DETERMINATION OF THE OPTIMAL LEVEL OF PENSION CONTRIBUTION IN THE PROPOSED NEW SCHEME FOR CIVIL SERVANTS IN KENYA

BY

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JULY 2008
Declaration

This research project proposal is my original work and has never been presented for a degree in any other university.

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This research project proposal has been submitted for examination with my approval as the University Supervisor.

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Dedication

I dedicate this research report to my family, my employer, and colleagues at the Kenya National Audit Office (KENAO) for being supportive during the time of my studies.
Acknowledgement

I would like to acknowledge the support, advice and tireless efforts of my supervisor Mr. Kisaka Sifunjo in the supervision during my research work and in writing of this research project report.

I also thank the Librarians at the University of Nairobi for allowing me the use of the library facilities.

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Abstract

Population ageing requires huge public expenditures for the aged on pensions, health and medical care, and influences government budgets, pension funds, and eventually long-term fiscal sustainability. The problem of an ageing population becomes more serious if it is associated with the pay-as-you-go (PAYG) defined-benefit pension scheme.

The aim of the study was to determine the optimal levels of pension contribution and to determine the implicit tax rate of the civil service pension scheme in Kenya. In achieving these two objectives, the study applied historical data for the wages and pensions, which was obtained at Ministry of Finance. In computing the implicit tax rate and the optimal level of contribution, the key variables included periodic contribution rates, wages earned while working, pension benefits received while in retirement, and the 91-Day Treasury bill rate.

The key findings revealed that the expenditure on pensions has been growing at a higher rate than the growth in national expenditure. This justifies the need to change the current PAYG regime to a contributory scheme. The implicit tax rates were found to be negative. As a result, the study proposed an average contribution rate of 21.07% of the wages earned towards financing the pension bill.

A general conclusion from the empirical analysis was that unless civil servants contribute to retirement scheme, as do private sector workers, the Government's pension fund will remain in deficit as the number of retirees continues to grow.
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<td>DB</td>
<td>Defined Benefit</td>
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<td>DC</td>
<td>Defined Contribution</td>
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<td>PROST</td>
<td>Pension Reform Options Stimulation Toolkit</td>
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<td>PAYG</td>
<td>Pay As You Go</td>
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<td>ILO</td>
<td>International Labor Organization</td>
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<td>IPD</td>
<td>Implicit Pension Debt</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>NDC</td>
<td>Notional Defined Contribution</td>
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CHAPTER ONE

1.0 INTRODUCTION

1.1. Background to the Study

Demographic changes have significant impacts on the social and economic performances of countries, regions and the whole world. Recently, the most observable demographic change is the phenomenon of rapidly ageing population. The proportion of the elderly in the total population is sharply increasing due to declining fertility rates and increasing life expectancy. Policy makers across the globe are struggling to adapt to the reality of ageing populations, globalization and tightening budgets.

The process of ageing that is going on in many countries leads to imbalances in the distribution of burdens across generations. The inter-generational distribution is affected through many channels. Nonetheless the system of old-age provision can easily be detected to be one of the most important channels for ageing populations placing higher burdens on young generations. In turn, demographic ageing will exert substantial pressure on current public pension systems during the years to come. Problems are by far less pressing, though not immaterial, if future pension entitlements are backed by some way of pre-funding (Fenge & Werding, 2003).

Population ageing requires huge public expenditures for the aged on pensions, health and medical care, and influences government budgets, pension funds, and eventually long-term fiscal sustainability. The problem of an ageing population becomes more
serious if it is associated with the pay-as-you-go (PAYG) defined-benefit pension scheme. Recent empirical analyses indicate that these two issues are potential threats to the financial stability of the pension fund in particular, and the government budget in general in almost all economies in the world (Hagemann and Nicoletti, 1989; Auerbach et al., 1989; Holzmann, 1998; and Holzmann et al., 2001).

One of the fundamental global problems facing social security protection today is the fact that more than half the world’s population including workers and their dependants are excluded from any type of social security protection. Non-coverage is greatest in Sub-Saharan Africa and South Asia, where more than 90 per cent of the population is not covered at all. A major contributing factor towards decreasing and low levels of social security coverage in these regions is the trend towards greater informalization or flexibility in labour market conditions, which in essence leave majority of workers outside the realm of social protection systems (Kisia, 2006).

To the extent that households can rely on the traditional arrangements and alternative investments in retirement security, there may be little cause for worry over low coverage. However, with the ageing of populations, urbanization and globalization, the elderly will have reduced access to informal, traditional safety nets in the family or community. Economic development may not be fast and comprehensive enough for individuals to accumulate sufficient real and financial assets over their working lives, rendering them increasingly vulnerable to the risk of poverty in old age (Holzmann and Stiglitz, 2001).
Pension reforms around the world have focused on aligning rights and benefits of public servants with those of private sector employees. Some reform measures have aimed at reducing benefits, keeping older workers longer at work, and moving to pre-funded or fully funded defined contribution schemes by revising the pension systems.

Public pension schemes in most countries are PAYG with the state as the key financiers. The difficulties facing PAYG pension schemes in both developing and OECD countries are leading to growing interest in advance funding of pensions as a complement or even a substitute for PAYG (Gordon and Ashby, 2007).

There is a wide spread perception that public pension systems in richer countries are in crisis. As schemes mature and the population ages, the burden of financing pensions has grown and, on current policies, will rise much further. The transformation in demographics and pension benefits that took over a century in richer nations is forecast to take less than 30 years in developing countries. The World Bank has argued that a ‘three-pillar’ pension system consisting of can mitigate emerging problems in developing countries’ public pension systems. The ‘three-pillars’ are, a publicly managed system with a mandatory participation, a privately managed mandatory savings system, and voluntary savings system (World Bank, 2005)

A quarter of a century ago, Chile embarked on a course of reform to modernize her economy. The radical reform that brought dynamism to the Chilean economy, replaced the old pay-as-you-go system with one pre-funded with personal retirement accounts. The old Chilean pension system was in crisis as it was paying more in benefits than it was receiving in contributions and the actuarial imbalances- pension debt- was projected to be greater than the country’s GDP. The Chilean experience
illustrates that, when needed, extreme and fiscally sound pension reforms can bring dynamism to the capital markets (Soto, 2007).

According to (Blanchard 1990) sustainability is about whether, based on current fiscal policy, a government is headed towards excessive debt accumulation. Blanchard defines sustainable fiscal policy as a policy that ensures that the ratio of debt to financial growth converges back towards its initial level. A good indicator of fiscal sustainability is one that sends clear and easily interpretable signals when current policy appears to be leading to a rapidly growing debt-to-financial growth ratio (Blanchard, 1990). Sustainability indicators not only signal a need for readjustment, but also indicate the magnitude of the adjustment needed. The most widely used indicators of sustainability are the financing gap and the tax gap.

Reforms in the civil service pension schemes have involved the development of funded occupational schemes and contributions by civil servants to the financing of their pension schemes (OECD, 2006). The civil service pension schemes guarantee a total pension benefit. This implies that government employees are sheltered against changes to the mandatory pension system. Coordination of government pension schemes is highly complex, and for most people it is difficult to understand how the pension is calculated.

A key figure suited to measuring the inter-generational imbalances in unfunded public pension schemes is given by the 'implicit tax rate' imposed on each generation's lifetime income. The burden involved in any unfunded pension scheme can be perceived to be a tax that is implicitly levied on a given individual's lifetime income.
The notion of 'implicit tax' is extremely useful for understanding the impact of PAYG pensions on the intergenerational distribution. The implicit tax involved in unfunded pensions is given by the difference of an individual's lifetime contributions paid while working and pension benefits accumulating later on, both discounted to form net present values of some period (Fenge & Werding, 2004).

Implicit tax rates are negative for those who were old or approaching retirement when pay-as-you-go pensions were inaugurated (Fenge, Uebelmesser and Werding, 2002). Not having paid contributions over their entire period of labour force participation, but being entitled to receive full-scale pension benefits, these individuals clearly gain from the introduction of unfunded pensions. On the other hand, positive tax rates that are imposed on all subsequent generations when the system matures is exactly what is needed to pay off for these initial gains (Sinn, 1997). Outside a theoretical context, the concept of implicit tax rates is also useful as a measure for the impact of ageing populations on existing public pension systems and for the way in which large-scale demographic ageing affects the inter-generational distribution of burdens.

1.2. The Pension Industry in Kenya

1.2.1. A Historical Perspective

The Kenyan retirement benefit sector dates back to pre-independent, when it existed in the form of the pioneer Civil Service Staff Pension Scheme and a few occupational schemes set up by large private companies. Prior to the enactment of the Retirement Benefit Act in 1997, the sector was by and large unregulated. There was a lack of a harmonized legislature framework and even with the establishment in 1965 of the National Social Security Fund a discordant regulatory environment. The only
regulations governing the sector were those inscribed in the Income Tax Act and trust laws. These regulations did not, encompass development objectives (Odundo, 2003).

Between 1965 and 1997 the industry was dominated by retirement benefit schemes run by employers, who typically gave secondary consideration to the interests of schemes members and to matters impacting the country economy. Many of these schemes further more were run through insurance companies whose operations were strictly nontransparent. As a result the industry was tainted by poor investments, delays and denials of payments to members, and the misuse and outright embezzlement of funds by those entrusted to guard them (Odundo, 2003).

The Government’s objective in establishing the Retirement Benefit Act was to bring the retirement benefit industry under a harmonized legislation and to address the many problems that had hitherto faced the industry. The Retirement Benefits law has two objectives: First, to protect the interest of members and sponsors of retirement schemes so as to ensure that members receive a reasonable retirement income and that the sponsors investment is safeguarded; and secondly, to spur Kenya’s economy growth through enhancing mobilization of domestic savings and capital formations as well as deepening the money market (Odundo, 2003).

The Retirement Benefit Authority (RBA) is mandated to oversee implementation of the new law and ensure that the retirements benefit sector plays its role in national development which is: Boosting the county’s savings; Contributing to the development of capital markets and capital markets investments; Provision of insurance for retired, to those unable to work due to disability and to the ageing
population by providing financial security; and to contribute towards fiscal policy.

Retirements benefit sector is structured into Civil Service Pension Scheme, NSSF, occupational and individual retirement benefits schemes (Odundo, 2003).

Kenya Civil Service Pension Scheme was established by the Pension Act Cap 189. This scheme provides benefits to all civil servants employed by the Government who are eligible for such benefits. It is a “pay as you go” non-funded and non-contributory scheme. The scheme’s liabilities are funded by the government. Every year the government makes budgetary allocations for the payment of benefits. The scheme is administered by the Pensions Department in the Ministry of Finance and is not under RBA. Public servants under this scheme include civil servants, Teachers and members of the disciplined forces.

The National Social Security Fund (NSSF) is essentially a mandatory savings scheme into which an employer pays a statutory contribution of 10% of an employee’s wage subject to a maximum regulated by the Act of which one half is recovered from the employee’s wage. All private sector employers and employees in establishments with five and more staff are mandated to make joint contributions on a monthly basis (Republic of Kenya, 1965).

Occupational Retirement Benefits Schemes are employment-based and are voluntarily established by employers for the benefit of their employees. In 2005, there were 1,352 occupational pension schemes operating in Kenya. Defined contribution schemes accounted for 87 per cent of the total schemes with defined benefit schemes accounting for the remaining 13% (Ogonda, 2006). The total assets of occupational
schemes stood at Kshs 155 billion ($22.1 million) as at June 2005. Of the total occupational schemes in Kenya, 125 are established by parastatals.

Individual Retirement Benefits Schemes are established and administered by insurance companies. These schemes are open to the general public and are convenient channels of retirement benefits savings for those individuals in employment but whose employers have not established occupational schemes for them; those in self employment; and those in employment who wish to make additional voluntary contributions. All Individual Retirement Benefits Schemes must be licensed by the RBA to operate and must be funded.

1.2.2. The Legal Perspective

The Pensions Act (Cap.189), of the laws of Kenya, came into operation in its present form with effect from 1st January, 1946. Since then it has been amended from time to time in order to update and make it easier to administer. The Pensions Act makes provisions for the granting and regulating the payment of pensions, gratuities and other allowances in respect of the public service officers under the Government of Kenya. According to the existing terms and conditions of service, officers in the public service expect terminal benefits in accordance with their letters of appointment, as an incentive for the services they render to the country for a number of years of their working life.

Paragraph 4 of the letter of appointment in the service of the Government of Kenya Form G.P. 24 (Revised) states that if one’s appointment is confirmed, he/she is eligible on retirement for retiring benefits in accordance with the provisions of the
Pensions Act. The benefits in question are non-contributory (Republic of Kenya, 2006a). According to the Pensions Act (Cap.189) civil servants or their dependants may be paid, on leaving the service of the Government and on fulfilling certain conditions, one or more of the following benefits: Service pension plus commuted pension, Service gratuity, Marriage gratuity; Injury pension, Death gratuity, Dependents pension, Compassionate gratuity, and Annual allowance.

In 2006, the Government introduced a funded Contributory Pension Scheme in the Public Service that was intended to make adequate retirement provisions for its employees. Membership to the proposed scheme known as Public Service Superannuation Scheme is meant to be compulsory for all new entrants into the service, but optional to pensionable employees aged below 50 years. Those aged over 50 years are not eligible to join the proposed scheme. The proposed scheme will also cover subordinate staff below the age of 50 who will opt to take up membership (Republic of Kenya, 2006b). Subordinate staff currently contributes to NSSF. Subordinate staffs who take up membership in the proposed scheme will access their benefits accrued under the NSSF only as provided for under the current NSSF Act Cap 258. All serving employees who do not opt or are not eligible on age grounds to join the proposed scheme, will remain in the current scheme and continue to contribute to the Widows and Children Pension Scheme (WCPS) where applicable while subordinate staff will continue to contribute to NSSF (Republic of Kenya, 2006b).
The proposed scheme aims to ease the burden of the heavy pension expenditure which has been steadily rising due to increased number of pensioners and the improved salaries. It is also expected to improve the benefits payable to employees on retirement as well as facilitate benefits vesting in employees on leaving the service. The current scheme does not provide for benefits to officers leaving the service before the age of 50 years (Republic of Kenya, 2007). Implementation of the proposed pension scheme has, however, been put on hold.

1.3. Statement of the Problem

One of the main challenges in the effort to modernize any particular pension scheme is the establishment of a sustainable pension system in the sense that it represents a reasonable allocation of burdens across generations (Republic of Norway, 2006). This requires measures to curb expenditure growth within the pension schemes, and it requires government to save a considerable proportion of its revenues over the years. A pension scheme should aim at making more people remain at work and provide high pension benefits (Perspektivmeldingen, 2004).

Kenya is facing a problem that is fast becoming a nightmare to the pension management industry. Workers on average are now living longer than they were expected. While official figures estimate that someone born in Kenya is likely to die at age 49, due to the grim reality of the Aids pandemic, actuaries say that many senior citizens are living up to age 78 (Omondi, 2007). Ageing of population means that organization will have to absorb huge unbudgeted pension liabilities. The government is especially a big victim given that it operates unfunded, non contributory pension
scheme for civil servants whose liabilities are financed from the tax revenues. The civil servants scheme has over 158,700 pensioners on its roll.

The Government’s pension expenditure has been steadily rising and there is concern about the ability of the existing pension system to continue to provide current pensions levels without a change in its design (Republic of Kenya, 2006). This study sought to present computable models that capture the essential aspects of the current Kenyan civil service pension system, specifically, the determination of optimal levels of pension contribution in the event of a change in the pension design. The study also sought to determine the implicit tax rate of the pension system. The study hypothesized that there exist an optimal contribution rate that can be applied to ensure sustainability of the pension system and reverse a large part of the ageing effects.

1.4. Objectives of the Study

The study sought to achieve the following objectives:

a) To determine the optimal levels of pension contribution

b) To determine the implicit tax rate of the civil service pension scheme in Kenya.

1.5. Importance of the Study

The findings of the study stand to guide the policy makers in the Ministry of Finance and Ministry of Planning & National Development in projecting the pension needs of the country’s public labour force in the upcoming generations. In light of the findings, recommendations have been made on ways of financing the civil service pension scheme to make it sustainable and reduce the government’s burden in the same.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1. Introduction

This chapter presents a review of the literature on reforms in the public pension schemes as presented by various researchers, scholars, analysts and authors. The chapter is organized as follows. Section 2.2 introduces the concept of pension sustainability. Section 2.3 reviews empirical studies on ageing and sustainability of public pension systems. Section 2.4 covers literature on modeling public pension systems' sustainability. Section 2.5 is the summary.

2.2. The Concept of Pension Sustainability

Sustainability is about whether, based on current fiscal policy, a government is headed towards excessive debt accumulation. To make this rather general statement operational, Blanchard defines sustainable fiscal policy as a policy that ensures that the ratio of debt to financial growth converges back towards its initial level. A good indicator of fiscal sustainability is one that sends clear and easily interpretable signals when current policy appears to be leading to a rapidly growing debt-to-financial growth ratio (Blanchard, 1990).

According to Blanchard (1990) sustainability indicators not only signal a need for readjustment, but also indicate the magnitude of the adjustment needed. The most
widely used indicators of sustainability are the financing gap and the tax gap. The construction of the two indicators is based on the same approach. First, the sustainable level of the fiscal variable at hand is calculated. Secondly, the gap is defined as the difference between the sustainable and the current level of the primary deficits or the tax ratio. The sustainable level of the fiscal variable is such that ensures convergence of the debt ratio towards a finite value and its calculation is governed by the condition of sustainability.

2.3. Ageing and Sustainability of Public Pension Schemes

In 1981 Chile became the first country to shift from publicly provided PAYG pensions to a funded system. Facing a large PAYG pension debt – estimated at 100% of GDP – Chile used a combination of debt financing and tax/expenditure reduction to manage the transition deficit. Parametric reforms of the old pension scheme included an increase in the retirement age. More importantly perhaps, the government had pursued a restrictive fiscal policy during this period, running significant budget surpluses. This public saving helped offset initial pension deficits caused by the loss of contribution revenues (World Bank, 2005).

In the early years Chile covered a significant part of the financing gap by issuing new government debt and selling it to the new pension funds. Their holdings of Treasury bonds rose from 2.2 million US dollars to 864 million US dollars between 1981 and 1986. During the subsequent five years, privatization proceeds replaced debt as the major source of deficit financing. In parallel, pension funds were allowed to purchase shares in the newly privatized and listed firms. In the end, the transition financing requirements were spread out over several decades by setting up incentives that led
mostly younger workers to switch to the new scheme and issuing 'recognition bonds' in lieu of rights accrued under the old scheme (World Bank, 2005).

Fenge and Werding (2004) examined pension systems of France, Germany, Italy, Japan, Sweden, the UK, and the USA. They computed implicit tax rates for individuals born between 1940 and 2000. They assumed individuals enter the labour market at the age of 20 years and earn average wages during their career. For the future development of productivity and wages they assumed real annual increases of 1.75% per year. Real interest rate was set at 4%. The current legal frameworks of the public pension system under scrutiny are taken as baseline while reform proposals are taken as a variant.

Pension reforms have important economy-wide repercussions. In particular, they are expected to affect labor-market performance. Depending on the extent of the tax–benefit link, contributions to a pay-as-you-go (PAYG) system have a partial tax character. The return to contributions depends on population and productivity growth and is therefore lower than the real interest rate in a dynamically efficient economy. Thus, contributions tend to be actuarially unfair from an individual perspective, and are partly perceived as taxes. Distorting labor taxes, in turn, restrict labor demand and are a source of unemployment (Christian and Mirela, 2004).

Ageing of the population puts formidable pressure on the pension system. Given current pension rules, contribution rates would have to rise quite impressively to fund the system. Since these contributions have partial tax character, this secular rise adds to the overall labor-tax burden, with potentially detrimental effects on labor-market
performance. Cutting pensions may help to stabilize statutory contribution rates. Lower statutory rates translate into lower effective tax rates and thereby help to reduce the labor-market distortion. On the other hand, pension cuts imply a lower rate of return and thereby a higher implicit tax component of given contribution levels. (Christian and Mirela, 2004).

Global population ageing is driving public pension reformers to seek ways to tighten the link between workers’ public pension contributions and pension benefits paid in retirement. In many nations, massive unfunded retirement system liabilities are partly attributable to the practice of paying defined benefit (DB) pensions which bear no tight relationship to workers’ lifetime payroll taxes or social security contributions (Bei, Olivia, and Piggot, 2006). This tax-benefit link can be strengthened in a notional defined contribution (NDC) system, where workers’ contribution histories are directly related to the value of benefits promised in retirement.

A study commissioned by the Federal Ministry of Finance (Austria) in 2001 sought to establish the effects of population ageing on the sustainability of public finances. The Austrian system of old-age insurance covers in various schemes all gainfully employed individuals. Entitlement to benefits normally depends on the period of membership of the relevant scheme and the amount of contributions made. The system is a pay-as-you-go system. The projected growth of the population is reported to have a considerable impact on the long-term financing of the public pension and health systems (Federal Ministry of Finance, 2001).
The declared objectives of Austrian pension policy included sustainability and quality assurance. The following measures were adopted in the wake of the 2000 pension reform. Increase in the statutory early retirement age by 1½ years and abolition of early retirement. Harmonization of various pension schemes and deletion of the legal provisions governing retirement pensions to permit drawing of a pension and simultaneous carrying on of gainful activity. Linking pension adjustments to net wages only and making one-off payment as a cushion against inflation. Reduction in the survivor's pension where the surviving spouse has income or is entitled to a pension. Finally, strengthening of the second and the third pillars.

In the same year, Hofer and Koman (2001) argued that the sharp drop in labor-force participation among the elderly was the result of strong disincentives of the Austrian pension system. The authors quantified the incentives to retire early by computing measures of social security wealth and of the implicit tax rates on continued work generated by the current system. They found the tax on continued work to become significant after the early retirement age. With these trends, labor-force participation rates at older ages are now among the lowest in EU countries: between the ages of 60 and 65, only about 10% of the population is in the labour force.

As a result of population ageing in Austria, (Eurostat, 1999) had projected an increase in all old-age-related expenditures, putting pressure on the finances of the welfare system and threatening the long-run fiscal sustainability. They had also projected an increase in public pension spending over the next decades, reaching 17% of GDP in 2050. Apart from demographic developments, three other factors that were likely to influence the expected increase in pension spending included: the share of working
Given the expected decline in employment, the government was likely to collect less revenue from taxes and social security contributions as a result. A higher employment rate of older workers would yield a double fiscal dividend as it would increase the number of contributors and decrease the number of people claiming pension benefits. Thus the recommendation was that any reform targeting an improvement in women's and the elderly's labour-force participation as well as lowering benefits was likely to alleviate some of the spending pressure (Eurostat, 1999).

Marin, Stefanits, Tarcali, (2001), carried out a review on the Hungarian pension system and reforms. Hungary reached the decision in 1997 to undertake a fundamental restructuring of its state pension system, which was implemented as of mid 1998. The prime motivation behind the reform of old age provision system was concern over long run funding. In terms of pension systems sustainability, Hungary currently has a comparatively favourable age structure, with delayed and less severe population ageing and extremely low life expectancy rates by Western-European standards.

Over the past five decades, the Hungarian pension system had been a purely PAYG, earnings-related scheme as is also the case in Austria (Marin et al., 2001). The most conspicuous feature of the Hungarian pension system reform is the replacement of this scheme by a three-pillar mixed system. The first pillar is a basic state pension funded on a PAYG basis. This scheme has, however, been substantially modified. The
second pillar is the mandatory retirement provision within the scope of fully funded private pension funds. A voluntary private pension provision continues to form the third pillar.

Kolawole (2006) assessed the efficiency and effectiveness of pension reforms in Nigeria through use of three criteria namely old age welfare, insurance, and promotion of economic development. The study identified four main types of pension schemes in Nigeria namely: the fully unfunded defined benefit scheme for civil servants; defined contribution scheme for employees in organized private sector administered by Nigerian Social Insurance Trust Fund, self-administered schemes common with government parastatals and private sector, and insured scheme by individuals administered by pension fund management or insurance companies. To facilitate reforms in these schemes, the author proposed that the government should come up with measures of financing existing pension deficits.

Whitehouse (2003) studied the reforms in the civil service pension scheme in Senegal. The civil-service scheme was reformed in January 2002. The reforms resulted in improved finances, corrected technical flaws, and improved equity. The main element of the civil service reform included: increase in retirement age to 60 years from 55 years, reduction of the accrual rate 1.8% from 2%, lengthening of the averaging period to 3 years as opposed to 1 year, indexation of pension benefits to prices rather than ad-hoc uprating to civil service pay and incorporation of housing allowance in the contribution and benefit base.
The recent fiscal considerations and pension reforms contained measures addressing the pension system, mainly by discouraging early retirement, which was made financially less attractive (Keuschnigg et al., 2000). The required contribution period was extended, and full pensions were made available only to retirees of age 60 or older. To compute benefits, a maximum gross replacement rate of 80% is applied for the PAYG pension scheme. The benefits depend on the retirement age, the number of contribution periods, and the average income over the best 18 contribution years.

A study by Butrica, Johnson, Smith and Steuerle (2004) had sought to establish whether work pays at old age. They hypothesized that one way of relieving the economic pressures created by an aging population would be to encourage workers to delay retirement. People who work an extra year produce goods and services that can support their current consumption and help cover the costs of both retirement programs and other government efforts, while at the same time reducing tax pressures on younger workers to support them in retirement.

The findings by Butrica, Johnson, Smith and Steuerle (2004) established that the implicit tax rate on work increases rapidly at older ages, approaching 50 percent for some workers by age 70. In addition, by age 65 people can typically receive nearly as much in retirement as they can by working. They concluded that if older Americans could delay retirement, they could substantially improve their economic well-being at older ages. For example, many people could increase their annual consumption at older ages by more than 25 percent by simply retiring at age 67 instead of age 62.

According to OECD (2004), when a worker reaches the age of eligibility to a pension, his retirement decision will depend not only on the current replacement rate but also
on the expected gain – in terms of higher future benefits – if he or she stays in the
labour force, weighed against the cost of doing so in terms of foregone pensions and
contributions paid. If this cost is exactly offset by a rise in future pension benefits, the
pension system is said to be “actuarially neutral”. By contrast, if this cost is not offset,
there is an implicit tax on continued work.

Giang (2004) described the publicly managed PAYG defined-benefit pension scheme
in Vietnam using an analysis of its financial sustainability in the context of an ageing
society in a dynamically efficient economy. By using actuarial models developed by
the ILO, they found that the Implicit Pension Debt (IPD) of the scheme was high in
comparison with GDP of the year 2000, which was the base year for projections. A
high IPD implied that the burden of maintaining the scheme was borne by the existing
and future participants and would cause financial instability and inter-generational
inequity. Giang (2004) thus recommended a move to a partially funded defined
contribution scheme with careful considerations of social and economic impacts.

Recently the concept of implicit pension debt (IPD) has penetrated the public
discussion in many countries on the basic premise that it shares some important
features with the explicit conventional defined public debt. It therefore needs to be
taken into account in a macroeconomic analysis that includes an assessment of fiscal
sustainability. While some differences between implicit and explicit debts do exist, for
many purpose they can be classified as public debt. Hence, knowledge about the
scope and development of IPD is important for macroeconomic analysis and policy.
In addition, good estimates of IPD are important for pension reform, ex-ante for its
initiation and preparation, and ex-post for its assessment (Holzmann, Palacios and Zviniene. August 2001)

In summary, there are four options for financing existing PAYG liabilities. First, increasing tax. Second, borrowing or issuing conventional public-sector debt. Third, cutting public spending. Fourth, ‘swapping’ pension liabilities with other government assets, for example, use of revenues from privatization or other divestment of public-sector assets. Privatization has a particular attraction as proceeds from the same are a ‘one-off receipt and the cost of a transition to funding is a one-off expense. Marrying the two seems sensible. However, the scale of revenues from asset sales has, in practice, proved sufficient to finance the transition cost whither only in part or only for a relatively short period (World Bank, 2005).

The choice between these financing mechanisms should, of course, be made in the general context of a sound fiscal policy. In practice, governments have tended to use a mix of mechanisms. It will therefore depend on the particular circumstances of the reforming country. Shifting to funding ends the process of rolling over the IPD to each upcoming generation and enhances the sustainability of the scheme. Some of the IPD therefore becomes explicit. The short-term transition cost adds to the government’s explicit deficit (or reduces the surplus) (World Bank, 2005).

In summary, strategies for increasing the sustainability of existing pension systems are, phasing in contribution, reducing pension, increasing retirement age, abolition of early retirement by making it less attractive, linking pension adjustment to net wages, extend contribution period for eligibility to pension, putting a maximum replacement
rate for PAYG systems. Fundamental pension design issues to assure pension system sustainability include restructuring of the pension system to a fully funded system and introduction of three-pillar systems and privatization of the pension system.

2.4. Modeling Public Pension Systems Sustainability

Today's pension policies can affect retirement incomes and public finances for decades to come. Retirement income systems that are affordable today will often prove unsustainable in the future under the twin pressures of demographic ageing and the maturing of pension schemes. PAYG pension systems were often introduced with little or no analysis of the medium and long-term effects on the aged, workers and public finances. Thus, once schemes are introduced, there remains a need for regular scrutiny of the impact of the pension system of factors such as changing life expectancy and patterns of labor force participation (World Bank, 2003).

Pension Reform Options Simulation Toolkit (PROST) is a World Bank's model that has been used to model pension systems in many countries. PROST is designed to answer the following kinds of question: How much will the pension system cost in the future? Is it viable and sustainable? What kind of benefits can people expect to receive in the future? Is the pension system equitable? Does it provide a decent retirement income to different categories of people? How large are the government's implicit pension liabilities? How would broadening of coverage, changing pensionable retirement or adjusting contribution rates affect the system? How will costs, expenditures and liabilities change under various reforms (World Bank, 2003)?
PROST is used in modeling pension contributions, entitlements, system revenues and system expenditures over a long time frame. It is designed to promote informed policymaking, bridging the gap between quantitative and qualitative analysis of pension regimes. It is a flexible, computer-based toolkit, easily adapted to a wide range of countries’ circumstances. It takes country-specific data provided by the user. It generates population projections, which, combined with economic assumptions, are used to forecast future numbers of contributors and beneficiaries. These in turn generate flows of revenues and expenditures. The model then projects fiscal balances, taking account of any partial pre-funding of liabilities (World Bank, 2003).

Pension modeling assesses schemes’ fiscal sustainability. Affordability is an essential prerequisite for achieving other policy goals. PROST can also assess different pension reforms informing both the policy makers and the public about the consequences of change. PROST can assess anything from ‘parametric’ reforms of initial PAYG systems - changing pensionable age, contribution rates and others - to fundamental reforms, such as the introduction of individual, funded retirement savings accounts. A shift from a DB PAYG scheme to one based on notional accounts can also be modeled. PROST can handle provident fund schemes as well as PAYG systems. In sub-Saharan Africa, it has been applied in Namibia and Zambia (World Bank, 2003).

Public pensions in many countries are pre-dominantly of a PAYG type. One of the stresses that PAYG pension systems experience is long-run financial stability. The main policy parameters that should be included in a model of state pension system sustainability are, the number of contributors to the system, the effective pension contribution rate, the average gross earnings subject to contributions, the number of
pensioners, and the effective pension replacement rate (Chand and Jaeger, 1999). Blake and Mayhew (2006) identified raising contribution rates, raising retirement age or reducing the pension amount and an increase in economic activities as the main policy levers that should be included in a model of a PAYG pension system sustainability.

When modeling pension system sustainability using PROST, the assumptions inputted into the model are on two tiers: Macro-economic variables and Pension specific variables (World Bank, 2004). The most important input variables include, GDP in nominal terms in the base year, the contribution ceiling, wage and pension brackets and cumulative distributions, demographic trends, macroeconomic growth trends for Real GDP, the inflation rate, the real interest rate, Government bond rate and the discount rate, the retirement age, contribution rates, pension and minimum wage indexations, contribution ceilings indexations and benefit related parameters such as replacement rate (World Bank, 2006).

### 2.4.1 Modeling the Impact of Ageing on Public Pension Systems

Several approaches have been taken to measure the impact of demographic ageing on public pension with particular attention being paid to potential fiscal imbalances across generations. The approaches include "net pension liabilities", "general government balances" and "generational accounting" all which are related to each other by the general idea that unfunded pension create an implicit debt. The "Implicit tax" is a further variable for measuring the inter-generational distribution of burdens arising from ageing populations. The parameter "Implicit tax" is easy to interpret in
a theoretical perspective and can be introduced to various works using micro level data (Fenge and Werding, 2003).

2.4.2 Modeling the Implicit Tax Rate

Implicit tax rate is a measure of the impact of ageing on public pension schemes. Ageing creates a burden in unfunded pension schemes once the system matures. This burden can be perceived to be a tax that is implicitly levied on a given individual lifetime income (Fenge and Werding, 2004). The parameter 'implicit tax' is extremely useful for measuring the impact of pay-as-you-go pensions on the inter-generational distribution (Thum and Weizsäcker, 2000; and Sinn, 2000). At the same time it is located at the very heart of the pay as you go mechanisms, highlighting the hidden form of inter-generational redistribution that goes on in any pay as you go scheme of old age provision (Fenge, Uebelmesser and Werding, 2002).

Fenge and Werding (2004) defined the implicit pension tax as the fraction of lifetime wages which represent the contributions that individuals do not receive back in terms of future benefits. This tax captures the degree of intergenerational redistribution and is a much better measure of the burden from pensions than simply looking at contribution rates. Implicit pension taxes are a form of generational accounting, a concept pioneered by Larry Kotlikoff and Alan Auerbach, Berkeley, among others.

According to Fenge and Werding (2004) the implicit tax involved in unfunded pensions is given by the difference of an individual’s lifetime contributions paid while working and pension benefits accruing later on, both discounted to form net present values of some period \( t \). However, defining implicit taxes in absolute terms is not very
instructive. Instead, consider the *implicit tax rate* \( I_t \) which relates the amount of implicit taxes to lifetime income earned by a typical individual in a given generation.

Assuming that the members of ‘generation t’ (i.e. those who take up work in period or ‘year’ \( t \)) retire in period \( T \) and die in period \( \Omega \), the implicit (or ‘benefit adjusted’) tax rate is given algebraically by equation (1).

\[
I_t = \left( \frac{\sum_{s=t}^{T-1} \frac{v_s \omega_s w_s}{\prod_{j=r+1}^T (1 + r_j)} - \sum_{s=T}^{\Omega-1} \frac{P_s}{\prod_{j=t+1}^T (1 + r_j)}}{\sum_{s=t}^{T-1} \frac{w_s}{\prod_{j=t+1}^T (1 + r_j)}} \right)^{-1}
\]

Where:

- \( I_t \) = Implicit tax rate
- \( v_s \) = periodic contribution rates
- \( w_s \) = wages earned while actively working,
- \( \omega_s \) = the fractions of earnings covered by the pension scheme,
- \( P_s \) = pension benefits received while in retirement; and
- \( r_s \) = the interest rates used for discounting all nominal amounts to period-\( t \) values.

If pension benefits fall short of the actuarial value of lifetime contributions, there will be a positive implicit tax rate \( I_t \) on lifetime income. Increasing contribution rates \( v_s \) drives up the implicit tax rate as long as an individual is subjected to paying them; it reduces implicit taxes as soon as it increases the budget from which the individual’s
pension benefit is financed. Similarly, increasing the fraction of covered earnings \( \omega \) implies a higher tax as long as it is relevant for the amount of contributions to be paid; it reduces the tax as soon as it expands the tax base for funding the individual’s pension (Fenge and Werding, 2004).

If the scheme is non-contributory PAYG, such as the Kenyan case, the first expression on the numerator of equation (1) collapses since the value \( \nu = 0 \) hence the implicit tax rate \( I_n \) is negative. The reason for this is that under non contributory PAYG pension scheme workers are entitled to receive full scale pension benefits without having contributed to the PAYG budget during their entire period of labour force participation. The benefits received by these workers are like gifts. It is easy to see that these gifts make implicit tax negative and gives rise to implicit pension debts that are generally implied in PAYG pension schemes (Fenge and Werding, 2003)

### 2.4.3 Modeling the Contribution Rates under Transition

Currently, the Kenyan civil service pension scheme is a non-funded, non-contributory, DB PAYG scheme financed through recurrent revenue (taxes). The increasing maturity profile, and taking cognizant of the fact that the Government’s pension expenditure has been steadily rising, there is a need to ensure sustainability of the pension scheme. Against the background of the Government’s constrained budget, the current unfunded scheme is causing increasing strain on the taxpayers. The Government has proposed to introduce a funded contributory scheme that makes adequate retirement provision for its employees (Republic of Kenya, 2006).
The proposed pension scheme for civil servants when implemented will lead to the Government shifting part of its rising pension burden to its employees. It will thus ease the Government’s growing exposure to future pension debt by asking workers to pay a portion of their monthly salary towards building their individual retirement funds. The shift to a contributory civil service retirement scheme means that workers will have to make a contribution just like the government to form funding kitty which will be managed by a board of trustee (Omondi, 2007).

For the pension system to be fully sustainable there is need for a transition from a PAYG to a fully contributory system. In his empirical study Heikki (2005) formulated a model for computing contribution rates under transition. Heikki argued that the population is composed of children, workers and retirees. Each of these phases of an individual’s life (for the purpose of managing the mathematics) can be set to be of equal length, which is set as the unit period represented by equation (2).

\[ E_t = L_{t+1} = R_{t+2} \]  \hspace{1cm} (2)

Where,

- \( E \) = Children
- \( L \) = Workers and
- \( R \) = Retirees

Heikki (2005) further defined a parameter \( f \) to expresses the number of children per worker as represented by equation (3).
\[ f_t = \frac{E_t}{L_t} \]  
(3)

Where:

\[ f_t = \text{Number of children per worker at time } t \]
\[ E_t = \text{Number of children at time } t \]
\[ L_t = \text{Number of workers at time } t \]

To keep a rough correspondence with real life, the unit period is best considered to last 30 years: this is currently the average childbearing age of women, and also, by chance, roughly the difference between the average age of a pensioner (70) and that of a worker (40). The assumed pension system delivers pensions accrued at a specified rate of the wage by working and paying pension contributions. Pensions in payment are indexed to the nominal wage rate, \( w_t \), assumed to be uniform for all. Pension per retiree for the unit period, as a percentage of unit wages can therefore be presented by equation (4)

\[ s_t = \sigma_t \pi_{t-1} \]  
(4)

Where

\[ \pi_{t-1} = \text{The accrual rate valid for period } t-1 \text{ workers determining their pension as a percentage of unit wage in the next period when retired, and} \]
\[ \sigma_t = \text{A scale factor which, firstly, takes into account the period at work and in retirement. It is essentially the ratio of the period in retirement to the period spent actively working.} \]
To construct a case which is more general than a pure PAYG system, the system may be allowed to have financial reserves, $+A_t$ (which can be negative). The interest rate is assumed to be uniform and a fixed margin, $d$, above the increase in the wage bill, which represents the scale of the economy. Thus, the interest factor $\rho_t$ can be expressed as in equation (5). The assumption of a fixed interest margin $(d)$ is a conventional one and leads to fine results in the final model (Heikki, 2005).

$$\rho_t = \left( \frac{w_t}{w_{t-1}} \right) \left( \frac{L_t}{L_{t-1}} \right) (1 + d) \quad \text{.......................................................... (5)}$$

Where:

- $w_t$ = Nominal wage rate at time
- $d$ = The marginal difference between interest rate and wage growth rate
- $L_t$ = Number of workers at time $t$

The interest factor $\rho_t$ is then used in computation of the *implicit pension debt* (IPD$_t$). This is defined as the present value of next period pensions accrued in period $t$ and algebraically represented by equation (6)

$$\text{IPD}_t = \frac{(s_{t+1})(w_{t+1})(R_{t+1})}{\rho_{t+1}} \quad \text{.......................................................... (6)}$$

Where:

- $s_t$ = Pension per retiree for the unit period, as a percentage of unit Wages
- $w_t$ = Nominal wage rate at time
- $R_t$ = Number of retirees at time $t$
- $\rho_t$ = Interest factor derived from equation (5)
The computed \( IPD_t \) is then applied in establishing the degree of funding \( z_t \) which defined as the ratio of financial reserves \( A_t \) to \( IPD_t \) (equation 7)

\[
z_t = \frac{A_t}{IPD_t}
\]  

(7)

Where

\[ A_t = \text{The value of existing financial reserves} \]

\[ IPD_t = \text{the implicit pension debt derived from equation (6)} \]

The contribution rate in each period \( t \) is denoted by \( c_t \). System revenue includes pension contributions and interest on its assets, and pensions are the only expenditure item. Thus, budget balance equation for any period \( t \) reads as shown in equation (8).

\[
c_t w_t L_t + (\rho_t - 1) A_{t-1} = s_t R_t + A_t - A_{t-1}
\]  

(8)

Where:

\[ w_t = \text{Nominal wage rate at time} \]

\[ L_t = \text{Number of workers at time} t \]

\[ \rho_t = \text{Interest factor derived from equation (5)} \]

\[ A_t = \text{The value of existing financial reserves} \]

\[ s_t = \text{Pension per retiree for the unit period, as a percentage of unit wages} \]

\[ R_t = \text{Number of retirees at time} t \]
Substituting from the population dynamics equations (2) and (3), pension accrual equation (4) and equations (5)-(6) for the definitions, the contribution rate $c_t$ can be expressed as shown in equation (9)

$$c_t = (1 - z_{t-1}) \frac{s_t}{f_t} + z_{t-1} \frac{s_{t-1}}{f_t(1 + d)}$$ ............................................... (9)

Where:

- $z_t$ = The degree of funding as derived from equation (7)
- $s_t$ = Pension per retiree for the unit period, as a percentage of unit wages
- $f_t$ = Number of children per worker at time $t$
- $d$ = The marginal difference between the interest rate and the wage growth rate

Equation (10) shows how the contribution rate is related to fertility that determines the ratio of retirees and workers in each unit period, pensions determined by the accrual rate and the ratio between time at work and in retirement ($s_t = \sigma_{t-1}$) the interest rate margin over the wage bill growth ($d$), and the degree of funding both in the past and in the current period.

The extreme case of full funding comes out by setting $z_t$ to 1 for the first period: the contribution rate is then equal to the present value of pension in the next period, and the system remains fully funded as long as this rule is followed. The elementary case of pure PAYG system is derived by setting $z_t$ to zero for all $t$; the contribution rate is then equal to the ratio of unit pension to unit wage divided by the relative number of retirees to workers that is determined by past fertility of the retired generation.
To compute the implicit tax rate, Heikki (2005) applied equation (10). However, since \( z_t = 0 \) for a purely PAYG, equation (10) is then adjusted to account for the fact that \( z_t = 0 \) which implies that the first term in the numerator collapses. The adjusted version of equation (10) thus appears as shown in equation (11). Equations (10) and (11) express implicit tax as a proportion of the total wage bill.

\[
tax_i = \frac{(1 - z_{t-1})s_i}{f_{t-1}} - \frac{(1 - z_t)s_{t+1}}{f_t(1 + d)} \quad (10)
\]

\[
tax_i = \frac{s_i}{f_{t-1}} - \frac{s_{t+1}}{f_t(1 + d)} \quad (11)
\]

2.5 Summary

Today's pension policies can affect retirement incomes and the public finances for decades to come. Retirement incomes systems that are affordable today will often prove unsustainable in the future under the twin pressures of ageing and the maturity of the pension schemes. PAYG pension systems were often introduced with little or no analysis of the medium and long-term effects on the aged, workers and public finances. There is therefore a need for regular scrutiny of the impact of the pension system of factors such as changing life expectancy and patterns of labor force participation (World Bank, 2003).

Pension systems can be modeled using PROST, which takes into account both quantitative and qualitative aspects of a pension system. PROST main advantage is that it is able to generate population projections, which, combined with economic assumptions, are used to forecast future numbers of contributors and beneficiaries. For
the pension system to be fully sustainable there is need for a transition from a PAYG to a fully contributory system.

Like government bonds, PAYG pensions are a promise to pay certain amounts at certain times in the future. Shifting to funding ends the process of rolling over the IPDs debts to each upcoming generation and enhances the sustainability of the scheme. The short-term transition cost adds to the government’s explicit deficit (or reduces the surplus). With contributions diverted into funded pension accounts, governments have four options for financing existing PAYG liabilities. These options are increased taxation, borrowing or issuing public sector debt, cutting public expenditure and ‘swapping’ pension liabilities with other government assets. The choice between these financing mechanisms should be made in the general context of a sound fiscal policy of the reforming country.

In Kenya, little empirical evidence has been conducted so far to determine the implicit tax rate of the civil service pension scheme or the level of sustainability of the scheme. This study will seek to address two key issues: First, to determine the implicit tax rate of the civil service pension scheme; and secondly, to determine the level of sustainability of the civil service pension scheme.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1. Introduction

This chapter provides the techniques, methods and procedures adopted in conducting the research. The chapter is organized as follows: Section 3.2 outlines the conceptual model. Section 3.3 provides the analytical model to be used. Section 3.4; describes the sources of data and sample details.

3.2. Conceptual Model

The study conceptualized that the optimal contribution level \( \bar{V}_t \) is a function of wages earned while working \( w_t \), the fractions of earnings covered by the pension scheme \( \omega_t \); pension benefits received while in retirement \( P_s \). Equation (12) presents the conceptual model for \( \bar{V}_t \).

\[
\bar{V}_t = f(w_t, \omega_t, P_s) \tag{12}
\]

Secondly, the study conceptualized that the implicit tax rates \( I_t \) is a function of periodic contribution rates \( \nu_t \), wages earned while actively working \( w_t \), the fractions of earnings covered by the pension scheme \( \omega_t \); pension benefits received while in retirement \( P_s \), and the interest rates \( r_t \) used for discounting all nominal amounts.

Equation (13) presents the conceptual model for \( I_t \).

\[
I_t = f(\nu_t, w_t, \omega_t, P_s, r_t) \tag{13}
\]
3.3. Analytical Model

The optimal level of contribution was determined by taking a ratio of the pension’s benefits received by those in retirement $P_i$ to the product of wages earned while working $w_i$ and the fractions of earnings covered by the pension scheme $\omega_i$. The analytical model for optimal level of contribution is represented by equation (14) below.

$$\bar{V}_i = \frac{P_i}{w_i \omega_i}$$

The implicit tax involved in unfunded pensions is the difference of an individual’s lifetime contributions paid while working and pension benefits accruing later on. Implicit tax rate $I_t$ is therefore a ratio of total amount of implicit taxes to lifetime income earned by a typical individual in a given generation. Equation (1) was applied as the analytical model for computing the implicit tax rates and is reproduced below:

$$I_t = \frac{\sum_{s=1}^{T-1} \sum_{r=1}^{t} \omega_i w_i}{\sum_{i=1}^{T-1} \prod_{s=1}^{i} (1 + r_i)} - \frac{\sum_{s=1}^{T-1} P_i}{\prod_{i=1}^{T-1} (1 + r_i)}$$

Where:

- $I_t$ = implicit tax rates
- $\nu_i$ = periodic contribution rates
- $w_i$ = wages earned while actively working,

$$\sum_{s=1}^{T-1} \omega_i w_i$$

$$\sum_{i=1}^{T-1} \prod_{s=1}^{i} (1 + r_i)$$
\( \omega_s \) = the fractions of earnings covered by the pension scheme,

\( P_s \) = pension benefits received while in retirement; and

\( r_t \) = the interest rates used for discounting all nominal amounts to period-t values.

Both \( I_t \) and \( \bar{v}_t \) were computed using MS-EXCEL® mathematical toolkit.

3.4. Data and Sample

The data for the study was drawn from the records at the Ministry of Finance and Directorate of Personnel Management. Observations covered 6 financial years, 2000/2001-2005/2006 and comprised of the following: The total Civil Service wage bill for each year, the average 91-day T-Bill rates for each year, and total pensions paid out in each year. The 91-day T-Bill rate was used as proxy for the interest rates \( (r_t) \) used for discounting all nominal amounts to period-t values.

The study sought to determine the optimal level of contribution and the implicit tax rate of the Civil Service Pension Scheme. In computing the optimal level of contribution and the implicit tax rate, the following were taken as the key variables: periodic contribution rates, wages earned while actively working, pension benefits received while in retirement, and the 91-Day Treasury Bill rate (used as proxy for the interest rates \( (r_t) \) used for discounting all nominal amounts to period-t values).
CHAPTER FOUR

4.0 DATA ANALYSIS AND INTERPRETATION

4.1. Introduction

This chapter presents the data analysis, interpretation, and discussion of the research findings. The chapter is organized as follows: Section 4.2 is on the optimality of financing under transition. Section 4.3 is on the implicit tax rates. Section 4.4 is a discussion of findings.

4.2. Optimality of Financing under Transition

4.2.1. The Rationale for Contribution by Beneficiaries

Figure 4.1 presents comparison of growth rates between national and pension expenditures for the financial years 2000/2001 through to financial year 2005/2006.

Figure 4.1: Comparative Growth between Pension and National Expenditures

Source: Field Data (2008)
The findings in Figure 4.1 indicate that the national budgetary expenditure exhibited marginal growth rate of 11.60% over the five-year period (from Kshs. 226,155 Millions in 2000/2001 to Kshs. 432,047 Millions in 2005/2006). On the other hand, pensions expenditure grew at an average rate of 18.59% over the five-year period (from Kshs. 6,101 Million 2000/2001 to Kshs. 13,007 in 2005/2006). This shows that the expenditure on pensions has been growing at a higher rate than the growth in national expenditure (except for financial year 2005/2006).

The negative growth in pensions expenditure for the financial year 2005/2006 is attributed to interruptions in processing of pensions during the relocation of Pensions Department from Uchumi House to Bima House. The growth in pensions expenditure at a higher rate than the growth in national expenditure justifies the need to change the current PAYG regime to a pension regime where the beneficiaries would be required to contribute. This would also assist the government in sealing the recurring annual budget deficits.

4.2.2. Modeling Optimal Contribution Rate

A contribution rate which theoretically remains constant indefinitely may be calculated by setting the present value of estimated future expenditures on pensions and administration as a product of a constant factor and the present value of estimated future earnings. Present value means the amount at a point in time of future payments taking into account expected future interest rates and the probability that persons in respect of whom the payments will be made will survive to make (or receive) the payments.
In this case, the rate of contribution is a fixed proportion of annual earnings. Annual disbursements in respect of long-term benefits are an increasing percentage of earnings. The contribution rate is set at a level to ensure indefinite financial equilibrium between the income and the disbursements of the scheme. In the early years (and for many years) the contribution rate should exceed the rate which would apply under the PAYG system. The annual contribution and investment income will exceed its annual disbursements. This excess forms a technical (or actuarial) reserve which is invested and the interest can be used to supplement contribution income when the annual disbursement eventually exceed the annual contributions.

The optimal level of contribution was determined by taking a ratio of the pension’s benefits received by those in retirement \( P_s \) to the product of wages earned while working \( w_j \) and the fractions of earnings covered by the pension scheme \( \omega_j \). The analytical model equation (14) was applied. Table 4.1 presents contributions rates that would have been applicable if the current PAYG civil servants pension scheme was contributory over the sample period.

Table 4.1 Optimal Contribution Rates (2000-2005)

<table>
<thead>
<tr>
<th>Year</th>
<th>( P_s ) Kshs Million</th>
<th>( w_j \omega_j ) Kshs Million</th>
<th>( \bar{V} = \frac{P_s}{w_j \omega_j} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000/01</td>
<td>6,101</td>
<td>35,453</td>
<td>17.21%</td>
</tr>
<tr>
<td>2001/02</td>
<td>8,069</td>
<td>39,876</td>
<td>20.23%</td>
</tr>
<tr>
<td>2002/03</td>
<td>9,041</td>
<td>42,457</td>
<td>21.29%</td>
</tr>
<tr>
<td>2003/04</td>
<td>11,218</td>
<td>49,811</td>
<td>22.52%</td>
</tr>
<tr>
<td>2004/05</td>
<td>13,229</td>
<td>55,002</td>
<td>24.05%</td>
</tr>
<tr>
<td>2005/06</td>
<td>13,006</td>
<td>61,533</td>
<td>21.13%</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>21.07%</td>
</tr>
</tbody>
</table>

Source: Field Data (2008)
Table 4.1 indicates that a contribution rate of between 17.21% and 21.14% of the basic wages would fully finance the pension bill. An average rate of 21.07% was obtained.

4.3. Implicit Tax Rates

The findings presented in Table 4.2 and Figure 4.2 represents the implicit tax rates for the Civil Servant Pension Scheme for the five year period between the 2000/2001 financial years and 2005/2006 financial years. The findings indicate that the implicit tax ratio dropped from -17.21% in 2000/2001 financial year to -20.23% in 2001/2002 financial year, but improved significantly to -21.14% in 2002/2003. An outstanding observation is that the ratios are negative. The reason for this is that under non-contributory pension scheme workers receive pension without having contributed to the pension budget.

Table 4.2 Implicit Tax rates (2000 – 2005)

<table>
<thead>
<tr>
<th>Year</th>
<th>A (In Kshs.)</th>
<th>B (In Kshs.)</th>
<th>C (In Kshs.)</th>
<th>( I_t = \frac{(A - B)}{C} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000/01</td>
<td>0</td>
<td>3,827,514,965.41</td>
<td>22,242,780,178.04</td>
<td>-17.21%</td>
</tr>
<tr>
<td>2001/02</td>
<td>0</td>
<td>5,062,127,898.28</td>
<td>25,017,940,751.06</td>
<td>-20.23%</td>
</tr>
<tr>
<td>2002/03</td>
<td>0</td>
<td>5,672,313,295.18</td>
<td>26,637,115,889.86</td>
<td>-21.29%</td>
</tr>
<tr>
<td>2003/04</td>
<td>0</td>
<td>7,038,339,164.73</td>
<td>31,251,176,229.65</td>
<td>-22.52%</td>
</tr>
<tr>
<td>2004/05</td>
<td>0</td>
<td>8,299,894,104.85</td>
<td>34,507,952,960.11</td>
<td>-24.05%</td>
</tr>
<tr>
<td>2005/06</td>
<td>0</td>
<td>8,160,385,241.12</td>
<td>38,605,376,216.37</td>
<td>-21.14%</td>
</tr>
</tbody>
</table>

\[
A = \sum_{s=0}^{T-1} \frac{\nu_s \omega_s w_s}{\prod_{i=s+1}^{T} (1+r_i)} ; \quad B = \sum_{s=0}^{T-1} \frac{P_s}{\prod_{i=s+1}^{T} (1+r_i)} ; \quad C = \sum_{s=0}^{T-1} \frac{w_s}{\prod_{i=s+1}^{T} (1+r_i)} .
\]
4.4. Discussion of Findings

The findings established that the expenditure on pensions has been growing at a higher rate than the growth in national expenditure (except for financial year 2005/2006). This justifies the need to change the current PAYG regime to a pension regime where the beneficiaries would be required to contribute. This would also assist the government in sealing the recurring annual budget deficits. Suggestions have been made that the civil servants pension scheme needs to be converted from a PAYG scheme to a contributory scheme.

The study established the civil servants and the Government would have contributed at a rate of between 17.21% and 21.14% of their basic wages to fully finance the pension bill. An average rate of 21.07% was obtained. This is greater than the rate of
20% proposed by the team of experts from the Ministry of Finance to the World Bank Institute in November 2006. According to the team, civil servants and the Government would have contributed 7.5% and 12.5% respectively (Republic of Kenya, 2006c). The present study's rate of 21.07% leads to a contribution of 7.9 and 13.17 by civil servant and the Government respectively. Contribution by civil servants towards their pension will result to reduced Exchequer burden of financing civil servants pension and increased implicit tax rates.

The pensions bill for financial year 2007/2008 is estimated to be Sh 23 billion. It is expected to rise to Sh45 billion by 2012, and Sh80 billion by 2016. It is this trend that some think will be unmanageable in a few years. The bottom line is: Where will the money come from? Already, the Government has been under pressure to shift expenditure to productive sectors of the economy, but the new proposals will put even more pressure on state finances. The pension issue is not only confined to the civil servants, but also extends to parastatals whose pensions are theoretically guaranteed by the Government.
5.0 SUMMARY AND CONCLUSIONS

5.1. Introduction

This chapter presents the summary, conclusions and recommendations derived from the findings of the study. The chapter also presents the limitations that were encountered in the process of gathering findings.

5.2. Summary

The aim of the study was to determine the optimal levels of pension contribution and to determine the implicit tax rate of the civil service pension scheme in Kenya. In achieving these two objectives, the study applied historical data for the wages and pensions, which was obtained from the Ministry of Finance and the Directorate of Personnel Management. In computing the implicit tax rate and the optimal level of financing needed to change the design of the scheme, the key variables included periodic contribution rates, wages earned while actively working, pension benefits received while in retirement, and the 91-Day Treasury Bill rate.

The key findings revealed that the expenditure on pensions has been growing at a higher rate than the growth in national expenditure. This justifies the need to change the current PAYG regime to a pension regime where the beneficiaries would be required to contribute. The implicit tax rates were found to be negative. As a result,
the study proposed an average contribution rate of 21.07% of the wages earned towards financing the pension bill. This would significantly reduce the financing gaps and increase the implicit tax rates. Secondly, the signs and decrease in values implicit tax rates were an indication that the financing gaps had increased steadily over the past years. This was attributed to three factors namely: increase in the number of retirees who are eligible to receive pensions, the increase in the minimum payable pension by the government from Kshs. 500 to Kshs. 2,000, and pressure to the government to shift expenditure to key productive sectors of the economy.

5.3. Conclusions

The results of the study were consistent with the assertion that unless civil servants contribute to a retirement benefit scheme, as do private sector workers, the Government's pension fund will remain in deficit as the number of retirees continues to grow. Suggestions have been made that the civil servants pension scheme needs to be converted from a PAYG scheme to a contributory scheme. The findings of the study were in agreement to suggestions by Ostaszewski (2001) who outlined several reasons to justify the change from a PAYG to a defined contributory scheme. The findings revealed a contribution rate of 21.07% which is slightly higher than the rate of 20% proposed to the World Bank Institute by the Government in November 2006.

5.4. Limitations of the Study

The study applied observations covering a five year period due to lack of data for period earlier than 1999. These observations were relatively few especially considering that finer results could be obtained by using observations spread out over
a period close to 20 years. Extrapolation of results to project the behaviour of outputs after the study period was not done. The study applied the current accrual rate of 2.5. Simulation for the proposed increase in retirement age to 60 years was not done due to lack of data on projected salaries since pensions are based on the “last” salary paid to the retiree.

5.5. Recommendations

In the research, the observations were confined to a 5-year period. In an attempt to refine the results obtained, further research can be done while extending the study period to a period of between 10 and 20 years. Further research can be conducted to establish the extrapolated behaviour of the results after the restricted study period. This will help to further justify the trends in financing gaps, after the transition. In addition, further research can done to determine optimal contribution rate using an accrual rate that is lower the current rate of 2.5. In regard to the above limitations, the researcher proposes that a model should be developed from which future pensions can be simulated based on the current civil service workforce.

5.6. Implications for Public Policy

The proposed rates for contributions to make the civil service pension scheme sustainable was 20% with the rate shared between the employees (7.5%) and the government (12.5%). The present study determined a rate of 21.07%, split as 7.9% for the employees and 13.17% for the government. Secondly, the present study showed that the implicit tax rates are negative in sign which implies that the pension burden is
with the exchequer. In addition the study shows that pension expenditure is growing faster than the national expenditure.

There is an urgent need to introduce a contributory pension scheme for civil servants to curb the high pension expenditure. An increase in financing gap could lead to an increase in domestic debt. This would push interest rates up and negatively affect the private sector. The findings of the study can form a basis of advising policy advisory institutions that would be constituted to spearhead pension reforms in Kenya.
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