

**AN INVESTIGATION OF THE DETERMINANTS OF THE AMOUNT OF  
BENEFITS ACCESSED BEFORE RETIREMENT AGE IN KENYA**

By

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**DECLARATION**

This research paper is my original work and has never been presented for any degree program in any other University.

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## **ABBREVIATIONS**

AVC	–	Additional Voluntary Contribution
CSPS	–	Civil Service Pension Scheme
DB	–	Define Benefit
DC	–	Defined Contributions
ER	–	Employer contribution
EY	–	Employee contribution
LCH	–	Life cycle Hypothesis
LCT	–	Life Cycle Theory
NRA	–	Normal Retirement Age
NSSF	–	National Social Security Fund
OECD	–	Organization of Economic Cooperation and Development
RBA	–	Retirement Benefits Authority
VIF	–	Variance Inflation Factor

## **DEDICATION**

The current research study is dedicated to my parents, Clarice and John for their continued support, encouragement, motivation and understanding throughout the period of my study. To my lovely daughter Nadia for giving me a reason to set the sky as my lower limit.



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## **ABSTRACT**

The primary purpose of a pension system is to provide regular income upon retirement. Most governments support pensions directly or give direction in the establishment of pension schemes. In Kenya, retirement schemes are set up on a voluntary basis and are regulated by Retirement Benefits Authority (RBA). In addition, RBA also regulates the National Social Security Fund, which is a statutory fund requiring all employers to make contributions on behalf of their employees. The employees are also obliged to make statutory contributions to the scheme. Prior to 2005, members of scheme would access up to 100% of their total benefits upon changing jobs or leaving service before attaining the retirement age of the scheme. In 2005, the Retirement Benefits Act was amended to prevent members from accessing the whole of their benefits upon leaving service before attaining the retirement age. This was further reversed in 2010, where the RBA Act was amended to allow members to access up to 75% of their total benefits upon changing jobs. Of interest was to establish how much was accessed by members upon leaving service. The study therefore looked at the data presented by the pension scheme administrators and used statistical tools to interpret and develop a predictive model for the early access of pension benefits. The results show that there is a negative relationship between amount of benefits accessed before retirement and the amount of income, age and the number of years in the scheme. Further, the results also showed that Younger members of scheme, those from age group 26 to 35 tend to withdraw their benefits early in comparison to the older members of the scheme. This is in line with Life cycle hypothesis that explains how rational individuals allocate their life-time earnings between consumption and retirement savings over their life cycle. In addition, the study shows that most members withdrew their pension scheme after working for less than five years and a majority, 51.8% withdrew 75% of the pension benefits. This is in line in the RBA regulations which stipulate that the maximum amount of benefits that can be withdrawn upon changing jobs for member have not attained retirement age is 75% of the total benefits.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background

Saving rates vary widely around the world. According to Loayza et al (2000), East Asia saves more than 30 percent of gross national disposable income in comparison to Sub-Saharan Africa which saves less than 15 percent. Such disparities have triggered a lot of debate on whether or not individuals are saving. Ideally, countries face different demographics and are subject to different shocks therefore saving rates may not necessarily be similar. The same also applies to savings for retirement. The fundamental purpose of a pension system is provision of regular income in old age. According to Holzmann and Hinz (2005), there are four major aims of a pension system; namely consumption smoothing over the life cycles of beneficiaries; providing insurance against risks especially the uncertainties of life expectancy after retirement; redistribution of income using public pension schemes to achieve a more equal distribution of income through transfers from the rich to the poor, and finally poverty alleviation among the elderly.

Most governments support pensions directly or give a road map on the establishment of pension schemes. Different countries have different jurisdictions for retirement, more specifically on early access to pension schemes. Whereas, most countries view pension as income that aids during retirement age, some countries like United Kingdom considered allowing for early access to pension benefits as a way of increasing saving rates. Silock et al (2008) proposed four potential methods of early access to pension savings. Firstly, the Loans and withdrawal model which would allow members to access loans from the pension funds and repayable with interest. Secondly, the Permanent withdrawal model which would allow members to withdraw permanently. Thirdly the Feeder Funds model which would allow members to have a pension fund and an individual savings account to enable members to access a determined amount of liquid savings. Finally, the Early Access to lump sums model which would permit early access to 25% of members' pension benefits at any age if the size of benefits is above the set minimum amount and below the set maximum amount. However, after intense consultation, the

Government of UK concluded that introduction of the above models would depend on further research on the whether or not early access could increase savings.

In order for the pension system to achieve the purpose for which it is established, the government is bound to get involved in the management of pension schemes and running of the schemes. According to Loayza et al (2000), market imperfections such as mandatory saving schemes can lead to excessive saving while negative effect on saving such as early access to pension funds, can result to little national saving.

Looking across the world, countries with high saving rates tend to have high income growth. According to Benartzi and Thaler (1999), on choices in repeated gambles and retirement, presentation of information has a strong influence on choice. Nyakundi(2006) adds that workers may suffer from myopia and fail to think about old age when economically active, causing them to consume as much as possible when working with the expectation that the society will take care of them when they are old. According to Bodie(2007),members of schemes from industrialized countries like United State, United Kingdom, Japan, Australia, turned their focus from relying on family and government to fund their retirement and invested in financial markets to fund their retirement. On the other hand, in Kenya, a majority of members have invested in savings and credits cooperative society shares as an additional source of income during retirement RBA(2008).Retirement schemes are started on a voluntary basis by employers in Kenya and are used to attract and retain workers. The maximum contribution that can be made into a fund by both the employer and the employee is 30% of the member's salary. According to RBA's statistical digest (2009), most individuals make contributions ranging from 5% to 10% of the income toward retirement benefits and have their employers matching the same.

### **1.1.1 Retirement Benefits Industry in Kenya**

The Retirement Benefits Industry in Kenya comprises of a non contributory civil service pension scheme; the mandatory National Social Security Fund (NSSF); private occupational pension schemes and individual retirement savings. The industry has a membership of 1. 6 Million, this represents coverage of 15% of the working population. The Civil Service Pension Scheme (CSPS) is not regulated by Retirement Benefits Authority (RBA), which is the regulating body for pension schemes in Kenya. Retirement system in Kenya is also characterized by fragmented

legislation and lacks a harmonized act for regulation of the system. For purposes of this study, we shall focus on only private occupation pension schemes and individual retirement savings.

In Kenya, retirement funds are set up on a voluntary basis and require prior registration by the regulator, Retirement Benefits Authority (RBA), before the commencement of operations. RBA regulates over 1300 schemes which are either Defined Benefits (DB) and Defined Contribution (DC) schemes. The scheme rules set out the retirement age, how benefits can be paid among others. Members therefore do not have access to their pension benefits while they are still working, however, upon changing jobs, members can access a certain portion of their pension benefits. According to RBA's investment report (2010), the pension industry had grown from Ksh. 40 Billion in 2002 to Ksh. 450 Billion in 2010. This represents 18% of Kenya's Gross Domestic Product. RBA attributes the composition of the growth to the presence of a regulatory framework in the country, hence increased confidence among members of schemes. In addition, schemes have grown in number from the year 2000 to date; increase in number implies increase in contribution rates, which directly impacts on the fund values of the schemes. High investment returns has also impacted greatly on the growth of the industry since retirement schemes invest in accordance with RBA's investment guidelines.

Prior to 2005, members of schemes could access all employers and employees contributions upon leaving service. RBA survey (2004) on pensioners revealed that most retirees had inadequate pension as a result accessing their pension benefits while still in active employment. In 2005, the Government of Kenya approved an amendment to the RBA Act through Legal Notice Number 56 (2005) which required members of schemes to preserve the whole of the employers' portion. RBA Members' survey (2005) showed that 72.3% of members were not happy with change to lock in the employer's portion.

On the review of international pension reforms by Collard and Moore (2010), early access to pension scheme is not allowed in most developed countries like Australia, Sweden, Poland and Uruguay. In New Zealand, early access is allowed based on Kiwisaver model. This model allows for early access under three circumstances, for purposes of purchasing a home, in cases of financial hardship and finally when the member is seriously ill or has permanent disability. Like wise in Kenya, there was an amendment to Retirement benefits Act, requiring members of schemes to preserve the whole of the employer's portion of a member's accumulated benefits

except under the following limiting circumstances affecting a member: ill health, death and where a member withdrew from the scheme before (3) years of membership (Legal Notice Number 56, 2005).

In 2006, there was an amendment through Legal Notice Number 61 & 62 (2006) to the preservation rule through allowing members emigrating from Kenya to other countries without any intention of returning to reside in Kenya to access their employer's portion of their accumulated benefits. Further in 2007, the law was amended through Legal Notice Number 93 & 95 (2007) allowing members who became incapacitated on grounds of ill-health to access their preserved benefits. The 2005 amendment on preservation of benefits was reversed through Legal Notice Number 165 (2010) which allowed members to access up to 50% of employers' preserved benefits upon leaving the service. For defined benefit schemes, the amendment increased the amount of benefit that could be accessed by members that left 33% to 50% of their accrued benefits as determined by the scheme actuary. This implied that members could access up to 75% of their total benefits upon leaving the service. This change triggered a rush for members who had previously preserved their benefits. Most members went back to their former employers and accessed the amount that had been locked in.

## **1.2 Statement of the Problem**

Retirement benefit in its nature is a long term benefit that members can utilize upon retirement. According to Schulz (2001), the purpose of retirement planning is to secure sufficient financial resources for retirement to prevent the level of living from dropping much below the pre-retirement level. Aon Consulting (2008) on the replacement study established that most members needed to be financially prepared for retirement. Replacement rate according to Organization of Economic Cooperation and Development (OECD) glossary is the measure of how effectively a pension system provides income during retirement to replace earnings which were the main source of income prior to retirement. In other words, the pension received during retirement is compared with the amount of income prior to retirement. In Aon Consulting (2008) study, they found that very few individuals knew how to prepare for retirement in order to have a high replacement ratio. Pensioner survey conducted by RBA pensioner survey (2008) indicated that 57.2% pensioners attributed pension as the most important source of income during retirement. A further 32.9% of pensioner admitted that pension was their only source of income.

Given that pension income forms greater percentage of income received during retirement, policy makers should come up with policies that preserve pension benefits. However, given that the legislation of Kenya allows for early access, an investigation into the determinants of the amount of benefits accessed before retirement age in Kenya will enable us come up with a predictive model which can inform policy makers. Indicative statistics from RBA shows that over five thousand members who had not accessed their benefits upon changing jobs did so when the law was amended. By, March, 2011, Ksh. 2 Billion had been accessed by members. This may generate into a serious problem especially if the amount accessed is not invested in income generating assets. This study therefore will establish whether certain factors influence the decision of a member to either access their benefits or not to access their benefits. According to Reno& Carvey (2007), in most developed countries, Social Security has replaced less than 40 percent for an average earner at 65, given that many retirees rely on social security. It is estimated that in Kenya the replacement rate is estimated to be 20% .According to Chichir (2009) uninterrupted saving contribution is one of the factors that lead to high replacement rates. This is far below ILO recommended rate of between 70-80 percent of prior earnings.

In Kenya, several scholars have researched on pensions schemes,Angima (1984) studied on employer's accounting for the cost of pension schemes in Kenya and established that many employers found private pension contribution expensive to the organization especially when it was contributory. Thumbi (1996) did an evaluation of pension schemes of provident funds investments portfolios in Kenya. Ngene (2002) did a study on an empirical investigation into portfolio performance measures by pension fund managers and the challenges they face in portfolio management in Kenya. Wanyama (2002) did a study on pension schemes and provident funds investment portfolios in Kenya where he looked at the implications of investment guidelines under retirement benefits act (1997) and regulations (2000) and how they affected pension administration. Omony (2003) did a survey of investment practices of pension fund managers in Kenya where he established that many pension funds were invested according to the regulations by the Retirement Benefits Authority (RBA). Kusewa (2007) looked at the impact of regulation of the retirement benefits sector on the financial performance of occupational pension schemes in Kenya and established that regulation increased confidence of the contributors as they were assured of quality management of their funds Gichuki (2008) examined factors influencing pensions sector development in Kenya where he identified culture and pension fund

mismanagement as the main factors influencing pension sector development while Muli (2008) looked at the challenges faced by insurance firms in the management of pension funds in Kenya.

Limited studies have concentrated on the relationship between the determinants of the amount of pension benefits withdrawn before retirement age. This study therefore seeks to fill this research gap by providing information of the factors affecting early access to pension benefits. One of the variables that is closely looked at when looking at the adequacy of retirement savings is income, although this is only one component of financial resource. Other variables like number of years in the scheme, and age come into play. Most studies conducted are in line with the determinants of savings as opposed to the determinants of early withdrawal of benefits. This is due to the nature of retirement industry across the world. Most jurisdictions view the money saved for retirement as money to be used during the retirement phase, however, a few countries like Kenya, have opened up to allow members to access their pension benefits before reaching retirement age. This study therefore intends to investigate the question on the relationship between amount of pension benefits accessed before retirement age and the following variables: amount of income; age and number of years in the scheme. It is important to note that there are several other studies on the determinants of saving which have incorporated other factors like household size, gender, household income in order to investigate the determinants of savings.

### **1.3 Objectives of the study**

The main objective of the study is to determine the relationship between the amount of benefits accessed before retirement age and the following determinants: amount of income; age and number of years in the scheme.

### **1.4 Importance of the Study**

The study will be of benefit to various stakeholders including:

#### **i. The Retirements Benefits Authority**

As a regulator, the Retirements Benefits Authority will benefit from the findings of this study in that the findings will give guidance in formulating rules and regulations governing access to early pension funds. These policies will help control the administration of early pensions in the country. The study will also enable the Authority to better understand the determinants of early



access to pension benefits. The study will be very beneficial to the pension regulatory body on Kenya, particularly as they make policy recommendation to the Government of Kenya.

## **ii. Pension Administrators and Fund Managers**

The findings of this research will be of benefit to pension administrators and fund managers in that it will provide knowledge on the relationship between the amount of benefits accessed and the number of years in the scheme, age and the amount of income. This will enable them to come up with proper plans with regards pension administration and management in Kenya.

## **iii. Members of schemes**

This study will also be of great importance to members of schemes in that it will provide them with information o factors affecting pension contribution and access to early pension in Kenya.

## **iv. Researchers and Academicians**

The results of this study would also be invaluable to researchers and scholars, as it would form a basis for further research. The study would be a source of reference material for future researchers on other related topics; it would also help other academicians who undertake the same topic in their studies.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Retirement benefits are intended to safeguard pensioners against shocks during retirement. According to Paralta (2010), the amount of benefits at retirement depends on many factors such as income, composition of households and age. Modigliani, in an interview (1999) considered savings as one of the most important pillars of the economic system. More often than not, in countries where there are no jurisdictions on preservation of retirement funds, benefits are withdrawn before retirement age. There has been views suggesting that pension rules, and the inaccessibility of pension saving until the age of 60 (previously 55), deters individuals from saving for retirement, reflective of the longstanding problem of under-saving in the country. Other views suggest that in some situations, pension rules may prevent individuals from smoothing their income (and consumption) across the life course in response to unexpected changes in income and expenditure, with associated perverse consequences; an example commonly cited is of an individual unable to access pension savings whose home is threatened with repossession. Properties and businesses are normally sighted as additional source of income during retirement. We observe the similar trend as evidenced in RBA pensioner survey conducted in 2009.

Discussion to enable early access to pension savings has been a feature of UK pension policy debate. The Government of UK through treasury in 2010, invited organizations to offer evidence or research on the prospects of whether early accessing of benefits could be used to boost pension saving, the risks involved and whether there were models of providing early access. The Government of UK wanted to investigate whether enabling early access would improve pension take up by individuals. After four months of consultation, the Government of UK decided not to consider early access until further research had been conducted on the same.

In Kenya, the discussion took a different form after the Government of Kenya amended the RBA Act and Regulations to allow members to access up to 75% of the pension benefits upon changing jobs or leaving service before attaining retirement age. As discussed, retirement benefit in its nature is a long term benefit that members can utilize upon retirement. Therefore, the

essence of planning and saving is to secure sufficient financial resources. The question that then comes to mind is why members would want to access their benefits early, before attaining retirement age, knowing that the access would contribute to lower benefits at retirement. Studies that have been done that are close to this particular subject have focussed on early retirement and its effect on members, determinants of savings, adequacy of retirement benefits among others. This chapter therefore will present literature relating to adequacy of retirement benefits and determinants of saving. This is because there is a close link between these studies and determinants of early access to pension funds. We shall look at theoretical framework and empirical studies that have been done on saving, and thereafter summarize the main findings. In addition, we shall look at scenario analysis of five members of schemes and assess how age, the number of years in service and the amount of income affect the amount of benefits at retirement.

## **2.2 Theoretical framework**

### **2.2.1 Life cycle theory**

According to Schlettwein (2010), lower to medium income group and younger persons have the tendency to withdraw early. According to Jappelli (2005), the main drive for saving is to build up resources to be used during retirement. According to Paralta (2010), there is no certainty that the income after the retirement age will be sufficient to maintain the desired level of consumption, individuals save a portion of that income in order to increase the allocation of wealth available when they reach retirement. The Life Cycle Hypothesis (LCH) is the central theorem of economic analysis in explaining how rational individuals allocate their life-time earnings between consumption and retirement savings over their life cycle. The LCH made its first appearance in two papers that Modigliani authored in the early 1950s together with Brumberg. According to Ando and Modigliani (1963), in the LCH of saving, wealth is accumulated during working years to finance consumption during retirement. However, they suggested that precautionary, bequest, and other motives must be taken into consideration. Modigliani considers the life cycle model as the most useful framework of studying the link between ageing, consumption and saving. The main result obtained from this framework is that the consumption is smoothed: the individuals will save in order to transfer purchasing power to the period of the retirement.

The life cycle approach in its simplest version implies that financial life of individuals occurs in three phases after starting a professional activity. In the first phase, each person earns a wage from his or her labor supply and has insufficient income to cover their needs; therefore they become indebted in order to finance their needs of durable goods (furniture, car, etc.), the purchase of a home and the education of their children. In a second phase, they pay off their debts run up in the previous phase and begin a process of accumulation of wealth to be able to finance their retirement period. In a third phase, they use up what they had saved during retirement. Work on precautionary saving, particularly by Carroll and Kimball showed that people who are sufficiently prudent and have uncertain future earnings will never borrow (Carroll & Kimball, 2006). According to Ando et al, wealth is build up during working years in order to finance, consumption during retirement in the life cycle theory (Ando & Modigliani, 1963; Kotlikoff, Speak & Summers, 1982; Hogarth, 1991). They suggested that precautionary, bequest, and other motives must be taken into consideration.

Taking into consideration other motives that may impact the life cycle theory, there are the risks of accidents during the active life (illness, unemployment, death, etc.), which require precautionary savings or specific insurance policies, including unemployment benefits of public welfare. In this scenario the bequests usually are involuntary assuming a finite life cycle horizon. Secondly, longevity risk associated with the number of years in retirement can result in an undesired level of consumption. Last but not the least; political risk related to changes in the regulations regarding pensions, for instance, early access of retirement funds may cause uncertainty. Originally, the LCT had assumptions that recognized the theorem required individuals to look at an uncertain future; researchers faced challenges in formulating models of how people would behave in cases of uncertainty (Deaton, 2005). This has since been relaxed and economists have adopted tools such as time series that enable individuals to handle expectations about the future. The LCT is as a result of principles that can be extended to deal with a wide range of issues concerning saving and consumption, most of which had not been envisaged in 1950 (Deaton, 2005).

One of the challenges with LCT is the issue effect of uncertainty. Modigliani argues that this would bring a demand for precautionary saving. Implying that the assets that have been

accumulated at by young people can serve both retirement and also for emergencies. In addition, Bloom, Canning and Moore do not consider LCT of saving as a complete model of saving and retirement. They argue that several influences such as precautionary saving have not been incorporated. They take into consideration developing countries where the elderly are supported by family members in comparison to industrialized countries where the most elderly are supported by social security systems (Bloom, Canning, & Moore, 2007).

### **2.3 Empirical studies**

Empirical studies done on saving have mainly focused on demographic variables, income and growth, structural variables, financial variables and international variables (Brookins & Hussain, 2001). Some of the studies that have been done on pension have tackled saving for retirement from the frontiers of consumption theory and econometric methods. Cocco and Lopes estimated the determinants of pension choice using individual level data. In their paper, they examine individual income, assets, and how demographics affect members' choice of pension plan. In addition, they also look at how education and occupation of the members affect their pension choice (Cocco & Lopes, 2004). Empirical data shows that consumption is lower for households who are much better off in terms of income in comparison to households with minimal income. Data has shown that there is negative saving rates of households with lower income (Deaton, 2005).

Loayza, Schmidt-Hebbel, and Serven (2000) examined the determinants to saving by looking at the effect of income, persistence, demographics, uncertainty. On persistence, Loayza et al, on what drive saving rates, argues that saving rates exhibit inertia and the effects of this change is a determinant of saving whose effects can be realized after many years. On income, Loayza et al, confirms what several studies had previously confirmed and documented the effects income and saving rates. The study shows that the impact of income is greater in developing countries than in industrial countries.

Doerpinghaus and Feldman (2001) considered five variables when predicting retirement decision. They considered current salary, age, number of years of service, marital status and gender status. Doeringer (1990) focused on the employees' expectation of future income. The

study showed that employees would rather not retire knowing that they would have to cut down on their standard of living after retirement. Doerpinghaus and Feldman (2001) study suggests that the amount of present salary should be inversely related to the employee decision to accept early retirement incentives. According to Wellner (1999), age is positively related to retirement. Research also shows that younger employees are less likely to retire early because they have not accrued sufficient income for retirement. Doerpinghaus and Feldman (2001) study showed that current years of service had a positive relation to early retirement since they are more likely to have accrued savings.

Doerpinghaus and Feldman (2001) considered gender in their analysis. Studies have shown that women have more frequent entrances and exits from the work force in comparison to men, implying that men are likely to accrue more savings in comparison to women. The study also looked at the effect on the marital status on retirement and considered other predictor variables like beneficiary age, disability and place of residency as factors that influence cost of living and retirement decisions. From the Study, Doerpinghaus and Feldman (2001) established that salary was positively correlated with early retirement. Secondly the greater the age of the employee, the likely they are to retire early. Thirdly, for D.B schemes, the more service the employee had accrued, the likely they are to retire early. The research also established that gender had no effects on early retirement. Lastly, the study also showed that married people are more likely to retire early in comparison to single people.

In addition there are also a lot of empirical studies dealing with the impact of the different variables of interest on savings mobilization. Some of the authors like Modigliani (1970); Bosworth, (1993); and Carrol and Weil, (1994) found a strong positive relationship between real per capita growth and saving rates. This finding however is controversial, since it is viewed both as evidence that saving drives growth and growth drives savings. The Authors found that a percentage increase in growth rate raises the private saving also by a similar rate. They used the world databases on saving and collection of time series on saving rates and related variables.

Mwega and Elbadawi (2000) used a model similar to empirical models on private savings. In their study, they said that private savings depended on the following variables: fiscal policy,

macroeconomics stability, openness of the economy, financial sector (Mwega & Elbadawi, 2000). Their study showed that foreign saving act as substitute for domestic saving by easing liquidity constraints.

## **2.4 Factors influencing the amount of benefits accessed**

### **I. Income Level**

Several debates have been held on the determinants of savings and income levels central in these debates. The life-cycle hypothesis on the other hand has been criticized for rejecting a positive relationship between incomes and saving, Modigliani (1993) in a recent study, argued for there being a positive relationship between income and saving for poor countries. He noted that in poor developing countries, saving ratio tends to rise with income, while in developed countries there is no significant, systematic relationship between saving and income level. Several studies of consumption and saving behavior have used a nonlinear specification between income and saving to capture an increasing marginal propensity to save. Loayza et al(2000) considers the influence of income to savings in greater in developing countries than in industrial countries. They considered that policies that spur development are indirect but effective way to raise private savings.

### **II. Age**

According to Doerpinghus and Feldman (2001) the greater the age of the employee, the likely they are to retire early. Age is also related to the number of years in a scheme. Younger members, according to the LCH, will tend to dissave during the early years of working since they have time to save during their latter years of working.

### **III. Number of years in the scheme**

Number of years in the scheme directly affects the amount of benefits saved for retirement. The following example on scenario analysis shows how the number of years in a scheme will affect the amount of benefits saved during retirement.

The following example of a scenario analysis shows the influence of age, number of years of service and income on the total benefits at retirement.

The table below shows scenario of five individuals in the same scheme, assuming the date of joining is at age 25 and retirement at is at 55. Further we assume that the rate of return from the scheme is 10% and that the salary will increase at a rate of 1% p.a. The starting salary is Ksh. 30,000

**Table 1: Scenario Analysis**

Details	X- contrib utes to NRA	Y- Contributes to NRA plus AVC	Z Locks all portion( ER +EY)	A Locks 100% ER	B Locks 50% ER
Age of joining	25	25	25	25	25
Retirement age	55	55	55	55	55
Leaves service	No	No	yes	yes	yes
No. of yrs of service	30	30	10	10	10
Additional voluntary contribution (AVC)	no	yes	no	no	no
Employer contribution	5%	5%	5%	5%	5%
Employee contribution	5%	7.5%	5%	5%	5%
Salary per month (Ksh)	30,000	30,000	30,000	30,000	30,000
Interest pa	10%	10%	10%	10%	10%
Salary increment pa	1%	1%	1%	1%	1%
*Total benefits at age 55 (Ksh) Million	6.75	8.44	4.20	2.1	1.05

AVC - Additional Voluntary Contribution (Additional income into the scheme)

ER - Employer contribution

EY - Employee contribution

NRA - Normal Retirement Age

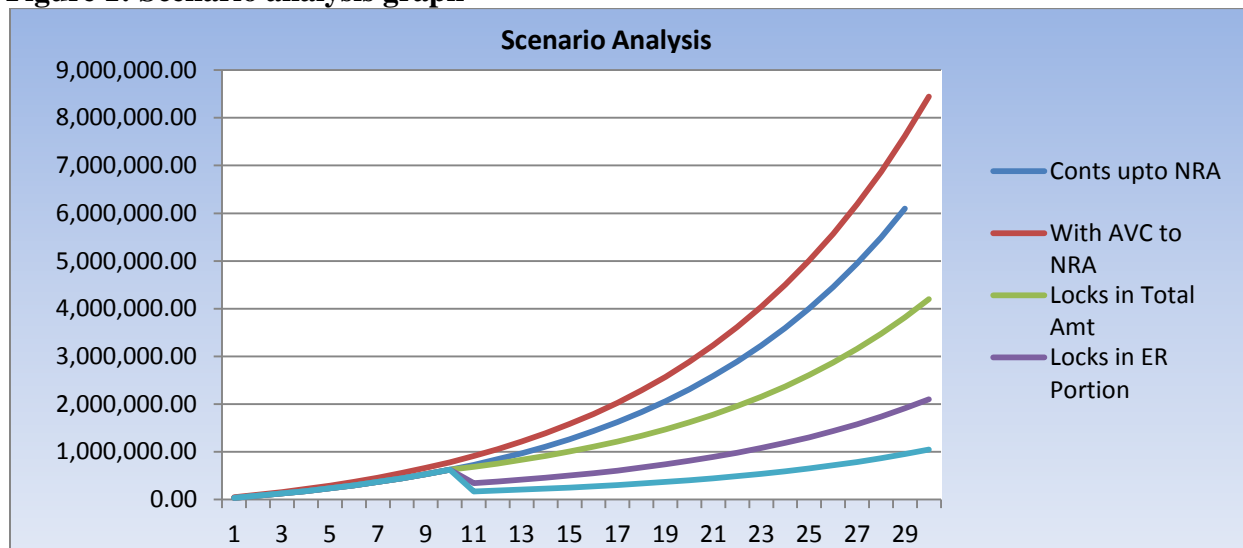
Table 2 below gives a summary of the results. However, Appendix one give a more detailed report.



**Table 2: Results of the scenario analysis**

Scenarios at year 30	Years of service	Annual Salary	Contribution	Opening Balance	Interest	Closing Balance at retirement (55)
1. Member contributes until retirement age	30	480,421	48,042	6,095,085	611,853	<b>6,754,980</b>
2. Member leaves service after 10 yrs but does not access	30	480,421	48,042	3820737	382073	<b>4,202,810</b>
3. Members leaves service and access only employee portion	30	480,421	-	1,910,368	191,036	<b>2,101,405</b>
4. Member leaves service and access 50% of employers' portion	30	480,421	-	955,184	95,518	<b>1,050,702</b>
5. Member stays in a scheme till retirement age with addition contribution of 2.5%	30	480,421	60,052	7,618,856	764,816	<b>8,443,725</b>

**Figure 1: Scenario analysis graph**



From the scenario analysis, we can conclude that members Number of years in service, age and amount of income can significantly impact on the amount of benefits that members retire with. We can see significant variance depending on whether the money was accessed before retirement age or at retirement.

## **2.5 Summary of theories**

From the study, it emerges that one of the challenges emerging from the studies with LCT is the issue effect of uncertainty. Modigliani argues that this would bring a demand for precautionary saving. Implying that the assets that have been accumulated at by young people can serve both retirement and also for emergencies. Work on precautionary saving, particularly by Carroll and Kimball showed that people who are sufficiently prudent and have uncertain future earnings will never borrow (Carroll & Kimball, 2006) They suggested that precautionary, bequest, and other motives must be taken into consideration.

Doeringhaus and Feldman (2001) established that gender had no effects on early retirement. In addition, the study also showed that married people are more likely to retire early in comparison to single people. The authors also established that salary was positively correlated with early retirement. Loayza, Schmidt-Hebbel, and Serven (2000) looked at determinants of saving and the effect of income, persistence, demographics, uncertainty. On persistence, Loayza et al, showed that saving rates exhibit inertia and the effects of this change is a determinant of saving whose effects can be realized after many years. On income, Loayza et al, confirms what several studies have previously confirmed positive relationship between income and saving rates.

Mwega and Elbadawi (2000) looked at private savings in which they used models to determine effects fiscal policy, macroeconomics stability, openness of the economy, financial sector (Mwega & Elbadawi, 2000). Empirical study by Deaton (2005) showed that consumption is lower for households who are well off in comparison to households with minimal income. The study also showed that there is negative saving rates of households with lower income.

In conclusion, these studies have focused on the determinant of savings and have looked at savings holistically and also focused on private savings. The contribution of this study will provide policy makers with evidence on the determinants of savings and the positive relationship between income and savings. In addition, precautionary, bequest, and other motives need to be taken into consideration.

From the scenario analysis, we establish that the amount of income, age and number of years in the scheme significantly affects the amount that a member gets during retirement. All factors

held constant, there is a difference of Ksh. 3 million between a member who accessed their contribution upon changing jobs and a member who decides not to access their benefits. In addition, we also establish that a member who makes additional savings into the funds ends up having a higher benefit in comparison to members who do not make additional voluntary contribution into the scheme.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter captures the research design and methodologies used in the study. The chapter explores research design, population, sample design, data collection procedures and data analysis techniques that were used in the study.

#### **3.2 Research Design**

This study adopted a descriptive research design aimed at investigating the relationship between the determinants of early access to pension benefits in Kenya. According to Cooper and Schindler, a descriptive study is concerned with finding out the what, where and how of a phenomenon (Cooper & Schindler, 2006). The study explored cross tabulation between the dependent variable, the amount of benefits withdrawn and the independent variables, age, number of years to retirement and the amount of income.

#### **3.3 Study Population**

##### **3.3.1 Target Population**

A population is a well defined or set of people, services, elements, events, group of things or households that are being investigated. The population for this study members of retirement schemes in Kenya. RBA regulates over 1300 registered schemes. The target will be drawn from the data bases of administrators and RBA.

##### **3.3.2 Sample and Sampling Procedures**

The incorporated a representative sample from the 1300 schemes registered with RBA. to collect the information relevant for the study. The researcher examined data of 2000 members who had withdrawn in the past 12 months. The data examined consisted of age, the amount of income, number of years in the scheme.

#### **3.4 Data Collection**

The study used secondary data collected from 24 registered administrators and the regulator, RBA. Letters were sent to administrators with through the help of the regulator, RBA. The

response rate was tremendous. Twenty administrators were able to give a detailed record of the members who had accessed their benefits in the past one year.

### 3.5 Data Analysis and Presentation

Regression analysis was used to analyze the relationship in consideration. The model was set up to study the hypotheses that there is a linear relationship between the dependent variable, the percentage amount of total benefits withdrawn and the independent variables which are age, amount of income and number of years in the scheme. The analytical results are presented by regression output tables in chapter four of this study.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where Y the dependent variable = Percentage of benefits withdrawn

$X_1$  = Amount of Income

$X_2$  = Age

$X_3$  = Number of years in the scheme

e = Error term

$\beta_0$  is the regression coefficient,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  are the slopes of the regression equation,  $X_1$ ,  $X_2$ ,  $X_3$ , are the various determinants of the amount accessed before retirement age, while e is an error term normally distributed about a mean of 0 and for purposes of this computation, the e is assumed to be 0. The equation will be solved by the use of statistical model SPSS (Statistical Package for Social Sciences). Rector scale was employed to determine the amount of benefits withdrawn from the scheme. The amount of withdrawal was categorized as follows:

**Table 3: Rector scale of the percentage of benefits withdrawn**

Percentage of benefits withdrawn	Code
0-25%	1
26% -50%	2
51%-75%	3
76%-100%	4

### **3.6 Data Reliability and Validity**

The accuracy of data largely depended on the data collection instruments in terms of validity and reliability. Validity of the data was guaranteed by comparing the secondary data from the administrators and the data that had been presented to the regulator, RBA.

## CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

### 4.1 Introduction

This section covers the analysis of the data, discussions and interpretation. The first step in analyzing the data was through descriptive measures this was done using SPSS. The pension scheme administrators submitted data of 2000 members. The data was compiled and only data of 1629 members was found to be valid. The data was thereafter coded in the following format shown in table 1 and analyzed.

Descriptive statistics, correlation and regression statistics were used to interpret the data. Number of years ranges from 1 to 15years in service.

**Table 4:Codes and Groups**

CODE	KSH	AGE	PERCENTAGE AMOUNT WITHDRAWN
0	Less than 50,000		
1	50,100 to 100,000	26-30	0-25%
2	100,100 to 150,000	31-35	26% -50%
3	150,100 to 200,000	36-40	51%-75%
4	200,100 to 300,000	41-45	76%-100%
5	300,100 and above	51-55	

### 4.2 Descriptive Statistic

#### 4.2.1 Amount withdrawn in comparison to age

Cross tabulation results indicate that a majority, 51.8% withdrew 75% of their benefits upon changing jobs. A majority of those who withdrew their pension came from the age group between 31 to 35 years. In addition, we also note that 16.7% of the members who withdrew their benefits were from the age group 51 years to 55years. This can be explained since most companies have their retirement age of set at age 55 and early retirement at age 50. On the other hand, younger members between age 26 years to 30years withdrew all their contribution upon changing jobs.

**Table 5: Amount withdrawn \* Age Cross tabulation**

			Age(years)						Total
			26-30	31-35	36-40	41-45	46-50	51-55	
Amount withdrawn	25%	Count	0	0	0	37	0	0	37
		% of Total	.0%	.0%	.0%	2.3%	.0%	.0%	2.3%
	50%	Count	5	64	33	6	0	0	108
		% of Total	.3%	3.9%	2.0%	.4%	.0%	.0%	6.6%
	75%	Count	16	87	116	144	209	272	844
		% of Total	1.0%	5.3%	7.1%	8.8%	12.8%	16.7%	51.8%
	100%	Count	258	208	173	1	0	0	640
		% of Total	15.8%	12.8%	10.6%	.1%	.0%	.0%	39.3%
<b>Total</b>		Count	279	359	322	188	209	272	1629
		% of Total	17.1%	22.0%	19.8%	11.5%	12.8%	16.7%	100.0%

#### 4.2.3 Amount withdrawn in comparison to the number of years in the scheme

From the cross tabulations in Appendix 2, we note that most members withdrew their pension scheme after working for less than one year. Cumulatively, a majority of 67% withdrew their benefits after working in their organization for not more than 5 years.

#### 4.2.4 Amount withdrawn in comparison to income

A majority of the members who withdrew their benefits were from the income group of Ksh. 50,100 to Ksh100,000. In addition, those from income group Ksh. 150,000 to 200,000 also withdrew their benefits early. Cumulatively, 73.1% of the respondents from income ranging from below ksh. 50,000 to Ksh. 200,000 had early withdrawal of their benefits.



**Table 6: Amount withdrawn \* Income Cross tabulation**

			Income (Ksh)					Total	
			Less than 50,000	50,100 to 100,000	100,100 to 150,000	150,100 to 200,000	200,100 to 300,000		300,100 and above
<b>Amount withdrawn</b>	<b>25%</b>	<b>Count</b>	10	27	0	0	0	0	37
		<b>% of Total</b>	.6%	1.7%	.0%	.0%	.0%	.0%	2.3%
	<b>50%</b>	<b>Count</b>	0	3	3	54	30	18	108
		<b>% of Total</b>	.0%	.2%	.2%	3.3%	1.8%	1.1%	6.6%
	<b>75%</b>	<b>Count</b>	6	25	201	265	141	206	844
		<b>% of Total</b>	.4%	1.5%	12.3%	16.3%	8.7%	12.6%	51.8%
	<b>100%</b>	<b>Count</b>	140	375	37	45	16	27	640
		<b>% of Total</b>	8.6%	23.0%	2.3%	2.8%	1.0%	1.7%	39.3%
<b>Total</b>		<b>Count</b>	<b>156</b>	<b>430</b>	<b>241</b>	<b>364</b>	<b>187</b>	<b>251</b>	<b>1629</b>
		<b>% of Total</b>	<b>9.6%</b>	<b>26.4%</b>	<b>14.8%</b>	<b>22.3%</b>	<b>11.5%</b>	<b>15.4%</b>	<b>100.0%</b>

### 4.3 Correlation analysis

#### 4.3.1 Amount withdrawn and number of years in the scheme

Correlation between amount of benefits withdrawn and the number of years in the scheme results indicate that as the amount of benefits withdrawn increases in value, the number of years in the scheme decreases. This implies a negative correlation between the two variables. This also implies that as the number of years in the scheme increases the amount withdrawn decreases. This results show that members of schemes who have stayed in their schemes for many years tend not to withdraw a hundred percent of their retirement benefits.

**Table 7: Correlations between amount withdrawn and number of years in the scheme**

		Amount withdrawn	Number of years_in_scheme
Amount withdrawn	Pearson Correlation	1	-.381**
	Sig. (2-tailed)		.000
	N	1629	1629
Number of years in scheme	Pearson Correlation	-.381**	1
	Sig. (2-tailed)	.000	
	N	1629	1629

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

#### 4.3.2 Amount of benefits withdrawn and the age of the member

Correlation between amount of benefits withdrawn and the age results indicate that as the amount of benefits withdrawn increases in value, the age of the member decreases. This implies a negative correlation between the two variables. This also implies that as the age of the member increases the amount withdrawn decreases. This shows that most members younger members tend to withdraw most of their benefits upon changing jobs as opposed to older members who will wait for either early retirement or normal retirement age before accessing 100% of their benefits. Table 6 shows the results of the correlation analysis.

**Table 8: Correlation between the amount withdrawn and age of the member**

		Amount withdrawn	Age
Amount withdrawn	Pearson Correlation	1	-.454**
	Sig. (2-tailed)		.000
	N	1629	1629
Age	Pearson Correlation	-.454**	1
	Sig. (2-tailed)	.000	
	N	1629	1629

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

### 4.3.2 Amount of benefits withdrawn and the income of the member

Correlation between amount of benefits withdrawn and income of the member indicate that as the amount of benefits withdrawn increases in value, the amount of income decreases. This implies a negative correlation between the two variables. This also implies that as the income of the member increases the amount withdrawn decreases. This shows that most members with higher income may not withdraw all their contribution upon changing jobs. This can be explained by the disposable income that is available to them in comparison to those members who are earning much lower income. This is in line with Doerpinghaus and Feldman (2001) study that suggests that the amount of present salary should be inversely related to the employee decision to accept early retirement incentives. Table 9 shows the results of the correlation analysis

**Table 9: Correlation between the amount withdrawn and income**

		Amount withdrawn	Income
Amount withdrawn	Pearson Correlation	1	-.440**
	Sig. (2-tailed)		.000
	N	1629	1629
Income	Pearson Correlation	-.440**	1
	Sig. (2-tailed)	.000	
	N	1629	1629

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

### 4.4 Regression analysis

The focus of the study was to look at the relationship between the dependent variable which is the amount of benefits accessed before retirement age and the independent variable of age, number of years in the scheme and amount of income. The regression output has enabled us to understand how the value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed. From the regression

output on table 10 below, we are able to come up with a predictive model of the amount of pension benefits that can be accessed before retirement age. Other outputs are in the appendix.

**Table 10: Coefficients**

Model	Unstandardized Coefficients		Std Coefficient	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	4.012	.033		120.663	.000	3.947	4.077					
Income_	-.209	.024	-.482	-8.803	.000	-.256	-.163	-.440	-.213	-.186	.149	6.720
Age	-.128	.010	-.321	-13.065	.000	-.148	-.109	-.454	-.308	-.276	.742	1.348
Number of years in scheme	.053	.013	.221	4.061	.000	.027	.079	-.381	.100	.086	.151	6.630

**a. Predictive model:**

Based on the output, we are able to come up with the predictive model for the amount of pension accessed.

$$\text{Percentage amount accessed} = 4.012 - \text{Income} * 0.209 - \text{Age} * 0.128 + \text{Number of years in scheme} * 0.053 + e$$

Example of the amount accessed using the predictive model:

Let us assume we have three members whose profiles are as follows: We refer to table 4 on the codes.

**Table 11: Examples using the predictive model**

MEMBER	AGE	NO. OF YEARS	INCOME (KSH)	% OF BENEFITS ACCESSED
X	26	1	45,000	100%
Y	45	9	150,000	75%
Z	53	15	230,000	50%

The results of the example above are in line with the output from the data given.

**b. Significance of Income as a predictor variable.**

The value of  $T=-8.803$  and  $p<0.001$  implies that at  $\alpha=0.05$  and  $0.01$  level of significance, there exists enough evidence to conclude that the slope of the income variable is not zero and, hence, that income is useful as a predictor of amount accessed before retirement.

**c. Significance of Age as a predictor variable**

The value of  $T=-13.065$  and  $p<0.001$  implies that at  $\alpha=0.05$  and  $0.01$  level of significance, there exists enough evidence to conclude that the slope of the income variable is not zero and, hence, age is useful as a predictor of amount accessed before retirement.

**d. Significance of the number of years in the scheme as a predictor variable**

The value of  $T=4.061$  and  $p<0.001$  implies that at  $\alpha=0.05$  and  $0.01$  level of significance, there exists enough evidence to conclude that the slope of the income variable is not zero and, hence the number of years in the scheme is a useful predictor of amount accessed before retirement.

**e. Collinearity statistics**

The output indicates that the variance inflation factor (VIF) of income is 6.720, of age is 1.348 and of the number of years in scheme is 6.630. Since neither of the predictor variables has a variance inflation factor (VIF) greater than ten then we can conclude that there are no apparent multicollinearity problems within the model.

**4.5 Analysis of variance**

$F=204.170$  and  $p<0.001$  This implies that at  $\alpha = 0.05$  or  $0.01$ , we can state that there exists enough evidence to conclude that at least one of the predictors is useful for predicting amount withdrawn ; therefore the model is useful.

**Table 12:ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	210.027	3	70.009	204.170	.000 <sup>a</sup>
	Residual	557.204	1625	.343		
	Total	767.231	1628			

#### 4.5 Summary of findings

- Younger members of scheme, those from age group 26 to 35 tend to withdraw their benefits early in comparison to the older members of the scheme. This is in line with Life cycle hypothesis explaining how rational individuals allocate their life-time earnings between consumption and retirement savings over their life cycle.
- Cumulatively, the study shows that most members withdrew their pension scheme after working for less than five years. This is consistent with also the LCH. In addition, this can be explained by the high job turnover of younger members in comparison to the older members of the schemes. Given that the amount saved in less than five years, on average may not be substantially high in comparison to members who have stayed in schemes for over six years. Therefore, most members would withdraw the maximum allowed by RBA Act and regulation of 75% of their total benefits. In addition, this finding is in line with Doerpinghaus and Feldman (2001) study which showed that current years of service had a positive relation to early retirement since they are more likely to have accrued savings.
- The study has established that 73.1% of the members from income ranging from below ksh. 50,000 to Ksh. 200,000 had early withdrawal of their benefits. This is in line with the study done by Loayza et al (2000) which established that the influence of income on savings is greater in developing than in industrial countries, tapering off at medium or high income levels. In addition,
- The study has established that there is indeed a relationship between the amount of retirement benefits accessed early and the age, the amount of income and the number of years in the scheme.
- As the number of years in the scheme increases the amount withdrawn decreases and vice versa. This results show that members of schemes who have stayed in their schemes for many years tend not to withdraw a hundred percent of their retirement benefits. Further, the results also showed that there is a high rate of withdrawal of benefits especially when members have stayed in the scheme for less than five years.
- As the age of the member increases the amount withdrawn decreases and vice versa. This implies that most members younger members tend to withdraw most of their benefits upon changing jobs as opposed to older members who will wait for either early retirement or normal retirement age before accessing 100% of their benefits.

- As the income of the member increases the amount withdrawn decreases and vice versa. This implies that members with higher income tend not to withdraw all their benefits upon changing jobs. On the other hand, members whose income is lower, tend to withdraw 75% to 100% of their benefits.
- The results of the regression model shows that the predictive model:  $\text{Percentage of the amount accessed} = 4.012 - \text{Income} * 0.209 - \text{Age} * 0.128 + \text{Number of years in scheme} * 0.053 + e$  can be used to predict the amount accessed when the age, income and number of years in the scheme is defined.
- On collinearity, we established that the predictive model does not have multicollinearity problems.
- In addition, the ANOVA output showed that there exists enough evidence to conclude that at least one of the predictors is useful for predicting amount withdrawn, therefore the model is useful.
- Further, we also established that income, age and number of years in service are useful predictors of the amount of benefits accessed before retirement age.
- The results of this study are in line with studies conducted by Loayza, Schmidt-Hebbel, and Servén (2000), Doeringhaus and Feldman (2001) and LCH by Modigliani.

## **CHAPTER FIVE: CONCLUSION & RECOMMENDATION**

### **5.1 Introduction**

The present study has attempted to provide additional empirical evidence needed to determine the determinants of the amount of benefits accessed before retirement age. Some studies that have been reviewed in this paper suggest that the amount of income, age and the number of years in the scheme indeed can affect the amount of accumulated pension benefits. Although most of the studies did not bring out the relationship between the amount of benefits accessed and the determinants aforementioned, this study attempted to bring out that relationship. It is important to note that in many jurisdictions around the world, pension savings is preserved until retirement age apart from special cases like ill-health, death in service, immigration and in some countries, mortgages. The objective of this paper was to present logical and empirical evidence of the determinants of the amount accessed before retirement age and how the amount accessed varies depending on the factors.

### **5.2 Conclusion**

The purpose of the study was to determine the relationship between the amount of benefits accessed before retirement age and the amount of income; age and number of years in the scheme of the member of the scheme. More specifically, the study addressed the question of whether there existed a relationship between the amount of benefits accessed and the variables of income, age and number of years in the scheme. The researcher received data from pension scheme administrators and analyzed it using descriptive statistics and regression analysis. More specifically, cross tabulations were used to investigate the various categories of members who accessed their contribution. The results indicated the percentage amount of contributions accessed with regards to each income group category, age category and the number of years in service.

The researcher also came up with a predictive model that can be used to predict the percentage amount of benefits that is expected to be accessed upon leaving service before retirement age. The model was tested and the variables were found to be quite useful in predicting the percentage of benefits accessed. The model also showed that there was a negative relationship



between the percentage of benefits withdrawn and age, the percentage of benefits withdrawn with income and finally the percentage of benefits withdrawn with the number of years in service. We can therefore conclude that there is indeed a relationship between the percentage amount of benefits accessed and age, the number of years and amount of income.

### **5.3 Recommendation**

Based on this study, policy makers should come up with policies to ensure that leaking of benefits is minimized during the early years of working in order for members to have a sustainable retirement. We have established that younger members, from age group 25 to 35 years tend to withdraw most of their benefits upon leaving service before retirement age. In addition, based on the scenario analysis, members need to be encouraged to make additional voluntary contributions in order to have an enhanced benefit during retirement. The analysis showed how early access, number of years to retirement and age greatly impacted on the amount of benefits accessed during retirement. The study has also established that older members tend to withdraw a smaller percentage of their benefits upon leaving service before retirement age. The regulator should ensure that most of these members are educated on issues to do with retirement just before they retire. Although the issue of education was beyond this scope, it will be important for the pension regulator to educate pre-retirees on issues to do with financial management to avoid financial loss during retirement.

### **5.5 Limitation of the study**

As with any research, this study had a range of challenges. The data used was secondary data availed by pension scheme administrators. Some of the data received were not complete; they either had dates of birth missing, or the income or number of years in service missing. The researcher therefore had to discontinue analyzing data of members who had missing data. Secondly, the accuracy of the data was not guaranteed since there were some members who accessed their benefits from the current employer and transferred it to an individual pension scheme. In such a situation, the administrator will record that as benefits accessed while in actual sense it is benefits accessed and reinvested in another scheme. Thirdly, this study came at a time when RBA ACT and regulations had been amended to allow members to access up to 75% of their benefits upon leaving service. There were some members who had previously preserved the whole of the employers' portion. Most of this members went back to access their contribution. The amendment biased the results of the study to a certain degree. From the cross tabulations, we

would see a majority of members from the different age groups withdrawing 25% of their retirement benefits. Lastly, studies done of this area are very limited. Most studies focused on determinants of savings. In most countries, early access is only allowed under specific instances such as ill-health, which is very similar to the Kenyan scenario, immigration, death in service and mortgages. Therefore, most members access their full benefits upon retiring.

### **5.6 Suggestions for further research**

In future, it will be ideal to include other variables like household size and household income in order to have an elaborate predictive model. We have seen from past studies that household size and household income play a very important role in savings and more specifically, private savings. Other studies included gender in their predictive model. Another area of research would be to look at the determinants of savings in Kenya. This specific study looked at the determinants of the amount accessed before retirement age. These two studies are closely related since they have similar variables affecting them.

This particular study only focused on income, age and the number of years in the scheme. We may also have other socio-cultural factors, economical and political factors that may influence the amount that is withdrawn by members before retirement age. In addition, the study should look at how these factors influence their decision of either withdrawing or preserving their benefits. From this particular study, we have noted that younger members tend to withdraw most of their benefits upon change of jobs. It will be useful to do a further research on this particular category of members to investigate how the amount withdrawn is utilized upon access. A similar study can also be done on retirees and access the adequacy of retirement savings upon retirement.

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## APPENDIX

### Scenario analysis

#### Scenario one: Member contributes till retirement age

Years of service	Annual Salary	Contributions	Opening Balance	Interest	Closing Balance
1	360,000.00	36,000.00	0	1,757.12	37,757.12
2	363,600.00	36,360.00	37,757.12	5,550.40	79,667.52
3	367,236.00	36,723.60	79,667.52	9,759.19	126,150.31
4	370,908.36	37,090.84	126,150.31	14,425.39	177,666.54
5	374,617.44	37,461.74	177,666.54	19,595.12	234,723.40
6	378,363.62	37,836.36	234,723.40	25,319.09	297,878.85
7	382,147.25	38,214.73	297,878.85	31,653.10	367,746.68
8	385,968.73	38,596.87	367,746.68	38,658.54	445,002.09
9	389,828.41	38,982.84	445,002.09	46,402.92	530,387.84
10	393,726.70	39,372.67	530,387.84	54,960.52	624,721.03
11	397,663.97	39,766.40	624,721.03	64,413.06	728,900.49
12	401,640.60	40,164.06	728,900.49	74,850.41	843,914.96
13	405,657.01	40,565.70	843,914.96	86,371.46	970,852.12
14	409,713.58	40,971.36	970,852.12	99,084.98	1,110,908.45
15	413,810.72	41,381.07	1,110,908.45	113,110.61	1,265,400.13
16	417,948.82	41,794.88	1,265,400.13	128,579.97	1,435,774.99
17	422,128.31	42,212.83	1,435,774.99	145,637.86	1,623,625.68
18	426,349.60	42,634.96	1,623,625.68	164,443.53	1,830,704.17
19	430,613.09	43,061.31	1,830,704.17	185,172.19	2,058,937.67
20	434,919.22	43,491.92	2,058,937.67	208,016.56	2,310,446.15
21	439,268.41	43,926.84	2,310,446.15	233,188.63	2,587,561.62
22	443,661.10	44,366.11	2,587,561.62	260,921.62	2,892,849.35
23	448,097.71	44,809.77	2,892,849.35	291,472.05	3,229,131.17

<b>Years of service</b>	<b>Annual Salary</b>	<b>Contributions</b>	<b>Opening Balance</b>	<b>Interest</b>	<b>Closing Balance</b>
24	452,578.69	45,257.87	3,229,131.17	325,122.10	3,599,511.14
25	457,104.47	45,710.45	3,599,511.14	362,182.19	4,007,403.77
26	461,675.52	46,167.55	4,007,403.77	402,993.76	4,456,565.09
27	466,292.27	46,629.23	4,456,565.09	447,932.43	4,951,126.74
28	470,955.20	47,095.52	4,951,126.74	497,411.35	5,495,633.62
29	475,664.75	47,566.47	5,495,633.62	551,885.03	6,095,085.12
30	480,421.40	48,042.14	6,095,085.12	611,853.39	6,754,980.65

**Scenario two: member leaves service after 10 yrs but does not access**

<b>Years of service</b>	<b>Annual Salary</b>	<b>Contributions</b>	<b>Opening Balance</b>	<b>Interest</b>	<b>Closing Balance</b>
1	360,000.00	36,000.00	0	1,757.12	37,757.12
2	363600	36,360.00	37,757.12	5,550.40	79,667.52
3	367236	36,723.60	79,667.52	9,759.19	126,150.31
4	370908.36	37,090.84	126,150.31	14,425.39	177,666.54
5	374617.444	37,461.74	177,666.54	19,595.12	234,723.40
6	378363.618	37,836.36	234,723.40	25,319.09	297,878.85
7	382147.254	38,214.73	297,878.85	31,653.10	367,746.68
8	385968.727	38,596.87	367,746.68	38,658.54	445,002.09
9	389828.414	38,982.84	445,002.09	46,402.92	530,387.84
10	393726.698	39,372.67	530,387.84	54,960.52	624,721.03
11	397663.965	39,766.40	624,721.03	64,413.06	728,900.49
12	401640.605	40,164.06	728,900.49	74,850.41	843,914.96
13	405657.011	40,565.70	843,914.96	86,371.46	970,852.12
14	409713.581	40,971.36	970,852.12	99,084.98	1,110,908.45
15	413810.717	41,381.07	1,110,908.45	113,110.61	1,265,400.13
16	417948.824	41,794.88	1,265,400.13	128,579.97	1,435,774.99

<b>Years of service</b>	<b>Annual Salary</b>	<b>Contributions</b>	<b>Opening Balance</b>	<b>Interest</b>	<b>Closing Balance</b>
17	422128.312	42,212.83	1,435,774.99	145,637.86	1,623,625.68
18	426349.595	42,634.96	1,623,625.68	164,443.53	1,830,704.17
19	430613.091	43,061.31	1,830,704.17	185,172.19	2,058,937.67
20	434919.222	43,491.92	2,058,937.67	208,016.56	2,310,446.15
21	439268.414	43,926.84	2,310,446.15	233,188.63	2,587,561.62
22	443661.099	44,366.11	2,587,561.62	260,921.62	2,892,849.35
23	448097.71	44,809.77	2,892,849.35	291,472.05	3,229,131.17
24	452578.687	45,257.87	3,229,131.17	325,122.10	3,599,511.14
25	457104.473	45,710.45	3,599,511.14	362,182.19	4,007,403.77
26	461675.518	46,167.55	4,007,403.77	402,993.76	4,456,565.09
27	466292.273	46,629.23	4,456,565.09	447,932.43	4,951,126.74
28	470955.196	47,095.52	4,951,126.74	497,411.35	5,495,633.62
29	475664.748	47,566.47	5,495,633.62	551,885.03	6,095,085.12
30	480421.396	48,042.14	6,095,085.12	611,853.39	6,754,980.65

**Scenario 3: Members leaves service and access only employee portion**

<b>Years of service</b>	<b>Annual Salary</b>	<b>Contributions</b>	<b>Opening Balance</b>	<b>Interest</b>	<b>Closing Balance</b>
1	360000	36,000.00	0	1,757.12	37,757.12
2	363600	36,360.00	37,757.12	5,550.40	79,667.52
3	367236	36,723.60	79,667.52	9,759.19	126,150.31
4	370908.36	37,090.84	126,150.31	14,425.39	177,666.54
5	374617.4436	37,461.74	177,666.54	19,595.12	234,723.40
6	378363.618	37,836.36	234,723.40	25,319.09	297,878.85
7	382147.2542	38,214.73	297,878.85	31,653.10	367,746.68
8	385968.7268	38,596.87	367,746.68	38,658.54	445,002.09
9	389828.414	38,982.84	445,002.09	46,402.92	530,387.84



<b>Years of service</b>	<b>Annual Salary</b>	<b>Contributions</b>	<b>Opening Balance</b>	<b>Interest</b>	<b>Closing Balance</b>
10	393,726.70	39,372.67	530,387.84	54,960.52	624,721.03
11	397663.9651	-	312,360.52	31,236.05	343,596.57
12	401640.6048	-	343,596.57	34,359.66	377,956.23
13	405657.0108	-	377,956.23	37,795.62	415,751.85
14	409713.581	-	415,751.85	41,575.18	457,327.03
15	413810.7168	-	457,327.03	45,732.70	503,059.74
16	417948.8239	-	503,059.74	50,305.97	553,365.71
17	422128.3122	-	553,365.71	55,336.57	608,702.28
18	426349.5953	-	608,702.28	60,870.23	669,572.51
19	430613.0912	-	669,572.51	66,957.25	736,529.76
20	434919.2222	-	736,529.76	73,652.98	810,182.73
21	439268.4144	-	810,182.73	81,018.27	891,201.01
22	443661.0985	-	891,201.01	89,120.10	980,321.11
23	448097.7095	-	980,321.11	98,032.11	1,078,353.22
24	452578.6866	-	1,078,353.22	107,835.32	1,186,188.54
25	457104.4735	-	1,186,188.54	118,618.85	1,304,807.40
26	461675.5182	-	1,304,807.40	130,480.74	1,435,288.14
27	466292.2734	-	1,435,288.14	143,528.81	1,578,816.95
28	470955.1961	-	1,578,816.95	157,881.69	1,736,698.64
29	475664.7481	-	1,736,698.64	173,669.86	1,910,368.51
30	480421.3956	-	1,910,368.51	191,036.85	2,101,405.36

**Scenario 4: Member leaves service after 10yrs and access 50% of employers' portion**

<b>Years of service</b>	<b>Annual Salary</b>	<b>Contributions</b>	<b>Opening Balance</b>	<b>Interest</b>	<b>Closing Balance</b>
1	360000	36,000.00	0	1,757.12	37,757.12
2	363600	36,360.00	37,757.12	5,550.40	79,667.52
3	367236	36,723.60	79,667.52	9,759.19	126,150.31
4	370908.4	37,090.84	126,150.31	14,425.39	177,666.54
5	374617.4	37,461.74	177,666.54	19,595.12	234,723.40
6	378363.6	37,836.36	234,723.40	25,319.09	297,878.85
7	382147.3	38,214.73	297,878.85	31,653.10	367,746.68
8	385968.7	38,596.87	367,746.68	38,658.54	445,002.09
9	389828.4	38,982.84	445,002.09	46,402.92	530,387.84
10	393726.7	39,372.67	530,387.84	54,960.52	624,721.03
11	397664	-	156,180.26	15,618.03	171,798.28
12	401640.6	-	171,798.28	17,179.83	188,978.11
13	405657	-	188,978.11	18,897.81	207,875.92
14	409713.6	-	207,875.92	20,787.59	228,663.52
15	413810.7	-	228,663.52	22,866.35	251,529.87
16	417948.8	-	251,529.87	25,152.99	276,682.85
17	422128.3	-	276,682.85	27,668.29	304,351.14
18	426349.6	-	304,351.14	30,435.11	334,786.25
19	430613.1	-	334,786.25	33,478.63	368,264.88
20	434919.2	-	368,264.88	36,826.49	405,091.37
21	439268.4	-	405,091.37	40,509.14	445,600.50
22	443661.1	-	445,600.50	44,560.05	490,160.55
23	448097.7	-	490,160.55	49,016.06	539,176.61
24	452578.7	-	539,176.61	53,917.66	593,094.27
25	457104.5	-	593,094.27	59,309.43	652,403.70
26	461675.5	-		65,240.37	717,644.07

Years of service	Annual Salary	Contributions	Opening Balance	Interest	Closing Balance
			652,403.70		
27	466292.3	-	717,644.07	71,764.41	789,408.47
28	470955.2	-	789,408.47	78,940.85	868,349.32
29	475664.7	-	868,349.32	86,834.93	955,184.25
30	480421.4	-	955,184.25	95,518.43	1,050,702.68

**Scenario 5: Member stays in a scheme till retirement age with addition contribution of 2.5%**

Years of service	Annual Salary	Contributions	Opening Balance	Interest	Closing Balance
1	360000	45,000.00	0	2,196.40	47,196.40
2	363600	45,450.00	47,196.40	6,938.00	99,584.40
3	367236	45,904.50	99,584.40	12,198.99	157,687.89
4	370908.4	46,363.55	157,687.89	18,031.74	222,083.17
5	374617.4	46,827.18	222,083.17	24,493.90	293,404.25
6	378363.6	47,295.45	293,404.25	31,648.86	372,348.56
7	382147.3	47,768.41	372,348.56	39,566.38	459,683.35
8	385968.7	48,246.09	459,683.35	48,323.17	556,252.61
9	389828.4	48,728.55	556,252.61	58,003.65	662,984.81
10	393726.7	49,215.84	662,984.81	68,700.65	780,901.29
11	397664	49,708.00	780,901.29	80,516.32	911,125.61
12	401640.6	50,205.08	911,125.61	93,563.01	1,054,893.69
13	405657	50,707.13	1,054,893.69	107,964.33	1,213,565.15
14	409713.6	51,214.20	1,213,565.15	123,856.22	1,388,635.56
15	413810.7	51,726.34	1,388,635.56	141,388.26	1,581,750.16
16	417948.8	52,243.60	1,581,750.16	160,724.97	1,794,718.73
17	422128.3	52,766.04	1,794,718.73	182,047.32	2,029,532.10
18	426349.6	53,293.70	2,029,532.10	205,554.41	2,288,380.21
19	430613.1	53,826.64	2,288,380.21	231,465.24	2,573,672.08

Years of service	Annual Salary	Contributions	Opening Balance	Interest	Closing Balance
20	434919.2	54,364.90	2,573,672.08	260,020.70	2,888,057.68
21	439268.4	54,908.55	2,888,057.68	291,485.79	3,234,452.02
22	443661.1	55,457.64	3,234,452.02	326,152.03	3,616,061.69
23	448097.7	56,012.21	3,616,061.69	364,340.06	4,036,413.96
24	452578.7	56,572.34	4,036,413.96	406,402.63	4,499,388.92
25	457104.5	57,138.06	4,499,388.92	452,727.74	5,009,254.72
26	461675.5	57,709.44	5,009,254.72	503,742.20	5,570,706.36
27	466292.3	58,286.53	5,570,706.36	559,915.53	6,188,908.43
28	470955.2	58,869.40	6,188,908.43	621,764.19	6,869,542.02
29	475664.7	59,458.09	6,869,542.02	689,856.28	7,618,856.40
30	480421.4	60,052.67	7,618,856.40	764,816.74	8,443,725.81

**Appendix 2: Amount withdrawn \* Number of years in scheme Cross tabulation**

			Number of years in scheme							
			1	2	3	4	5	6	7	8
Amount withdrawn	25	Count	17	20	0	0	0	0	0	0
		% of Total	1.0%	1.2%	.0%	.0%	.0%	.0%	.0%	.0%
50	Count	0	6	0	10	61	6	14	10	
	% of Total	.0%	.4%	.0%	.6%	3.7%	.4%	.9%	.6%	
75	Count	12	81	162	164	145	39	75	25	
	% of Total	.7%	5.0%	9.9%	10.1%	8.9%	2.4%	4.6%	1.5%	
100	Count	350	179	28	21	29	6	12	6	
	% of Total	21.5%	11.0%	1.7%	1.3%	1.8%	.4%	.7%	.4%	

<b>Total</b>			<b>Count</b>	<b>379</b>	<b>286</b>	<b>190</b>	<b>195</b>	<b>235</b>	<b>51</b>	<b>101</b>	<b>41</b>
			<b>% of Total</b>	<b>23.3%</b>	<b>17.6%</b>	<b>11.7%</b>	<b>12.0%</b>	<b>14.4%</b>	<b>3.1%</b>	<b>6.2%</b>	<b>2.5%</b>
<b>Number of years in scheme</b>											<b>Total</b>
			<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>		
Amount withdrawn	<b>25</b>	<b>Count</b>	0	0	0	0	0	0	0	<b>37</b>	
	<b>%</b>	<b>% of Total</b>	.0%	.0%	.0%	.0%	.0%	.0%	.0%	<b>2.3%</b>	
	<b>50</b>	<b>Count</b>	1	0	0	0	0	0	0	<b>108</b>	
	<b>%</b>	<b>% of Total</b>	.1%	.0%	.0%	.0%	.0%	.0%	.0%	<b>6.6%</b>	
	<b>75</b>	<b>Count</b>	38	25	49	22	5	1	1	<b>844</b>	
	<b>%</b>	<b>% of Total</b>	2.3%	1.5%	3.0%	1.4%	.3%	.1%	.1%	<b>51.8%</b>	
	<b>100</b>	<b>Count</b>	4	5	0	0	0	0	0	<b>640</b>	
	<b>%</b>	<b>% of Total</b>	.2%	.3%	.0%	.0%	.0%	.0%	.0%	<b>39.3%</b>	
<b>Total</b>			<b>Count</b>	<b>43</b>	<b>30</b>	<b>49</b>	<b>22</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>1629</b>
			<b>% of Total</b>	<b>2.6%</b>	<b>1.8%</b>	<b>3.0%</b>	<b>1.4%</b>	<b>.3%</b>	<b>.1%</b>	<b>.1%</b>	<b>100.0%</b>

**Appendix 2: Regression output**  
**Coefficient Correlations<sup>a</sup>**

Model		Number of years in scheme	Age	Income_	
1	Correlations	Number of years in scheme	1.000	-.087	-.895
		Age	-.087	1.000	-.145
		Income_	-.895	-.145	1.000
Covariance	Number of years in scheme		.000	.000	.000
		Age	.000	.000	.000
		Income	.000	.000	.001

**Collinearity Diagnostics<sup>a</sup>**

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Income_	Age	Number of years in scheme
1	1	3.618	1.000	.01	.00	.01	.00
	2	.250	3.801	.30	.03	.08	.06
	3	.107	5.810	.64	.01	.90	.00
	4	.025	12.046	.04	.96	.00	.93