement planning activities if they believe these actions will benefit them. This further implies that individuals will be motivated if they believe that financial literacy and any other actions can aid them in making better decisions, ultimately leading to improved long-term outcomes such as accumulating enough pension funds.

The study's findings support this theory, demonstrating that financial literacy, the independent variable, significantly influences the dependent variable under examination, which is the perceived adequacy of retirement savings. The actions intended to achieve the desired outcome—adequate retirement savings—include participation in literacy programs and engaging in investment and wealth accumulation, all aimed at enhancing one retirement savings.

2.3.2 Lifecycle model

The theory presented in 1963 by Ando and Modigliani addresses economic issues related to retirement savings and centers around optimizing utility throughout an individual's lifespan by rationalizing their income allocation. This theory posits that individuals and families can accumulate savings during their working years and into retirement, with the intention of using or spending these savings post-retirement. The underlying idea is that households can even out their spending's marginal utility over their lifetime through such saving behavior. A notable accomplishment is their successful transformation of these ideas into a formal model, which was then integrated into an already well-defined and established economic theory. This life cycle model suggests that individuals might make intelligent and rational decisions about their spending levels across different life stages. However, these decisions are often influenced by their available financial resources (Browning & Crossley, 2001; Copur & Gutter, 2019; Modigliani, 1986). Notably, the life cycle model was developed by Browning and Crossley.

Modigliani (1986) highlights the imperative of preparing for retirement as a fundamental reason for saving money for the future. Bazhenova and Krytsun (2013) emphasize that the main motivation behind individuals saving a portion of their discretionary income is the desire for a comfortable retirement. This model rests upon several assumptions about human behavior: participants have a forward-looking perspective across their lifetimes; they can reasonably anticipate their future financial resources; they comprehend the financial needs of successive life periods; and they make informed financial choices, reflecting rationality. Benartzi and Thaler (2007) assume that households possess the cognitive capacity and willpower to optimize their consumption while minimizing spending. People save during their younger, healthier years to secure funds for when they are older and either unable or unwilling to work, granting them freedom in spending choices.

The central focus of the examined investigation revolves around attitudes toward the adequacy of retirement savings, particularly the concept of setting aside money during one's working years to ensure a comfortable retirement later. Some savings are obligatory, like pension deductions and contributions to the National Social Security Fund (NSSF), while others encompass insurance policies and investments to bolster retirement comfort. The theory assumes that individuals possess awareness of their financial resources and make informed choices, captured by financial literacy and financial sophistication. Financial literacy represents a basic understanding of financial matters, while financial sophistication denotes the capacity for prudent financial decision-making. Public university staffs, immersed in a knowledge-based environment, are conscious of their retirement dates and deductions.

Another underlying theory assumption is that institutions play a negligible role. These institutions manage financial resources on behalf of their clients. Institutional factors serve as moderating variables. They are expected to influence the level of trust, subsequently impacting perceptions of savings and retirement. Study results propose that financial literacy, sophistication, and institutional factors significantly influence perceived retirement savings adequacy. Hence, the life cycle theory encompasses the variables in focus, as it highlights lifetime utility, consumption smoothing, and decision-making.

2.3.3 Prospect Theory

Prospect theory, pioneered by Daniel Kahneman (1981) and Tversky & Kahneman (1992), and later elaborated by Barberis and Nicholas (2013), presents a pragmatic alternative to the traditional expected utility theory. Kahneman (2003) further expounded that prospect theory offers insight into how decisions are made in scenarios involving risky choices among various alternatives. It examines how people perceive and value decisions marked by uncertainty, often expressing these choices in terms of potential gains.

A key facet of prospect theory is its recognition of different psychological states influencing an individual's decision-making process. These states encompass regret aversion and loss aversion (Waweru et al., 2003). According to Kahneman (2003), a pivotal contribution of this theory lies in how individuals frame outcomes or transactions mentally, which subsequently impacts their expected or realized utility. This theory's insights guided the current study, which explored decision-making between current consumption and future savings, focusing on retirement savings adequacy. This exploration incorporates considerations of the time value of money, encompassing discount rates and credit constraints. As such, the study investigated the impacts of financial literacy, financial sophistication, and institutional factors on the perceived adequacy of retirement savings.

The study's dependent variable is "perceived retirement saving adequacy," representing individuals' beliefs about the sufficiency of their retirement funds. Since public university employees typically participate in employer-sponsored pension schemes, the study aimed to gauge their sense of adequacy and, if lacking, propose measures to bolster their retirement confidence. Hence, the theory's emphasis on decision-making processes, specifically regret aversion and loss aversion, aligns with the study's focus. Achieving adequate retirement savings necessitates financial decisions related to saving for the future. The study's findings corroborated the principles of prospect theory. The outcomes implied that public university employees generally perceive their retirement savings as sufficient. Their perceptions are shaped by their concerted efforts to ensure a secure retirement, involving decision-making processes characterized by risk aversion and loss aversion.

2.3.4 Symbolic Interaction theory

This theory, initially proposed by Herbert Blumer in 1969 and subsequently developed by Korgen and White in 2008, highlights the pivotal role of perceived meaning in human experience. It contrasts with the notion of an objective situation or actual reality (Goffman & Berger, 1974). While the study of actual retirement savings holds great importance, this theory underscores the significance of the subjective or perceived dimension. It suggests that how individuals perceive their circumstances matters just as much. The life-cycle model offers a foundational framework for understanding retirement savings, within which a more tailored retirement-specific framework can be constructed.

Symbolic interactionism, a key concept within this theory, posits that individuals navigate their lives based on their interpretation of their actual situations (Bilton et al., 2002; Sinclair et al., 2021). Therefore, the views and perceptions people hold about themselves and the value they attach to financial independence during retirement can profoundly influence their motivation to save sufficiently for retirement. One's perception of their retirement savings can dictate not only the timing of retirement but also future financial behavior (Sergel-Karpas & Werner, 2015). This aligns with the sentiment expressed in Proverbs 23:7, which states, "As a man thinks, so is he."

Perceptions wield substantial influence over attitudes and behavior. In this context, the study's findings uphold the principles of this theory. They indicate that many public university employees who exhibited confidence in their retirement savings were also engaged in actions to enhance their retirement funds. These findings reinforce the theory's assertion that the study of perceptions is as crucial as the examination of actual retirement savings. Moreover, these perceptions wield influence over saving behavior and actual wealth accumulation.

2.3.5 Neo Institutional theory

This theory was forwarded by John Meyer, Brian Rowan and Powells, (1977, 1983).The theory focuses on structures which may include norms, schemes, rules and routines become guidelines for social behavior.

The theory further posits that decisions and social patterns may not arise from an individual's' preference but rather from an institutions tradition that exerts influence on individuals' decision. The theory is crucial in highlighting the relationship between institutional factors and perceived retirement saving adequacy. Institutional factors was measured by the trust levels that individuals have on the financial intermediaries that manage pensions namely government managed social fund (NSSF),university pension schemes and banks and insurance companies. The theory is useful in explaining that these financial institutions handling pensions influence financial behavior which is saving for retirement. The findings of the study are in agreement with the dimensions of this theory that institutions affect decisions and behavior.

2.4 Pension Schemes in Kenya

In the Kenyan context, various social security schemes are available, categorized into three main groups: public schemes, occupational schemes, and individual schemes. Public schemes, established by parliamentary acts, consist of two pillars. The first pillar mandates compulsory membership in pension schemes. The second pillar, occupational schemes, offers both voluntary and mandatory membership options, managed privately. The third pillar comprises voluntary schemes. These three pillars dictate contribution levels and benefit distribution within retirement benefit schemes (Chitembwe, 2007).

According to the Central Bank of Kenya, pension savings in the country have shown substantial growth. Between 2005 and 2009, pension savings increased from Kshs. 176 billion to Kshs. 313 billion. Pension schemes have become significant players in the equities and bond markets, with Old Mutual Kenya (2007) indicating that Kenya's pension sector accounted for Kshs. 212 billion or 23% of the Gross Domestic Product (GDP). Notably, retirement savings in Kenya are managed through statutory contributions under the National Social Security Fund (NSSF), employer-led schemes, and a formal retirement benefit sector encompassing 11% of the labor force (Kareithi, 2009).

Recognizing the role of the retirement and pension industry in enhancing economic growth and increasing domestic savings (currently at a rate of 13%), the Government of Kenya underscores its importance. The legal framework for this industry is established by the Retirement Benefits Act of 1997, with oversight provided by the Retirement Benefits Authority (RBA). The RBA aims to expand retirement coverage, potentially elevating domestic savings to 25% (RBA, 2007).

In the realm of public universities in Kenya, each institution maintains its own pension scheme, with contributions shared between employers and employees. For example, Moi University has employer-employee contribution rates of 15% and 7%, respectively, effective from January 1, 2005. Conversely, private universities may opt for contributions to private insurance companies or pension schemes. Kabarak University, for instance, administers its pension program through Britam insurance company.

Table 2.1: Classification of Retirement Benefit Scheme in Kenya

Scheme type	NSSF	Public Service Pension Scheme	Occupational scheme	Individual Scheme
Legal structure	Act of Parliament	Act of Parliament	Established under trust	Established under trust
Membership	Employee in formal sector establishments excluding public service employee	All public service employees including civil servants, teachers and discipline forces. Separate scheme for armed forces	Formal sector workers in companies that operate retirement scheme	Open to all on voluntary basis
Funding Regulations	Funded RBA	Non funded act of parliament	Funded RBA	Funded RBA

Source: Researcher, 2022

2.5 Empirical literature

This section provides a description of past studies that have been done that links the independent variable - financial literacy, mediating variable - financial sophistication, moderating variable –institutional factors and the dependent variable perceived retirement saving adequacy.

2.5.1 Effects of Financial Literacy on Retirement Planning Activities

Because retirement savings requires people to think about their retirement future, financial literacy has been emphasized as a strategy to increase voluntary retirement savings (Van Rooij *et al.,* 2011). Financial literacy has been described as one of the primary characteristics that determine retirement savings behavior and has been given attention as a way to increase retirement savings. According to Hilgert *et al.* (2003), Lusardi *et al.* (2010), and Sang *et al.* (2014), people who are financially illiterate are more likely to make decisions that result in bad results for their investments, finances, and retirement planning.

Aluodi *et al.,* (2017) investigated how employees in the insurance industry in Kenya reacted to different levels of financial literacy and how it affected their readiness for retirement. The research was conducted using an explanatory research methodology, and the respondents were selected using a stratified proportionate random sample approach. Questionnaires were used to collect data, and one-way analysis of variance and Pearson correlation analysis were used to analyze the data. The outcomes of the study indicated that a person's level of financial literacy did not have a significant effect on their readiness for retirement.

Bernheim and Garrett (2003) investigated whether or not there was a correlation between having access to financial education provided by employers and having savings. In addition, the authors discovered that financial education provided by employers led to greater savings and increased retirement savings. In addition, the study discovered that participating in brief training programs improved participants' capacity to make decisions and their saving practices.

Hastings and Mitchell, in their study from 2020, investigated the roles of financial literacy and impatience in determining retirement wealth and investment practices. In the study, evidence was gathered from Chile in order to investigate a number of aspects that appear to be associated to making poor financial decisions. A measure of impatience was also found to be a powerful predictor of both wealth and investment in health, according to the results. Even though it seems to be a less reliable indicator of sensitivity when structuring investment decisions, one's level of financial literacy was found to be connected with wealth.

Nguyen *et al.,* (2017) investigates the preconditions of achieving financial security throughout one's lifecycle by focusing on financial literacy and retirement planning in

Vietnam. The city of Ho Chi Minh provided 257 workers from the public and private sectors for the purpose of collecting data. According to the findings of a descriptive study, employees in the public sector have a greater level of financial literacy and a better understanding of social insurance than employees in the private sector do. The findings of the study indicate that having a strong understanding of finances and making consistent contributions to savings are two key elements that strengthen retirement planning. In contrast, the study found that sector employment played no significant role in retirement planning.

Using data from the SAVE survey, Bucher-Koenen and Lusardi (2011) evaluated the level of financial literacy in Germany. They discovered that women, those with lower levels of education, and residents of East Germany had the lowest levels of awareness of fundamental financial concepts. The research also made a comparison between low income and education levels in East Germany and their counterparts in West Germany. It concluded that East Germans had a lower reading level and, as a result, accumulated less wealth for their retirement. As a result, the conclusion that was reached was that there was a positive correlation between having financial awareness and planning for retirement.

Agunga Mourine (2017) conducted research in Nairobi, Kenya, to investigate the level of financial literacy and financial preparedness for retirement among permanent and pensionable employees working for state-owned enterprises. Explanatory and stratified proportional random sample methods were utilized in this study to collect data from the respondents. Questionnaires were used to collect data, and one-way ANOVA and Pearson's correlation analysis were used to assess the results of those analyses. Multiple linear regression and multinomial logistic regression were utilized in order to test the hypotheses underlying the research. The findings of the study indicated that being financially literate did not have a significant effect on being prepared for retirement. In Russia, Klapper and Panos (2011) explored the correlation between financial literacy and retirement planning. They conducted face-to-face interviews with 1,400 people to gather data for their study. The researchers came to the conclusion that there is a strong and favorable relationship between financial literacy and retirement planning.

Njuguna and Otsola (2011) conducted research to assess the levels of financial and pension literacy. In order to ascertain the requirements for financial literacy, the researchers identified measures that can increase pension literacy. The researchers employed an employee sample that was taken from people who were members of occupational pension plans that were listed in the register maintained by the Retirement Benefits Authority. The findings of the study found that members of occupational pension plans in Kenya had a high literacy level, and the researchers suggested that there should be more member participation in the management of pension schemes.

Mwathi, (2017) investigated how employees at Egerton University in Nakuru County, Kenya, made personal financial decisions as a function of their level of financial literacy. The study design that was used was a descriptive survey. Employees of Egerton University, including upper management, middle level staff (including technical, administrative, and teaching personnel), and lower level workers (totaling 1998 employees), made up the population. This included employees at all levels, from lower to higher. The use of a sample determination table allowed for the calculation of 320 respondents. The outcomes of the study indicated that a positive and significant correlation existed between personal financial knowledge and financial skills in the process of arriving at personal financial decisions; nevertheless, the researchers found that financial attitudes did not significantly influence financial decisions. It was determined that one's level of financial literacy has a considerable and favorable influence on their individual choices regarding their financial future.

Gitari (2012) investigated the relationship between a person's level of financial literacy and their preparation for retirement in Nairobi, Kenya. The population was made up of people who were participants in registered pension systems. In each of the sampled schemes, a stratified random sample was used to choose respondents. In order to gather information from the respondents, questionnaires were given to them and then collected once they were finished. The findings of the research pointed to major factors that determine the amount of money individuals have set up for their retirement.

In their 2015 study, Onduko and colleagues looked into the factors that influence retirement planning in Kenya. According to the findings, retirement planning is significantly influenced by factors such as an individual's education level, income, and level of financial knowledge. On the other hand, factors such as one's age or marital status did not play a substantial role in the process of retirement planning. The level of financial literacy of a person was a significant factor in determining their membership in a pension scheme. This was largely due to the fact that a person's level of financial literacy was reported to influence both their saving behavior and their portfolio choice. The researchers came to the conclusion that one's level of financial literacy is a crucial factor in determining the extent to which pension scheme members plan for their retirement, and that there is a correlation between financial literacy and retirement planning.

Githui and Ngare (2014) conducted research to evaluate the connection between financial literacy and retirement planning in Kenya's informal sector. The results showed that factors such as income levels, age, marital status, and level of education are favorably connected to retirement planning. Financial literacy was shown to have a favorable effect on retirement planning, and the results also suggested that these factors positively affect retirement planning. There was no difference in approach to retirement planning based on a person's gender. The findings of the study reveal that a financially illiterate person who has not planned for their retirement is significantly, which necessitates a greater investment in programs that teach financial literacy in order to prevent the trend.

The impacts of increasing financial literacy and planning for retirement in Chile were investigated in Moure (2016). Only 47% of the population understands compound interest, and only 18% understands the idea of inflation, according to the research that showed very few Chileans were engaged in retirement planning. Financial literacy levels are also rather low, with only 47% of the population knowing these concepts. The researcher went on to reach the additional conclusion that there is a positive and significant association between financial literacy and retirement planning. This means that investments in financial education could get a substantial impact on the way people think about retirement and, as a result, their capability of reaching retirement with sufficient financial resources.

The authors of the aforementioned study, Kalmi and Ruuskanen (2018), looked at the connection between financial literacy and retirement planning in Finland. According to the findings, the degree of financial literacy in Finland is fairly good, despite the possibility that it is not evenly distributed across the population. According to the findings of the study, there is scant evidence of a connection between financial literacy and retirement planning. On the other hand, there is a strong and favorable connection between retirement planning and a measure of financial literacy. The researcher found a positive link between financial literacy and retirement planning among women when the sample was broken down according to gender. Lusardi and Mitchell (2017) evaluated the relationship between financial literacy and retirement planning by checking out the information about respondents' financial knowledge acquired in school before entering the labor market and certainly before planning for retirement. The results concluded that gradually reducing publicly guaranteed pension benefits may pose a problem for individuals who have a lower level of financial literacy. According to the conclusions of the study, one's likelihood of being financially prepared for retirement increases in proportion to the level of financial expertise possessed.

Meir *et al.* (2016) conducted research on the level of financial literacy and preparation for retirement in Israel. The outcomes of the study suggested that behaviors such as searching for financial information and monitoring household costs were positively associated with retirement literacy. This was the case even after taking into account a number of demographic and behavioral factors that were controlled for. There was no statistically significant connection found between retirement literacy and either financial knowledge or numeracy skills. If an individual is more likely to check their bills and account statements on a regular basis, they may have a better degree of financial literacy about retirement savings. However, having a higher level of financial competence does not necessarily indicate having higher levels of retirement literacy.

During the course of his research on retirement planning, Magera (1999) came to the conclusion that the retirement benefit sector in Kenya was not yet at its full potential. The study's author suggested that Kenya's social security system should be reorganized so that it would be able to offer its members a choice in the level of protection they receive, as well as effective education that would help people mentally prepare for retirement. In addition, the researcher suggested that pay should be standardized so that the disparity between the poorly paid public sector and the highly paid private sector could be reduced.

Siringi and Lumwanu (2007) investigated the alleviation of suffering and the dilemma facing retirees. The researcher came to the conclusion that the majority of public officials as well as teaching personnel chose not to participate in the new pension scheme that the government had created. Francis Nganga, the secretary general of the KNUT, claims that the staff members were unable to obtain proper information on the benefits that it offered to them. The paper highlighted many concerns relating to an individual's pension plan that may be resolved by conducting extensive consultations, particularly with professionals. It was also pointed out that the providers of the individual pension plans need to make more of an effort to educate the general public about the individual pension plans, including the significance of these plans as well as the flaws that exist in them. The conclusions of the study came to the conclusion that retirees gain access to large sums of cash all of a sudden, which, if they are not adequately planned for, then they end up wasting it, providing an unfavorable impression to potential retirees.

Survey questions were given to employees of financial and banking institutions, and data was collected from 192 employees using a standardized questionnaire. The study was conducted by Monyoncho (2010) and studied the effects of financial literacy on personal financial management practices. When it came to aspects pertaining to personal financial management practices, the researcher saw considerable discrepancies between the finance respondents and the non-finance respondents. According to the findings of the study, people who have a solid understanding of personal finance are more likely to engage in a variety of regular financial practices. The researcher also discovered that even if a person is not financially literate, they can still engage in financial management behaviors due to the fact that there are other alternative routes of learning financial knowledge. Therefore, this further indicates that one's level of financial literacy has an impact on how they manage their personal finances.

Gitau and Otsola (2011) investigated the factors that members of occupational pension systems in Kenya use to predict their level of financial literacy towards their pensions. The purpose of the study was to evaluate the levels of financial literacy about pensions as well as the factors that affect them. It was discovered that the levels of pension financial literacy vary depending on factors such as gender, age, level of education, job experience, level of pension plan design management, income, participation in previous pension financial literacy programs, area of specialization, and membership in a pension plan board. However, the level of pension financial literacy does not change depending on the marital status of the individual.

Njuguna *et al.* (2011) investigated the levels of financial and pension literacy, the financial literacy needs, to establish the challenges to participating in financial and pension education, and finally, to recommend strategies to enhance financial and pension literacy among the members of pension schemes in Kenya. This research was conducted in Kenya. The number of employees, 2395, was calculated using the members of the 1308 pension systems. According to the findings of the study, individuals who were members of pension schemes registered better levels of financial awareness on pension scheme practices than on general financial literacy concerns. It was also observed that there was a lack of platform for involvement. In addition to this, a significant barrier to participation in pension scheme affairs was a lack of information and comprehension about pension-related issues.

Researchers Rono *et al.* (2021) evaluated the association between entrepreneurial intensity, personal characteristics, financial factors, psychological factors, and plans to retire among individuals working in Kenyan public institutions. The winners were chosen from among 384 staff working at seven public universities in Kenya. According to the findings of the study, personal variables, financial considerations, psychological factors, and the level of employees' entrepreneurial activity all had a major impact on whether or not workers intended to retire. According to the conclusions of the study, employees of public universities should consider making both tangible and financial investments before making the decision to retire.

2.5.2 Effect of Financial sophistication on Perceived Retirement Saving Adequacy

There are a surprisingly small number of research that investigate the link between high levels of financial sophistication and adequate levels of retirement savings. Kim and Hanna (2015) conducted research to determine whether or not financial savvy is an important factor in retirement readiness in the United States. Using data from the 2010 Survey of Consumer Finances (SCF), the researchers examined the relationship between a person's level of financial knowledge and their projections for their ability to maintain their standard of living during retirement. According to the findings of the survey, the percentage of households in which the full-time head was between the ages of 35 and 60 who were adequately prepared for retirement in 2010 fell to 44% from 58% in 2007. The findings of the study also suggested that households headed by a person with a college education had a greater likelihood of accumulating sufficient funds for retirement compared to households headed by somebody with a lower level of education, such as a high school diploma. The authors went on to reach the further conclusion that households that utilized the services of a financial planner had a greater chance of ending up with a sufficient retirement nest egg than their counterparts who did not utilize these services.

Lusardi *et al.* (2014) conducted a study to determine the level of financial literacy and sophistication among those over the age of 65 in the United States. The outcomes of the survey suggested that older respondents are not financially sophisticated. This implies that they did not comprehend fundamental components of investing, such as investment fees, risk diversification, asset value, and portfolio choice. Subgroups that also exhibited major deficits in terms of financial sophistication included women, who have the lowest average education level, as well as non-Whites who are beyond the age of 75. When such information is available, retirees are required to accept responsibility for their own retirement security, and they must also acknowledge that their limited levels of knowledge may result in results that are potentially severe and unfavorable. Kim and Hanna (2013) conducted research to determine how one's level of financial sophistication impacts their ability to adequately plan for retirement. The researchers looked at the data from the 2010 Survey of Consumer Finances (SCF), and they found that only 42 percent of households are adequately prepared for retirement. In addition, the researchers investigated the effects of three proxies for financial sophistication, which are as follows: (1) education; (2) the utilization of financial planning services; and (3) comprehension of the SCF survey questions. According to the findings of a multivariate study, the likelihood that a household has sufficient funds for retirement is higher for individuals with a college education than for those with lower levels of education. It was shown that households who utilized the services of a financial planner had a greater chance of having adequate retirement savings than those households who did not utilize the services of a financial planner. According to the findings of the research, having a pretty good comprehension of the Survey of Consumer Finance survey may not be significantly connected with the probability of having an acceptable retirement.

Clark *et al.* (2008) investigated the impact of socio-economic position, financial sophistication, salience, and the level of deliberation among British employees in terms of UK retirement planning. The purpose of the study was to determine whether or not employees in the UK recognize the need of saving money for the future and whether or not they intend to do so. Using a sample that was statistically representative of people living in the UK, researchers found that age, respondents' risk tolerance, income, and whether or not their spouses enrolled in employer-sponsored pension plans were all factors that positively linked with respondents' perceptions of the significance of pension planning.

Smith *et al.* (2012) investigated the impact that a household's level of financial sophistication had on the amount of home leverage they used. The purpose of this study was to establish whether or not higher levels of home leverage were connected with tax consequences, a higher level of financial sophistication, and a willingness to increase portfolio allocation to risky assets. According to the findings of the study, there is a time trend toward low housing leverage, but there is no tendency toward high housing leverage. On the other hand, excessive housing leverage was highly connected with tax effects, financial sophistication, and portfolio incentives. These factors all contributed to an increase in housing leverage.

2.5.3 Effects Financial Literacy on Perceived Retirement Saving Adequacy

A questionnaire was used to collect data for the study that Nguyen et al. (2019) conducted, which investigated the influence of employees' levels of financial literacy and pension awareness on the investment decisions they made for their retirement. The data collection took place in 2018, and a total of 427 valid questionnaires were used for the study. According to the findings of the study, an employee's level of basic financial literacy and knowledge about pensions are significant factors that increase the likelihood that the employee will exercise their choice of retirement investment. On the other hand, an employee's level of advanced financial literacy has a significant effect on the choice of growth investing options for retirement.

In their study, Adam *et al.* (2017) explored the factors that influence the seniors' financial well-being in the Cape Coast Metropolis of Ghana. These factors included retirees' financial knowledge and behavior, family support, the number of dependents they supported, and retirement preparation. A cross-sectional survey approach was used to choose 400 respondents from among the association's total membership of 1500 people in order to investigate the effects of financial literacy, financial behavior, family support, the number of dependents, and retirement planning on financial wellness. According to the conclusions of the study, seniors' financial well-being is greatly impacted by their financial behavior, financial literacy, retirement planning, and the support they receive from their families.

Foster *et al.* (2015) conducted research on the presentation format as well as financial literacy, accessibility, and an assessment of the ability to save for retirement. It was observed that the participants had an improved ability to obtain vital information and to evaluate the relative performance of funds as a result of the salience that was brought about by the presentation format. According to the findings of the study, there is value to be had from financial literacy programs, which are called for by regulators. However, the study also stated that further benefits may be obtained by placing an emphasis on numeracy abilities and by adopting presentation forms that promote information accessibility and checkability.

Sabri et al. (2015) conducted research on the level of financial literacy, financial management habits, and retirement confidence held by women employed by government organizations. The investigation into the function that financial management practices play in mediating the relationship between financial literacy and retirement confidence was carried out with the help of structural equation modeling. In order to collect data, questionnaires that respondents had to fill out on their own were employed. The sample consisted of 626 people with an average age of 36.06 years and a standard deviation of 9.855 years. The vast majority of responders (73%) were married in some capacity. According to the findings of the research, the connection between the benefits of financial literacy on retirement confidence is one that is indirect and wholly mediated by the practices of financial management. There was a substantial link between retirement confidence, financial literacy, and the behaviors of financially managing one's finances.

Anantanasuwong (2019) evaluated the influence of financial literacy on retirement savings as well as the impact on present bias and exponential growth bias, both of which have been identified in earlier research as being detrimental to savings. The findings of this study were published in the journal .The study came to the conclusion that higher levels of financial literacy are linked to an accurate picture of exponential growth, which in turn encourages retirement savings. In addition, those who are financially savvy are less likely to be influenced by the present bias when they are saving for their retirement.

In their 2015 study, Chou and colleagues investigated the elements that contribute to the perception of adequate retirement savings in Hong Kong. This study used data from a survey that was done in 2012 with 999 workers in Hong Kong to replicate earlier studies that were conducted on workers in the United States and the Netherlands using an interdisciplinary model of financial planning. The findings of the study identified six different factors: three psychological factors (financial knowledge, future time orientation, and goal clarity), three social support variables (support from spouse, early learning from parents, and support from friends), three institutional factors (trust in the government, quality of employer pensions, and trust in banks and fund managers), retirement savings planning activity, and perceived retirement savings adequacy. According to the findings of the research, path analyses were applied in order to validate the model for the entire sample as well as separately for younger (N = 437) and older (N = 562) workers. The model was shown to be beneficial in studying the elements that contribute to retirement savings planning. This was found to be the case despite the fact that the path analyses discovered a relatively small number of age differences.

Research conducted by Reyers (2018) looked on people's perceptions of whether or not they have saved enough for retirement in South Africa. The findings of the study made use of data from South Africans to evaluate how confident workers feel about their future retirement income adequacy and whether or not behavioral variables play a part in their impression of being ready for retirement. The findings of this research shed light on the important part that behavioral factors play in the way people in developing markets in Africa think about the sufficiency of their retirement income. It has been discovered that respondents' retirement confidence is positively associated to factors such as self-assessed knowledge, financial risk tolerance, excellent financial behavior, and a viewpoint on the passage of time.

2.5.4 Financial Sophistication as a Mediating variable

Niazi and Malik (2019) investigated the effect that socio-demographics, risk inclination, investment variety, and the level of financial expertise had in moderating the relationships between these variables. This descriptive study was conducted using a survey questionnaire that contained 70 items on 775 respondents from Pakistan, Canada, Tunisia, Romania, Jordan, Moldova, and the UK. The respondents consisted of 85 military personnel and personal interviews with 18 respondents. The outcomes of the research led the researchers to the conclusion that socio-demographic factors, risk inclination, and investment decision-making are highly influenced by a person's level of financial sophistication.

Akhtar *et al*. (2018) conducted research to determine the extent to which a person's level of financial sophistication and personality influence their involvement in the stock market. A random sample of 451 people who participate in the stock market was used to test the hypothesis utilizing archival research as the research methodology. The process developed by Andrew Hayes was used to evaluate moderation. Extroversion and openness to experience are two of the psychological variables that have been found to have a favorable correlation with stock market participation. On the other hand, awareness, agreeableness, and neuroticism were found to have a negative effect. The most likely ways in which a person's personality can influence their participation in the stock market are through their level of financial literacy, their gender, and their trading experience. It was also shown that a person's level of financial acumen can help to mitigate the association between certain fundamental personality qualities and involvement in the stock market. It was also established that behavior finance may not be entirely predetermined by one's DNA, but rather, it is identified by qualities that are less influenced by financial literacy. This was another conclusion that was reached.

Li and Lu (2018) conducted a theoretical and empirical investigation of the effects of research and development constraints, as well as funding limitations, on the level of environmental sophistication of Chinese businesses. According to the model's predictions, firms' expenditures on research and development have the potential to increase their degree of green sophistication, while limitations on firms' access to financing have a moderating effect on the level of green sophistication of their exports. The findings of the research are used to create an index of green sophistication by incorporating a green coefficient into conventional export sophistication. Our assumptions were verified by the information contained in the database of China's industrial firms. It was discovered that the limitations on finance had a considerable moderating influence on the connection between research and development and the level of green sophistication achieved in exports.

Deplorable emotions, political sophistication, and political intolerance were all subjects of investigation in Gibson et al.'s (2020) study. Using a sizable cross-section of the American population, researchers were able to examine the hypotheses underlying their study. The outcomes of the research led the researchers to the conclusion that feelings of anger, hatred, and fear are positively and significantly associated to political intolerance, albeit to a lesser extent. In addition, it's possible that the impacts of emotions on intolerance aren't always more pronounced in those who aren't as intelligent. The traditional belief that less knowledgeable persons rely on emotions in formulating political judgements is given less support by the outcomes of the research.

Financial Sophistication has been explored as an independent variable, as a moderator, and as a mediator; however, little has been done to investigate its role as a moderator in the relationship between financial literacy and the perception of one's ability to save for retirement financially. The capacity to make sound financial decisions, positive investment options, and actual wealth building are all outcomes that can be attributed to one's level of financial sophistication. Sophistication in this area is crucial because it serves as a measure of one's ability to avoid making mistakes in this area.

2.5.5 Institutional Factors as a Moderating Variable

The working population and businesses alike understand the significance of having access to retirement and pension plans for themselves and their employees, Tolos *et al*, (2014). As a component of the overall conceptual framework, the World Bank has suggested incorporating a multi-pillar pension system. This system would be comprised of a combination of the five fundamental components that are as follows: (a) the non-contributory, "zero pillar," which provides a minimal level of social protection; (b) the "first-pillar" contributory system, which is linked to varying levels of earnings and may seek to replace a portion of income; (c) the mandatory "second pillar," which is essentially one's savings account that may be constructed in several different ways; (d) the voluntary "third-pillar" arrangements may take different forms but are flexible and discretionary; and (e) This conceptual framework is dependent on the availability of monetary and fiscal resources within the budget as well as the design of the supplementary components that make up a typical pension system. Some studies on retirement refer institutional factors as economic factors. Institutional factors are majorly the forms of retirement funding available in different economies.

Social security pensions: advancements and reforms (Gillion *et al.,* 2000) contains documentation regarding the architecture and structure of the multi-tier model that was developed by the ILO. The International Labor Organization's (ILO) set of principles that guide pension reforms and advances include four tenets: solidarity, universal coverage, obligatory affiliation, and equity of treatment. These are the four tenets that guide pension reforms and advances. The provision of an income and the replacement of earnings lost as a result of retirement, whether voluntary or involuntary, for all of those individuals who have contributed; the adjustment of this income to take into consideration inflation and the general rise in the cost of living in the community as a whole.

Adams & Rau, (2011), Henkens & Hershey, (2010) noted that institutional factors may interfere with workers willingness and ability to formulate and implement a retirement savings plan.Van Dalen,(2010) assessed the impact of institutional factors on Dutch and American workers and found a positive and significant association between trust in banks and employers pension schemes and perceived retirement saving adequacy. Franca and Hershey, (2018) examined the Brazilian case of perceived retirement saving adequacy and found that there was a significant relationship between trust in government as a provider of retirement income and perceived retirement savings adequacy.

In their research, Amorim and Franca (2020) investigated the role of health, financial, and social resources as potential mediators of the association between retirement planning and overall satisfaction. Specifically, they focused on the relationship between overall satisfaction and retirement planning. The study was conducted on a total of 1194 retired individuals in Brazil, whose ages ranged from 44 to 88 years old, with a slight majority of the participants being female (55.4%). The participants' ages ranged from 44 to 88 years old. A questionnaire was given to the participants, and they were asked to fill it out with information about themselves, including their socio-demographic characteristics, their individual resources, their retirement planning, and their level of happiness in retirement. In the sense that it was discovered that only physical, financial, and social resources play a mediating role in the relationship between retirement planning and pleasure in retirement, the proposed model was partially supported. This was the case because it was discovered that only these three resources play a role. The model is supported by this finding to a certain extent. The findings show how critical it is for persons who are planning their retirement to concentrate on expanding the personal resources that are essential to their well-being, particularly those resources that are related to their health, wealth, and relationships.

Neo-institutional arguments imply that the availability and value of internal and external resources, as well as the decisions to allocate these resources toward innovation projects, are governed by institutional variables (Guillén, 2000; Peng, 2003; Peng & Heath 1996). Neo-institutional arguments also argue that institutional elements influence the decisions to deploy these resources toward innovation projects. Institutions have an impact not simply on the availability and value of resources in individual households, but also on the decisions those households make regarding how those resources should be distributed across multiple possibilities of products, services, and savings.

2.6 Knowledge gap

The research gaps outline the ways in which the current study is distinct from previous research. The current study was very different from the empirical studies that were discussed in the earlier sessions in a number of different ways: First, although earlier research has concentrated on the adequateness of retirement savings, not much work has been done on the effects of institutional variables as a moderator or financial sophistication as a mediating variable. This is despite the fact that such studies have been conducted. Previous research has also placed an emphasis on real retirement savings, but the dependent variable in this instance is perceived retirement saving adequacy. This is a subjective measure that looks at the beliefs of pre-retirees to determine whether or not they have adequate resources for retirement. In their study, Amorim and Franca (2020) investigated the role of health, financial, and social resources as potential mediators of the association between retirement preparation and a sense of fulfillment during retirement. Yeung and Zhou, (2017) conducted research to determine whether or not pre-retirement planning activities had the potential to boost seniors' total financial resources. The retirees studied were Hong Kong Chinese. The findings of the research indicated that the mediation models confirmed the hypothesis that retirees who had engaged in more planning and preparing activities before to retirement had a larger likelihood of acquiring greater financial resources at the early stage, which contributed to favorable improvements in post-retirement well-being. Niazi and Malik (2019) investigated the moderating influence of socio-demographics, risk propensity, and investment variety in relation to the concept of financial sophistication. Akhtar *et al.* (2018) looked into how a person's level of financial acumen as well as their personality affects their involvement in the stock market. The authors of this study, Lusardi *et al.* (2014), evaluated the financial literacy and sophistication of the elder population in the United States. In their study, Smith *et al.* (2012) looked at the level of financial sophistication and housing leverage among families headed by seniors. Only a few of the aforementioned studies investigated the role of financial sophistication as a mediating variable.

Second, there hasn't been much research done in Kenya on how to best save for retirement. Muthanna, (2018) focused on small and medium-sized enterprises in Saudi Arabia. Study by Kanagasabai & Aggarwal, (2020), was done in India. The research that Abuseif and Chew Abdullah (2016) conducted took place in Jordan. The research carried out by Mackenbach *et al.* (2019) was carried out in Dutch, whereas the research carried out by Tu & Yang (2016) was carried out among the elderly Chinese population.

Few academic programs are offered at Kenya's state universities. Researchers Rono et al. (2021) looked at the connection between entrepreneurial intensity, personal characteristics, financial factors, psychological factors, and intentions to retire among workers at Kenyan public institutions. Aluodi *et al.* (2017) investigated the impact of employees' level of financial literacy on their readiness for retirement. The participants were drawn from Kenya's insurance industry. Agunga Mourine (2017) conducted research in Nairobi, Kenya, to assess the level of financial literacy and financial preparedness for retirement among permanent and pensionable employees working for state-owned corporations.

The previous research has made it abundantly evident that there are insufficient studies done on universities in Kenya; hence, there is a need to fill the vacuum. It is also important to highlight that studies on the perceived sufficiency of retirement savings have been conducted in wealthy nations. However, this study will be conducted in the setting of developing countries, specifically Kenya. The purpose of the current study is to address this vacuum by analyzing the impacts of financial literacy, financial sophistication, and institutional factors on employees' perceptions of their ability to adequately save for retirement. The employees in question are found in Kenyan public universities.

2.7 Conceptual Framework

The conceptual framework depicts independent, dependent, moderating, and mediating variables. The independent variable is financial literacy, the dependent variable is perceived retirement saving adequacy. The mediator is financial sophistication and the moderating variable institutional factors.

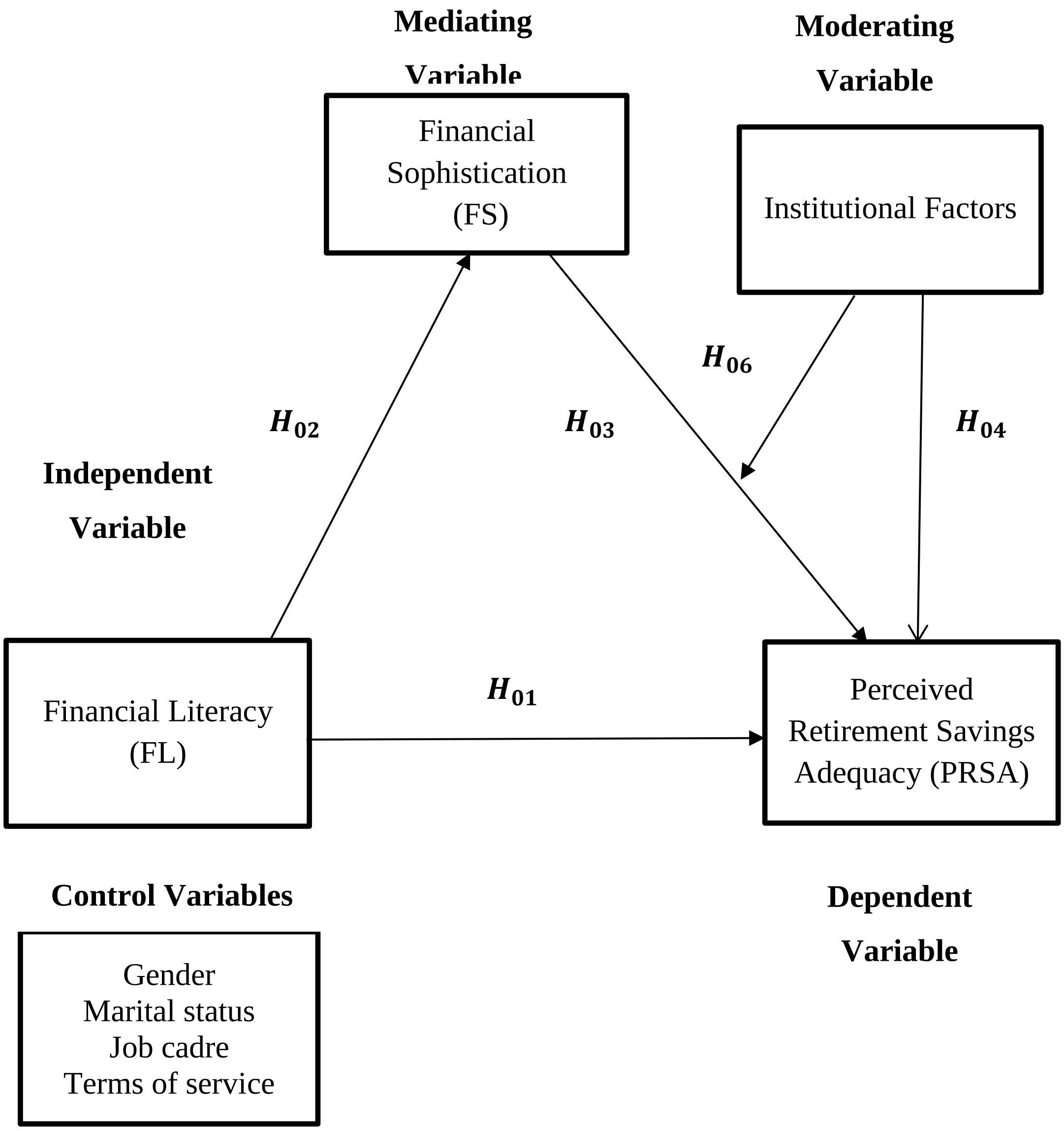

Figure 2.1: Conceptual Framework Hayes Model 14

Source: Researcher's Conceptualization, 2022

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The research methodology refers to the system of techniques or systems used in sampling and acquiring the necessary data for a particular study. Similarly, it is the application of data collection techniques and methodology standards in any field of knowledge. This chapter describes the research paradigm/philosophy, research design, target population, data collection methods, validity and reliability of the research instruments, and data analysis techniques.

3.2 Research Paradigm/ Philosophy

According to Morrison (2016), a research paradigm is "a set of beliefs, values, and assumptions that serve as a guide for conducting research while taking into account nature of reality and knowledge." This set of beliefs, values, and assumptions serves as a guide for conducting research. The three types of research paradigms that are utilized the most are interpretativism, pragmatism, and positivism. Interpretativism is a research philosophy that is used to uncover the meanings of the issues that are being studied and to better their understanding (Veal, 2005). The philosophy refrains from one making preconceived notions regarding the theory, the hypothesis, and the measurement. (Creswell, 2009; Morgan, 2007).In the philosophical school known as pragmatism, data is gathered in a complicated natural and social phenomenon then they are investigated using a mix of qualitative and quantitative approaches. The philosophy further interprets situations in different scenarios depending on the case, which makes room for a wide variety of perspectives and interpretations of the universe. A positivist strategy was utilized by the researcher during the course of the study (Dunn & Neumann, 2016). The reason is that there is an objective reality that is distinct from the viewpoint of the researcher which is the foundation of positivism. This further entails conducting a research in a manner that is more organized and under control, being guided by a research topic, hypotheses, and methods that have been articulated in a clear manner. Positivism was also applied since this paradigm seeks to generate generalizations based on statistical and mathematical methodologies that are applicable across time and context (Morrison, 2016).

According to the positivist view of science, truths are able to be discovered, and if those truths can be comprehended, it is possible to foretell future events (Rutter, 2013). (Saunders *et al.*, 2009) asserts that research can be carried out in accordance with positivism by employing well-developed hypotheses that are obtained from prior research or an already established theory and hypotheses with a large number of samples that are selected at random.

3.3 Research Design

An explanatory research design was used in this study. Explanatory research, according to Blumberg *et al.* (2014), concentrates on why questions. The 'why' questions were addressed by developing causal explanations. Causal explanations provide evidence that variable X (financial literacy) influences phenomenon Y (perceived retirement saving adequacy) (cause-effect relationship). This design was chosen because it closely aligns with the study's research objectives and is suitable for assessing the study's hypothesis.

3.4 Target population

Lune and Berg (2017) describe "population" as the universal set of participants in a hypothetical or real set of events, people, or items that the researcher uses to align response results. Population can refer to either real or imagined events, people, or objects. The public universities located within the greater Nairobi metropolitan area were the subject of this investigation. The examination focused on faculty members as well as support staff. The population of interest for this study was comprised of the 17,320 staff members working in public universities within metropolitan area of Nairobi, Kenya. The universities were Kenyatta University (KU), University of Nairobi (UON), Jomo Kenyatta University of Science and Technology (JKUAT), and Technical University of Kenya (TUK).

3.5 Description of the Sample size and Sampling Procedures

From the target population of 17,320, Taro Yamane (1973) sample size formula and modified by Kent (2008) was used to arrive at a sample size of 389 respondents shown below.

$$n = \frac{N}{1+N(e)^2} \ldots\ldots 3.1$$

Where n is the sample size, N is the population size, e is the level of precision.

$$n = \frac{17320}{1+17320(0.05)^2} = 390 \ldots\ldots 3.2$$

3.6 Sampling Techniques

According to Kothari (2004), a sampling technique is either a procedure for selecting an acceptable sample for the purpose of determining the parameters or a description of the procedures used by the researcher to pick representative respondents from the accessible or target population. In line with the allocation presented by Neyman (1992), the following is the ideal sample size for the stratum h:

$nh = n(Nh/N)$…………………………………………………….………………..3.3

Nh = Population size in Stratum h, where h = 1, 2, 3….14

N = Total Population Size

n = Sample size.

Table 3.1: Sampling Distribution Table

Institution	**N**		Nh=n(Nh/N)	**Sample per stratum**	
		Public universities			
Universityof Nairobi	8195	Academic 2,670 Adm-5,525	390x 8,195/17,320	184	Academic -60 Adm- 124
Kenyatta University	5210	Academic-1,610 Adm-3,600	390x 5,210/17,320	117	Academic-36 Adm- 81
JKUAT	2630	Academic 500 Adm- 2,120	390x 2,630/17,320	59	Academic-11 Adm- 48
TUK	1285	Academic 689 Adm- 596	390x 1,285/17,320	29	Academic-16 Adm- 13
Total	**17320**			**390**	

Source; University websites, 2021)

3.7 Data type, Data Collection Instruments and Procedures

3.7.1 Types of Data

The study used primary data which was collected directly from public university employees in Kenya within Nairobi metropolitan area using questionnaires.

3.7.2 Data Collection Instruments

Data collection refers to the process of gathering all of the relevant information for a particular demographic unit that has been chosen. Questionnaires may be used to quickly collect data from a broad population and reach a big number of respondents with reasonable ease (Lindner *et al.*, 2001), and were distributed to each and every respondent. The questionnaires were the preferred method of data collection. They are effective with reference to the utilization of time, effort, and money. As a result of these factors, the questionnaires were self-administered with the assistance of study assistants, and data was collected within reasonable time. Queries on comprehending and understanding the study were handled immediately.

3.7.3 Data Collection Procedures

Waltz *et al*. (2010) defines data collection as the practice of acquiring and measuring information on variables of interest in a systematic manner in order to answer research questions, test hypotheses, and evaluate outcomes. The respondents were selected through stratified systematic random sampling. Before engaging in actual data collection, the researcher conducted a preliminary survey in a few universities in order to familiarize with the current study area and to schedule appointments with the specific universities identified. A scientific method was used to arrive at the respondents. During the appointment day, the researcher got a list for both the academic and administrative employees from the human resources department after which the population for a particular university was divided by the sample to get the nth value. For example, for Kenyatta University the total population is 5,210 employees and the sample size is 117 the nth result is 44, so therefore the researcher picked ever 44th on the list for both academic and non-academic staff. The questionnaires were proportionally distributed to different departments and schools within the university.

Self-administered questionnaires were accompanied by a cover letter detailing the precise purpose of the study and assuring respondents of stringent confidentiality. Closed-ended questionnaires provided a list of potential responses from which the respondent could select one. The list of responses was defined and communicated to the research assistants in a clear and meaningful manner. The questionnaires were distributed with the assistance of research assistants who were instructed on how to minimize errors and bias in the data collection process. The identification and training of research assistants who are knowledgeable and conversant with the topic was accomplished. The principal investigator coordinated the process and provided direction as required. After completion, the instrument was reviewed prior to data coding and analysis.

3.8. Measurement of variables

3.8.1 Financial Literacy

The level of participants' financial literacy was evaluated based on their responses to six questions taken from scales developed by Bucher-Koenen (2011) and Stromback *et al*. (2017) and modified to meet the parameters of the present study. Some of the questions that are asked are as follows: "I have a greater understanding of how to invest my money," "I have a greater understanding of how to manage my credit use," "I have a very clear understanding of my financial needs," "I am able to maintain my financial records for income and expenditure," "I have little or no difficulty managing my finances," and "I am able to create my own weekly (monthly) budget." Likert (1932) developed the rating scale with points ranging from one to five, with one signifying a strong disagreement and five indicating a strong agreement.

3.8.2 Financial Sophistication

Financial Sophistication was measured using 8 items adopted from Estalami (2014) and was modified to suit the study as follows, I consult financial professionals before investing, I have been spending beyond my means, I have been saving for my retirement, I usually consider ATM fees when doing bank withdrawals, I usually use the same bank/insurance company in spite of poor customer service, I hardly understand the terms for pension schemes, I understand financial obligations associated with financial matters.

3.8.3 Institutional factors

Institutional factors were measured using 3 items adopted from Chou (2015) and modified to suit the study. The questions included: I am confident that government institutions can manage my future retirement income protection, I am confident that the bank or fund manager can manage my pension income and lastly my employer provides me with a good retirement income protection scheme.

3.8.4 Perceived Retirement Saving Adequacy

The level of retirement savings adequacy was determined by using three items that were taken from Van Dalen *et al.,* (2010) and changed so that they would meet the parameters of the present study. Some of the questions are as follows: "I am saving enough to retire comfortably," "I expect to have a good retirement income," and "I think I will have enough money to retire comfortably." A measurement scale of 1 to 5 will be used, with 1 representing strongly disagreeing and 5 representing strongly agreeing. This scale was first proposed by Likert (1932).

3.8.5 Control Variables

These are variables that are held constant but could possibly influence the study’s outcomes. The control variables for this study were gender, experience, level of education, job grade and lastly terms of service and are discussed as follows;

(i) Gender

Gender differences have been reported to affect retirement savings and further perceptions about the adequacy of retirement savings. Gerrans *et al*, 2004, Fernandez-Lopez *et al*, 2015 found that gender disparities affect retirement savings decisions. The research instrument gave the option of male and female.

(ii) Experience

Public University employees in Kenya are largely members of defined contribution savings plan where the employer and the employee contribute equal amounts which are deducted at source to cater for retirement. Previous studies report differences in retirement saving behavior (Lusardi, 2003, Alkhawaja et *al*, 2022) noted among older workers and younger workers. It's assumed that older workers who are almost retiring will have a different perception as compared to their younger counterparts who feel they still have time to prepare for their retirement.

(iii) Level of education

Public universities in Kenya are viewed as the institutions of higher learning. However, the work force consists of both skilled and unskilled labor that possesses diverse educational backgrounds. The teaching staffs hold highest levels of education while the support staffs range from technical certification to high levels of education. Previous studies highlighted that respondents with higher education report favorable financial outcomes as compared to their counterparts who do not hold any formal education (So-Hyun *et al*, 2013, Dulebohn *et al*, 2007).

(iv) Job Grade

Employees in public universities belong to different employment grades. Teaching staffs are placed between grades 11 to 15. The support staff is placed between grade 1 to grade 15 based on their educational background and experience. The higher the grade the higher the salary scales and the higher the pension remittances.

(v) Terms of service

Public universities have different cadres of service namely Permanent and pensionable terms, contract terms and casual terms. Permanent and pensionable terms offer a more stable employment option since employees engagements with the employer can be only be terminated upon retirement. Contract terms of employment are renewable periodically. Casual terms of employment are short term engagement that the university recruits based on certain needs and their engagement can be easily terminated upon the lapse of time or that particular activity. Terms of service is assumed to affect the income levels of retirees and can further affect their savings and perceptions

3.9 Data Reliability and Validity

3.9.1 Reliability of the Research instrument

A research measurement instrument is said to have a certain level of reliability if it is able to produce consistent results when it is used in settings that are very similar to one another. It is the part of a measuring instrument that ensures consistency in the output or results produced by the instrument in response to the same inputs being used. The proportion of the discrepancy in the survey replies that can be attributed to differences in the individuals who took the survey is the definition of reliability. This indicates that the results to a credible survey will vary not because the items on the questionnaire are vague or unclear, but rather because respondents may have different points of view.

It is possible to arrive at an approximation of the reliability of research equipment either through mathematical modeling or through preliminary testing. In the current investigation, the elements of the questionnaire will be derived from earlier research and adapted to the setting of a public university. Additionally, it will be beneficial to carry out a pilot study in order to refine the instrument. The components of the questionnaire were subjected to pilot testing with university staff members in Eldoret with the goals of removing any ambiguous wording and improving the clarity of the questions in order to raise the level of dependability. Cronbach's alpha is another statistic that could be utilized to make a determination on the instrument's trustworthiness. According to Cooper and Schindler (2006), the majority of researchers consider dependability values of 0.70 or above to be satisfactory.

3.9.2 Validity

Ewen et al. (2013) define validity as the measure to which an instrument effectively assesses its intended purpose. According to Ghauri and Grohaug (2005), it reflects how well the collected data encompasses the true scope of the inquiry. Deacon and Abramowitz (2005) add that a valid instrument accurately measures the idea and produces accurate results. The research employs internal validity to comprehend causal relationships between causes and their effects.

Several strategies were adopted to ensure the reliability of research tools. A representative cross-section of responders from Eldoret's universities tested the preliminary questionnaire. Eldoret residents working in public institutions formed the pre-test sample, consisting entirely of individuals from that city. Pre-test respondents were anticipated to be comparable to final survey participants in terms of background characteristics and subject matter knowledge. To avoid potential biases, pre-tested universities were excluded from the study's population of interest.

Confirmatory factor analyses were performed to assess the accuracy of variables. A series of such analyses was conducted using the SPSS Process Macro, utilizing the correlation matrix and maximum likelihood estimation approach. Researchers first evaluate a study's validity through convergent and then discriminant validity assessments in separate stages.

This study employed the latent variable based on the average variance extracted (AVE), recommended by Larker and Fornell (1981) for assessing convergent validity. The average variance extracted quantifies the proportion of construct variance explicable through convergent validity indications. Generally, an acceptable level is considered above 0.5. Additionally, discriminant validity ensures observed variables exclusively measure one component and don't strongly correlate with other latent variables (Michaels and Gow, 2008).

This study employed a latent variable based on the average variance extracted (AVE), as recommended by Larker and Fornell (1981), to assess the convergent validity of the research. According to Linnan (2008), the average variance extracted represents the proportion of construct variance that convergent validity indications explain within a variable. Typically, an acceptable threshold lies above 0.5. Moreover, the study explored discriminant validity to ensure that observed variables exclusively measure a single component and exhibit minimal correlation with other latent variables (Michaels and Gow, 2008).

To test discriminant validity, this research adopted a method proposed by Bagozzi et al. (1991) and Li et al. (1998). Pairs of constructs were analyzed within subsets of measurements using a series of two-factor confirmatory models. Each model underwent two runs: in the first, the correlation between the two constructs was constrained to unity; in the second, the correlation was left unconstrained. Results from both runs for each model were compared. A comparison was then made between the measurement model and one where correlations across constructs were unity-constrained. To assess the change in the statistic's value, chi-square analysis was employed.

3.10 Model Specification

The collected data was analyzed using multiple regressions and correlation analysis, the significant of the independent variable, Mediating variable and moderating variable was be tested at a confidence level of 95%. The regression equation of the study was applied as shown below,

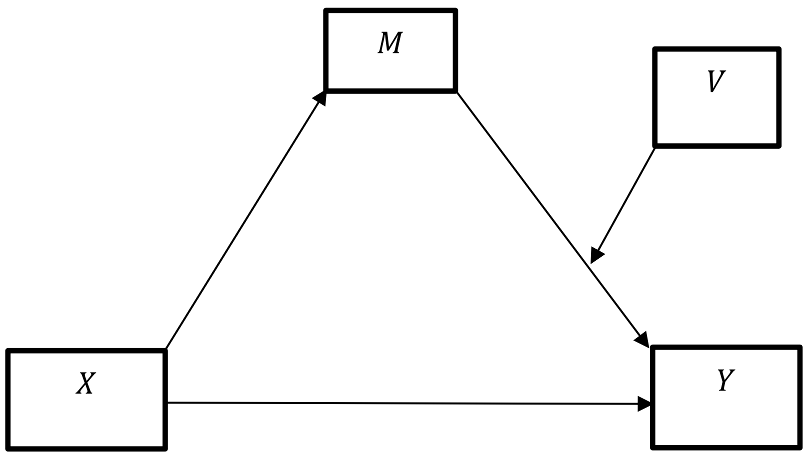

Figure 3.1: Moderated Mediation

Source: Hayes model 14, 2013

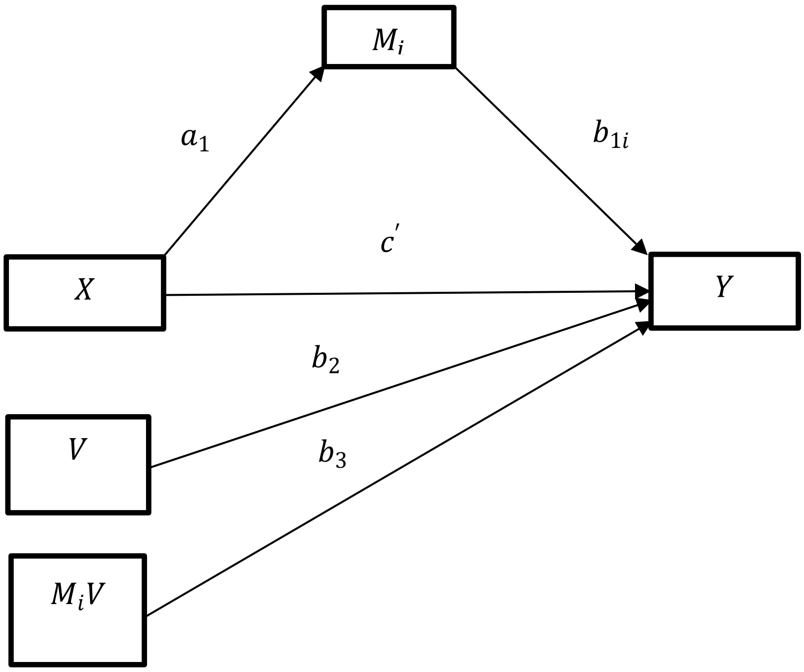

Figure 3.2: Statistical Diagram

Source: Hayes model 14, 2013

The direct effect of X on Y = c'

The conditional indirect effect of X and Y through

$M_i = a_1(b_{1i} + b_{3i}V)$……………………………………………………….3.3

$M_i = a_1 b_{1i} + a_1 b_{3i} V$…………………………………………………...….3.4

3.11 Data Preparation and Analysis

The collected field data underwent coding, cleaning, and entry into SPSS version 22 for analysis. A data summary was generated to identify emerging patterns and issues related to key themes. These trends and issues are contingent on the variables and objectives set. Relevant scores were derived by aggregating ratings assigned to various indicators of the variables. Parveen and Leonhauser (2008) emphasize that this aggregation process, merging scores from diverse variables into indices, is rooted in blending qualitative methodologies with gathered data.

The study explored the influence of financial literacy, financial sophistication, and institutional factors on the perception of sufficient retirement savings. Our analysis employed descriptive statistical methods such as cross-tabulations and frequency distributions to unravel insights. The statistical inferences were carried out using techniques including a multiple regression model and bivariate correlation analysis.

3.11.1 Outliers

According to Bakker and Witterts (2014), outliers are extreme scores or values of data sets that have the potential to have a substantial impact on the analysis and conclusion of the study. According to Cousineau and Chartier (2010), the presence of an outlier can cause measurement differences, can point to an error in the experiment, but more importantly, its presence can substantially distort estimations of regression coefficients and produce results that cannot be relied upon. Inaccurate data was detected through the use of minimum and maximum statistics, which resulted in the generation of frequency tables for all variables. These tables were used to identify outliers produced by inaccurate data entry. Outliers were controlled based on the initial statistical analysis of frequency by tracing the proper data by comparing the cases on the computer spreadsheet to the questionnaire utilizing the coding system provided by the questionnaire. This allowed for the management of the outliers.

3.11.2 Data Screening

The first stage involved proof reading the original data against the computerized data set. The researcher examined the data output of descriptive values for accuracy and graphic presentation of each variable examined during investigation. Further, the screening process examined means and standard deviations to determine accuracy.

3.11.3 Factor Analysis

Unobserved and latent variables, such as financial literacy and sophistication, as well as institutional factors on retirement saving sufficiency, are each measured by several observable (construct) variables. As a result, it was essential to carry out a factor analysis (FA) in order to condense the large number of measured variables into a manageable number of composite variables that keep as much information as possible from the original variables, and to ascertain whether or not these variables accurately represent the underlying constructs. Principal Components Analysis (PCA), a statistical approach used to identify a small collection of unobserved variables (called components) that can account for as much variance as possible among a larger set of observed variables, was used to reduce the number of variables (Mann, 1995). PCA is a technique used to find a small set of unobserved variables (called components) that can account for as much variance as possible among a larger set of observed variables.

In this study, factor analysis (FA) was carried out in four stages: determining whether the data can be factorized, generating factors and evaluating their overall fit, interpreting factors and labelling them, and computing factor scores for further statistical analysis (Heir *et al*., 2006). The data was evaluated according to a number of criteria in order to establish whether or not they are acceptable for factor analysis, which is synonymous with "factorability." In order to rule out the possibility of their being any multicollinearity between the variables, we checked the determinant to make sure that it does not have a value of zero. Indicating that a factor model is appropriate, checking that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is more than 0.5 and Bartlett's test of sphericity is significant (at p 0.05) shows that the correlation matrix of the original variables is not an identity matrix. This implies that a factor model was used. The researcher checked to see if all of the diagonals of the anti-image correlation matrix had a value larger than 0.5. If they did, it indicated that there is an underlying (latent) structure present among the variables that have been observed. Last but not least, the correlations between the variables were analyzed to establish whether or not they correlated at least 0.30 with at least one other item (which would indicate the existence of a latent construct) and whether or not any of the correlations exceeded 0.90 (which would indicate the absence of data singularity).

Principal Components Analysis, often known as PCA, is the method that is applied in order to extract the factors or components of the data. The method allowed for the extraction of an unlimited number of components provided that the Eigenvalues of each component (the amount of variation explained by each component) are each greater than one. The factors had their order switched around so that they are easier to interpret. Rotations were performed using both an oblique approach called Promax (which causes components to be correlated) and an orthogonal procedure called Varimax (which forces components to be uncorrelated), and the one that created the component structure that was deemed to be the most optimal was selected. The resultant component structures of the factors are either kept because they make a lot of theoretical sense and explain a lot of the variance in the observed variables (a threshold of 50 percent), or they are simplified by removing variables that appeared unspecified because they had a standardized loading greater than 1 or high cross-loading (Mann, 1995). In either case, the resultant component structures of the factors are kept.

3.10.1 Direct Effect

Model 1: Testing the Direct Effects

$$PRSA = \beta_0 + \beta_1 c_1 + \beta_2 c_2 + \beta_3 c_3 + \beta_4 FL + \varepsilon \ldots\ldots 3.5$$

PRSA = Perceived Retirement Saving adequacy

$C_1 - C_3 =$ controls, ε = error term, $\beta1 \ldots \beta3$= the slope/coefficients

3.10.2 Testing Mediation Effects

According to MacKinnon and colleagues' (2009), different strategies have been presented as ways to test ideas regarding mediation. The causal steps strategy, which was made popular by Baron and Kenny (1986) and in which the researcher estimates the trajectories of the model, is by far the most common approach. According to Azen (2003) and Budescu, mediation hypotheses offer the ways in which an independent variable (X) can impact a dependent variable (Y) by way of one or more mediators (M). The mediation procedures that just include one mediating variable are referred to as basic mediation processes.

According to Baron and Kenny (1986), full mediation presents the most compelling evidence for mediation when there is an indirect effect but no direct effect. They refer to this scenario as having an indirect effect. Partial mediation refers to a situation in which an influence can have both indirect and direct repercussions. According to Ia-Cobucci (2008), when all experiments are correctly completed and published, the majority of papers come to the conclusion of 'partial mediation.'" To put it another way, there is typically some kind of instant effect associated with mediation.

The regression of the mediator on the independent variable, the regression of the dependent variable on the independent variable, and the regression of the dependent variable on both the independent variable and the mediator are the three regression equations that need to be estimated in order to conduct a mediation test. In order to begin the process of mediation, the following prerequisites need to be met: The first equation must indicate that the independent variable has an effect on the mediator; the second equation must show that the independent variable has an effect on the dependent variable; and the third equation must show that the mediator has an effect on the dependent variable. After using Sobel's test to determine the significance of the mediating impact, we then conducted a bootstrap test to determine the significance of the indirect effect. According to Hayes (2015), the bootstrap test is nearly always more trustworthy than Sobel's test.

Model 2: Mediating Effect

$Y = b_1 + c'X + \varepsilon$……………………...……….…………………………….... 3.6

$M = b_2 + a_{1i}X + \varepsilon$…………………………………………………….....…3.7

$Y = b_3 + b_iM + \varepsilon$………………….………………….……….………..……… 3.8

3.10.3 Testing Moderation Effects

Model 3: Moderating Effect

Y = $b_1 + b_3'M + b_3$MV+ ε … …………………………….…………………….. .3.9

3.10.4 Testing Moderated Mediation Effects

According to Little et al. (2007), the phenomenon of mediated moderation takes place when the magnitude of an indirect effect is contingent on the level of some variable, or, to put it another way, when the mediation interactions are dependent on the level of a moderator. According to Muller et al. (2005), proof of statistically significant moderation of at least one path in the causal chain that links X (the independent variable) to Y (the dependent variable) through M (the mediator) is required in order to establish the validity of the moderated mediation model. When investigating the possibility of moderation by mediation, it is required to validate the presence of mediation between the independent variable and the dependent variable. It is considered that financial sophistication mediates the association between financial literacy and perceived retirement savings sufficiency, and this relationship can be modified by institutional factors. In this instance, the relationship between the two concepts is also believed to be moderated. At a confidence level of 95%, the moderation mediation process was evaluated using the process macro (Hayes, 2012).

Model 4: Moderated Mediation (Indirect Effects)

$M_i = a_1 b_{1i} + a_1 b_{3i} V$…………………………………………………......….3.10

Y = Perceived Retirement saving adequacy,

X = Financial Literacy

M= Financial Sophistication,

V= Institutional factors,

ε = error term, a, b c are coefficients

Conditional indirect effect of X on Y through M

3.12 Data Analysis

Data was analyzed using SPSS and presented in both descriptive and inferential.

3.12.1 Descriptive Statistics

In descriptive statistics, the demographic profile of a target population is described in terms of frequency and percentage of the sample characteristics through the use of tables and written explanations. Additionally, descriptive statistics were used to measure the central tendency of constructs through the use of frequencies, mean, and standard deviation. The respondents' age, gender, level of education, place of birth, and work experience were all included in the demographic information. The results were laid out for the audience in the form of a frequency distribution table.

3.12.2 Inferential Statistical Analysis

Inferential statistical analysis was carried out with the assistance of the multiple regression models and the bivariate correlation analysis. Inferential statistics such as Pearson correlation coefficients (r) and multiple regression analysis were utilized by Hair *et al.* (2010) in order to investigate the connection that exists between a single dependent variable and a number of different independent variables. When testing for correlation, the Pearson correlation r was utilized so that an accurate assessment of the strength of the relationship could be made between the dependent and independent variables. Both interval and ratio scale data can be analyzed using this method. The correlation coefficient can take any value from minus one hundred to plus one hundred. A perfect and strong positive correlation is shown by the value +1.00, whilst a perfect and strong negative correlation is indicated by the value -1.00. On the other hand, absolute correlation coefficients of r 0.35 suggest low or weak correlations, while 0.36 to 0.67 indicate moderate correlations, 0.68 to 1.0 show strong or high correlations, and r coefficients > 0.90 indicate exceptionally high correlations (Field, 2005). These results are from a study that was conducted by Field (2005).

3.13 Testing Assumptions of Regression

The following diagnostic tests were carried out. This includes normality, linearity, homoscedasticity, and multicollinearity.

3.13.1 Normality Test

The normality test is used to determine whether or not a data set follows a normal distribution (Saunders *et al.*, 2007). Normality stipulates that the test's distribution is bell-shaped, with a mean of 0 and a standard deviation of 1, resulting in a bell-shaped curve that is symmetrical. The residuals of variables are presumed to have a normal distribution. In other words, the errors in the prediction of value Y (the dependent variable) are distributed in a manner that closely resembles the normal distribution. If the assumption of normality is violated, interpretation and inference may no longer be valid or reliable (Razali & Wah, 2011). Multiple parametric tests based on the normal distribution must initially test for normality (Doornik & Hansen, 2008; Field, 2013). Field (2013) contends that two indicators denote a departure from the norm: Kurtosis has a significant effect on tests of variance and covariance (it measures the peakness or flatness of a distribution, with an acceptable range of -2 and +2), whereas skewness has a significant effect on tests of means (it measures the asymmetry of a distribution, with an acceptable range of -2 and +2) (Tabachnick & Fidell, 2007; George & Mallery, 2010). Utilizing Jarque-Bera, the normality was examined. The skewness and kurtosis of a distribution are used to test for normality (Jarque and Bera, 1987). Based on Lilien (1995), a goodness-of-fit test is the Jarque-Bera test. It examines whether the skewness and kurtosis that accompanied a normal distribution were present in the sampled data. This is how the JB statistic is calculated.

$$\mathrm{JB} = \frac{n}{6}\left(S^2 + {}^{1}\!/_{4}\,(K-3)^2\right)\ldots\ldots 3.11$$

Where, S is the skewness and K is the kurtosis. n is the number of observations and JB is Jarque-Bera. If $S = 0$ and $K = 3$ then the data followed standard normal distribution. This statistic has an asymptotic $\chi^2(2)$ distribution if the null hypothesis is correct (Jarque and Bera (1987). The Jarque-Bera test is more appropriate method because it is a joint test. The null hypothesis states that data are taken from normal distributed population. When probability of chi2 test is greater than 0.05, null hypothesis accepted and data considered normally distributed.

3.13.2 Linearity Test

The assumption of linearity is met when tests show that there is a linear relationship between independent variable and the outcome variable. The scatter diagram of residuals will be used to examine whether there is some significant linear relationship between dependent and independent variable or not (Kothari & Garg, 2014).

3.13.3 Test of Homoscedasticity

Homoscedasticity, the opposite of heteroscedasticity, implies that the variability of the dependent variable is the same across all values of the independent variables (Schutzenmeister *et al.*, 2012). By assuring that the data used to test hypotheses are normal and accurately transformed, heteroscedasticity was minimized or eliminated. If the data are discovered to be heteroscedastic, they must be transformed using techniques such as logs or Z scores. Using the scatter diagram of residuals, Kothari and Garg (2014) determined whether the data distribution was homoscedastic or heteroscedastic.

3.13.4 Test for Multicollinearity

Multicollinearity is typically characterized by a strong correlation between independent variables and dependent variables. Non-accounting for perfect multicollinearity results in indeterminate regression coefficients and infinite standard errors, whereas defective multicollinearity results in large standard errors (William *et al.,* 2013). The precision and accuracy of rejecting or failing to reject the null hypothesis are impacted by large standard errors. The issue during estimation is not the presence of multicollinearity, but its severity. Multicollinearity was examined utilizing variance inflation factor VIF, where VIF 10 indicates the presence of multicollinearity (Midi *et al.,* 2010).

3.14 Ethical Considerations

Respecting the rights of others and maintaining honesty, the researcher acted ethically throughout the study. This entailed obtaining informed consent, assuring anonymity, confidentiality, privacy respect, and truthfulness in data reporting. Informed consent also involves ensuring that all respondents participate knowingly, willingly, and intelligently in the study. Therefore, the researcher conveyed the purpose of the study to the respondents in order to convince them to sign a consent form voluntarily. Maintaining anonymity by preventing respondents' identities from being linked to their responses ensured their anonymity. Confidentiality was achieved by allowing respondents to disclose as much or as little information as they wished. Research integrity was upheld by ensuring that data presentation, analysis, and interpretation were based solely on the collected data.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents the research findings gathered utilizing the methodology described in chapter three. It examines the findings of financial literacy, financial sophistication, and institutional factors on perceived retirement savings adequacy among university employees in Kenya. This chapter describes the descriptive and inferential statistical findings of the study. The chapter begins with a description of the demographic characteristics of data collection participants. This is followed by the reporting of data relevant to the study's research objectives, factor analysis, correlation analysis, and regression analysis.

4.2 Response Rate of the Sampled University Employees

According to the sample size formula developed by Taro Yamane (1973) and modified by Kent (2008), 390 questionnaires were disseminated to the employees of public universities. According to the collected data, only eight (8) of the 382 questionnaires that were correctly filled and returned were discarded because the respondents were unable to answer the questions, resulting in a response rate of 97.95%. A high response rate allowed for the collection of sufficient data that could be generalized to ascertain the relationship between financial literacy, financial sophistication, and institutional factors on perceived retirement saving adequacy among Kenyan public university employees. Response rate denotes the proportion of respondents who completed the survey in relation to the total sample size (Mitchell, 1989). The participation rate, or response rate, is the proportion of a sample population that responds to a survey and is regarded as an important aspect of the validity of survey-based research. It guarantees precision and validity (Hair *et al.,* 2010). Response rates provide valuable insight into the precision of collected data.

According to Fincham (2008), a response rate of 70 percent or higher is sufficient to conduct the analysis. Population is defined by Lune & Berg (2017) as the universal set of all participants of a hypothetical or actual set of events, people, or objects that the researcher employs to align the response result. The research focused on both teaching and non-teaching personnel at the university. In this regard, the response rate is an essential measure of survey quality, as it guarantees accurate and reliable survey results (Babbie, 2013; Hait *et al.,* 2010). A high response rate ensures that survey results are more accurate (Rear & Parker, 1997).

4.3 Data Preparation and Cleaning

As an essential part of data cleansing and preparation, the data used in this study were examined to detect and verify errors. This entailed analyzing absent values and outliers. As shown in Table 4.1, anomalies are deleted when discovered, whereas absent values were not observed. If the missing values had been present, the mean value would have been used (Aguinis, 2004, Fichman et al., 2005, Jose, 2013). According to Jaccard & Turrisi (2003) and Jose (2013), an outlier can affect the output and diminish the precision and statistical significance of your results. Tabachnick and Fidell (2013) also propose that absent values below 5% should be replaced with the mean. According to Smuk (2015), the most effective way to avoid missing data issues is to have a study design that decreases the probability of missing data occurrence. Often, the simplest method to deal with missing data in an analysis, particularly in a questionnaire, is to use only those records that have been fully observed. The lack of data affects inference and forecasting of the outcomes (Marlin, 2008).

Table 4.1: Summary Statistics

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender	382	100.0%	0	0.0%	382	100.0%
Age group	382	100.0%	0	0.0%	382	100.0%
Experience	382	100.0%	0	0.0%	382	100.0%
Education	382	100.0%	0	0.0%	382	100.0%
Cadre	382	100.0%	0	0.0%	382	100.0%
Terms of Service	382	100.0%	0	0.0%	382	100.0%
PRSA	382	100.0%	0	0.0%	382	100.0%
FS	382	100.0%	0	0.0%	382	100.0%
FL	382	100.0%	0	0.0%	382	100.0%
IFS	382	100.0%	0	0.0%	382	100.0%

Source: Research Data, 2022

The study used boxplot to detect the presence of outliers. Results indicated that only the dependent variable (PPRSA) had outliers (check Figure 4.1). Tabachnick and Fidell (2013) define an outlier as a case with an extreme value on a single variable (a univariate outlier) or an unusual combination of scores on more than two variables (a multivariate outlier) that can statistically distort the data. They are data observations that deviate significantly from the remainder and frequently result in substantial changes to the conclusion (Aguinis *et al.*, 2013). To see if the outliers have an impact on your data: the study contrasted the mean and the 5 percent trim mean. A significant discrepancy between these values increases the likelihood that your subsequent analysis, such as correlation and regression, may be affected. The mean that removes 5% of the dataset's extreme ends (both lower and higher ends) is known as the "5% trimmed mean.". In this study, the outliers were removed to avoid impact on the regression analysis.

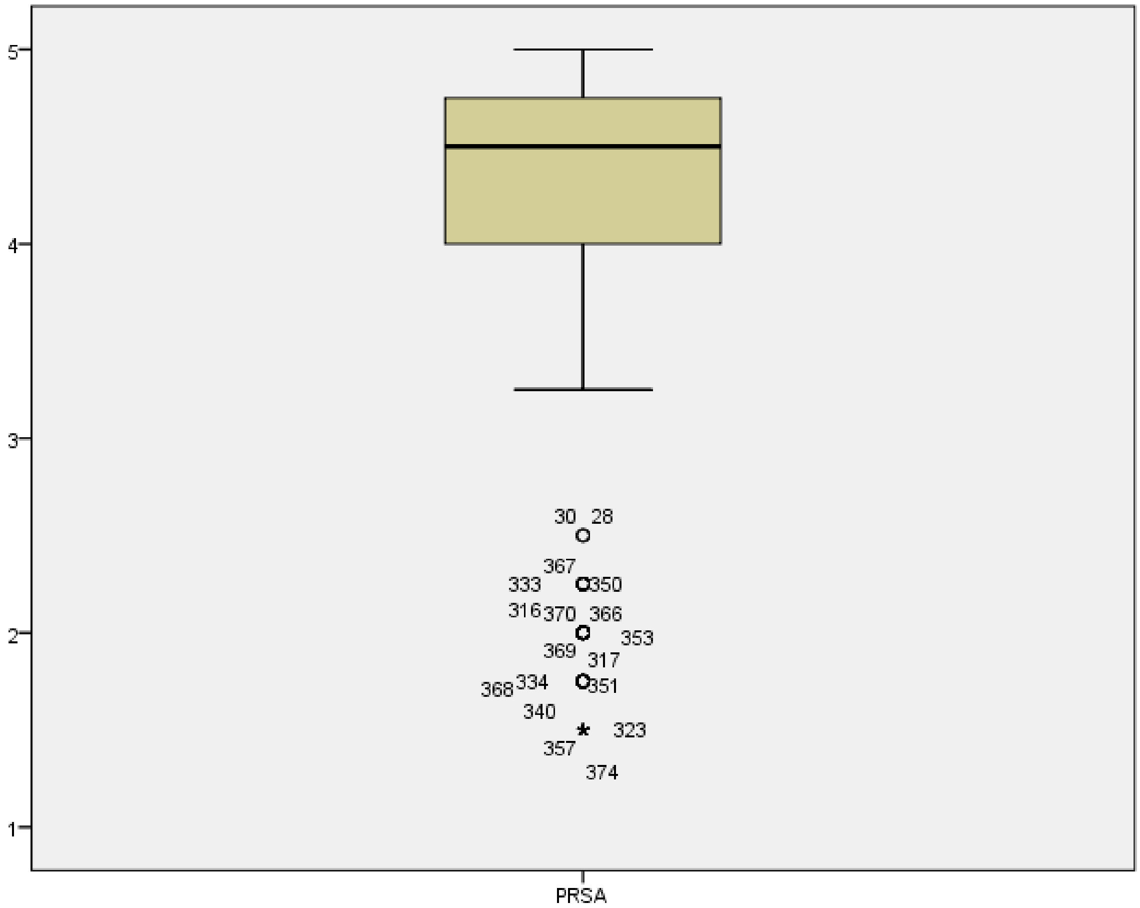

Figure 4.1: Checking Outliers

Source: Research Data, 2022

4.4 Descriptive on Demographic Characteristics

This section discusses the demographic characteristics of the respondents included in the study sample. Using descriptive statistics, frequency tables, and percentages, these data serve as a foundation for further analysis of the specific research objectives and their results. The information is crucial because it sheds light on the nature and caliber of the respondents, allowing for justifiable interpretations. Examining the gender, age, experience, cadre, and service tenure of each of the 382 survey respondents. As descriptive statistics, we provide frequency and percentages.

Table 4.2: Descriptive on Demographic Characteristics of the University Employees

		Frequency	Percent	Cumulative Percent
Gender	Male	219	57.3	57.3
	Female	163	42.7	100.0
	Total	**382**	**100.0**	
Age group	Below 25 years	24	6.3	6.3
	26-35 years	114	29.8	36.1
	36-45 years	135	35.3	71.4
	46-55	66	17.3	88.7
	More than 55 years	43	11.3	100.0
	Total	**382**	**100.0**	
Experience	Below 5 years	13	3.4	3.4
	5-10 years	24	6.3	9.7
	11-15 years	66	17.3	27.0
	15-20	141	36.9	63.9
	Above 20 years	138	36.1	100.0
	Total	**382**	**100.0**	
Education	Primary Certificate	15	3.9	3.9
	Secondary Certificate	39	10.2	14.1
	Diploma	82	21.5	35.6
	Bachelor’s degree	121	31.7	67.3
	Master’s degree	94	24.6	91.9
	PhD degree	31	8.1	100.0
	Total	**382**	**100.0**	
Cadre	1-4	148	38.7	38.7
	5-10	111	29.1	67.8
	11-15	104	27.2	95.0
	15-17	19	5.0	100.0
	Total	**382**	**100.0**	
Terms of Service	Contract	135	35.3	35.3
	Permanent	194	50.8	86.1
	Casual	53	13.9	100.0
	Total	**382**	**100.0**	

Source: Research Data, 2022

4.4.1 Gender of the University Employees

The gender distribution of respondents reveals that 57.3% (n= 219) of them were male, while 42.7% (n= 163) of them were female. These findings demonstrate gender distribution, as almost an equal number of male and female respondents participated in the study.

4.4.2 Age of the University Employees

Age of the respondents was categorized into five age groups, the age below 25, the age between 26 and 35 years, 36-45, 46-55 and the age above 55 years. The results on age cohorts were presented in Table 4.1 show that the majority (n = 135, 35.3%) were in the age cohort of 36-45 years while the cohort of 26-35 years were (n = 114, 29.8%). Further, the least were aged below 25 years at 6.3 % whereas those aged above 55 years were 11.3%.

4.4.3 Job Experience of the University Employees

From the results, majority had experience between 15-20 years at 36.9% followed by those with experience above 20 years at 36.1%. Experience below 5 years was the least followed by those with 5-10 years with respective percentages of 3.4% and 6.3%. Experience can be considered as a source of helpful information to retirement savings; it can develop capacities in the application of techniques, assessment of business problems, and preparation of action plans. Experience can also be viewed as a source of useful knowledge to retirement savings. Experience teaches empathy and provides support for all of life's challenges, as well as the development of abilities that identify and activate those skills. Additionally, it cultivates attitudes toward change and supports new start-ups and other enterprises, both of which may assist employees in the development of ways that lead to retirement readiness, particularly with regard to savings and other endeavors.

4.4.4 Educational Level of the University Employees

Education level was categorized into six levels; primary certificate, secondary certificate, diploma, bachelor's degree, master's degree and PhD degree. From the university employees sampled, majority have attained bachelor's degree at 31.7% followed by masters and diploma holders at 24.6% and 21.5 respectively. Overall, at least 67.3 have attained masters and below which indicated high percentage of university employees are learned. This implies that majority of the public universities in Kenya employs persons who are educated enough to understand the concepts to articulate issues that enhances performance in general.

4.4.5 Job Cadre of the University Employees

From the responses, majority of the university employees fall under grade 1-4 (38.7%), followed by those in grade 5-10 at 29.1 percent. The highest cadre was 15-17 at 5.0 percent.

4.4.6 Terms of Service of the University Employees

Table 4.2 presents results that majority of the university employees' terms of service are on permanent at 50.8 percent whereas those on contract were at 35.3 percent. 13.9 percent are on casual bases.

4.6 Descriptive Statistics for Constructs

Garson (2012) asserts that all quantitative analysis methods assume reliable measurement that is largely free of coding inaccuracies. Therefore, it is a good idea to perform descriptive statistics on the data so that you can be certain that the means and standard deviations are typically as predicted and that there are no out-of-bound entries outside of the expected range. Descriptive statistics on each of the variables was analyzed in form of mean scores, standard deviation, minimum and maximum value of each item used in relation to perceived retirement savings adequacy (dependent variable), financial literacy (independent variable), financial sophistication (mediating variable) and institutional factor the moderating variable.

4.6.1 Descriptive Statistics for Perceived Retirement Savings Adequacy

Table 4.3 indicates the perceived retirement savings adequacy was measured using four items. Each item was rated in a five Likert scale for which 5 = Strongly Agree, 4 = Agree, 3 = undecided, 2 = Disagree, 1=Strongly Disagree. Results showed that public universities employees agreed that they expect to have a good retirement income (mean response of 4.11 and standard deviation =.928). Public university staff also think to have enough money to retire comfortably (mean = 3.99. standard deviation = 1.378). Further, public university employees expect to live in retirement and given that they do not adjust your current saving behavior, they expect that have adequate resources to retire comfortably (mean = 4.26, standard deviation = 1.030). When someone stops working entirely and can sustain themselves through investments, pension plans, and other sources, they are said to be in retirement (Luccarella, 2016). Retirement, as defined by Petkoska & Earl (2009), is the point at which a person stops working at their primary position and starts receiving a pension from either public or private sources. For many workers, it is a significant adjustment in their lives (Denton & Spencer, 2009).

Table 4.3: Descriptive Statistics for Perceived Retirement Savings Adequacy

Descriptive Statistics					
	N	Min	Max	Mean	Std. Dev
I am saving enough to retire comfortably	382	1	5	3.72	1.468
I expect to have a good retirement income	382	1	5	4.11	.928
I think I will have enough money to retire comfortably	382	1	5	3.99	1.378
Based on how you expect to live in retirement and given that you do not adjust your current saving behavior, it's expected that you will have adequate resources to retire comfortably	382	1	5	4.26	1.030

Source: Research Data, 2022

4.6.2 Descriptive Statistics for Financial Literacy

Financial literacy was measured using eight items each rated on the Likert scale; 5 = Strongly Agree, 4 = Agree, 3 = undecided, 2 = Disagree, 1=Strongly Disagree. Table 4.4 presents descriptive results that public university employees in Kenya have better understanding of how to manage my credit use (mean = 3.83 and standard deviation = 1.294), have the ability to maintain financial records for my income and expenditure (mean = 3.68 and standard deviation =1.490), have little or no difficulty in managing my money (mean =3.92 standard deviation =1.235), and have the ability to prepare my own weekly (monthly) budget (mean =3.76 standard deviation = 1.301). The significance of having small standard deviations implies the responses are around their means.

Due to the complexity of the global economy's financial structures and the fact that Africa is a part of the global village, financial education is booming in the western world (Monyoncho, 2010). Along with lowering debt loads, building wealth, and managing it well, financial literacy is essential for influencing member participation in pension plans and savings behavior (Agnewet *et al*, 2007; FSD, 2009; Lusardi *et al*., 2010). On a systemic level, financial education is crucial to the health of the economy. For instance, clients that are financially literate are more inclined to save and to save more than their less literate counterparts

Table 4. 4: Descriptive Statistics for Financial Literacy

Descriptive Statistics					
	N	Min	Max	Mean	Std. Dev
I have better understanding of how to invest my money	382	1	5	3.46	1.515
I have better understanding of how to manage my credit use	382	1	5	3.83	1.294
I have a very clear idea of my financial needs	382	1	5	3.71	1.407
I have the ability to maintain financial records for my income and expenditure.	382	1	5	3.68	1.490
I have little or no difficulty in managing my money	382	1	5	3.92	1.235
I have the ability to prepare my own weekly (monthly) budget	382	1	5	3.76	1.301

Source: Research Data, 2022

4.6.3 Descriptive Statistics for Financial Sophistication

This variable is used in this study as the mediating variable measured using the eight items rated on five Likert scale. Table 4.5 indicates the results of the analysis which confirms that, most respondents had the same opinion that they consult financial professionals before investing (mean =4.20, standard deviation =1.147), have been spending beyond my means (mean = 4.03, standard deviation =1.184), usually consider ATM fees when doing bank withdrawals (mean =3.77, standard deviation =1.204) and also understand financial obligations associated with financial matters (mean = 3.87, standard deviation =1.155). According to Calvet *et al*., (2009), in the domain of household finance, the requirement for financial sophistication has grown in importance. Household finance scholars are becoming more and more interested in the idea of financial sophistication since it is described as a household's capacity to avoid making financial blunders. Workers who are deemed financially smart have greater experience and tend to make fewer financial blunders than those who are labeled financially illiterate (Kim & Hanna, 2015).

Table 4.5: Descriptive Statistics for Financial Sophistication

Descriptive Statistics					
	N	Min	Max	Mean	Std. Dev
I consult financial professionals before investing	382	2	5	4.20	1.147
I have been spending beyond my means	382	1	5	4.03	1.184
I have been saving for my retirement	382	1	5	3.43	1.449
I usually consider ATM fees when doing bank withdrawals	382	1	5	3.77	1.204
I usually use the same bank/insurance company despite poor customer service	382	1	5	3.61	1.413
I hardly understand the terms for pension schemes	382	1	5	3.76	1.386
I understand financial obligations associated with financial matters	382	1	5	3.87	1.155

Source: Research Data, 2022

4.6.4 Descriptive Statistics for Institutional Factors

Another key variable was institutional factors; moderator was measured on a five Likert scale. 5 = Strongly Agree, 4 = Agree, 3 = undecided, 2 = Disagree, 1=Strongly Disagree. Table 4.6 indicates that public universities employees in Kenya have had similar opinion that their employer provides a good pension plan with a mean response of 3.59 and a standard deviation of 1.276. They also had trust the government to manage future pensions (mean = 4.19, standard deviation = .680), trust banks and insurance companies to manage their pensions (mean = 4.51, standard deviation = .651) and finally believe their employer provides sufficient information regarding pension plans with an average responses of 4.27 and a small deviations of .824. Anyone who invests in the future needs to have faith in a system that will safeguard their interests throughout time and act as an insurance function. As stated by Hyde et al. (2007), "trust decreases complexity because it allows people to delegate responsibility for tasks that they lack the necessary competence to perform alone." When evaluating individuals' perceptions of the adequacy of their savings, the level of trust they place in their financial intermediaries or regulatory institutions responsible for retirement savings plays a crucial role.

Table 4.6: Descriptive Statistics for Institutional Factors

Descriptive Statistics					
	N	Min	Max	Mean	Std. Dev
My employer provides a good pension plan	382	1	5	3.59	1.276
To what extent do you trust the government to manage future pensions	382	2	5	4.19	.680
To what extent do you trust banks and insurance companies to manage your pension	382	2	5	4.51	.651
My employer provides sufficient information regarding pension plans	382	2	5	4.27	.824

Source: Research Data, 2022

4.7 Reliability of the Research Instruments

This study included measurements from tested constructs, but it was required to test the research instrument by determining whether all of the items could yield reliable results. This is consistent with Co-operation and Development's (2013) assertion that reliability is a key element of accuracy. As a result, it is preferable that the measures yield the same results when applied under identical conditions and make a distinction between changes in the measure caused by actual changes in the condition being measured and changes that are merely due to measurement error. According to Mun and Kim (2015) recommendation, the individual items' Cronbach's alpha was taken into account in this study to evaluate which item may be eliminated to increase the reliability of the questionnaire.

Jackson (2015) opined that reliability is used in statistical research to assess the internal consistency or stability of an instrument while measuring particular concepts. According to Mohajan (2017) and Joppe (2000), reliability refers to how well results hold up over time and accurately represents the entire population. The coefficient is used to examine the internal consistency of the measuring scales' items and determine whether they are statistically acceptable. The findings shown in Table 4.7 demonstrated that all coefficients were within the generally recognized limits of 0.7 proposed by Hair *et al* (2010). Reliability for perceived retirement savings adequacy with for items was .910 and 9.19 after items have been standardized. Financial literacy and financial sophistication each had reliability of .968 and .855 respectively. Furthers, they have become more reliable after items have been standardized especially for financial literacy. Institutional factor had an average reliability of .705 and .738 before and after standardization.

Table 4.7: Reliability of Research Instruments before and after Standardization

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Perceived Retirement Savings Adequacy	.910	.919	4
Financial Literacy	.968	.969	6
Financial Sophistication	.855	.846	8
Institutional Factors	.705	.738	4

Source: Research Data, 2022

4.8 Factor Analysis

Before testing the hypotheses, the study examined the factorability of its items to select a limited number for assessing relationships between associated variables. During the process of refining measurements, each construct's validity was scrutinized. Items with factor loadings below 0.5 were excluded from analysis to enhance construct validity. The evaluation of construct validity, defined by Souza et al. (2017) as a measure of how well a scale captures its intended purpose, is conducted in this study using factor analysis.

Principal components analysis aimed to identify and calculate composite scores for underlying factors in the study. Typically, factor analysis aims to distill a small set of variables representing interconnected phenomena. Eigenvalues were employed to gauge the comprehensive variance encompassing each factor. Varimax rotation was applied to express a subspace through a handful of significant elements. Varimax's objective is to maximize the sum of squared loading variances across the entire dataset.

4.8.1 Factor Loading on Perceived Retirement Savings Adequacy

Four items adapted from Van Dalen *et al.* (2010) were utilized to assess perceptions of adequate retirement resources. Under principal component analysis, the items were subjected to factor analysis. The method of factor analysis permits the extraction of as many components as feasible. Each variable's results were discussed in detail. According to Kaiser 1974, KMO values for all constructs used to define variables must be greater than 0.7 for factor analysis. The eigenvalues for factor one of Perceived Retirement Savings Adequacy were 3,221, resulting in an initial variance of

80.53 percent. Typically, the aggregate of eigenvalues equals the number of independent variables. The proportion represents the relative weight of each factor; factor 1, factor 2, and factor 3 accounted for 96.47 percent of rotation sums of squared loadings. Initial eigenvalues indicated that the three factors explained 80.53 percent, 9.16 percent, and 6.78 percent, respectively, of the variance. Using the varimax rotation of the factor loading matrix, solutions for each of these factors were analyzed. The preferred solution was the three-factor model, which explained 96.47 percent of the variance.

Table 4.8: Total Variance Explained on Perceived Retirement Savings Adequacy

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cum. %	Total	% of Variance	Cum. %	Total	% of Variance	Cum %
1	3.22	80.53	80.53	3.22	80.53	80.530	1.68	42.11	42.11
2	.37	9.16	89.69	.37	9.16	89.691	1.11	27.84	69.95
3	.27	6.78	96.47	.27	6.78	96.472	1.06	26.52	96.47
4	.14	3.53	100.00						

Extraction Method: Principal Component Analysis.

Component Transformation Matrix

Component	1	2	3
1	.687	.512	.516
2	-.477	.853	-.211
3	-.548	-.101	.830

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Source: Research Data, 2022

Loadings in factor analysis are the correlations and weights between each variable and the factor. The significance of identifying the dimensions of the components rises as the loading increases. A negative value indicates that the factor has an opposite effect. According to the findings of the study, all loadings were positive, indicating that the variables in this instance had a positive effect on the three components. According to Kaizer (1974), Hutcheson and Sofroniou (1999), and Hair *et al.* (2006), principal component analysis components with loadings greater than 0.40 are extracted when factor 1 is considered. Those who receive a score below 0.40 are eliminated.

Figure 4.2 illustrates a scatter plot of eigenvalues after factoring. Scree plots are a popular method for determining the number of retained factors. (Luckman, 2004; Rabe-Hesketh, & Everitt, 2007; Cattell, 1966). Cattell (1966) defines a scree plot as a graph of decreasing eigenvalues. The principal factor method is used to derive factors from a factor model. Due to the geometry of the scree plot and Kaiser's well-known criterion, which suggests that we retain factors with higher eigenvalue values, the plot indicates that we should retain one factor.

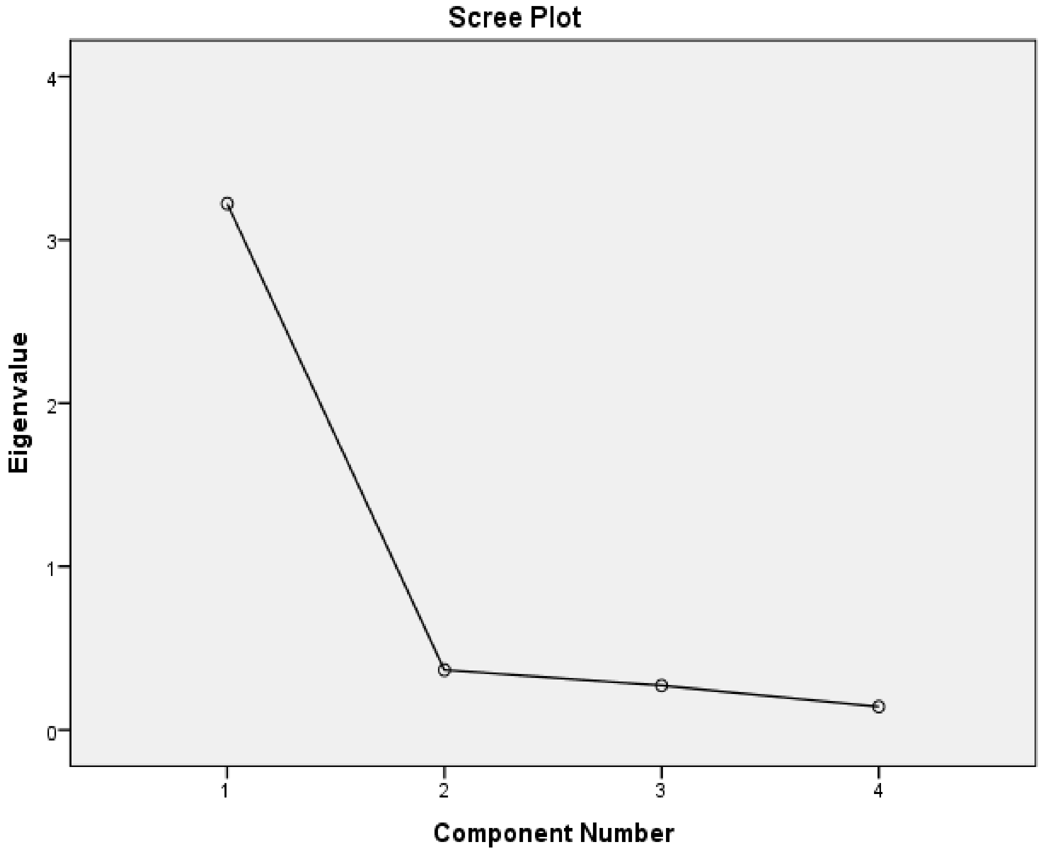

Figure 4.2: Scree plot of eigenvalues of Perceived Retirement Savings Adequacy

Source: Research Data, 2022

Variables with greater loadings have less uniqueness compared to the remainder of the constructs, and the lower the loading, the more unique the construct. Under the rotated components, the 'I am saving enough to retire comfortably' construct had higher loadings of 0.841 under factor 1. The item 'I expect to have a good retirement income' had loadings of 0.891 under factor 2 and 0.822 under component 1 for the item 'I believe I will have enough money to retire comfortably' and the item 'Based on how you expect to live in retirement and assuming you do not change your current saving behavior, it is expected that you will have sufficient resources to retire comfortably had.848 loadings based on factor 3.

Table 4.9: Rotated Factor loadings on Perceived Retirement Savings Adequacy

Rotated Component Matrix[a]			
	Component		
	1	2	3
I am saving enough to retire comfortably	.841		
I expect to have a good retirement income		.891	
I think i will have enough money to retire comfortably	.822		
Based on how you expect to live in retirement and given that you do not adjust your current saving behavior, it's expected that you will have adequate resources to retire comfortably	.423		.848

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 4 iterations.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.836
Bartlett's Test of Sphericity	Approx. Chi-Square	1173.279
	Df	6
	Sig.	.000

Source: Research Data, 2022

Figure 4.3 depicts rotated components in space. The research employed varimax rotation. The rotated variables have a correlation. The Varimax rotation maximizes the total squared variance of the loadings. Previously, we stated that the varimax rotation is the rotation that maximizes the varimax criterion, which is the sum of the squared loadings across all columns. A column of loadings with a high variance tends to contain a series of large values and a series of low values, thereby attaining the goal of factor analytic interpretation's simplicity. Typically, this produces more interpretable factors with a simpler structure than an orthogonal rotation. In numerous applications (such as after factor and pca), the factors before rotation are orthogonal (uncorrelated), whereas the factors after rotation are correlated. Both the anti-image correlation matrix and the anti-image covariance matrix comprise the negatives of the partial correlation coefficients. The majority of off-diagonal elements will be small in a decent factor model (*see* Appendix I).

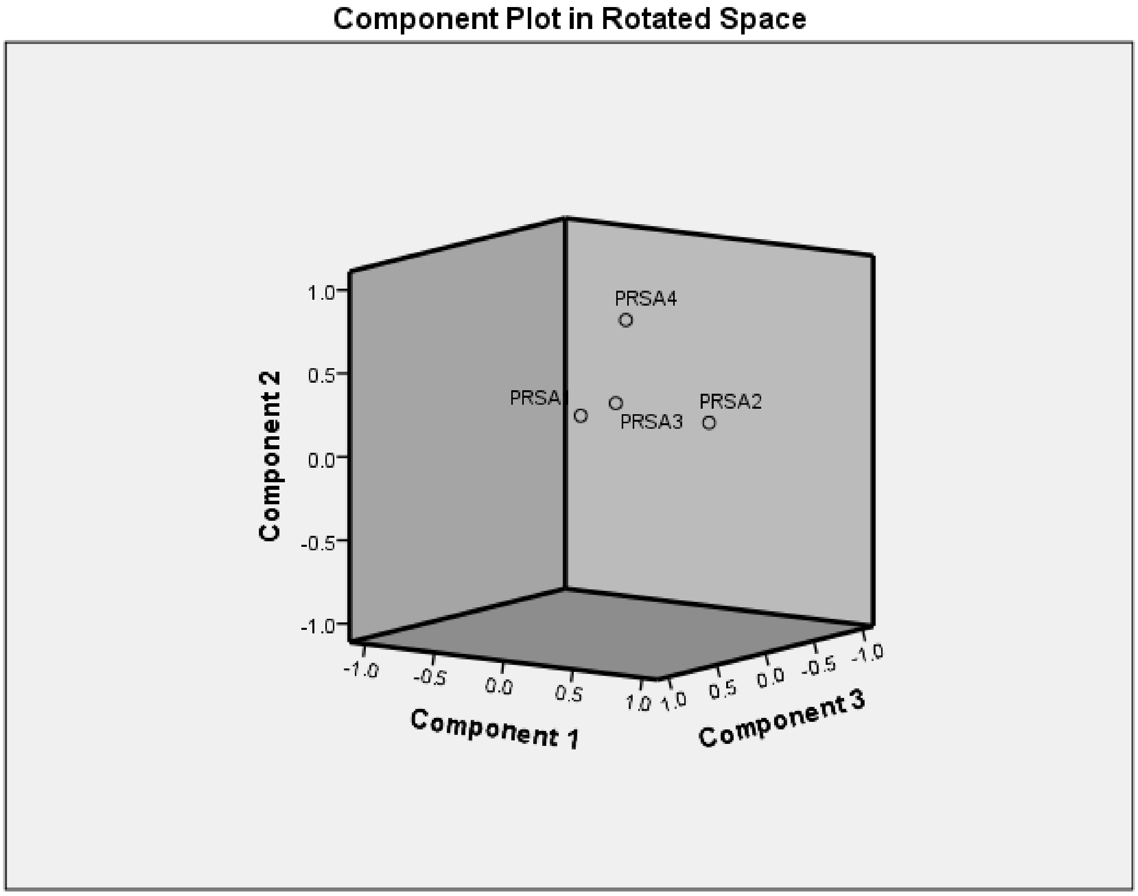

Figure 4.3: Component Plot in Rotated Space for Perceived Retirement Savings Adequacy

Source: Research Data, 2022

4.8.2 Factor Loading on Financial Literacy

Several constructs adopted from (Strömbäck *et al.*, 2017) were used to measure financial literacy subjected to factor analysis under principal component analysis. Financial literacy had eigenvalues of 5.21 for factor one giving a total initial variability of 86.79 percent. The sum of eigenvalues equals the number of variables. The relative weight of each factor for factor 1, factor 2 and factor 3 accounted for rotation sums of squared loadings 95.93 percent. Initial eigenvalues indicated that the three factors explained 86.79%, 6.35% and 2.79% of the variance, respectively. Under rotated sum of squares, factor 1 had loadings as percentage of variance of 37.45%, factor 2 and 3 had 30.34% and 28.14% respectively. Solutions for these factors were each examined using varimax rotation of the factor loading matrix. The three-factor solution preferred explained 95.93% of the total variance.

Table 4.10: Factor Loading on Financial Literacy

Total Variance Explained

Component	Initial Eigenvalues Total	% of Variance	Cumulative %	Extraction Sums of Squared Loadings Total	% of Variance	Cumulative %	Rotation Sums of Squared Loadings Total	% of Variance	Cumulative %
1	5.21	86.79	86.79	5.21	86.79	86.79	2.25	37.45	37.45
2	.38	6.35	93.14	.38	6.35	93.14	1.82	30.34	67.79
3	.17	2.79	95.93	.17	2.79	95.93	1.69	28.14	95.93
4	.13	2.21	98.14						
5	.09	1.45	99.59						
6	.02	.41	100.00						

Extraction Method: Principal Component Analysis.

Component Transformation Matrix

Component	1	2	3
1	.622	.565	.542
2	.783	-.454	-.425
3	-.006	-.689	.725

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Source: Research Data, 2022

The Kaiser-Meyer-Olkin (KMO) to test for sampling adequacy indicated KMO value of .852 and Bartlett's test showed a Chi-square of 3508.688 with 15 degrees of freedom and significance of p-value 0.000 as presented by Table 4.10. The significance of Chi-Square confirms that the constructs were fit for factor analysis.

Under the rotated components, the construct 'I have better understanding of how to invest my money' had higher loadings of .804 under factor 3. The item 'I have better understanding of how to manage my credit use' had loadings of .583 under factor 2 and .608 for component 3. Further, the item ‘I have a very clear idea of my financial needs’ was loaded with .812 loadings. Another construct ‘I have little or no difficulty in managing my money’ and ‘I have the ability to prepare my own weekly (monthly) budget’ were respectively had loadings of .884 and .637.

Table 4. 11: Rotated Components for Loading on Financial Literacy

Rotated Component Matrix[a]

	Component		
	1	2	3
I have better understanding of how to invest my money		.420	.804
I have better understanding of how to manage my credit use	.466	.583	.608
I have a very clear idea of my financial needs		.812	.437
I have the ability to maintain financial records for my income and expenditure.	.745	.519	
I have little or no difficulty in managing my money	.884		
I have the ability to prepare my own weekly (monthly) budget	.637	.557	.511

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.852
Bartlett's Test of Sphericity	Approx. Chi-Square	3508.683
	Df	15
	Sig.	.000

Source: Research Data, 2022

The scree plot in Figure 4.4 show eigenvalues in decreasing order suggests the number of components to be 3 (Luckman, 2004 & Cattell, 1966). The study therefore fit a factor model, extracting factors with the principal factor method. The plot suggests that we retain three factors, both because of the shape of the scree plot and because of Kaiser's well-known criterion suggesting that we retain factors with more eigenvalue value.

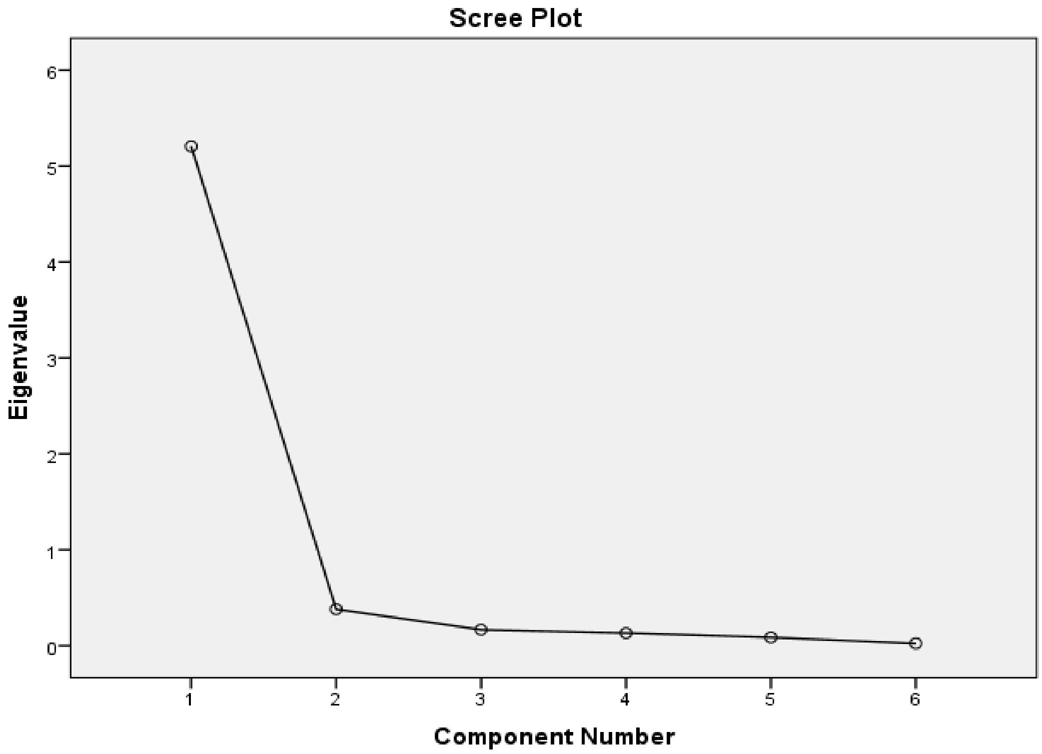

Figure 4.4: Scree plot of eigenvalues of Financial Literacy

Source: Research Data, 2022

The rotated component as depicted in Figure 4.5 yields more interpretable factors with a simpler structure than the orthogonally rotated component. In numerous instances As shown in appendix I, the anti-image correlation matrix contains the negatives of the partial correlation coefficients, and the anti-image covariance matrix contains the negatives of the partial covariance's.

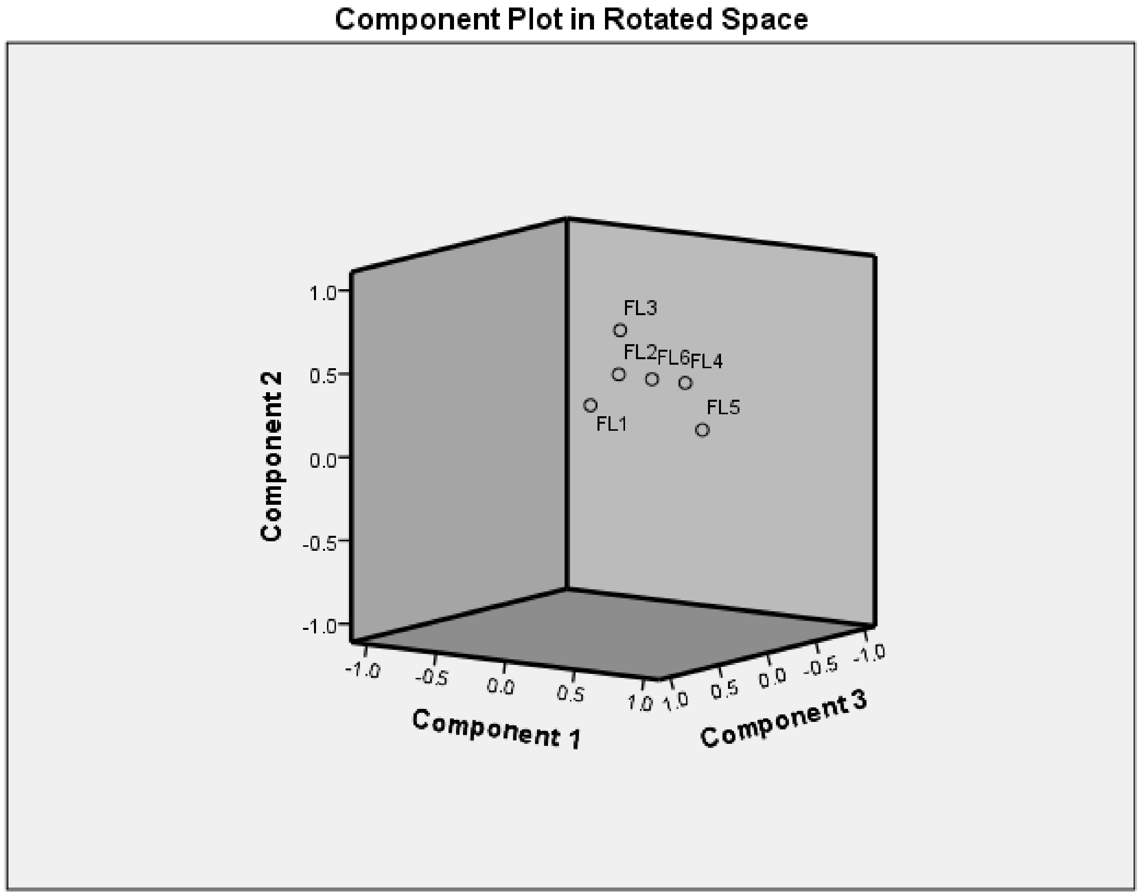

Figure 4.5: Component Plot in Rotated Space for Financial Literacy

Source: Research Data, 2022

4.8.3 Factor Loading on Financial Sophistication

Table 4.12 presents results for financial sophistication measured eight on items adopted from (Estalami, 2014). These are ‘I consult financial professionals before investing’, ‘I have been spending beyond my means’, ‘I have been saving for my retirement’, ‘I usually consider ATM fees when doing bank withdrawals’, ‘I usually use the same bank/insurance company despite poor customer service’, ‘I hardly understand the terms for pension schemes’ and ‘I understand financial obligations associated with financial matters'. All these items were subjected to factor extraction using PCA and Kaiser-Meyer-Olkin to test for sampling adequacy. A total of 61.03 percent of total variation can be explained by factor 1 with eigenvalue of 4.88. Both factor 1, 2 and 3 on rotated sum of squared loadings explained 88.99 percent.

Table 4.12: Total Variance Explained on Financial Sophistication

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cum %
1	4.88	61.03	61.03	4.88	61.03	61.03	4.87	60.83	60.83
2	1.41	17.62	78.65	1.41	17.62	78.65	1.22	15.27	76.10
3	.83	10.34	88.99	.83	10.34	88.99	1.03	12.89	88.99
4	.34	4.31	93.30						
5	.29	3.64	96.94						
6	.13	1.57	98.51						
7	.10	1.20	99.71						
8	.02	.29	100.00						

Extraction Method: Principal Component Analysis.

Component Transformation Matrix

Component	1	2	3
1	.998	-.001	-.064
2	.037	.823	.567
3	.052	-.568	.821

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Source: Research Data, 2022

The Kaiser Meyer Olkin(KMO) measure of sampling adequacy of 0.825, the Chi-Square approximation of 3310.317, and the Bartlett's test of sphericity (p =.000) indicate adequate levels for factor analysis. Each of the items or constructs had loadings greater than 0.70. The first item pertaining to financial professionals had a factor load of.769 considering component 1. Another item concerning retirement savings (.906), as displayed in Table 4.13. Other factors with higher loadings under component 1 include ATM fees when making bank withdrawals (.935), using the same bank/insurance company frequently despite subpar customer service (.953), and understanding financial obligations related to financial matters (.985).

Table 4.13: Rotated Components for Loading on Financial Sophistication

Rotated Component Matrix[a]			
	Component		
	1	2	3
I consult financial professionals before investing	.769	-.406	
I have been spending beyond my means		.948	
I have been saving for my retirement	.906		
I usually consider ATM fees when doing bank withdrawals	.935		
I usually use the same bank/insurance company despite poor customer service	.952		
I hardly understand the terms for pension schemes	.838		
I understand financial obligations associated with financial matters	.985		.990

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.825
Bartlett's Test of Sphericity	Approx. Chi-Square	3310.317
	df	28
	Sig.	.000

Source: Research Data, 2022

Figure 4.6 indicate that factor or component 1, 2 and 3 with higher eigenvalues was preferred as discussed earlier (Luckman, 2004 and Cattell, 1966).

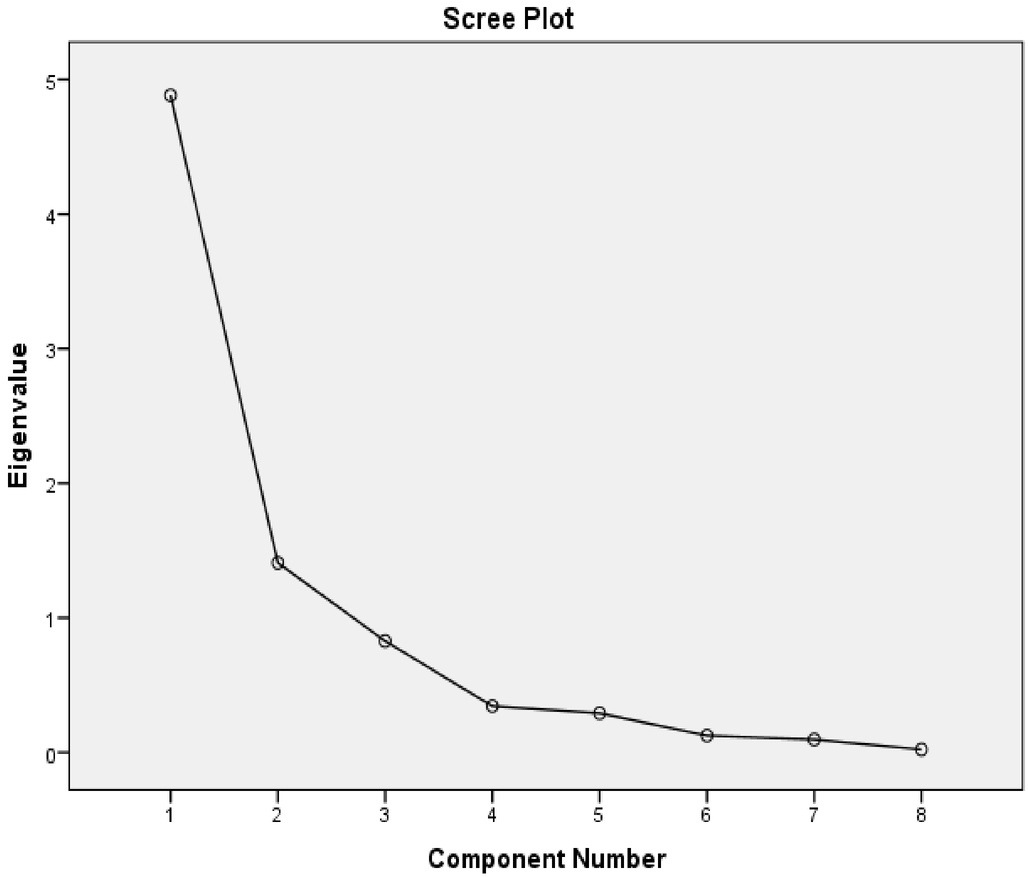

Figure 4.6: Scree plot of eigenvalues of Financial Sophistication

Source: Research Data, 2022

The rotated component as illustrated in Figure 4.7 yields more interpretable factors with a simpler structure. In many applications, the anti-image correlation matrix and the anti-image covariance matrix both include the negatives of the partial correlation coefficients and partial covariance, respectively.

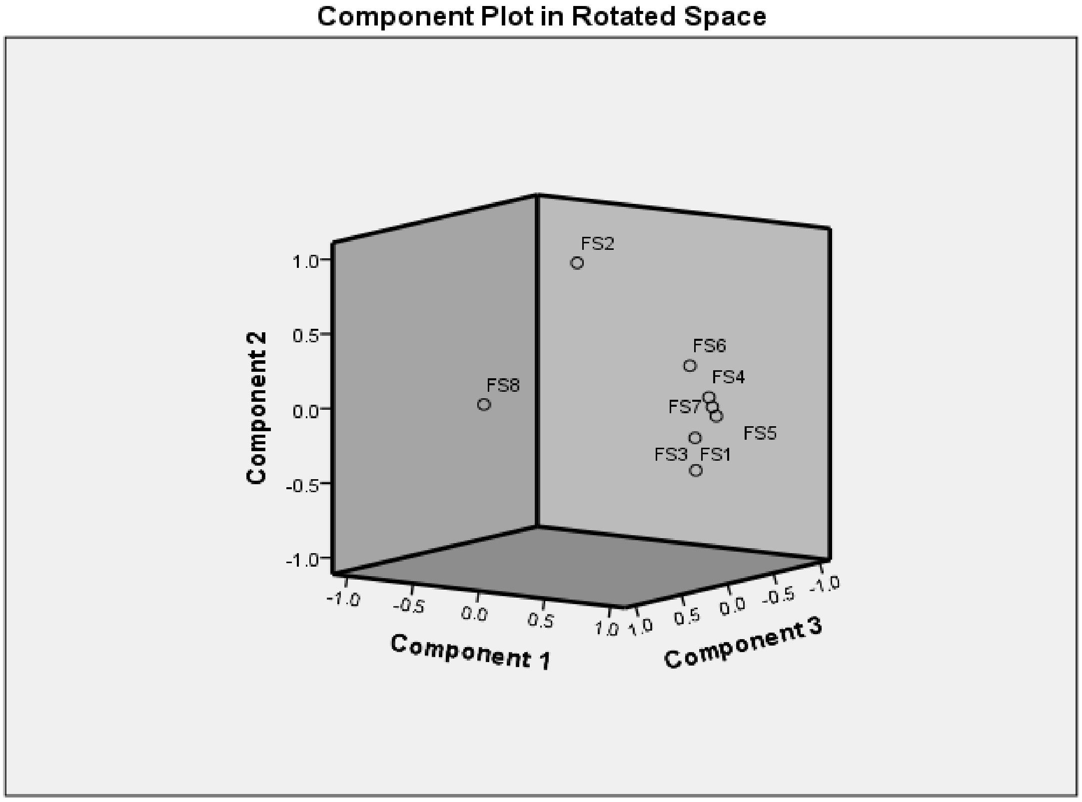

Figure 4.7: Component Plot in Rotated Space for Financial Sophistication

Source: Research Data, 2022

4.8.4 Factor Loading on Institutional Factors

Factor extraction method was used to reduce items measuring institutional factors. These items were adopted from subjected through principal component analysis. These items are ‘My employer provides a good pension plan’, ‘To what extent do you trust the government to manage future pensions’, ‘To what extent do you trust banks and insurance companies to manage your pension’ and ‘My employer provides sufficient information regarding pension plans’. Results presented in Table 4.14 that the first two components explained 78.51% while the remaining two explained 21.49%. Under Varimax rotated sum of squared loadings, the first two explained 63.63% of the total variation.

Table 4. 14: Total Variance Explained on Institutional Factors

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.26	56.41	56.41	2.26	56.41	56.41	1.317	32.91	32.91
2	.88	22.10	78.51	.88	22.10	78.51	1.229	30.72	63.63
3	.54	13.49	92.00	.54	13.49	92.004	1.14	28.37	92.00
4	.32	8.00	100.00						

Extraction Method: Principal Component Analysis.

Component Transformation Matrix

Component	1	2	3
1	.643	.630	.437
2	-.445	-.158	.882
3	.624	-.761	.179

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Source: Research Data, 2022

Figure 4.8 indicate that all the factors or component 1, 2, 3 and 4 had higher eigenvalues suggesting that all the four components were preferred as discussed earlier from the opinion of Luckman (2004) and Cattell (1966).

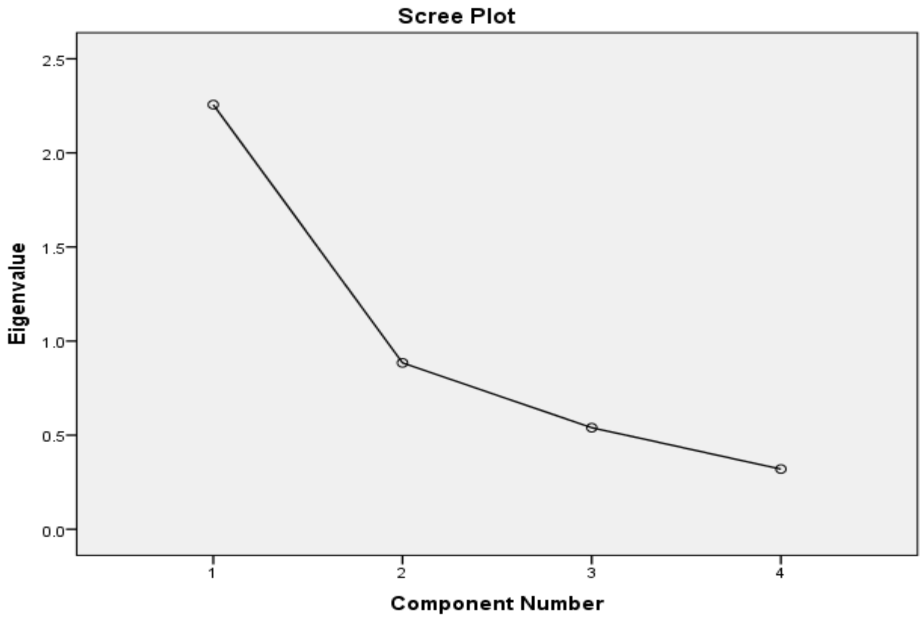

Figure 4.8: Scree plot of Eigenvalues of Institutional Factors

Source: Research Data, 2022

Kaiser Meyer Olkin measure of sampling adequacy of.714, Chi-Square approximation of.403.883, and Bartlett's test of sphericity (p =.000) indicate adequate levels for factor analysis. Each of the products had higher loadings than 0.7. Kaiser (1974) and Field (2005) state that KMO values extend from 0 to 1. Values close to zero indicate that there are greater partial correlations than total correlation. In other words, there is an extensive correlation, which suggests that there are issues with factor analysis. The KMO values between 0.8 and above indicate that the sampling is sufficient for factor analysis, whereas values below 0.6 indicate that remedial action is required. The first item regarding an employer's provision of a decent pension plan was factor-loaded with a component 1 value of.660. As shown in Table 4.14, there is a second item concerning trust in the government to administer future pensions (.875). Other pension management-related factors with higher loadings under component 3 included trust institutions and insurance companies.941, and the final items regarding employer provision of adequate information regarding pension plans had weights of.913. All of these items were kept.

Table 4.15: Rotated Components for Loading on Institutional Factors

Rotated Component Matrix[a]

	Component		
	1	2	3
My employer provides a good pension plan	.660	.640	
To what extent do you trust the government to manage future pensions		.875	
To what extent do you trust banks and insurance companies to manage your pension			.941
My employer provides sufficient information regarding pension plans	.913		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.714
Bartlett's Test of Sphericity	Approx. Chi-Square	403.883
	Df	6
	Sig.	.000

Source: Research Data, 2022

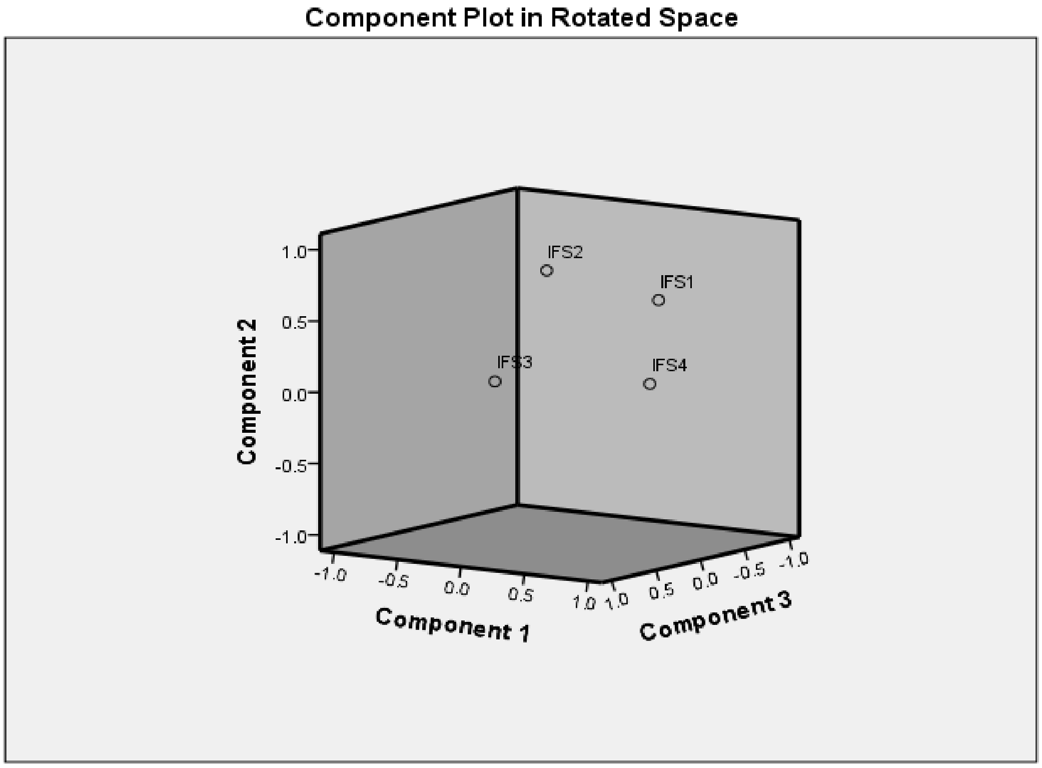

Figure 4.9: Component Plot in Rotated Space for Institutional Factors

Source: Research Data, 2022

4.9 Diagnostic Results

Several multiple regression assumptions must be established in statistical analysis before conclusions regarding the results can be drawn. The researcher tested a number of the regression model's presumptions before doing correlation and regression analyses. This is due to the possibility of Type I or Type II errors, as well as an over- or underestimation of significance or impact size. However, if these presumptions are violated, expected results would be unreliable, leading to the possibility of misleading conclusions and recommendations. To make sure the data fulfilled the criterion in this investigation, normality, linearity, multicollinearity, and homoscedasticity tests were undertaken. Regression analysis assumptions, according to Hair *et al.* (2010), are crucial for ensuring that the results were truly representative of the sample and for obtaining the best results.

4.9.1 Normality

In order for the research to draw correct conclusions based on its model estimation, the residuals from the regression should adhere to a normal distribution. The residuals from the regression have to follow a normal distribution if the model estimate is to be used as a reliable source for drawing inferences. According to Table 4.16, which displays the Jarque-Bera value of 0.0013 and its probability of 0.997, the null hypothesis proposed by Jarque and Bera, which asserts that the data followed a normal distribution, was found to be plausible and was therefore accepted. According to Kline (2011) and Tabachnick and Fidell (2013), skewness analyzes the symmetry of a distribution, whereas kurtosis gauges how peaky the distribution is. Due to the presence of symmetry, the visualizations in table 4.16 of the skewness (-0.048) and kurtosis (2.811) of the research variables show that the data followed a normal distribution (Kline, 2011). As a result, the investigation led to the discovery of the fact that the data followed a normal distribution.

Table 4.16: Jarque Bera Test for Normality

Skewness	-0.048
Kurtosis	2.811
Jarque- Bera	0.0013
Probability	0.997

Source: Researcher, 2022

Examining the skewness and kurtosis values of the data is another way to validate the findings of the test of normalcy. Figure 4.10 illustrates the form and dispersion of distributions in the data, and the study used a histogram to determine whether or not the data were normally distributed. When the premise of regression and the majority of other approaches, which is that error terms are normally distributed, is met, the histogram of standardized residuals should display a curve that is generally normal, according to Garson (2012). According to Garson (2012), the expectation for any predictive technique is a normal distribution of error, with the largest number of predictions being at or near zero and then trailing off into "high prediction" and "low prediction" tails. This is the case in any predictive technique. Further, skewness and kurtosis values can be looked at in order to verify the results of the normality test. According to Kline (2011); Tabachnick and Fidell (2013), skewness evaluates a distribution's symmetry, whereas kurtosis gauges its peakiness. The research variables' skewness and kurtosis which are shown in Figure 4.10, show that the data was normally distributed because of symmetry (Kline, 2011). The study therefore concluded that data followed a normal distribution.

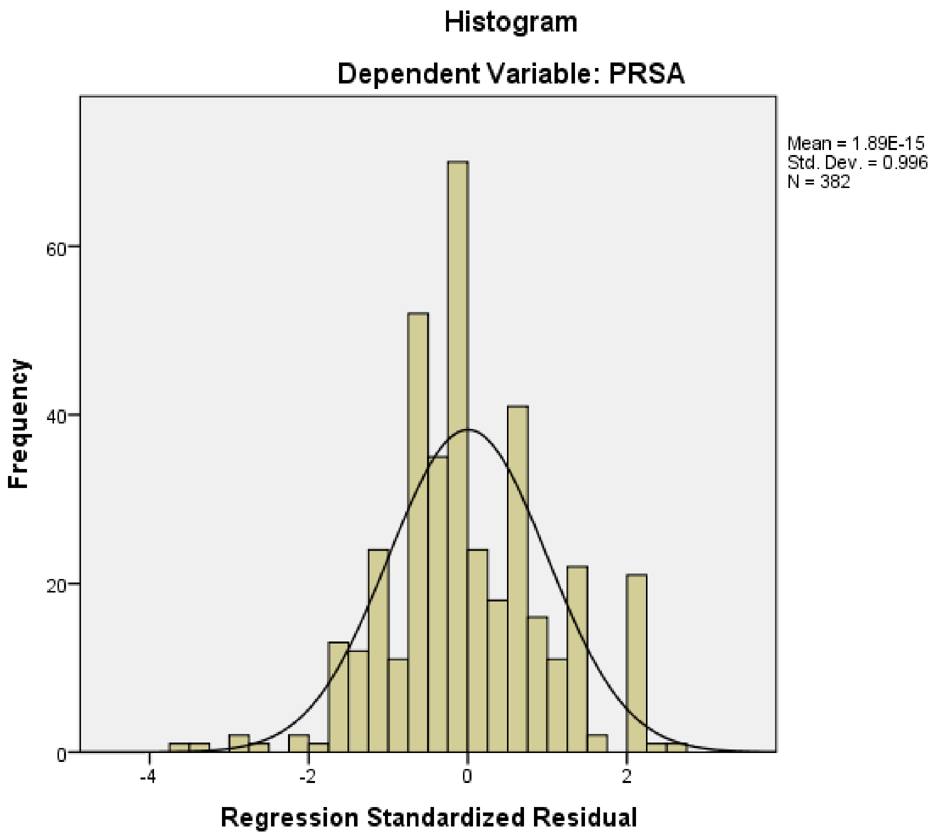

Figure 4.10: Histogram Showing Normal distribution

Source: Research Data, 2022

4.9.2 Linearity

In this investigation, the linearity assumption was investigated by carrying out a straightforward inspection of a P-P plot in which the scores were depicted by a straight line (Pallant, 2013). P-P plot employs residuals. The residuals are synonymous with the error terms, which can be understood as the disparities between the actual value of the dependent variable and the value that was predicted. In the event that they are linear, they will be in accordance with the diagonal line, as shown in Figure 4.11. According to the regression standard residual, the observed values and predicted values were discovered along the diagonal line. Since there were no substantial departures from the line, the linearity assumption was successful in being met.

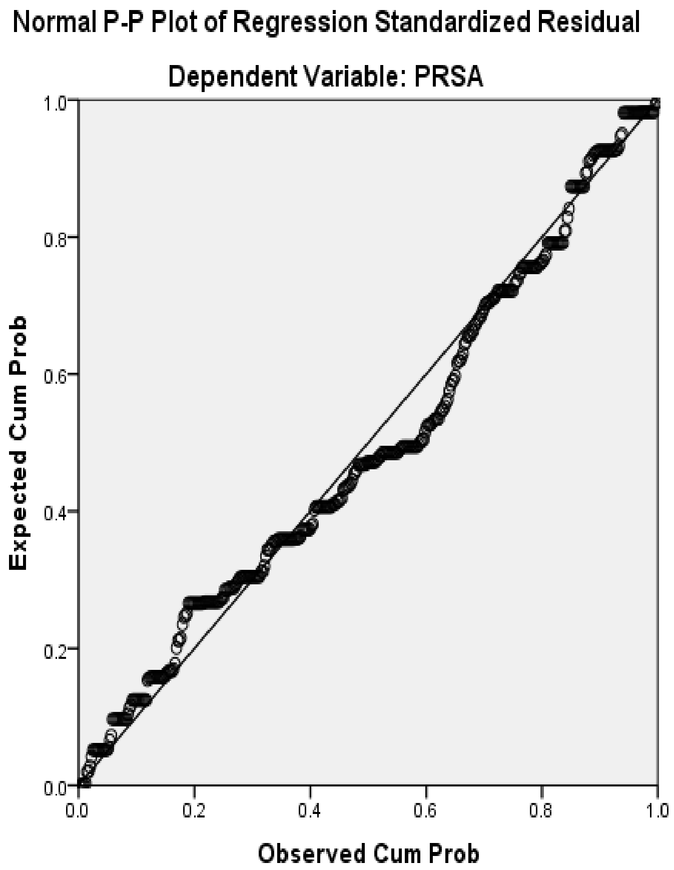

Figure 4.11: Linearity Test

Source: Research Data, 2022

4.9.3 Multicollinearity

Multicollinearity is an excessive degree of inter-correlation between the independent variables, making it impossible to distinguish between the independent outcomes (Garson, 2012). This is essentially the presumption that the study predictors do not have a very high degree of correlation. Regression results for collinearity diagnostics were used to examine tolerance and VIF. According to Garson (2012), the independent variable should be removed from the analysis due to multicollinearity if the tolerance value is less than the threshold value of .20 or VIF > 4.0.

From Table 4.16 the tolerance were substantially greater than .20 and VIF values were below 4.0, thus, it is acceptable. In line with suggestion of Garson (2012), Hair, Anderson, Babin, and Black (2010) and Aminu and Shariff (2014) these result show that multicollinearity does not exist in this study.

Table 4.17: Results for Multicollinearity

Coefficients[a]							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.168	.367		-.457	.648		
Gender	.080	.073	.036	1.094	.275	.977	1.024
Age group	-.018	.030	-.020	-.602	.547	.976	1.024
Experience	-.009	.035	-.009	-.269	.788	.952	1.051
Education	-.007	.029	-.008	-.250	.803	.962	1.039
Cadre	.059	.039	.050	1.507	.133	.982	1.019
Terms of Service	.068	.051	.045	1.345	.179	.978	1.022
FL	.053	.067	.052	.792	.429	.255	3.915
FS	.640	.070	.588	9.195	.000	.266	3.754
IFS	.331	.069	.198	4.774	.000	.630	1.588
a. Dependent Variable: PRSA							

Source: Research Data, 2022

4.9.4 Homoscedasticty

Homoscedasticity is based on the premise that the distribution of the data is consistent over the entire spectrum of the dependent variable. The absence of homoscedasticity can be inferred from the presence of errors (residuals) that are greater in some sections of the range than in others. According to Garson (2012), in order for residuals to form an unstructured cluster of points, the homoscedasticity condition has to be satisfied. Osborne and Waters (2002), who argue that residuals should range between -2 and/or +2 points, support this as well. They say that this is the appropriate range for residuals. Based on the data plot (Figure 4.12) of standardized residuals vs standardized anticipated values, it appeared as though the assumption of homoscedasticity had been satisfied. The data plot showed that there was no discernible funneling, and the majority of residuals fell below the indicated threshold.

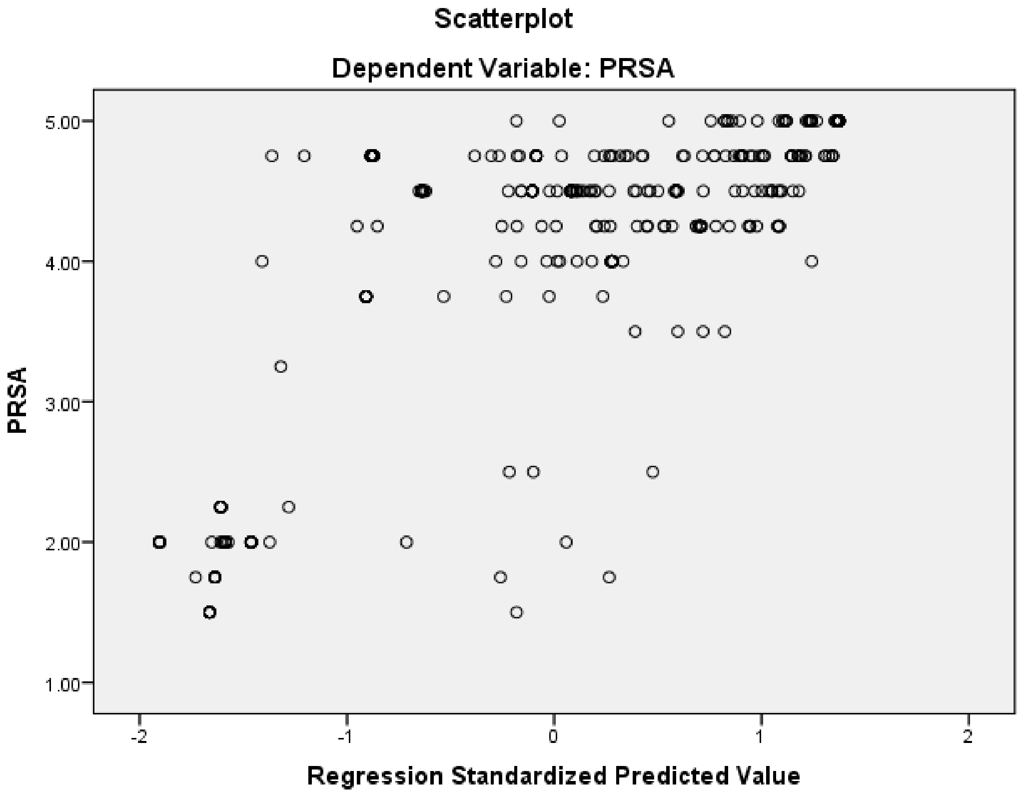

Figure 4.12: Homoscedasticity for data distribution

Source: Research Data, 2022

4.10 Correlation Analysis

The Pearson correlation coefficient approach is used to determine both the nature of the linear relationship that exists between the variables under study and the degree to which they are correlated with one another. According to Gogtay and Thatte (2017), the word "correlation" refers to a phrase that is used to define the relationship that exists between two or more quantitative variables. It also evaluates the extent and magnitude of the connection between the variables, in addition to determining the direction in which the connection points. The value of the coefficient, which indicates whether there is a positive or negative correlation, can range from -1 to +1. This implies that the association may be positive or negative. For the purpose of determining the nature of the connections that exist between the various elements of this investigation, Pearson's correlation was applied.

Table 4.17 show a high positive significant correlation between perceived retirement savings adequacy and financial sophistication $(\rho = .747, p = .000)$, also perceived retirement savings adequacy correlates with financial literacy and institutional factors with their respective coefficients $\rho = .674\ (p = .000)$ and $\rho = .558\ (p = .000)$. It indicates that for an employee of public university in Kenya to have adequate savings during retirement, he/she must be financially literate, sophisticated and also the institution they are working for enhances their retirement savings. Financial sophistication highly correlates with financial literacy at $\rho = .852\ (p = .000)$. It also correlated institutional factors $(\rho = .557\ (p = .000)$. Age, gender, experience, education level, job cadre and terms of Service did not show any significant correlation with other covariates.

Table 4.18: Pearson Correlation Coefficients

		PRSA	Gender	Age group	Experience	Education	Cadre	T. Service	FS	FL	IFS
PRSA	Pearson Correlation	1									
	Sig. (2-tailed)										
Gender	Pearson Correlation	.051	1								
	Sig. (2-tailed)	.323									
Age group	Pearson Correlation	-.004	.048	1							
	Sig. (2-tailed)	.930	.353								
Experience	Pearson Correlation	-.128*	-.044	.048	1						
	Sig. (2-tailed)	.012	.396	.346							
Education	Pearson Correlation	-.082	-.086	.077	.130*	1					
	Sig. (2-tailed)	.108	.093	.131	.011						
Cadre	Pearson Correlation	.095	-.082	.006	.010	.028	1				
	Sig. (2-tailed)	.064	.107	.907	.843	.586					
Terms of Service	Pearson Correlation	.044	.060	-.048	.016	-.054	.066	1			
	Sig. (2-tailed)	.396	.238	.353	.760	.296	.195				
FS	Pearson Correlation	.747**	.023	.043	-.128*	-.086	.062	.005	1		
	Sig. (2-tailed)	.000	.653	.399	.012	.093	.224	.919			
FL	Pearson Correlation	.674**	.003	.007	-.138**	-.064	.072	.014	.652**	1	
	Sig. (2-tailed)	.000	.956	.896	.007	.210	.162	.778	.000		
IFS	Pearson Correlation	.558**	.009	-.045	-.172**	-.066	.024	-.060	.557**	.585**	1
	Sig. (2-tailed)	.000	.866	.377	.001	.196	.636	.241	.000	.000	

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Source: Research Data, 2022

4.11 Model Estimation and Hypothesis Testing

Assumptions of multivariate linear regression, including linearity, normality, multicollinearity, and homoscedasticity, were met, and the study adopted a hierarchical regression model to test the effect of the covariates (controls variables) in the study and all direct effect hypotheses. Additionally, a multiple regression model was developed using Hayes (2018) Model 1 for the moderation effect of institutional factors, Model 4 to test for mediation, and Hayes Model 14 to test mediated moderation.

4.11.1 Direct Effects (Hierarchical Regression Model)

Before testing the direct effect hypotheses, the effect of the control variables in this study was examined. This was accomplished through the use of hierarchical regression analysis, as shown in Table 4.18. The effect of control variables on the dependent variable is depicted in the first model of the table. At the 5% significance level, gender, age, education level, cadre, and length of service had no effect on perceived retirement savings adequacy. The only control variable found to influence perceptions of adequate retirement savings was experience (p-value =.02). In the model summary, a modest R-square of 0.034 indicates that 3.4% of the variance in retirement savings adequacy can be explained by the control variable. The analysis of variance (ANOVA) revealed significant F-statistics ($F = 2.186$, $P > F = .044$), indicating model fitness and indicating that the results can be meaningfully interpreted.

The study examined how the R-square changed when the independent, mediating, and moderating variables were added hierarchically to the equation. When financial literacy was added to the model (model 2), the R-square increased from.428 to.462, indicating a significant effect of financial literacy in explaining variation in perceived retirement savings adequacy of approximately 46.2%. In addition, financial literacy had a positive direct effect on the perception of adequate retirement savings (=.664, p=.000). When added to the regression equation, Model 3 reveals the impact of financial sophistication. At =.631 (p=.000), the relationship between financial sophistication and perceived retirement savings adequacy was positive and significant. The coefficient of determination (R square) increased to 0.570 when model fitness (F-statistic) was significant. The final section of the tables (model 4) provides a summary of the findings when all variables were added in a hierarchical fashion. These variables increased the R-square from to 0.595, indicating that institutional factors play a significant role in explaining retirement savings adequacy. The adequacy of retirement savings is significantly influenced by institutional factors (=.198, p=.00005).

Model 1: Testing the Direct Effects

PRSA = $\beta_0 + \beta_1 c_1 + \beta_2 c_2 + \beta_3 c_3 + \beta_4 FL + \varepsilon$…………………………………….3.5

PRSA =Retirement Planning Saving adequacy

$C_1 - C_3 =$ controls, ε = error term, β1… β3= the slope/coefficients

Table 4.19: Direct Effects (Hierarchical regression Model)

Variables	**Model 1** Coeff. (β)	**Model 2** Coeff. (β)	**Model 3** Coeff. (β)	**Model 4** Coeff. (β)
Gender	.046(.372)	.048(.245)	.037(.278)	.036(.275)
Age	.005(.922)	-.006(.868)	-.031(.364)	-.020(.547)
Experience	-.120*(.020)	-.031(.416)	-.026(.452)	-.009(.788)
Education	-.064(.214)	.031(.422)	-.010(.764)	-.008(.803)
Cadre	.099(.052)	.051(.187)	.048(.162)	.050(.133)
T. of service	.643(.521)	.026(.492)	.031(.360)	.045(.179)
FL	-	.664**(.000)	.129*(.048)	.052(.429)
FS	-	-	.631**(.000)	.588**(.000)
IF	-	-	-	.198**(.000)
R^2	.034	.462	.570	.595
Adj. R^2	.018	.452	.561	.585
ΔR^2	.034	.428	.108	.025
F- statistic	2.186	45.958	61.924	60.793
P>F	.044	.000	.000	.000

Source: Research Data, 2022

4.11.2 Mediation Analysis (Hayes Model 4)

The study utilized Hayes model 4 in Process-Macro to examine the mediating effect of financial sophistication on the relationship between financial literacy and perceived retirement sufficiency. The hypothesis is that financial sophistication can transmit the causal effect of financial literacy to adequate retirement savings. A financially literate employee influences an individuals' financial sophistication level, which in turn influences the retirement savings adequacy. By analyzing the collected data, the study addressed this query. According to Barron and Kenny (2012), in mediation analysis, the effect of the independent variable (FL) on the dependent variable (PRSA) is referred to as the total effect, which is then divided into a combination of a direct effect of independent variable on dependent and an indirect effect of independent variable on dependent variable via mediating variable (FS).

Table 4. 20: Mediation Analysis (Hayes Model 4)

Variables		**M(Financial Sophistication) Coef. (SE)**	**95% CI**		**Y(Retirement Savings Adequacy) Coef. (SE)**	**95% CI**
Financial Literacy (X)	β_1	.806***(.026)	.756, .857	β_2	.141**(.067)	.010, .272
Financial Sophistication (M)		-	-	β_3	.686**(.070)	.548, .825
Constant	α_1	.739***(.099)	.544, .935	α_2	.904**(.146)	.616, 1.191
\		$R^2 = .7252$ F=1002.984 p=.000			$R^2 = .5638$ F=244.920 p< .000	

	Index	SE (Boot)	Boot 95% CI
Mediation of FS	.556	.061	.436, .680

Note: Coef.. = coefficient, SE = standard error, CI = confidence interval.95% confidence interval for conditional direct and indirect effect using bootstrap.*p <0.10; **p <0.05 ***p <0.01.

Despite being widely used, mediation analysis has frequently been challenged for its effects on causal mediation. Researchers can often randomize only one of the three variables in the mediation hypothesis, making mediation a complete method. The independent and dependent variables' causal relationships are not supported by the randomization of the independent variable. By using recent statistical advancements in causal mediation research, MacKinnon and Pirlott (2015) solved these constraints. The same participant may typically take part in both the experimental and control conditions in within-subjects designs.

Table 4.19 demonstrates a positive and significant relationship between financial literacy and the financial sophistication (=0.806, p=.000). This connection is known as path 'a'. Financial literacy (FL) and PRSA have a positive and statistically significant relationship (=.141,p=.035), as suggested by path c' in mediation analysis by Zhao *et al*. (2010). Barron and Kenney (2012) and Zhao *et al.* (2010) reported that the effect of FS on PRSA was positive and statistically significant (=.686, p=.000) along path 'b'. According to Zhao *et al.* (2010), the significance of the path ab indicates a mediation effect. In this study, the coefficient of.5536 was significant because the bootstrap confidence interval did not contain zero, i.e., the bootstrap lower limit confidence interval (bootLLCI) was positive (.4356) and the bootstrap upper limit confidence interval (bootULCI) was positive (.6795). Since the bootstrap standard error was.0610 and the coefficient is.5536, the t-statistic can be obtained by dividing the coefficient by the standard error:.5536/.0610 = 9.075>1.96. We conclude that FS acted as a mediator in the relationship between FL and the PRSA. The bootstrap method is a resampling technique used to estimate population statistics by replacing samples in a dataset. It can be utilized to estimate summary statistics like the mean and standard deviation (Hesterberg, 2011). Bootstrap methods can be significantly more precise than conventional inferences based on the Normal or t distribution.

4.11.3 Moderation Analysis (Hayes Model 1)

Results presented in Table 4.20 are for the moderation analysis. The study adopted moderation technique suggested by (Hayes, 2012). Moderating variable according to Memon *et al*. (2019) can be enhancing, buffering, or antagonize the relationship between the predictor variable and the outcome variable. If the moderator variable is significant, it can cause an amplifying or weakening effect between the dependent and independent variables (Memon *et al.,* 2019). The effect of a moderator can be shown via the interaction of an independent and moderating variable (Lee *et al* 2015). Results indicate that the interaction between financial sophistication and institutional factors was negative and significant ($\beta = -.549, p = .000$). The relationship between financial sophistication and perceived retirement saving adequacy was negative and significant and introduction of institutional factors reverses the relationship, therefore study concludes that an institutional factor weakens the employees' retirement savings adequacy.

Table 4. 21: Moderation Analysis (Hayes Model 1)

		Y(Retirement Savings Adequacy)	
Variables		**Coef. (SE)**	**95% CI**
Financial Sophistication (M)	β_1	2.858***(.230)	2.405, 3.312
Institutional factor (W)	β_2	2.498*** (.233)	2.039, 2.957
Interaction (M*W)	β_3	-.549*** (.058)	-.662, -.435
Constant	α_0	-8.329***(.897)	-10.093, -6.565
		$R^2 = .6678$	
		$\Delta R^2 = .0802$	
		F=253.3294	
		P= .000	

Note: Coef.. = coefficient, SE = standard error, CI = confidence interval.
95% confidence interval for conditional direct and indirect effect using bootstrap.
**p* <0.10; ***p* <0.05; ****p* <0.01.
Source: Research Data, 2022

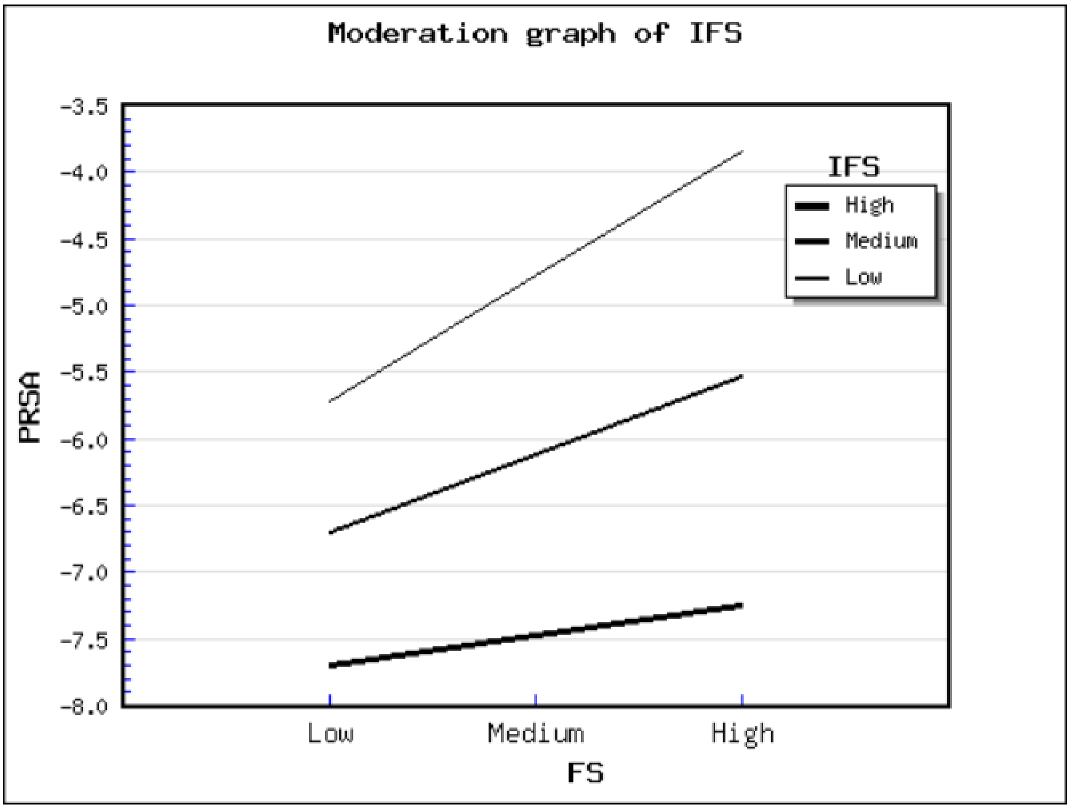

Figure 4.13: Modgraph for the moderating effect of Institutional Factors (IF) on the relationship between financial sophistication (FS) and Perceived Retirement Saving Adequacy (PRSA)

According to figure 4.13, when perceived retirement savings adequacy is optimum, then financial sophistication is high while institutional factors is low. The null hypothesis that there is no significant moderating effect of institutional factors on the relationship between financial sophistication and perceived retirement saving adequacy among university employees in Kenya was rejected. It was concluded that institutional factors moderates the relationship between financial sophistication and perceived retirement saving adequacy. This view is supported by the regression results of significant and of ($\beta = -.549, p = .000$).The place of institutional factors cannot be overemphasized since financial intermediaries are tasked with the responsibility of safe guarding retirement savings. These institutions affect the perception of the adequacy of retirement savings which means that people who feel adequate trust that the financial intermediaries that manage their pensions will perform their part of their contractual obligations of releasing their pensions upon retirement. Though, in this case the relationship is significant and negative which further means that institutional factors reverses the relationship between financial sophistication and perceived retirement saving adequacy. The reason may be that most financial intermediaries have experienced institutional failures, non-remittance problems and financial difficulties in the education sector. This may explain reasons for the negative effects, which means that most public university employees have low trust on institutions that manage pensions.

4.11.4 Moderated Mediation (Hayes Model 14)

The financial literacy had a significant impact on perceived retirement savings adequacy in the direct model. The study further found that financial sophistication enhanced retirement savings adequacy. However, institutional factors as a moderator reversed the relationship. Nevertheless, the study investigated the significant influence of financial literacy on perceived retirement savings adequacy via financial sophistication together with institutional factor. The study found mixed findings. That is financial sophistication positively mediated the relationship but after introduction of institutional factors to act as a moderator, the relationship was antagonized. Table 4.21 indicate that FS significantly impacted PRSA (β =2.851, p=0.000). The moderator also had a positive impact on PRSA (β =2.494, p=0.000). The interaction between FS and IF (FS*IF) weakened the relationship (β =-.5485, p=0.000).

The moderated mediation further was negative and significant. This is because the bootstrap lower limit confidence interval (BootLLCI) and bootstrap upper limit confidence interval (BootULCI) was nonzero or using other method where t-value can be calculated as -.4423/.0437 = 10.12 which is greater than 1.96 at 5 percent level of significance. Thus, the research concludes that since FS positively mediated the relationship but institutional factors though significant reversed the relationship. The negative moderated mediation was caused by the strong negative impact of institutional factors

Table 4.22: Moderated Mediation (Hayes Model 14)

		M(FS)			**Y(PRSA)**	
Variables		**Coef. (SE)**	**95% CI**		**Coef. (SE)**	**95% CI**
Financial Literacy (X)	β_1	.806*** (.025)	.756, .856	β_2	.006(.0606)	-.113, .125
Financial Sophistication (M)		-	-	β_3	2.851**(.241)	2.377, 3.326
Institutional factor (W)		-	-	β_4	2.494** (.058)	2.029, 2.9595
M*W		-	-	β_5	-.549** (.058)	-.662, -.4348
Constant	α_1	.739***(.099)	.544 .935	α_2	-8.318**(.904)	-10.096,-6.5402
		$R^2 = .7252$ F=1002.9845, P=.000			$R^2 = .6678$ F=189.5018 P= .000	
		Index	SE (Boot)			Boot 95% CI
Index of moderated mediation		-.4423	.0437			-.5324 -.3607

Note: Coef.. = coefficient, SE = standard error, CI = confidence interval.
95% confidence interval for conditional direct and indirect effect using bootstrap.
*p <0.10; **p <0.05; ***p <0.01.
Source: Research Data, 2022

4.12 Test of Hypotheses

There are Seven objectives in this study. The study's hypotheses were tested using regression analysis in order to achieve these objectives. The first, second, third, and fourth hypotheses concerning direct effects were tested. The fifth hypothesis was examined by means of mediation analysis (model 4 of Hayes, 2012). Model 1 (moderation) was used to test the sixth hypothesis, while model 14 (moderated mediation) was used to test the seventh hypothesis. These speculations were Financial literacy has no significant impact on perceived retirement savings adequacy among Kenyan university employees. The financial literacy of university personnel in Kenya has no effect on their financial sophistication, according to H_02. H_03: The financial sophistication of university employees in Kenya has no significant effect on their perceptions of their retirement savings. Institutional factors have no significant impact on the perception of adequate retirement savings among Kenyan university employees. Financial sophistication does not mediate the relationship between financial literacy and perceived adequacy of retirement savings among university employees in Kenya. The relationship between financial sophistication and perceived retirement savings adequacy among university employees in Kenya is not significantly moderated by institutional factors. Institutional factors do not moderate the indirect association between financial literacy and perceived retirement saving adequacy via financial sophistication among university employees in Kenya.

4.12.1 Financial literacy has no significant effect on perceived retirement saving adequacy among university employees in Kenya

The first hypothesis is H_01: financial literacy has no effect on perceived retirement savings adequacy among university employees in Kenya. According to Table 4.18, financial literacy had a statistically significant impact on retirement savings adequacy (=.664, p=.000). This indicates that the first hypothesis, H_01, that financial literacy has no effect on perceived retirement savings adequacy among university employees in Kenya was rejected, and that financial literacy significantly influences retirement savings adequacy.

4.12.2 Financial literacy does not affect financial sophistication among public university employees in Kenya

The second objective was to investigate the relationship between financial literacy and financial sophistication among Kenyan university employees. The study evaluated a hypothesis to determine whether financial literacy has influenced financial sophistication. According to Table 4.19, financial literacy had a positive and statistically significant effect on financial sophistication (=.8064, p=.000). The second hypothesis was therefore refuted at a significance level of 5% due to this significant effect. This confirms that financial literacy is a prerequisite for financial sophistication.

4.12.3 Financial sophistication does not have significant effect on perceived retirement saving adequacy among university employees in Kenya

One of the fundamental goals of this study was to determine the significant effect of financial sophistication, the mediating variable, on the perception of adequate retirement savings (the dependent variable). To accomplish this, a model was estimated, and the resulting data is presented in Table 4.19. The coefficient for the outcome is positive (=0.6864) and statistically significant at the 5% level (p=.000). This indicates that financial sophistication influences perceptions of retirement savings sufficiency. Thus, the third hypothesis H_03, that financial sophistication has no significant effect on perceived retirement saving adequacy among university employees in Kenya, was rejected, and it was concluded that financial sophistication plays a crucial role in influencing perceived retirement saving adequacy among university employees in Kenya.

4.12.4 There is no significant effect of institutional factors on perceived retirement saving adequacy among university employees in Kenya

The fourth objective was to investigate and comprehend the moderating effect of institutional factors on the direct effect of financial sophistication on the perception of adequate retirement savings. Prior to that, it would have been judicious to comprehend how the moderating variable affects the dependent. According to Table 4.20, institutional determinants have a significant effect on perceived retirement saving adequacy (=2.4979, p=0.000). Therefore, the null hypothesis H04 that institutional factors have no effect on the perceived adequacy of retirement savings among university employees in Kenya was rejected. This suggests that there is sufficient evidence to suggest that institutional factors influence the retirement savings adequacy of Kenyan university employees.

4.12.5 Financial sophistication does not mediate on the relationship between financial literacy and perceived retirement saving adequacy among university employees in Kenya

The other primary objective was to assess the mediating effect of financial sophistication on the relationship between financial literacy and perceived retirement savings adequacy. In mediation analysis, Zhao *et al.* (2010) suggest certain stages. Path 'a' demonstrates the relationship between financial literacy (independent variable) and financial sophistication (mediator). In this case, the results indicate that there is a positive and significant relationship between financial literacy and financial sophistication (=.8064, p=.000). Path 'b' occurs when the mediator (financial sophistication) influences the dependent (perceived retirement saving adequacy).

The effects of mediator on the dependent variable were found to be positive and statistically significant (=.6864, p=.000). The final path is 'c', in which the independent variable influences the dependent variable in the presence of the mediator. With a coefficient of =.1412 and a p-value of.0349, financial literacy was found to have a positive and statistically significant effect on perceptions of adequate retirement savings. According to Barron and Kenneth (2012) and Zhao *et al.* (2010), the significance of the path a*b indicates the effect of mediation. In this investigation, the 0.5536 coefficient was significant because the bootstraps confidence interval was nonzero (did not contain zero). The lower limit was 0.4356, and the upper limit was positive (0.6795). We conclude that financial sophistication mediated the relationship between financial literacy and perceived retirement savings adequacy.

4.12.6 There is no significant moderating effect of institutional factors on the relationship between financial sophistication and perceived retirement saving adequacy among public university employees in Kenya

The sixth objective was to assess the moderating effect of institutional factors on the association between financial sophistication and perceived retirement saving adequacy among university employees in Kenya. According to Table 4.20, the interaction between financial sophistication and institutional factors was negative and statistically significant (=-.549, p=.000). The relationship between financial sophistication and perceived retirement savings adequacy was positive and statistically significant; however, the introduction of institutional factors reverses this relationship, so the study concludes that an institutional factor diminishes the retirement savings adequacy of employees.

According to Barron and Kenney (2012), the purpose of a moderator is to either strengthen or diminish the direct relationship, and it is evident from this study that the relationship between financial sophistication and perceived retirement saving adequacy was weakened by the introduction of institutional factors. Therefore, it was concluded that institutional factors do not significantly moderate the relationship between financial sophistication and perceived retirement saving adequacy among university employees in Kenya.

4.12.7 Institutional factors do not moderate the indirect relationship between financial literacy and perceived retirement saving adequacy via financial sophistication among public university employees in Kenya.

The study examined the moderated mediation effects of institutional factors on the indirect relationship between financial literacy and perceived retirement saving adequacy via financial sophistication among university employees in Kenya. The relationship between financial literacy and perceived retirement savings adequacy was found to be non-significant. Secondly, the mediation effect of institutional factors on the association between financial literacy and perceived retirement saving adequacy was also significant. Third, the moderating effect of institutional variables was significant. The final result for the moderated mediation was found to be negative (=-0.4423) and significant (bootstrap confidence interval is non-zero) (see Table 4.21).

This indicates that the hypothesis H_07, that institutional factors do not moderate the indirect relationship between financial literacy and perceived retirement savings adequacy via financial sophistication among university employees in Kenya, cannot be supported.

4.13 Discussion of Findings

The research indicates that financial literacy has favorable and significant implications for the amount of money that can be saved for retirement. According to Kusairi et al. (2019), financial literacy is the capacity to understand how money works in the world. This includes the ability to comprehend how people earn or generate money, how they manage it, how they make it grow (convert it into more), and how they contribute it to support others. Greenspan (2002) also hypothesizes that financial literacy equips individuals with the necessary financial information to create household budgets, implement savings strategies, and make informed investment decisions. This idea is based on the concept that individuals with a basic understanding of finance are better positioned to make such decisions. According to Mwangi and Kihiu (2012), the appropriate application of this knowledge assists households in meeting their financial obligations through strategic planning and resource allocation to maximize utility.

Financial literacy can be acquired through increased education levels, which enable individuals to enhance their fundamental reading and numerical skills required to access financial information and enhance financial literacy. These findings are supported by Lin et al. (2017) and numerous other authors who demonstrate that financial literacy positively impacts retirement planning. An individual's level of financial literacy correlates directly with their engagement in retirement planning. A connection exists between the extent of financial knowledge and activities in the financial sector, potentially leading to long-term consequences (Bucher-Koenen & Lusardi, 2011; Niu et al., 2020).

However, several studies (Noone et al., 2010; Almenberg & Save-Soderbergh, 2011; Aluodi et al., 2017; Farrar et al., 2019; Niu et al., 2020) suggest that higher education levels do not necessarily impact retirement planning, regardless of an individual's level of financial literacy. Nevertheless, financial literacy remains a crucial aspect of retirement planning highlighted in various studies. Based on prior research (Boisclair et al., 2017; Ricci & Caratelli, 2017; Kalmi & Ruuskanen, 2018; Larisa et al., 2020), a specific type of financial literacy significantly influences retirement planning in advanced economies.

In the context of retirement planning, an individual's level of financial literacy plays a pivotal role in understanding financial products that support investments suitable for retirement. This "financial literacy" entails familiarity with diverse financial products and services available in the market, leading to better financial decisions (Altman, 2012). Having valuable information is a key aspect of financial literacy (Lusardi & Mitchell, 2007), enhancing people's ability to analyze information and make informed investment choices.

Mounting evidence suggests that financial outcomes during retirement significantly improve with enhanced financial literacy (Lusardi & Mitchell, 2007). Financial literacy encompasses understanding economic concepts, effectively communicating financial ideas, managing personal finances, making sound financial decisions, and confidently preparing for future financial needs (Remund, 2010).

Moreover, various factors including financial considerations, psychological factors, personal traits, and entrepreneurial intensity significantly affect employees' retirement intentions (Rono et al., 2021). Trust in institutional characteristics moderates the relationship between financial sophistication and perceived retirement fund sufficiency. Trust plays a role in government institutions, commercial intermediaries, and other components that shape the retirement system.

In conclusion, your text discusses the influence of financial literacy on retirement planning and outcomes. It highlights the correlation between financial knowledge and effective retirement planning, considering factors such as education, institutional trust, and psychological aspects. The research underscores the importance of understanding financial concepts to make informed decisions about retirement and savings.

4.14 Summary of Models and the Parameters Used

Table 4.23: Summary of Models and the Parameters Used

Hypothesis	Statement	Method	Test statistic	Decision
H_{01}:	Financial literacy has no significant effect on perceived retirement saving adequacy among university employees in Kenya.	Direct Effects (Hierarchical regression Model)	β=.664 p=.000	Null hypothesis rejected
H_{02}:	Financial literacy does not affect financial sophistication among university employees in Kenya.	Indirect effects(Mediation analysis, Hayes model 4	β=.8064 p=.000	Null hypothesis rejected
H_{03}:	Financial sophistication does not have significant effect on perceived retirement saving adequacy among university employees in Kenya.	Indirect effects(Mediation analysis, Hayes model 4)	β=.686 p=.000	Null hypothesis rejected
H_{04}:	There is no significant effect of institutional factors on perceived retirement saving adequacy among university employees in Kenya.	Indirect effects(Moderation analysis, Hayes model 1)	β=2.498 p=.000	Null hypothesis rejected

H_{05}:	Financial sophistication does not mediate on the relationship between financial literacy and perceived retirement saving adequacy among university employees in Kenya.	Indirect effects(Mediation analysis, Hayes model 4)	β=.554 nonzero bootstraps confidence limit	Null hypothesis rejected
H_{06}	There is no significant moderating effect of institutional factors on the relationship between financial sophistication and perceived retirement saving adequacy among university employees in Kenya.	Indirect effects(Moderation analysis, Hayes model 1)	β=-.549 p=.000	Null hypothesis rejected
H_{07}:	Institutional factors do not moderate the indirect relationship between financial literacy and perceived retirement saving adequacy via financial sophistication among university employees in Kenya.	Indirect effects(Moderated Mediation analysis, Hayes model 14)	β=-.442 nonzero bootstraps confidence limit	Null hypothesis rejected

Source: Research Data, 2022

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

5.1 Introduction

This chapter presents a summary of this study's main empirical findings. It recommends different policy recommendations based on these results that could be adopted by university employees in Kenya. These policy recommendations could also be of benefit to policy makers' responsible advising university employees to make informed choices that would lead to enhancing their retirement savings. Finally, the chapter underlines the potential opportunities in this field of study for future studies.

5.2 Summary of Findings

The main objective of the study was to assess the moderating effect of institutional factors on the indirect relationship between financial literacy and perceived retirement saving adequacy as mediated by financial sophistication among public university employees in Kenya. The study used an explanatory research design and a structured questionnaire was administered to public university employees.

Results indicated that three hundred and eighty two (n=382) questionnaires administered were correctly filled and returned, eight (8) were dropped due to the respondents' inability to respond to the questions translating to a response rate of 96.71%. The gender distribution of respondents shows that majority were male with a 57.3%, (n= 219), while female was represented by 42.7%, (n= 163). Age wise, majority (n = 135, 35.3%) were in the age cohort of 36-45 years while the cohort of 26-35 years were (n = 114, 29.8%). Majority had experience between 15-20 years at 36.9% followed by those with experience above 20 years at 36.1%.

On reliability of constructs, the perceived retirement savings adequacy had Cronbach alpha .910 and 9.19 after items have been standardized. Financial literacy and financial sophistication each had reliability of .968 and .855 respectively. Further, they have become more reliable after items have been standardized especially for financial literacy. Institutional factor had an average reliability of .705 and .738 before and after standardization. Principle component analysis was used in factor analysis. Each construct was factored and those met the criterion were retained.

There was high and significant correlation between perceived retirement savings adequacy and financial sophistication ($\rho = .747, p = .000$), also perceived retirement savings adequacy correlates with financial literacy and institutional factors with their respective coefficients $\rho = .674$ ($p = .000$) and $\rho = .558$ ($p = .000$). Results indicate that for an employee of public university in Kenya to have adequate savings during retirement, they must be financially literate, sophisticated and also the institutional factors that is where they save for retirement enhances their savings. Financial sophistication highly correlates with financial literacy at $\rho = .852$ ($p = .000$). Financial sophistication also correlates with institutional factors ($\rho = .557$ ($p = .000$). Age, gender, experience, education level, job cadre and terms of Service did not show any significant correlation with other covariates. All the hypotheses were tested and results were significant. This implies that all the seven hypotheses were rejected at 5 percent level of significance.

5.2.1 Financial literacy and perceived retirement savings adequacy

The presented results demonstrate a positive and statistically significant effect of financial literacy on retirement savings adequacy (β=.664, p=.000). This finding suggests that university staff members who possess a good understanding of financial matters tend to have higher confidence in the adequacy of their retirement savings.

This result aligns with the findings of Mullock and Turcotte (2012), who also observed that individuals with financial literacy tend to be more confident about their retirement preparations. Financial literacy, in the context of this study, refers to basic knowledge of financial matters, as defined by the Financial Security Department (FSD) in 2009. According to the FSD, financial literacy involves an individual's capacity to make sound financial decisions and judgments that contribute to both immediate and long-term financial security.

In essence, the level of financial literacy can significantly impact one's financial security, not only in the present but also in the future, thereby enhancing overall financial well-being. Hence, it can be concluded from these results that financial literacy plays a crucial role in influencing the perceived adequacy of retirement savings among public university staff.

5.2.2 Financial Literacy and Financial Sophistication

The study's second objective was to examine the impact of financial literacy on financial sophistication among public university employees in Kenya. The results indicate a positive and statistically significant relationship between financial literacy and financial sophistication (β=.8064, p=.000). This suggests that individuals who are financially literate are more likely to exhibit financial sophistication.

Financial sophistication, in this context, is defined as a household's ability to make informed and wise financial decisions, as noted by Huston (2012). On the other hand, financial literacy refers to an individual's understanding of fundamental financial concepts and practices. The findings of this study support the idea that being financially literate is a precursor to becoming financially sophisticated.

Financial sophistication is associated with making sound financial decisions and an increased likelihood of accumulating wealth, as highlighted by research conducted by Calvet (2009) and Kim et al. (2015). These findings are consistent with those of Lusardi et al. (2014), who also observed a positive correlation between financial literacy and financial sophistication. Therefore, it can be concluded that financial literacy plays a pivotal role in shaping financial sophistication among public university employees in Kenya

5.2.3 Financial sophistication and Perceived retirement savings adequacy

The third objective of this research aimed to investigate the significant effect of financial sophistication as a mediating variable on perceived retirement saving adequacy, which is the dependent variable. The results indicate that financial sophistication has a positive and statistically significant influence on perceived retirement saving adequacy (β=.6864, p=.000). This suggests that financial sophistication plays a crucial role in shaping how public university employees in Kenya perceive the adequacy of their retirement savings.

These findings are in line with previous research conducted by Kim and Hanna (2013 & 2015) in the USA, which also emphasized the importance of financial sophistication in retirement preparedness. Household financial sophistication is associated with a greater sense of adequacy in retirement income. This is because financial sophistication reflects an individual's ability to make informed and wise financial decisions, which can contribute to a more secure retirement.

In summary, the results of this study affirm that financial sophistication has a significant impact on how public university employees in Kenya perceive the adequacy of their retirement savings. Those with higher levels of financial sophistication are more likely to feel confident about their retirement income.

5.2.4 Institutional Factors and Perceived Retirement saving Adequacy

The results reveal that institutional factors have a significant effect on perceived retirement saving adequacy, with a coefficient of $\beta=2.4979$ and $p=0.000$. This implies that institutional factors indeed play a substantial role in shaping public university employees' perceptions of the adequacy of their retirement savings in Kenya.

This finding aligns with the idea that trusts in financial intermediaries and an institution is a crucial aspect of evaluating the perception of retirement savings adequacy. Financial contracts and relationships between individuals and financial service providers are heavily reliant on the level of confidence that individuals have in these institutions (Guiso et al., 2004). Therefore, the study's results support the notion that institutional factors significantly influence how individuals perceive the adequacy of their retirement savings.

This understanding of the impact of institutional factors on perceived retirement saving adequacy sets the stage for exploring how these factors moderate the relationship between financial sophistication and retirement savings adequacy, which was the fourth objective of the study.

5.2.5 Financial sophistication mediating effect on the relationship between Financial Literacy and Perceived Retirement Saving Adequacy

The fifth objective of this study aimed to examine the significant mediating role of financial sophistication in the relationship between financial literacy and perceived retirement saving adequacy. This analysis typically involves three steps, as outlined by Zhao et al. (2010).

The first step is to establish path 'a,' which represents the effect of financial literacy (the independent variable) on financial sophistication (the mediator). The results indicate that there is a positive and significant relationship between financial literacy and financial sophistication ($\beta=0.8064$, $p=0.000$). This suggests that individuals who are more financially literate tend to be more financially sophisticated.

The second step involves establishing path 'b,' which examines whether the mediator (financial sophistication) affects the dependent variable (perceived retirement saving adequacy). Results show that the effect of the mediator on the dependent variable is positive and significant ($\beta=0.6864$, $p=0.000$). This finding confirms that financial sophistication plays a mediating role in the relationship between financial literacy and perceived retirement saving adequacy.

The last step, path 'c,' assesses whether the independent variable (financial literacy) still has a direct effect on the dependent variable (perceived retirement saving adequacy) in the presence of the mediator. The results indicate that financial literacy also has a positive and significant direct effect on perceived retirement saving adequacy, with a coefficient of $\beta=0.1412$ ($p=0.0349$).

To confirm the mediation effect, researchers often look at the product of the coefficients from paths 'a' and 'b,' known as the indirect effect (a*b).* In this study, the coefficient of ab is 0.5536, and it was found to be significant because the bootstrap confidence interval did not include zero. The bootstrap lower limit was 0.4356, and the bootstrap upper limit was positive (0.6795). This confirms that there is indeed an indirect relationship between financial literacy and perceived retirement saving adequacy, mediated by financial sophistication.

In summary, the study's results indicate that financial sophistication plays a significant mediating role in the relationship between financial literacy and individuals' perceptions of retirement saving adequacy.

5.2.6 The moderating effect of institutional factors on the relationship between financial sophistication and Perceived Retirement Savings Adequacy

The sixth objective of this research aimed to examine the moderating effect of institutional factors on the relationship between financial sophistication and perceived retirement saving adequacy among public university employees in Kenya. The results of this analysis indicate an important and interesting finding.

The interaction between financial sophistication and institutional factors was found to be negative and significant (β=-0.549, p=0.000). This means that the relationship between financial sophistication and perceived retirement saving adequacy changes when institutional factors are introduced. Specifically, institutional factors reverse the previously positive and significant relationship between financial sophistication and perceived retirement saving adequacy. In simpler terms, the presence of institutional factors weakens the perceived retirement savings adequacy of public university employees.

This finding aligns with the idea that institutions have a significant impact on individuals' financial decisions and saving behavior. Institutions can either legitimize or constrain the actions of individuals, as noted by Mueller et al. (2014). Trust in the institutions responsible for handling pension savings is crucial in determining individuals' perceived retirement saving adequacy. Previous studies, such as the one mentioned by Van Dalen et al. (2010), have highlighted the importance of trust in financial systems that serve as a form of insurance to protect individuals' financial interests over time.

In this study, the negative moderating effect of institutional factors suggests that many public university workers may not trust the institutions tasked with safeguarding their retirement interests. This lack of trust in institutions could be attributed to previous institutional failures, issues related to non-remittances in the education sector, and financial challenges in government institutions. It underscores the critical role that institutions and trust play in individuals' perceptions of retirement saving adequacy.

In summary, institutional factors have a significant impact on the relationship between financial sophistication and perceived retirement saving adequacy among public university employees in Kenya, and the presence of these factors weakens the perceived adequacy of retirement savings. This finding highlights the need for attention to institutional trust and credibility in retirement savings systems and policies.

5.2.7 The moderating role of institutional factors on the relationship between financial literacy and perceived retirement saving adequacy as mediated by financial sophistication among public university employees in Kenya

The final objective of the study was to examine the mediated moderation effects of financial sophistication and institutional factors on the relationship between financial literacy and perceived retirement saving adequacy via financial sophistication among public university employees in Kenya. The results of this analysis revealed several important findings.

First, the study established that the relationship between financial literacy and perceived retirement saving adequacy was significant, indicating that individuals with greater financial literacy were more likely to perceive their retirement savings as adequate.

Second, the mediation effect of financial sophistication on the relationship between financial literacy and perceived retirement saving adequacy was also significant. This suggests that financial sophistication plays a role in mediating the impact of financial literacy on individuals' perceptions of retirement saving adequacy.

Third, the study found that institutional factors, which represent the economic environment in which individuals operate, had a significant moderating effect. This means that institutional factors influence the relationship between financial literacy, financial sophistication, and perceived retirement saving adequacy.

Lastly, the moderated mediation effect was found to be negative and significant. In other words, the presence of institutional factors weakened the indirect relationship between financial literacy and perceived retirement saving adequacy via financial sophistication.

These findings highlight the complex interplay of financial literacy, financial sophistication, and institutional factors in shaping individuals' perceptions of retirement saving adequacy. While financial literacy and financial sophistication are important factors, institutional trust and economic conditions also play a crucial role in influencing these perceptions.

The study underscores the need for policies and interventions that not only focus on improving financial literacy and sophistication but also address institutional trust and the economic environment in which retirement savings are managed. Trust in pension institutions and concerns about the security and longevity of financial intermediaries handling pension interests remain significant issues that can impact individuals' retirement planning and saving behavior.

In summary, the study's results suggest that the relationship between financial literacy and perceived retirement saving adequacy is mediated by financial sophistication and moderated by institutional factors. Understanding these dynamics can inform more effective strategies for promoting retirement savings adequacy among public university employees in Kenya.

5.3 Conclusions

Based on the findings, financial literacy, financial sophistications and institutional factors have a significant effect of retirement savings adequacy among public university employees in Kenya. The study concludes by alluding that being financially literate and sophisticated financially can influence your perception of the adequacy of retirement savings. The findings further showed that institutional setting matters and that institution may act as a moderator. In Kenyan public universities the levels of financial and pension literacy determines the financial literacy needs and the strategies need to be put in place to enhance pension literacy for a better retirement savings.

Financial literacy and perceived retirement saving adequacy have shown positive and significant results. Knowledge of financial matters exposes individuals to a broad range of financial products and services including awareness of financial education and financial concepts necessary to actualize savings and wealth accumulation. This will improve savings and investment since financial literacy will help households create budgets, initiate savings plans and make strategic decisions.

Studies have provided a link between financial literacy and good financial outcomes. Perceived retirement saving adequacy serves as a measure to evaluate one's feeling and confidence about their retirement savings. Therefore more retirement trainings and seminars should be encouraged so as to improve knowledge on financial products and services. This will in turn improve retirement savings and retirement confidence.

Financial literacy and financial sophistication resulted in a positive and significant relationship with perceived retirement saving adequacy. Financial literacy is basic knowledge of financial matters while financial sophistication is one’s ability to make prudent financial decisions and also one’s ability to avoid financial blunders. The study confirms this position that financial literacy leads to financial sophistication. The more literate one is, the more sophisticated they are and the better the financial decisions will be.

Financial sophistication is also positively and significantly related with perceived retirement savings adequacy. Financial sophistication is defined as one’s ability to make prudent and rational financial decisions. If one is able to make prudent financial decisions like savings and investment decisions then they are bound to feel better about the adequacy of retirement savings. Financial sophistication also reduces chances of financial mistakes which in turn improves overall financial wellbeing and the likelihood of engaging in good financial behaviors like savings, wealth accumulation and good investment practices.

More financial trainings and seminars should be encouraged in both government and private entities so as to improve financial abilities which in turn will improve financial behaviors which in turn will create a better perception on the adequacy of retirement savings.

Institutions setting influences and limits choices firms and individuals because institutional arrangements may either legitimize or constraint the actions and individuals. Institutional factors were operationalized through three major constructs namely government pension schemes, employers individual pension schemes and banks and insurance companies. Institutional factors moderated the model and resulted in a negative and significant relationship. Institutional factors have reversed the relationship between financial sophistication and perceived retirement savings adequacy. This means that public university employees have a poor perception about institutions that are tasked with managing pensions both at national and institutional level.

Therefore there is need for more reforms to ensure pension institutions are managed better and operate within set guidelines. This will reduce institutional failures and will increase retirement savings which in turn will improve perceptions about saving for retirement. Also, there is emphasis on savings for retirement through the national social security fund (NSSF) whereby the government recommended that more people are issued with fund numbers so as get as many people as possible saving for their retirement. There are also suggestions to allow for mobile payments to the fund and more retirement products and services that will cover entrepreneurs and the private sector.

5.4 Recommendations

Based on the findings, the study has several recommendations and implications which can be broadly grouped into managerial, policy and theoretical implications.

5.4.1 Policy and Practical Recommendations

The government plays a central role in promoting retirement savings adequacy among public university employees and the wider population. Governments should invest in financial literacy programs, both for employees and the general public. These programs should focus on prudent financial decision-making, with a particular emphasis on retirement savings and investment choices. Integration into the standard curriculum, regular training sessions, and retirement seminars are essential components. The government as a regulator must ensure that institutions responsible for managing pensions are efficient, transparent, and responsive. Prompt processing of pension deductions, corporate governance mechanisms, and policies to safeguard operations are crucial. Trust in these institutions is vital for encouraging retirement savings.

The government as a regulator must establish a strong legal framework to oversee financial intermediaries, including mechanisms for addressing customer complaints and responsiveness to customer needs. This enhances trust in financial intermediaries.

The government through its budgeting may also increase budgetary allocations to the pension industry, such as the National Social Security Fund (NSSF), to ensure its long-term viability and sustainability. A thriving pension sector encourages retirement savings and confidence in these institutions.

The government can also oversee the introduction of savings plans tailored to different segments of the economy, including government employees, the self-employed, and the private sector. Enforce regulations that facilitate voluntary incremental deductions for employees to enhance retirement savings.

The government can oversee the Expansion in the range of financial instruments and products available to different sectors of the economy. Providing diverse options allows individuals to optimize their retirement savings and investments.

By taking these actions, governments can contribute significantly to improving retirement savings adequacy, ensuring financial security for their citizens, and promoting overall economic well-being

5.4.2 Managerial Implications

The study's findings indeed offer valuable insights into the importance of retirement savings and how they can be improved, particularly for public university employees in Kenya. The government through legislation can support and implement government initiatives aimed at enhancing retirement savings. Measures like doubling government contributions and revising monthly contributions based on income can substantially improve savings for retirement. This can also be achieved by increasing deductions to the Social Security Fund. The government as well as the university's pension schemes may conduct awareness campaigns to ensure pensioners are well-informed about their contributions and retirement savings. It's essential for individuals to understand their savings and feel comfortable with their retirement plans. If necessary, provide educational resources and counseling to assist with retirement planning. This can also be achieved by doing retirement counseling to pre retirees to encourage knowledge on different pension products thus improving attitudes on the adequacy of retirement funding.

The government and employers pension schemes may consider increasing monthly deductions for public university employees' retirement savings through the National Social Security Fund (NSSF) or other pension schemes. Higher contributions can lead to more substantial retirement funds and increased retirement confidence.

The government and the managers of university's pension schemes may ensure that institutional pension schemes within public universities are managed with integrity and efficiency. Appoint individuals of high moral standing to oversee these institutions and ensure timely remittances to retirees. This will build trust in the pension system and improve perceptions of retirement savings adequacy.

The government can further hold financial intermediaries dealing with pensions accountable for good business practices. This can be achieved through effective board oversight and regulatory mechanisms that minimize institutional failures and protect retirement savings.

Implementing these recommendations can contribute to a more secure and confident retirement for public university employees in Kenya and, potentially, for the wider population. It's crucial to prioritize retirement savings adequacy as part of the broader efforts to enhance financial well-being and social security.

5.4.3 Theoretical Implications

The application of motivational theories, such as expectancy theory in retirement savings and financial behavior is highlighted by how theory can be used to understand the link between financial behavior (retirement savings) and the expected outcome (feeling adequate about retirement savings). Financial literacy and financial sophistication play a crucial role in influencing this relationship, supporting the theory's premise that individual beliefs about the effort-to-performance-to-outcome relationship impact their motivation.

The life cycle theory is another relevant framework, especially when analyzing retirement savings behavior. It provides a structured way to understand how individuals save throughout their working lives to support their retirement. The findings of this study align with this theory, as public university employees with defined contribution plans are essentially following this life cycle model by accumulating savings during their working years to use in retirement. However, it's worth noting that, the theory should consider the impact of perceptions on retirement adequacy in addition to savings behavior.

Prospect theory's focus on decision-making processes and psychological factors like risk aversion and loss aversion also provides valuable insights into retirement savings behavior. The choice between current consumption and saving for the future, especially in the context of risky investments, aligns well with the principles of this theory.

Symbolic interaction theory's emphasizes on subjective aspects and perception of human behavior. The study's findings suggest that how individuals perceive their retirement savings can influence their financial behavior. This highlights the importance of addressing not just the financial aspects of retirement planning but also the psychological and perception-related factors. The theories create an understanding of how perceptions about retirement savings adequacy translate into specific financial behaviors can provide deeper insights into retirement planning and help design more effective financial education and intervention programs.

5.5 Contribution of the study

Previous studies on retirement savings in the Kenyan context have focused on post retirees. This study assessed the perceived retirement saving adequacy of pre retirees who in this case are public university employees. Most studies have also examined actual retirement savings, this study focused on the subjective aspects of retirement savings. The findings of the study suggest that financial literacy, financial sophistication and institutional factors have a significant impact on perceived retirement saving adequacy. The study contributes to Victor Vrooms theory of motivation that links particular behaviors to certain outcomes. Public university workers will likely engage financial literacy programs and retirement savings plans if they feel like such actions will result in a comfortable retirement. The study results also improves on the dimension of life cycle hypothesis that individuals will save during their active work life to later utilize the same over their retirement. The motivation for saving for retirement is achieve a comfortable retirement.

The study findings suggest that the Government as a custodian of social security funds and the overall regulator for the public sector should increase voluntary savings to improve on retirement savings. They may also check on the operations of pension schemes to reduce on institutional failures and ensure prudent management of pension funds.

5.6 Limitations and Suggestions for Further Research

The study under review examined the perceptions of public university staff about their adequacy of their retirement savings. This is a subjective assessment of one's retirement savings which may or may not be true. Therefore, further studies can assess the actual retirement savings and check their adequacy as compared to future consumption. The study was also limited to public university staff who are majorly members of defined contribution schemes, therefore research can be done for other sectors in our economy who may or may not have a defined contribution scheme.

Further research should link perceptions to financial behavior since this study focuses on perceptions on the adequacy of retirement savings.

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APPENDICES

APPENDIX I: ANTI- IMAGE

Anti-image Matrices

		FL1	FL2	FL3	FL4	FL5	FL6
Anti-image Covariance	FL1	.145	-.046	.021	.022	.045	-.034
	FL2	-.046	.121	-.046	.001	-.022	-.006
	FL3	.021	-.046	.126	.015	.064	-.035
	FL4	.022	.001	.015	.130	-.016	-.034
	FL5	.045	-.022	.064	-.016	.166	-.041
	FL6	-.034	-.006	-.035	-.034	-.041	.031
Anti-image Correlation	FL1	.869[a]	-.351	.159	.162	.292	-.510
	FL2	-.351	.926[a]	-.373	.004	-.158	-.093
	FL3	.159	-.373	.833[a]	.115	.441	-.561
	FL4	.162	.004	.115	.913[a]	-.108	-.533
	FL5	.292	-.158	.441	-.108	.827[a]	-.577
	FL6	-.510	-.093	-.561	-.533	-.577	.773[a]

a. Measures of Sampling Adequacy(MSA)

Anti-image Matrices

		FS1	FS2	FS3	FS4	FS5	FS6	FS7	FS8
Anti-image Covariance	FS1	.317	.141	-.040	.040	-.068	.019	-.013	.070
	FS2	.141	.713	.019	-.023	-.016	-.095	.009	-.120
	FS3	-.040	.019	.167	.004	.005	.072	-.035	-.065
	FS4	.040	-.023	.004	.089	.002	.028	-.035	.041
	FS5	-.068	-.016	.005	.002	.110	-.003	-.024	.050
	FS6	.019	-.095	.072	.028	-.003	.198	-.045	-.030
	FS7	-.013	.009	-.035	-.035	-.024	-.045	.029	-.014
	FS8	.070	-.120	-.065	.041	.050	-.030	-.014	.846
Anti-image Correlation	FS1	.866[a]	.296	-.175	.238	-.362	.077	-.130	.135
	FS2	.296	.516[a]	.054	-.091	-.057	-.253	.059	-.155
	FS3	-.175	.054	.865[a]	.036	.036	.396	-.500	-.172
	FS4	.238	-.091	.036	.848[a]	.020	.208	-.681	.151
	FS5	-.362	-.057	.036	.020	.911[a]	-.018	-.419	.163
	FS6	.077	-.253	.396	.208	-.018	.807[a]	-.588	-.072
	FS7	-.130	.059	-.500	-.681	-.419	-.588	.747[a]	-.089
	FS8	.135	-.155	-.172	.151	.163	-.072	-.089	.479[a]

a. Measures of Sampling Adequacy(MSA)

Anti-image Matrices

		IFS1	IFS2	IFS3	IFS4
Anti-image Covariance	IFS1	.570	-.235	.155	-.275
	IFS2	-.235	.584	-.268	-.044
	IFS3	.155	-.268	.707	-.190
	IFS4	-.275	-.044	-.190	.598
Anti-image Correlation	IFS1	.567[a]	-.408	.244	-.471
	IFS2	-.408	.659[a]	-.417	-.074
	IFS3	.244	-.417	.537[a]	-.293
	IFS4	-.471	-.074	-.293	.673[a]

a. Measures of Sampling Adequacy(MSA)

APPENDIX II: QUESTIONNAIRE

My name is Sheila Jepkorir Arusei, a student at Moi University pursuing a PhD Degree in Business Management (finance). I am conducting a research study concerning ***Effects of Financial Literacy, Retirement Planning Activities, and Financial Sophistication on Perceived Retirement Saving Adequacy among Employees in Public universities in Kenya.*** I have selected you as my study respondent. Please, take a few minutes to answer the questions in this questionnaire. I assure you that your answers will be kept completely confidential and will be used for academic purposes only.

Section A; Demographic Characteristics of Respondents

1. Name of the University you work for the University

2. Number of years you have worked with this institution

Below 5 years [ ] 5-10years [ ] 11-15years [ ]

15-20years [ ] Above 20 years [ ]

3. In what age bracket are you now?

Below 25 years [ ] 26-35years [ ] 36-45years [ ]

46-55years [ ] More than 55years [ ]

4. Please indicate your gender? Male [ ] Female [ ]

5. Please indicate the highest level of education you have attained.

Secondary [ ] Certificate [ ] Diploma [ ]

Degree [ ] Masters [ ] PhD [ ]

6. What is your job grade?

1-4 ( ) 5-10 ( )11-15 () 15-17 ()

7. Terms of Service?

Contract ( ) Permanent ( ) Casual ( )

Section B; Financial Sophistication (Mediator)

In this section the study is interested in your view of financial sophistication. Read each of the statements and answer by ticking in the appropriate category that best fits your opinion. The categories are: 5 = Strongly Agree, 4 = Agree, 3 = undecided, 2 = Disagree, 1=Strongly Disagree

1	**Financial sophistication**	5	4	3	2	1
2	I consult financial professionals before investing					
3	I have been spending beyond my means					
4	I have been saving for my retirement					
5	I usually consider ATM fees when doing bank withdrawals					
6	I usually use the same bank/insurance company despite poor customer service					
7	I hardly understand the terms for pension schemes					
8	I understand financial obligations associated with financial matters					

Adopted from (Estalami, 2014)

Section C; Institutional Factors

In this section the study is interested in your view Institutional Factors (IF) Read each of the statements and answer by ticking in the appropriate category that best fits your opinion. The categories are: 5 = Strongly Agree, 4 = Agree, 3 = undecided, 2 = Disagree, 1=Strongly Disagree

Statements	**5**	**4**	**3**	**2**	**1**
My employer provides me with a good retirement plan					
To what extent do you trust the government to manage future pensions income					
To what extent do you trust banks and insurance companies to manage your pension income					

Section D; Perceived retirement saving adequacy (DV)

In this section the study is interested in your view of Perceived retirement saving adequacy. Read each of the statements and answer by ticking in the appropriate category that best fits your opinion. The categories are: 5 = Strongly Agree, 4 = Agree, 3 = undecided, 2 = Disagree, 1=Strongly Disagree

Perceived retirement saving adequacy		5	4	3	2	1
1	I am feel that I am saving enough to retire comfortably					
2	I feel that I will have a good retirement income					
3	I think i will have enough money to retire comfortably					
4	Based on how I expect to live in retirement and given that I do not adjust my current saving behavior, it's expected that I feel that I will have adequate resources to retire comfortably					

Adapted from Van Dalen *et al.,* (2010)

Section E; Financial literacy (IV)

In this section the study is interested in your view of financial literacy. Read each of the statements and answer by ticking in the appropriate category that best fits your opinion. The categories are: 5= Strongly Agree, 4 = Agree, 3 = undecided, 2 = Disagree, 1=Strongly Disagree

Financial Literacy	5	4	3	2	1
1. I have better understanding of how to invest my money					
2. I have better understanding of how to manage my credit use					
3. I have a very clear idea of my financial needs					
4. I have the ability to maintain financial records for my income and expenditure.					
5. I have little or no difficulty in managing my money					
6. I have the ability to prepare my own weekly (monthly)					

Adopted from (Strömbäck *et al.*, 2017)

APPENDIX: III LETTER OF INTRODUCTION TO UNIVERSITIES IN KENYA

Sheila Jepkorir Arusei,

School of Business and Economics, Moi University,

Dear Sir/Madam,

I am a student at Moi University, School of Business and Economics pursuing PHD and carrying out a research study on concerning ***financial literacy, retirement planning activities, and financial sophistication on perceived retirement saving adequacy among university employees in Kenya*** You have been selected as a participant in this study and your co-operation will be highly appreciated. Attached is a questionnaire, you are requested to give your honest opinion about the research study. The information will be used for the purpose of this research only and shall be accorded all the confidentiality.

Thank you. Yours faithfully,

Sheila Jepkorir Arusei,

APPENDIX IV: RESEARCH WORK PLAN

Stage	**Research activity**	2022			
		April - July	Oct	Nov	Dec
1	pilot survey Collection of literature Complete revised version of research proposal Reproduction of research				
2	Main research work Data collection				
3	Data processing and analysis Editing Data re-organization and filling into the computer Test hypotheses Drafting of preliminary research report				
4	Preparation of research report and dissemination Editing Revision and correction of the draft report Reproduction of the final copies Submission and request for presentation				

APPENDIX V: LIST OF UNIVERSITIES IN KENYA

Name of Institution	Year Established
Public Chartered Universities	
University of Nairobi (UoN)	1970
Moi University (MU)	1984
Kenyatta University (KU)	1985
Egerton University (EU)	1987
Jomo Kenyatta University of Agriculture and Technology (JKUAT)	1994
Maseno University	2001
Masinde Muliro University of Science and Technology (MMUST)	2007
Dedan Kimathi University of Technology (DKUT)	2007
Chuka University (CU)	2007
Technical University of Kenya (TUK	2007
Technical University of Mombasa (TUM)	2007
Pwani University (PU)	2007
Kisii University (KSU)	2007
Maasai Mara University (MMARAU)	2008
South Eastern Kenya University (SEKU)	2008
Meru University of Science and Technology (MUST)	2008
MultiMedia University of Kenya (MMU)	2008
Jaramogi Oginga Odinga University of Science and Technology	2009

(JOOUST)	
Laikipia University (LU)	2009
University of Kabianga (UoK)	2009
University of Eldoret (UoE)	2010
Karatina University (KARU)	2010
Kibabii University	2011
Murang'a University College (JKUAT)	2011
Machakos University Collecge (KU)	2011
The Co-operative University College of Kenya (JKUAT)	2011
Embu University College (UoN)	2011
Kirinyaga University College (JKUAT)	2011
Rongo University College (MU)	2011
Garissa University College (MU)	2011
Taita Taveta University College (JKUAT)	2011
Kaimosi Friends University College (MMUST)	2015
Alupe University College (MU)	2015
koitaleel Samoei University College	2018
Private Chartered Universities	
University of Eastern Africa, Baraton (UEAB)	1989
Catholic University of Eastern Africa (CUEA)	1984
Daystar University (DU)	1989
Scott Christian University (SCU)	1989
United States International University (USIU)	1989
St Paul University (SPU)	1989

Pan Africa Christian University (PAC)	1989
African International University (AIU)	1989
Kenya Highlands Evangelical University (KHEU)	1989
Africa Nazarene University (ANU)	1993
Kenya Methodist University (KeMU)	1997
Strathmore University (SU)	2002
Kabarak University (KABU)	2002
Great Lakes University of Kisumu (GLUK)	2006
KCA University (KCAU)	2007
Mount Kenya University (MKU)	2008
Adventist University of Africa (AUA)	2008