

The Nigerian, Swedish and Chilean Pension Systems: A Comparative Analysis of Schemes and Reforms

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Abstract

The contemporary global debate about pension reforms is based mainly on the concern for the long-term financial viability of existing government operated pension systems. Against this background, Nigeria, Sweden and Chile responded to the challenges posed by their pension systems by initiating reforms. While Chile and Nigeria completely moved from a defined benefit system to a defined contribution system, Sweden chose a “hybrid”, a model which has received wide acclaim by social security experts. Given the interest pension systems and reforms have generated globally as well as in Nigeria, a cross-country comparative analysis is imperative to bring into sharp focus the specific differences and similarities in these three pension reforms if any. Thus, this study comparatively evaluates the Nigerian, Swedish and Chilean pension reforms as a means of enriching ongoing global debate and cross-country comparisons on pension reform experiences. Guided by a three dimensional classification framework which describes the options available in reforming a pension system, three core benchmarks were used for this comparative analysis. These are the objective(s) of reform, the model of reform adopted, and the likely outcomes of reform vis-à-vis meeting the redistribution, saving and insurance functions of a pension scheme. Results indicate that the Chilean and Nigerian models are less likely to achieve the redistribution and insurance functions of a pension scheme while the Swedish model is better placed to achieve all the three key functions of a pension system. It is recommended that opportunities for achieving the redistribution and social insurance functions of a pension scheme should be explored in subsequent amendments to the pension legislation.

Keywords: Demographic crisis, Pension reform, Public policy

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1. Introduction

The contemporary global debate about pension reform is based mainly on the concern for the long-term financial viability of existing government operated pension systems (Lindbeck and Persson, 2003). While the definition of pension reform may vary, the theme has been consistent: public pay-as-you-go (PAYG) pension schemes are increasingly becoming excessively burdensome and projections of the proportion of Gross Domestic Product (GDP) that will be “absorbed” by public pensions are high (Lindbeck and Persson, 2003).

Despite the recognition of national peculiarities in the problems affecting national pension systems, the pension reform debate compares and contrasts the World Bank model and the model preferred by the International Labour Office (ILO). The underling normative assumption of the World Bank’s model is that private funded schemes are inherently superior to public PAYG pension systems. The ILO, however, argue that many of the existing public PAYG systems continue to function efficiently and with some parametric reforms, could meet the structural and institutional challenges (McKinnon and Charlton, 1999).

Nigeria, Sweden and Chile have all reformed their pension systems in order to address the different challenges they face in delivering an efficient and sustainable pension system. While the Swedish model have largely received widespread acclaim as a model to be emulated (see Palmer, 2002; Palme, 2005; Selen and Stahlberg, 2007)², Nigeria have been criticised for “copying” the Chilean model without taking into account its weaknesses, as well as Nigeria’s peculiar socioeconomic and institutional environment (Casey and Dostal, 2008). The main objective of the study is to comparatively evaluate the Nigerian, Swedish and the Chilean Pension Reform policies which came into effect in 2004, 1999 and 1981 respectively

² Indeed, several countries such as Latvia, Italy, Poland, Hungary, etc have emulated the Notional Defined Contribution (NDC) idea of the Swedish model (Palmer, 2002)

as a means of enriching ongoing global debate and cross-country comparisons of pension reform experiences (for example, see Hyde and Dixon, 2008; Muller, 2008; Casey and Dostal, 2008; Barrientos, 2002; Grech, 2010; and Anderson, 2012)³. From the standpoint of pension reform literature in Nigeria, this study provides a fresh perspective in evaluating the evolving outcome of the 2004 Nigerian pension reform policy. This because extant studies have largely focused on the Nigerian experience (alone) with respect to governance and institutions of the old DB pension scheme (Odia and Okoye 2012), financial market development (Mesike and Ibiwoye, 2012), savings mobilization, capital market development and economic growth (Gunu and Tsado, 2012) and history of the pension system in Nigeria (Odo, et al, 2011) and the features, prospects and challenges of pension management in Nigeria (Fapohunda, 2013).

2. Global Pension Crises: An Overview

From a global perspective, pension crisis mean that there are more people who will require financial support but less money to provide for it (Tanner, 1998). This is largely because current government run PAYG systems are faced with two major problems rooted in demography and political economy (World Bank, 1994). First, we have an aging world. The proportion of the population over the age of 60 will double by the year 2030 from about 8% to more than 16%.⁴ Furthermore, we are experiencing a decline in fertility rates around the world. In 1970 the fertility rate was approximately 3.3%. Today it is down to 2.96%, and by 2020 we expect it to be as low as 2.5%. The result

³ The key benchmarks for these comparative studies includes: policy learning and policy transfer (Casey and Dostal, 2008), sustainability of reforms (Grech, 2010), the politics of choice in occupational pensions (Anderson, 2012), debate on pension privatization as a subset of neoliberal agenda of welfare retrenchment (Hyde and Dixon, 2008), old age support in developing countries (Barrientos, 2002) and political economy considerations (Muller, 2008)

⁴ The situation is worse in countries that are members of the Organisation for Economic Cooperation and Development (OECD) where the percentage of the population over the age of 60 will go from approximately 18% to an astounding 32% (Tanner, 1998).

of changing demographic structure means that the worker/retiree ratio is shrinking rapidly (Tanner, 1998)⁵.

The second problem is perhaps more fundamental. The PAYG systems break the link between contributions and benefits. Consequently, politicians are likely to succumb to the elderly lobby to increase benefits even when such a move is not fiscally sustainable (Tanner, 1998). In addition, developing countries like Nigeria have weak institutional arrangements making the pension system susceptible to corruption and mismanagement (Shams, 2004). The World Bank (1994), report that extended family and other traditional ways of supporting the retired are weakening due to urbanization, mobility, war and famine.

3. Conceptual Analyses

Pension Reform evokes certain primary questions: What is a Pension System? What is its essence? Why do governments interfere? Besides providing conceptual clarification, the answers to these questions could also provide a benchmark for a meaningful comparative analysis.

3.1. Pension System

A Pension Scheme or System is the totality of plans, procedures and legal processes of securing and setting aside funds to meet the social obligation of care which employers owe their employees on retirement or in case of death and disability (NICON, 2005). It serves as a structured method of providing economic security to an individual when he can no longer support himself (Onifade, 2001). As a pre-arranged and well thought out plan, it gives the beneficiaries confidence that the benefits promised are secure and will be

⁵ This implies that the number of workers “paying” into the PAYG system and transferring their wealth to current retirees is getting smaller and smaller. For example in Austria and Belgium, the ratio is already below 2:1. By 2030 it will likely be below 1:1 (Tanner, 1998)

paid at the appropriate time (Onifade, 2001). It can also be viewed as a financial plan through which a worker's benefit is provided for whenever it falls due based to the rules of the plan (Chinwuba, 2003).

3.2 *The Essence of Pension Schemes*

The primary purpose of a Pension Scheme or System is to help individuals or households achieve an allocation of life resources by smoothing consumption over life, as postulated in the Life–Cycle Hypothesis (Ando and Modigliani, 1954). This is achieved by transferring resources from ones working life to post-retirement when income dries up. Specifically, however, there are three reasons for the existence of Pension Plans, viz: Social Insurance, Re-distribution, and Savings (Modigliani and Muralidhar, 2004).

First, Social Insurance is particularly valid for public systems. It is equivalent to undertaking a social obligation to ensure that all citizens, especially the old, have the requisite resources to meet their basic needs thus insuring them against disability, longevity, insolvency, inflation and investment risks. Second, Pension Schemes could serve as a re-distribution mechanism for transferring resources from the “rich” to the “poorer” segments of society that cannot afford to accumulate adequate reserves⁶. Third, pension schemes enable the accumulation of savings at the macro and micro level. As economic theory postulates, countries need savings for capital formation, and individuals need savings to support themselves in the non-earning phase of their lives (Modigliani and Muralidhar, 2004).

⁶ Although redistribution features are not a pre-requisite for a Pension Scheme, they differentiate a Pension Scheme from a “Social Security” scheme, where a basic (rather than a generous) minimum pension payment is provided (Modigliani and Muralidhar, 2004).

3.3. *Why do Governments Intervene?*

Aaron and Reischauer (1998) report that the primary reasons for the state to provide pension arrangement stems from the belief that many citizens are “myopic”⁷ and lack the information to enable them accumulate adequate resources for retirement, as well as the idea that many segments of the society may not be “sophisticated” enough to set up appropriate arrangements. Yet another reason for government involvement is the absence of developed insurance and capital markets that put annuities beyond the reach of most people. The World Bank (1994) argued that “the long term poverty problem”⁸ also necessitates the intervention of governments.

4. **Types of Pension Plans**

Pension Systems can be broadly categorised by the benefits they promise and how the promised benefits are managed/financed⁹. The choice is often between two types of pension plans: Defined-Benefit (DB) and Defined-Contribution (DC)¹⁰.

⁷ The word “myopic” is traditionally used to describe individuals who (irrationally) do not realize their need for resources as they grow older. However, a more recent view of myopic behaviour is that an individual, albeit concerned about future needs, tends to discount the near future at a higher discount rate than the distant future (such as the retirement period) (Lindbeck and Persson, 2003).

⁸ This describes a situation where there are pockets of severe poverty among those whose lifetime incomes is too low to cover minimally adequate consumption levels during their working years and therefore, retirement.

⁹ Unless stated otherwise, section IV and V is largely drawn from Modigliani and Muralihar (2004) where a more comprehensive discussion on the types of pension systems, their similarities and differences is provided.

¹⁰ For a new insightful categorization of pension systems, especially vis-a-vis the new concept of NDC, see Gora and Palmer (2004). This study however, sticks to the general distinction between DC and DB pension plans

4.1. Defined-Benefit Plan

DB Pension Plan (also known as PAYG system) provides a “defined-benefit”—a pre-specified annuity—either in absolute currency or as a fraction of a measure of past earnings and years of employment. The *guaranteed* pension benefit could be in either real or nominal terms. Participants, sponsors, or both make contributions that could change over time. Such plans rely on inter and intra generational pooling of investment and liability risk, which is called the “social allocation of risk”.

4.2. Defined-Contribution Plan

In DC Pension Schemes, participants, sponsors, or both make pre-specified contributions either in absolute currency or as a fraction of a measure of salary. These contributions may also be partially or totally voluntary. Participants invest contributions in financial/non-financial assets. The final pension benefit prior to retirement is *uncertain* because it depends entirely on asset performance. Note that in DC plans, it is possible for contributions to change over time due to changes in tax laws or if the existing contribution rate provide an insufficient or excessive replacement rate.

The main distinction between a DB and DC plan can be succinctly summarised thus:

‘The essential characteristic of DB plan is that the terminal outcome is defined (a target replacement rate to be paid to participants is articulated by a sponsor), whereas in a DC plan, the terminal outcome is variable’

With respect to investment characteristics, the table below provides a comparison of DB and DC pension schemes.

Table 1: Investment Characteristics of DB and DC Pension Schemes

Defined Benefit	Defined Contribution
(1) Provide stable benefits.	(1) Allow for matching of cash flow with needs
(2) Plan sponsor bears risk	(2) Individual bears risk.
(3) Pool investment risk	(3) Individual has choice in investment.
(4) Provide insurance against longevity	(4) Allow for bequeathing of wealth.

Source: Modigliani and Muralidhar, (2004).

However, choosing between DB and DC plans also has non-investment implications. For example, DC plans require well-educated, financially literate workers to use the freedom of choice to ensure adequate replacement rates at retirement. DB plans must be supported by strong government institutions to ensure that sufficient funds are soundly invested to meet future liabilities¹¹. With respect to contribution and returns, the link between defined benefit and defined contributions pension plans is described thus:

‘Nominal contributions over working life, compounded at the expected return on assets (With or without volatility) = Expected wealth at retirement = Expected present value of desired annuity as of the retirement date (Which can be related to replacement rate)’

The statement above can be represented algebraically as follows:

$$E_{w_t} = P_t(1+r)^t \quad \mathbf{1}$$

Where,

E_{w_t} = Expected wealth at retirement

P_t = Nominal contributions over working life

r = Rate of return on investment

t = Time or number of years

¹¹ Modigliani and Muralidhar (2004) opined that innovative new plans that incorporate the beneficial characteristics of each type of plan can achieve the same objective. For example, Blommestein et al. (2009) show that hybrid plans appear to be more efficient form of risk sharing than either of DC or DB plans

Nominal contributions are equal to the contribution rate multiplied by the nominal wage. That is:

$$P_t = a(W_t) \quad 2$$

Where,

P_t = Nominal contributions over working life

a = Contribution rate

W_t = Nominal wage

t = Time or number of years

As an illustration, assume the contribution rate is fixed. When returns are volatile, this equation characterizes a DC plan. If the volatility of returns is eliminated, either through an investment strategy or a guarantee, then final wealth and the present value of the annuity at retirement becomes a function of salary growth. In other words, if the rate of return is guaranteed, the replacement rate (the rate of pension annuity to some measure of salary) can be guaranteed, given salary growth. Thus the equation above can also characterise DB plans.

5. A Framework for Comparing Pension Reforms

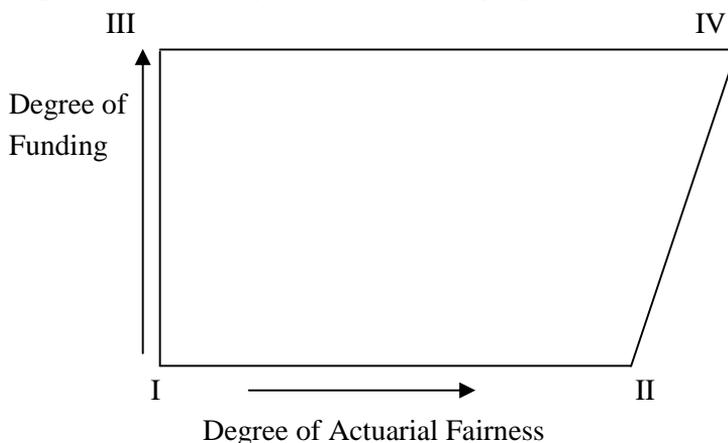
Pension reform encapsulates institutional change¹². Lindbeck and Pearson (2003) provide a three dimensional classification framework which describes the options available in reforming a pension system, viz: DB versus DC, funded versus un-funded and actuarial versus non-actuarial pension system¹³. This three-dimensional classification facilitates separating the consequences of pension system for work incentives (highlighted by the actuarial non

¹² Hobley and Shields (2000) posit that institutional change focuses on the rules and processes that govern relationships between organizations and the public, and between different organizations. It refers to changes in the architecture and relationships between the public, agencies and organizations

¹³ The term actuarial is used to describe the relationship between contributions and benefits at the individual level (Lindbeck and Persson, 2003)

actuarial dimension), capital formation (highlighted by the funded non-funded dimension) and risk sharing (highlighted by the DB/DC dimension). Regardless of the immediate objective of a Pension Reform, it can theoretically be described as a movement in these three dimensions.

Figure 1: Taxonomy of Social Security Systems



Source: Lindbeck and Persson, (2003).

5.1. Making the System more Actuarial: A Move from I to II

The starting point for most countries initiating pension reform is in the neighbourhood of position I in Figure 1 above. While some countries limit their ambitions to *parametric* reforms by either reducing benefits or raising contribution rates (without changing the basic rules of the system), other countries change the benefits rules in an actuarial direction, while maintaining a PAYG system. Still other countries undertake *systemic* reform of their PAYG system, by a radical shift from a position close to I to a position close to II, with individual, so-called notional account of pension claims (see Lindbeck and Persson, 2003).

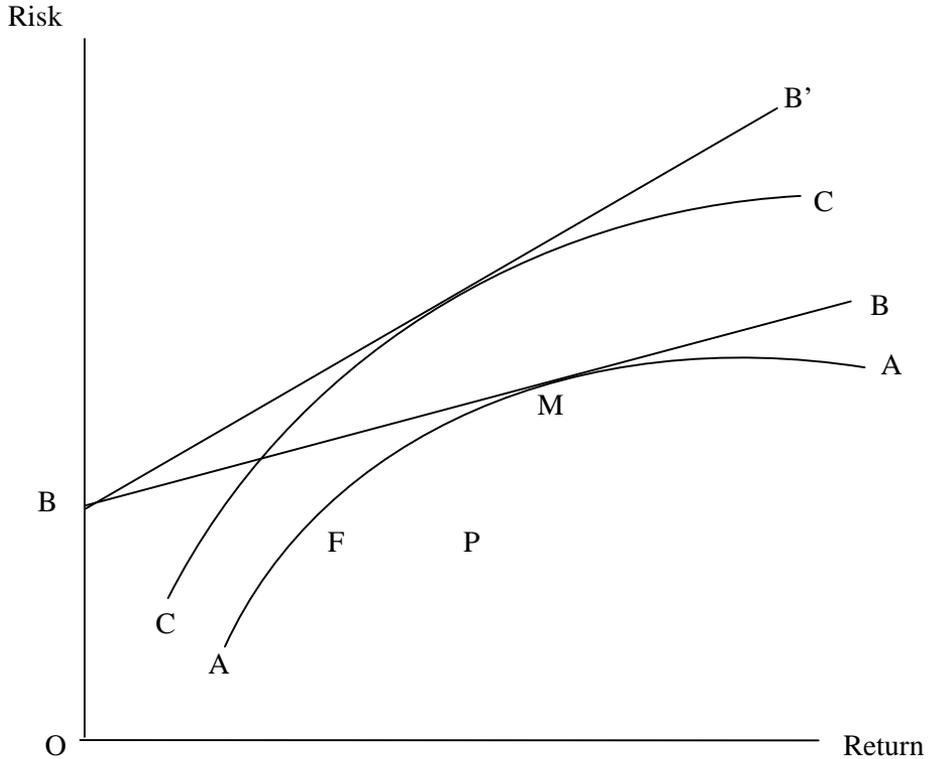
5.2. *Shifting to a Funded System: A move from II to IV*

There are three arguments often used to justify shifting to a funded system: (a) the individual would receive a higher return on his mandatory saving (b) aggregate national saving would increase and (c) better risk diversification of pension claims could be achieved. In a shift from a quasi-actuarial to an actuarially fair, fully funded system, an individual will experience two changes in his budget constraint. First, he will receive a market return on his mandatory savings rather than a return equal to the growth rate in the tax base. Second, he may have to pay a new tax on income or consumption in order to honour the claims of the old PAYG pensioners (Lindbeck and Persson, 2003).

5.3. *Defined-Benefit/Defined-Contribution Dimension-A Portfolio Approach*

Figure 2 below illustrates how different pension systems operate with respect to the risk-return space. The efficient frontier is depicted by the curve CC, above the AA curve- but it could just as well be below AA. A non-constrained individual will then choose a combination of the risk-free asset, traditional risky asset, and the mandatory PAYG asset-a position located somewhere on the capital-market line BB. For a liquidity constrained individual, on the other hand, the introduction of a PAYG system means that he will be confined to point P. According to the government revealed preference, point P is superior to point O, which the liquidity constrained individual would choose in the absence of a mandatory system. Indeed, this is one reason why a PAYG system is introduced in the first place (Lindbeck and Persson, 2003).

Figure 2: Risk – return Portfolio Opportunities in Mandatory Pension Systems



If there is a total shift to a fully funded system, the PAYG asset, that is, pension claims with an uncertainty yield tied to the growth rate of the tax base, disappears. A non-constrained individual can then choose a risk/return combination along the capital market line BB that is tangent to the original efficiency frontier AA - just as if there was no mandatory system. Theoretically, this conclusion holds not only if the individual can choose among many competing pension funds, but also if there is a single government operated fund-provided that well functioning derivative market exist and that the individual is able and willing to transact in these markets (Lindbeck and Persson, 2003).

6. Chilean Pension Systems / Reform

In May 1981, Chile replaced its government run PAYG retirement scheme with a private system where workers fund their own retirements through compulsory savings. This system is a fully funded DC scheme that is mandatory for all workers who entered the labour force after January 1983. Workers, who were in the labour force prior to January 1983, had the option of remaining in the old government run system, or moving to the new system. Workers who remained in the old system received their pension rights guaranteed under the new law, while those who moved received from government “recognition bonds” that acknowledged their contributions under the old system. The recognition bond matures when the workers reaches retirement age, dies, or becomes disabled (ARMC, 2004).

The new DC Pension Scheme is administered by specialised private companies called Administradoras de Fondos de Pensiones (AFPs) which are pension fund administrators. Each month workers deposit a minimum of 10% of their wages in their individual pension savings accounts, managed by AFPs of their choice (ARMC, 2004). This percentage applies only to the first \$22,000 of annual income. Therefore, as wages go up with economic growth, the “mandatory savings” content of the pension system goes down. A worker may contribute an additional 10% of his wages each month, which is also tax deductible, as a form of voluntary savings. The workers contribution are invested in various securities such as equities and fixed income instruments amongst others. The contributions and the returns are tax deductible (ARMC, 2004). The Chilean Pension System is regulated by an independent government agency, i.e., the Superintendencia de Administradoras de Fondos de Pensiones. At the point of retirement, beneficiaries are provided with three retirement options, viz: a lifetime annuity, programmed withdrawals (based on their life expectancy and those of their dependants) or a temporary programmed withdrawal with a deferred lifetime annuity (ARMC, 2004).

The Pension Reform in Chile has been reported to have contributed significantly to savings and economic growth of the country. For example, the private Pension System has been a major factor in increasing savings. Between 1984 and 1997, the country's economy grew at about 7% on average per year, investment and savings increased and inflation was reduced from around 25% to below 10% range (ARMC, 2004).

However, several drawbacks of the Chilean model of Pension Reform have been identified. These include high risk of personal misfortune (e.g. sickness and invalidity) and volatility in the rates of return on investment funds¹⁴ (see Gillion and Binilla, 1992), high transitional cost estimated to amount to almost 5% of GDP (see Uthof (1993), low compliance, adverse distributional effects and high administrative costs (see Singh, 1996).

7. Swedish Pension Systems / Reform

Sweden's Public PAYG Pension System underwent sweeping reforms in 1999, intended to eliminate most of the subsidy in the system and tie benefit more closely to contributions. The new system applies to all employees born after 1954 and is being gradually applied to those born between 1938 and 1953; employees born before 1938 will not participate in the new system. The new public system has three tiers: an "Income Pension", a "Premium Pension" and a "Guarantee Pension" (Palme, 2003).

7.1. Income Pension

One fundamental change is that the earnings related component becomes the "first tier" with the benefit formula adhering to the principle of DC. Here, the total size of the contribution (18.5%) has been defined with a view to maintaining the replacement levels of the old system in expenditure terms.

¹⁴ According to Gillion and Binilla (1992) this falls short of the minimum standards imposed by the ILO Convention on Social Security on invalidity, old age and survivor's benefits.

The reform involves an increase roughly equal to a scenario in which the ceiling of the old system is linked to earnings. The concept of notional accounts means that the PAYG character of the system is retained in this part since the contributions (which is 16% of earnings) of the working age population are used to pay the pensions of the retired population. However, the size of the contribution is registered in the individual (notional) accounts. The principle is that all contributions are “accumulated” and attributed a rate of return equal to the growth in average annual pensionable income of all insured person (Palme, 2003).

Although there is no fixed retirement age in the new system, the pension cannot be drawn before the age of 61 and there is no legal right for employees to continue in employment beyond the age of 67. Withdrawal is flexible, not only beyond the age 67, but also in terms of percentage. The size of the pension is determined by the accumulated notional wealth and the life expectancy of the cohort (although the pension is lifelong for each individual). The “annuity” from this part of the system is calculated at an interest rate of 1.6%. This interest rate has been imputed in the conversion of the accumulated notional wealth in order to ensure a more even income distribution over time during retirement. The pension of people born in 1954 and later will be fully calculated in accordance with the new benefit formula. Pension of people born between 1938 and 1953 will be determined by a combination of old and new rules. The cost of administration has been calculated at 0.7% of contribution or 0.02% of notional capital (Palme, 2003). The benefit formula was designed in accordance with the principle of lifetime earnings as the basis for determining the size of future pensions. This is shown in algebra as follows:

$$\text{Annuity with } r = C / G_{ir} \quad 3$$

Where,

C = Notional capital accredited at the time of retirement

G_{ir} = Life expectancy from the time of retirement with a real rate of return r

In the formula above, G_{ir} is defined as follows:

$$G_{ir} = \frac{\sum_{t=i}^N (1+r)^{-(N-i)} lx_t}{lx} \quad 4$$

Where,

lx = Value for the age we are considering

N = Last year for which people presently living are alive

t = Time period

r = Real rate of return (1.6%)

An important motive here is the creation of a structure that will provide a strong incentive to increase the labour supply and make all types of redistribution occurring within the system explicit and motivated by social policy consideration. Thus, future entitlements to income pension are not only linked to earnings but also to other forms of income such as social insurance benefits, including credits for having small children, engaging in tertiary education and doing national service. Child care provides special grounds over and above income and other earnings for awarding pension entitlements (Palmer, 2000).

7.2. *Guaranteed Pension*

The provisions for low-income pensioners constitute the strongest redistribution elements¹⁵. The Guaranteed pension (GP) is linked to the income pension (IP). This means that only those who lack an IP will get a GP at the maximum rate. Those who have an IP below the guaranteed level will receive a GP supplement. This differs from the old system in that those who have earned entitlement to IP will get a slightly higher total statutory

¹⁵ The universality of the basic provisions is important when you consider the classical social policy goal of combating poverty (Palme, 2003).

pension (sum of GP and IP) than those with only a GP (Palme, 2003). The reformed public system is insulated from what happens with private provision since the GP is only linked to the IP (including the funded component) and not to private pensions, whether occupational or individual (Palme, 2003).

7.3. Fully Funded Individual Account within a Public Framework

This part of the reform opens up the possibility for private fund managers to handle individual contributors within a public framework where public authorities both collect contributions and pay out the pensions. It also introduces individual risk-taking within the social insurance system, where programmes are usually designed for collective risk sharing. As indicated above determinations with regard to the size of the total contribution rate in the new system were guided by a desire to secure the same benefit levels as in the old system, while the size of the notional accounts benefits was determined by the explicit goal of maintaining earned entitlements. This left 2.5% for a pre-funded element (Palme, 2003).

Contributions to the Swedish System are compulsory. They are collected jointly with the other contribution by the National Tax Board (RSV). The National Debt Office manages the funds until the final assessment of a person's taxable income is made. The money is then transferred to the Premium Pension Authority (PPM). The PPM manages the individual account of all contributions to the system. Each individual can choose a maximum of five different fund managers for his/her accumulated funds and fund manager(s) can be switched each day of the working week without cost (Palme, 2003).

The PPM aggregates all individual choice everyday and trades them with the fund managers, thus ensuring saver anonymity. The accumulated funds of each individual are equal to the contributions and annual return on investment (plus inheritance gains and minus administrative costs). Funds

can be withdrawn from the system starting at the age of 61 but can be postponed as long as the contributor wishes. The withdrawal is always in the form of an annuity provided by PPM. The annuity is either a fixed interest annuity or a variable annuity. The proportion of funds that can be withdrawn is flexible. The administrative cost of the PPM is currently about 0.3 percent of assets. To this about 0.5 percent for the fund managers' administrative cost must be added (Palme, 2003).

There are many benefits to Sweden's new system. The combination of partial privatisation and reform of the PAYG portion of the retirement system has resulted in a fiscally sustainable system. Others are greater incentive to work, increased national savings, a flexible retirement age, lower taxes and less government spending, opportunities for more reform, a fairer system that no longer redistributes income from the poor to the rich, and greater retirement income for retirees (Norman and Mitchell, 2000).

In spite of its wide acclaim, some loopholes have been identified in the Swedish system too¹⁶. Although the real assets in the Swedish Trust Fund are a benefit, these real assets are accompanied by risks because politicians control how the money in the trust fund is invested. Politically inspired investment harm workers by putting their retirement funds at risk and harm the economy by misallocating savings (Norman and Mitchell, 2000). Lastly, the Pension Reform has not dealt with one of Sweden's major structural problem of absenteeism. Although it has increased for twenty years, mainly due to women changing from part-time work to full-time work, the annual number of per capita hours worked has fallen on the average by 0.4% per year since 1960 (Norman and Mitchell, 2000).

8. Pension Reform in Nigeria

¹⁶ See Palmer (2002) for some insightful comments by L. J. Kotlikoff, J. Liebman and A. Borsch-Supan on the downsides of the Swedish pension reform

A reform of the Pension System in Nigeria was necessary because government was no longer able to adequately meet its pension obligations under the old PAYG system. Studies such as Shams (2004) and ARMC (2004) document the failures of the PAYG System. The Pension Reform Act (2004)¹⁷ has brought about fundamental changes to the structure of leaving service benefits and the way they are provided for with a clear shift from DB to DC system. The main features of the Pension Reform Act 2004 include:

- (a) Contribution of funds by both the employer (7.5%) and the employee (7.5%) to fund retirement benefits in public and private sectors. *Ceteris paribus*, the value of the contributions at any point in time can be estimated thus (Maiturare, 2006):

$$C_n = \frac{A[(1+i)^n - 1]}{i} \quad 5$$

Where,

C_n = Value of contribution

n = Number of years of contribution

A = Average annual contribution

i = Average (net) investment yield over the n period

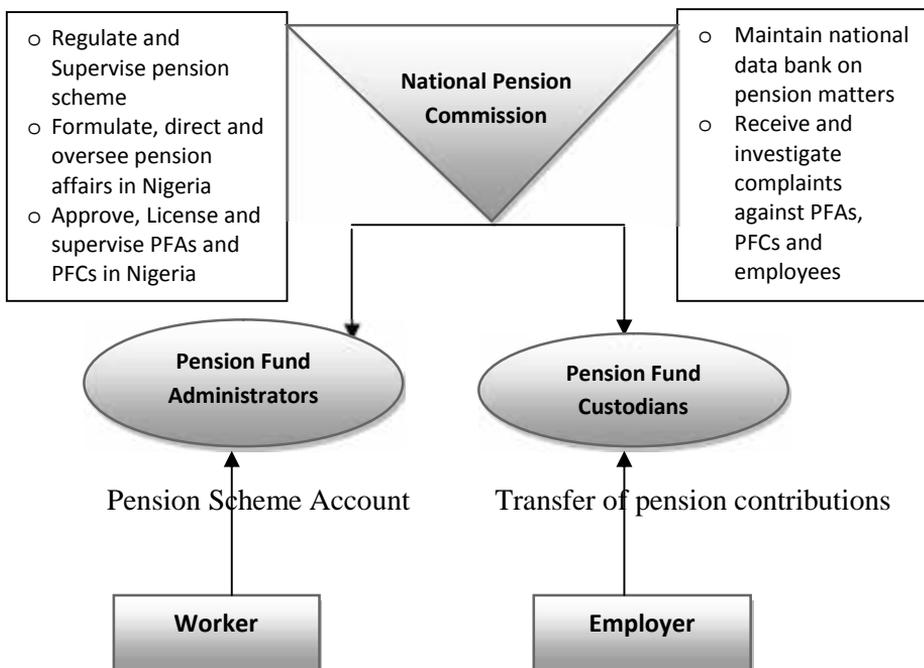
- (b) Crediting the employee's Retirement Savings Account with Pension Fund Administrators (PFAs) with any funds so contributed;
- (c) Pension Fund Assets are to be privately managed by professional pension fund managers;
- (d) Strict regulation of the activities of Pension Funds Administrators and Custodians of Pension Fund Assets under uniform laws and regulations for both the Public and the Private Sectors;

¹⁷ The Pension Reform Act (2004) have recently been amended and passed into law in 2014. However, the amendments primarily borders on guidelines about a) tax exemptions, b) withdrawal from retirement savings account, c) offences and Penalties, d) scope and coverage e) the basis and rates of contribution (see Pension Reform Act, 2014). Thus the key benchmarks for comparison of the three models as well as the findings and conclusions of this article remains valid

- (e) Establishment of the National Pension Commission (NPC) charged with the responsibility for matters relating to the regulation, supervision and effective administration of The Scheme
- (f) Transitional Departments (Civil Service, Military, Police, Customs, Immigrations and Prisons and Security other security agencies) to handle transition logistical issues

In addition to the salient features of the Nigerian pension reform itemized above, the diagram below shows the key organs and stakeholders in the new pension reform industry.

Figure 3: Architecture of the New Pension System



Source: Garba, 2006

Table 3: Key Differences between the Old and New Pension System in Nigeria

Feature	Old	New
Benefit Entitlement	Fixed and Defined	Variable- Function of the Retirement Account Balance
Contributions	Unfunded/Very Limited Funding	Funded by Employer and Employee
Mode of Withdrawal	Gratuity and Pension	Annuity or Programmed Withdrawal + Lump Sum Above Specified Minimum.
Regularity/Payment	Depend on Government/Employer	Independent of Government

Source: Provident Alliance Ltd, 2005

Based on the overview information provided on the Swedish, and the Chilean pension system and the 2004 Nigerian pension reform Act, Table 4 below provides a detailed and focused comparison of the three pension reforms. The based on key indicators of their ability to achieve the redistribution, savings and insurance functions of a pension scheme are highlighted, viz: features such as model of new scheme, its goal(s), pattern of contribution, public and private institutions involved, availability of safety nets, administrative costs, determinant of benefits, etc.

Table 4: Comparison of the Three Pension Reforms: Chile, Sweden and Nigeria

Feature	Chile	Sweden	Nigeria
1. Old Pension Scheme	○ Defined Benefit	○ Universal Pension (FP) and Graduated Supplement (SPT)	○ Defined Benefit
2. New Pension Scheme	○ Defined Contribution	○ Three Tier System with Savings, Insurance and Re-distributive Functions: <ul style="list-style-type: none"> • Income Pension • Guarantee Pension • Premium Pension 	○ Defined Contribution
3. Date	○ 1981	○ 1999	○ 2004
4. Goals	○ To create a social security system opened for all citizens, based equally on freedom and solidarity, promoting fairness as well as efficiency.	○ Insurance, Savings and Re-distribution	○ Ensure that every pensioner would receive benefits regularly; assist individuals save and establish uniform rules for pensions.
5. Employee Contribution	○ $0.1 * E$; where E is less than or equal to \$22,000	○ Income Pension- $0.16 * E$ (notional account) ○ Premium Pension- $0.025 * E$ (fully funded individual account)	○ 7.5% of Monthly Emolument ○ 2.5% of Monthly Emolument for the Military
6. Employer Contribution	○ Zero	○ Zero	○ 7.5% of Monthly Emolument. ○ 12.5% of Monthly Emolument for the Military.
7. Tax Implications	○ Tax Deductible	○ Tax Deductible	○ Tax Deductible
8. Institutions	○ Superintendence of Pension Fund Administrators	○ Premium Pension Authority ○ National Tax Authority ○ National Debt Office	○ National Pension Commission (NPC) ○ Transitional Departments

		<ul style="list-style-type: none"> ○ National Social Insurance Board ○ Local Insurance Offices ○ Premium Pension Authority 	
9. Pension Fund Managers	<ul style="list-style-type: none"> ○ Administradoras de Fondos de Pensiones (AFPs) 		<ul style="list-style-type: none"> ○ Pension Fund Administrator (PFAs) ○ Pension Fund Custodians (PFCs)
10. Safety Nets	<ul style="list-style-type: none"> ○ Minimum Pension Guaranty, but arbitrarily set at about 75% of minimum wage and subject to a minimum of 240 months of contribution 	<ul style="list-style-type: none"> ○ Notional Accounts First Pillar 	<ul style="list-style-type: none"> ○ Minimum Pension Guaranty but only for those that have contributed for a certain number of (unspecified) years.
11. Investment Options	<ul style="list-style-type: none"> ○ Equities and Fixed Income Instruments 	<ul style="list-style-type: none"> ○ Equities and Fixed Income Instruments 	<ul style="list-style-type: none"> ○ Equities, Fixed Income Instruments and Real Estate
12. Rate of Return and Risk	<ul style="list-style-type: none"> ○ Uncertain but must not be lower than specified minimum 	<ul style="list-style-type: none"> ○ Income Pension: the growth in average annual pensionable income of all insured employees. ○ Guarantee Pension... ○ Individual Account: Uncertain 	<ul style="list-style-type: none"> ○ Uncertain but must not be lower than a minimum (yet to be specified)
13. Freedom of Choice vis-a-vis fund managers	<ul style="list-style-type: none"> ○ Workers are free to choose any AFP and transfer from one to another up to twice in a year. 	<ul style="list-style-type: none"> ○ Up to five fund managers and funds can be switched each day of work at no cost. 	<ul style="list-style-type: none"> ○ Free to choose any PFA. Can only switch from one to another at least once in a year.
14. Retirement Age	<ul style="list-style-type: none"> ○ Not Specified 	<ul style="list-style-type: none"> ○ Not Specified 	<ul style="list-style-type: none"> ○ Not Specified
15. When Pension Can be Drawn	<ul style="list-style-type: none"> ○ Retirement, Death or Disability 	<ul style="list-style-type: none"> ○ From 61 years 	<ul style="list-style-type: none"> ○ Retirement or from 50 years (subject to section 3 (2)) whichever is later
16. Choices When Pension Could be Drawn	<ul style="list-style-type: none"> ○ Lifetime annuity ○ Programmed Withdrawal 	<ul style="list-style-type: none"> ○ Income Pension and Graduated Pension: Annuities 	<ul style="list-style-type: none"> ○ Programmed monthly or quarterly withdrawals

<p>17. Administrative Cost</p>	<ul style="list-style-type: none"> ○ Temporary Programmed Withdrawal and Deferred Lifetime Annuity ○ Variable – as high as 15% of contribution in 1990 	<ul style="list-style-type: none"> ○ Individual Account: fixed interest annuity or variable annuity ○ Income Pension: 0.7% of Contribution or 0.02% of Notional Capital ○ Premium Pension: 0.3% of assets (PPA) + 0.5% of assets (Pension Fund Managers) 	<ul style="list-style-type: none"> ○ Lifetime Annuity ○ Conditional Lump sum withdrawal ○ 3% of investment returns <ul style="list-style-type: none"> ● 2% for PFA ● 0.6% for PFC ● 0.4% for NPC
<p>18. Determinants of Benefits</p>	<ul style="list-style-type: none"> ○ Contributions, rates of return, inflation, risk and uncertainties 	<ul style="list-style-type: none"> ○ Income Pension: Accumulated Notional Wealth, Life Expectancy, Social Insurance Benefits (credit for children, education and national service) ○ Guarantee Pension: Annuity from income pension ○ Premium Pension: Contributions, rates of return, inflation, risk and uncertainties 	<ul style="list-style-type: none"> ○ Contributions, rates of return, inflation, risk and uncertainties
<p>19. Transition Mechanism</p>	<ul style="list-style-type: none"> ○ Recognition Bonds Payable at the time of Retirement. 	<ul style="list-style-type: none"> ○ Compensatory pension in transition to notional accounts 	<ul style="list-style-type: none"> ○ Federal Government Retirement Bonds Redeemable at the time of Retirement
<p>20. Freedom of choice between new and old schemes</p>	<ul style="list-style-type: none"> ○ Mandatory for all workers who entered the labour force after January 1983 but optional for those who were in the labour force before then. 	<ul style="list-style-type: none"> ○ Mandatory for all employees born after 1954. Gradually applied to those born between 1938 and 1953. Those born before 1938 are not eligible to participate in the new system. 	<ul style="list-style-type: none"> ○ Mandatory for all employees that have three years or more to retire as at 1st July 2004. Those that have three years or less to retire as at that date are exempted.

Source: Author-compiled from overview on the three pension reforms

9. Discussion of Comparative Analysis

The model of pension reform adopted as well as its goal(s) are major indicator of whether a pension system will be able to achieve the redistribution, savings and insurance function (see feature 2 in Table 4 above). Based conceptual analysis on pension systems, the definition and distinction between DB and DC pension schemes as well as options in reforming a pension system, Nigeria and Chile clearly adopted the DC system while Sweden chose a hybrid of DC and DB. In addition, Table 4 above show that only the Swedish model explicitly has redistribution, savings and insurance functions as its goal (see feature 4) which is reflected in the hybrid nature of the system. The number of institutions in place to implement the reforms (see feature 8) also reflects the difference between the Swedish model (five institutions due to its hybrid nature and multiple goals) and the Nigerian and Chilean model (two and one respectively due to their relatively narrow focus in terms of its goal). The nature of safety nets (feature 10) in the three systems also reflects their capacity to achieve the insurance and redistribution functions. While there are preconditions to qualify for a minimum pension in the Chilean and Nigerian model, there are non in Swedish model as one pillars dedicated to providing minimum pension. Another key measure of the capacity of a pension scheme to achieve the insurance function is the rate of return and the risk sharing capacity of the system (see feature 12). Because the rate of return and risk is based on three main pillars in the Swedish model, uncertainty with respect to rate of return on contributions is mitigated and the capacity to insurance retirees against old age risks is enhanced. Comparing the determinants of pension benefits in the three systems also reveals that benefits in the Nigerian and Chilean models depends on rates of investment return, inflation, risk and uncertainties, while the Swedish model is anchored on the three main pillars of the system (see feature 18). The three pension systems compared above will most likely achieve the savings functions of a pension scheme because either employer and employee or both are mandated to contribute for the future retirement benefit of the employee (see feature 5

and 6), which was not the case in old PAYG system. However, the savings rate is likely to be higher in Nigerian and Chilean systems because of its relatively weak provision for redistribution and risk mitigation. But, this will go a long way in improving aggregate savings; bridging the gap between the demand and supply of investible funds.

The fact that the Swedish model explicitly have insurance and redistribution functions among its goals (and made explicit provisions to achieve them), is central in how it differs from the Nigerian and Chilean models which do not explicitly have these functions among its key objectives or goals. In particular, the Nigerian model cannot achieve the redistribution function because there is no explicit provision to allocate resources from the richer segments of the society to those with low lifetime incomes. As we have seen, achieving the insurance function of a pension scheme is explicitly based on uncertain investment return and inflation risk in both the Chilean and Nigerian models which undermines the insurance function. However, Modigliani and Muralidhar (2004) argued that innovative new plans that incorporate the beneficial characteristics of each type of model can achieve the same objective. This is demonstrated by Blommestein, et al (2009) where simulations results (focusing on inflation and investment risks) show that hybrid plans (those in between traditional DB and individual DC) may entail more efficient and sustainable forms of risk sharing than either of the other two.

10. Summary, Conclusion and Outlook

This study presents a comparative analysis of the Nigerian, Swedish and the Chilean Pension Reforms within the context of global pension reform debate. By situating pension reform within the context of the economics of Pension Scheme/Reform as a Social Security System, the study comparatively evaluated the pension reform models, goals, and by extension, the extent to which the Swedish, Chilean and Nigerian these three pension reforms would achieve the re-distribution, savings and insurance functions of

a Pension Scheme. Based on brief overview review of the relevant conceptual, theoretical and empirical literature and a focused comparative analysis of the Swedish, Nigerian and the Chilean Pension Systems using key relevant benchmarks, findings indicate that the Swedish system is likely to achieve the re-distribution, (poverty alleviation), savings (capital formation) and insurance (requisite resources to insure against old age risks) functions of a pension scheme. On the contrary, the Nigerian and the Chilean reforms have a relatively weak capacity to achieve the redistribution and insurance functions but are better placed to achieve the savings functions of a pension scheme. Given its welfare and poverty effects (which are central to developing countries in general), it is recommended that opportunities for enhancing the redistribution and social insurance functions of a pension scheme should be explored in subsequent amendments to the pension legislation in Nigerian and Chile. While the Ethiopian pension system is not directly in focus in this study, lessons could be drawn from its findings depending on Ethiopia's peculiar pension challenges, institutional environment, as well as overall objective of the social security system.

There are several ways in which this study could be extended. This comparative study could be further enriched by increasing the number of countries and increasing and, or completely altering the benchmarks for comparison (such as efficiency, sustainability and winners and losers of pension reforms). Since this study largely adopted a qualitative approach, a quantitative assessment could validate or invalidate the findings in this study hence extending the literature.

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