

PENSION SYSTEMS – A GENERAL OVERVIEW

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Abstract

Ghana, like most countries, has introduced comprehensive reforms to its pension system, leading to the establishment of a new three-tier pension structure in 2008. This paper looks at the general concept of pensions from the basics and is intended to serve as a source of reference for subsequent papers on pensions. It considers the rationale for pension systems, the types and models of pension provision, including a review of the two models of pension systems by two leading international organizations; the World Bank and the International Labour Organisation (ILO). It also discusses the three criteria normally used to classify pension systems around the world: (1) how the coverage is decided (employment-related, universal and means-tested); (2) how benefits are calculated (defined contribution or defined benefit), and (3) how benefits are financed (pay-as-you-go or fully-funded).

Contents

Sections	Page
Abstract	1
1.0 Introduction	4
2.0 Definition, Objectives and Adequacy of Pensions	5
2.1 Definition of Pensions	5
2.2 Objectives of Pensions	5
2.3 Adequacy of Pensions	6
2.4 Risks that affect Retirement Income	6
3.0 Pension Systems, Models and Benefits	7
3.1 Pension Systems	7
3.2 Pension Models	8
3.3 Pension Benefits	13
4.0 Financing Options for Pensions	20
4.1 Pay-As-You-Go Schemes	20
4.2 Pre-funded schemes	21
4.3 Relative merits of PAYG and pre-funding arrangements	21
5.0 Design Of Pension Systems	22
5.1 Essential features of Pension System design	22
5.2 Sources of Risks to consider in designing Pension System	22
5.3 Designing Pensions to protect against Old-age economic insecurity	23
5.4 Evaluation criteria for Pension Systems	25
6.0 Conclusions	26
7.0 Glossary of Pension Terms	27
8.0 References	29

Tables	Page
1 Summary of similarities and differences between World Bank and ILO Pension Models.	11
2 Summary of key elements of Defined Benefit Schemes & Defined Contribution Schemes	16

1.0 Introduction

There is no denying the fact that when we retire and can no longer do active work, we will still need money to meet financial and other social obligations. The reality, however, appears to be that few people actually think about long-term savings for their days in retirement. This may be due to lack of proper education on the benefits of pensions or poor financial planning towards retirement.

The striking reality is that because more people are living longer now, the period of retirement could be as much as a third of one's life-span and there is the need for an arrangement that provides an adequate safety net or retirement income security. Pension is one of the most effective ways to save money for retirement.

On the global scene, formal retirement income schemes are thought to cover fewer than 15% of the world's households (Holzmann, Packard & Cuesta, 2001) and less than 10% of the world's working-age population (Gillion, Turner, Bailey & Latulipe, 2000). Most of those without coverage live and work in developing countries. Many do not participate in available schemes because they are unpaid caregivers or are unemployed, others because they are employed in agriculture or in the informal sector of the economy. In most developing countries, the elderly live at the bottom of the socio-economic strata. These older persons enjoy no proper pension system and have scarce retirement savings, if any.

Pension issues have consequently remained high on the public agenda for some time now. The issue of longevity in particular due to increased health awareness and better health care facilities compared to 10 or 15 years ago is taking centerstage.

Until recently, there was little debate and very scattered information on the origin or evolution of pensions in Ghana. In our Universities and other research institutions, there is limited information and analytical study on pensions. Administrators of pensions in both public and private sectors appear to have limited knowledge on pension issues. Unions and other stakeholders also appear to have limited knowledge on pensions and mostly concentrate on salary issues without due regard to the importance of pension.

Prior to the recent pension reform in Ghana, the Government of Ghana had no adequate policy guidelines to address inadequacy and administration of existing pension schemes. Pension matters neither appeared to be a priority for Government nor workers.

The IFS regards the subject of pension an important area of study to inform the necessary policy interventions. This paper, which is a precursor to another paper on pensions in Ghana, looks at the general concept of pensions. It considers the rationale for pension systems, the types and models of pension provision, benefit mechanisms and pension financing. Its principal intention is to act as a reference work for subsequent articles on pensions.

The rest of the paper is organized as follows: Section 2 considers the need for pensions and objectives of a pension system. It defines pension and looks at adequacy of pensions and income replacement rates; Section 3 examines different models for provision of pensions including the World Bank's multi-pillar system and International Labour Organisation's multi-tier system. It also looks at the types of pension benefits, including their advantages and disadvantages; Section 4 looks at the financing options for pensions; Section 5 discusses the essential features of pension system design and the sources of risks to consider in the design of a pension system.

It further discusses some criteria for evaluating pension systems. Section 6 is the conclusion.

Definition, Rationale and Adequacy of Pensions

2.1 Definition of Pensions

Pensions is defined in the Cambridge online dictionary as “an amount of money paid regularly by the government or a private company to a person who does not work anymore because they are too old or have become ill”.

In the paper, *Designing Pension System for Developing Countries*, Oliver Mitchell and Gary Fields (1996) defined pension to be “a benefit paid to an employee who retires from his or her job after reaching a prescribed age, say 65”. When this benefit is paid regularly and periodically from the time the employee leaves his job until death, the pension benefit is called an annuity. Alternatively, if a single payment is made upon retirement, it is called a lump-sum benefit. A payment made to a worker who leaves the company before reaching retirement age is not a pension; this is termed a **severance payment**. The defining feature of a pension therefore is that it is paid only after the beneficiary has grown old and retired.

In most traditional societies, families or communities care for individuals who reach old age, become disabled, or suffer the death of a wage earner. However, even in these instances, there are always individuals who do not have adult children to care for them or whose communities and families are too poor to supply adequate care or are otherwise unable or unwilling to do so. As societies modernize and people move from the communities in which they have been raised, community and family ties weaken and leave the elderly and disabled without an adequate safety net or retirement income security.

2.2 Objectives of Pensions

The main rationale for pensions is to protect against old-age economic insecurity and to provide retirement income security. The retirement incomes should be adequate to allow older people to enjoy decent living standards and economic independence.

From an individual viewpoint, income security in old age requires two types of instruments: a mechanism for consumption smoothing, and a means of insurance.

Consumption smoothing

People seek to maximize their well-being not at a single point in time, but over time. People save in order to postpone consumption to a more preferable point in time. Most people hope to live long enough to be able to retire. Thus, a central purpose of retirement pensions is consumption smoothing – a process which enables people to transfer consumption from their productive middle years to their retired years, allowing them to choose their preferred time path of consumption over working and retired life.

Insurance

When life's expectancies increase, people are more likely to outlive their working years. In consequence people begin to want and need old-age insurance, protecting them against the risk of outliving their total lifetime compensation. Thus, the second instrument of pension is insurance.

2.3 Adequacy of Pensions

Adequacy of pensions is often measured as the ratio of the annual amount of an individual's retirement income to his or her yearly earnings just prior to retirement. The resultant ratio is the income replacement ratio or replacement rate. For instance, a person who retires from a job with a GH¢100,000 annual salary and has GH¢75,000 a year in retirement income has a replacement rate of 75 percent.

At the global level, the resultant net income replacement ratio is rarely 100%. This is because it is expected that income needs in retirement are usually lower than when one is in regular employment, as expenses incurred on commuting to work, cost of meals away from home, office attire, etc. are excluded. However, the universally agreed position is that the target replacement rate should be higher for low income workers than for high income workers, since the consumption of low-income workers constitutes a higher percentage of their income.

By contrast the World Bank's stance is that "pension systems need to provide adequate, affordable, sustainable, and robust benefits." By "adequate" the Bank intends that "all people regardless of their level or form of economic activity" have access to benefits "that are sufficient to prevent old-age poverty on a country-specific absolute level in addition to providing a reliable means to smoothen lifetime consumption for the clear majority of the population."

The Bank specifies that "for a typical, full-career worker, an initial target of net-of-tax income replacement from mandatory systems is likely to be about 40% of real earnings to maintain subsistence levels of income in retirement." Systems offering rates above 60% are seen as unaffordable, as the Bank argues that they would require contribution rates which would be quite detrimental. Adequacy needs to be guaranteed over time such that "the pension program should be structured so that the financial situation does not require unannounced future cuts in benefits, or major and unforeseen transfers from the budget" and systems should be able to "sustain income-replacement targets in a predictable manner over the long term in the face of unforeseen conditions and circumstances."

The International Labour Organization (ILO) has through the years led representatives of governments, employers and trade unions to agree on several conventions on pension provision. These conventions aim to "guarantee protected persons who have reached a certain age the means of a decent standard of living for the rest of their life" – which is set by Convention 238 at a replacement rate of 45%.

This needs to be maintained in view of changes in the cost of living subsequent to retirement. The ILO also argues that "statutory pension schemes must guarantee adequate benefit levels and ensure national solidarity" and that risks should not be borne solely by the individual but must be shared among all social agents. Coverage must also extend to all members of society and without gender inequality in the provisions.

2.4 Risks that affect Retirement Income

Workers who contribute to any pension scheme, be it public or private, expect in return to receive an income in retirement. This expected income is subject to a number of risks, which can be classified as follows (Bodie 1990):

- i. Adverse political change – the possibility that the rules of the game will change in such a way that income in retirement turns out to be much less than was promised.
- ii. Poor investment returns – the possibility that retirement income will be inadequate because of low returns on contributions.
- iii. Volatile investment returns – the possibility that retirement income, while adequate on average, will be very low for extended periods of time.
- iv. Longevity – the risk that the retiree will outlive his or her savings.
- v. Inflation – the risk that inflation will erode the purchasing power of a pension.

No pension scheme can eliminate all of these risks, and there are difficult trade-offs involved. Higher returns on contributions normally come at the expense of greater volatility, for example. Also, protection of the purchasing power of a pension comes at the expense of income, at least in the early years of retirement.

3.0 Pension Systems, Models and Benefits

3.1 Pension Systems

This section looks at both informal and formal pension systems. Several developing countries have, in recent years, introduced social pensions that provide some minimal basic income security to all persons in old age. In these schemes, eligibility is not conditional upon having previously contributed, but rather upon reaching a certain age. It is non-contributory and cash income is given to all older persons, regardless of their socio-economic status (Universal Social Pension). There is also the Means-Tested Social Pensions which is solely for the poor and are conditional on the level of income.

All such non-contributory schemes are either financed through general taxation, through special levies on specific activities or sectors or through “solidarity” tax or contributions on earnings by those participating in earnings-related pensions

Formal systems take the following three main forms:

1 Public pay-as-you-go schemes

This is by far the most common formal system, mandatory for covered workers in all countries. Coverage is almost universal in high income countries and widespread in middle income countries. These systems are typically defined benefit schemes where the pension benefit is an indirect function of the individual's earnings history, with provisions for both intragenerational and intergenerational redistribution.

2 Occupational Schemes

These are privately managed pensions offered by employers to attract and retain workers. They are often facilitated by tax concessions and are increasingly regulated by governments.

3 Personal savings and annuity schemes

These are fully funded defined contribution schemes. Workers save when young to support themselves when old. Since benefits are not defined in advance, workers and retirees bear the investment risks on their savings.

Although most public pensions are largely pay-as-you-go, are financed by a payroll tax, and pay a defined benefit, there are many variations on this theme. Some countries build up large reserves. Some use general revenue finance. The defined benefit may change often, and it may be flat, means-tested, or earnings-related.

3.2 Pension Models

Various retirement and pension systems have been established in countries around the world. Pension models are utilized to guide the design of a new pension system and the reform of an existing pension system. They also provide a framework with which emerging issues in retirement systems can be assessed. A number of organizations have advocated a multi-pillar approach to pension provisions, including the World Bank and the International Labour Organization.

It is generally accepted that a multi-tier or multi-pillar approach be adopted in pension system design and reforms, though differences remain between the two dominant international organizations involved in pension policy, the ILO and the World Bank. The next two sections of the paper briefly present the multi-pillar model of the World Bank and multi-tier model of the ILO.

3.2.1 The Multi-Pillar Model of the World Bank

The World Bank in 1994 published a comprehensive report on old age financial security systems - Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth. The Report identifies different models of pension provision and proposed a combination of different models (multi-pillar system) which has been adopted by a number of countries.

The Bank's report looks at both the informal and formal systems. The report argues that less developed countries in Africa and Asia primarily rely on informal systems for providing for old age security. These informal systems are typically based on family transfers including extended family relationships where children support and often live with their parents and grandparents. The movement from farm to factory and from country to city during the industrial revolution led to the demise of informal systems in most of the now-industrialized countries.

The pillars are three in number, each with a different function:

1. Basic pension;
2. Mandatory contributions to an earnings-related scheme; and
3. Voluntary saving.

The first pillar is an antipoverty pillar that guarantees a minimum income in old age, irrespective of a person's history of earnings. The second is a forced savings pillar that provides, in general, the most benefits to those with the most covered earnings. Pillar 3 is a voluntary savings pillar, available to anyone who wants to supplement the retirement income provided by the first two pillars. The first pillar protects the elderly from absolute poverty (consumption below a minimum level that is regarded as decent by community standards) whereas the second two pillars promise increased consumption in retirement in exchange for reduced consumption in preretirement years.

The 1994 Report (p.238) recommends separating basic pensions from earnings related pensions “and placing them under different financing and managerial arrangements in two different mandatory pillars—one publicly managed and tax financed, the other privately managed and fully funded”.

Pillar 1 should ideally be noncontributory and cover the entire population. The Report (p. 243) recommends that it be financed from “a broad tax base, such as income or consumption tax instead of a payroll tax” unless coverage at first is employment related, in which case it “should initially be financed from payroll taxes levied on covered groups”. It is essential that Pillar 1 pensions be noncontributory if they are to reach everyone. Especially in developing countries, it is simply not realistic to expect the poor to qualify for a minimum pension through contributions. As Estelle James (1999, p. 9), lead economist for the 1994 World Bank Report, explains: “Extending coverage by requiring low income informal sector workers to contribute to social security would not be in the interests of these workers ..., even if the government had the capacity to enforce the mandate.” The World Bank (2001, p. 32) in an official publication accepted this reasoning and, despite a history of almost total neglect of Pillar 1, promised that henceforth it’s “work on pension reform will focus more on the provision of retirement benefits for people through public noncontributory schemes and community support”.

Since then, the World Bank’s attention has increasingly focused on refining system designs to adapt these principles to widely varying conditions and better address the needs of diverse populations to manage the risks in old age. The conceptual framework for the Bank’s pension work is presented in its 2005 research report titled *Old Age Income Support in the 21st Century: An International Perspective on Pension Systems and Reform* (Holzmann and Hinz 2005) and is further discussed in Holzmann et al. (2008).

The 2005 report expands the three pillars of the 1994 Report to five pillars to include two additional pillars: a basic (zero) pillar and a nonfinancial (fourth) pillar.

The suggested multi-pillar pension system in the new conceptual framework is composed of some combination of five basic elements: a) a non-contributory or “zero pillar” (in the form of a demogrant or social pension) that provides a minimal level of protection; b) a “first-pillar” contributory system that is linked, in varying degrees to earnings and seeks to replace some portion of income; c) a mandatory “second pillar” that is essentially an individual savings account but can be constructed in a variety of ways; d) voluntary “third- pillar” arrangements that can take many forms(individual, employer sponsored, defined benefit, defined contribution) but are essentially flexible and discretionary in nature; and e) informal intra-family or intergenerational sources of both financial and nonfinancial support to the elderly, including access to health care and housing. Details of the five pillars, according to the World Bank (2008), are as follows:

- A non-contributory “zero pillar” to deal explicitly with the poverty alleviation objective in order to provide all of the elderly with a minimal level of protection. However, it is stated that the viability of the “zero pillar” depends on the availability of budgetary resources and the design of complementary elements of the pension system;
- A mandatory “first pillar” with contributions linked to varying degrees to earnings with the objective of replacing some portion of lifetime pre-retirement income. It is typically financed on a pay-as-you-go basis;

- A mandatory “second pillar” that is typically an individual savings account, such as a defined contribution plan, with a wide set of design options including active or passive investment management, choice parameters for selecting investments and investment managers, and options for the withdrawal phase;
- A voluntary “third pillar” taking many forms but is essentially flexible and discretionary in nature. Third pillars compensate for rigidities in the design of other systems but include similar risks as second pillars; and
- A non-financial “fourth pillar” which includes access to informal support, such as family support; other formal social programs, such as health care and/or housing; and other individual financial and non-financial assets, such as home ownership and reverse mortgages where available.

3.2.2 International Labour Organisation (ILO) Multi-Tier Model

The ILO’s multi-tier model design and structure are detailed in a book *Social Security Pensions – Development and Reform* (Gillion et al. 2000). The ILO’s guiding principles of pension development and reform include all-encompassing coverage, compulsory affiliation, solidarity, and equality of treatment. Thus, the benefit structure of pension schemes can be thought to achieve these five general objectives: (i) the extension of coverage to all members of the population; (ii) protection against poverty in old age, during disability or on death of the wage earner for all members of the population; (iii) provision of an income, in replacement of earnings lost as a result of voluntary or involuntary retirement for all those who have contributed; (iv) adjustment of this income to take account of inflation and, at least to some extent, of the general rise in living standards; and (v) creation of an environment for the development of additional voluntary provisions for retirement income.

According to Gillion et al (2000) there is no one perfect universal retirement income scheme. The level of economic development, the population age structure and political factors affect the retirement income scheme appropriate for different countries. As the economic, demographic and political situation in a country alters, changes in retirement income schemes may also be required. Because of the interaction between social security retirement benefit schemes and economic development, retirement income schemes evolve over time and different systems may operate more successfully in different countries and at different periods.

All countries need to develop pluralistic designs and flexible structures for their social security schemes. To meet the goals of alleviating poverty in old age and providing low-risk retirement benefits, generally multiple sources of benefits are needed.

The book on *Social Security Pensions – Development and Reform* (Gillion et al. 2000) stresses the roles of the retirement income scheme in reducing poverty and providing low- risk retirement income. To do that, retirement income must have an element that is redistributive, and it must be provided from diversified sources. The relative importance of the different sources will depend on the rate of return and risk of the different sources. To reduce risk through risk diversification, the best approach can be characterized as a multi- tiered system, with the tiers being determined by their risk and redistributive characteristics.

The ILO's principles entail resilient anti-poverty and equality elements. As such, a bottom anti-poverty tier is the first tier in its pension system design. In contrast, the three-pillar pension system proposed by the World Bank in 1994 starts with a pay-as-you-go first pillar, which is a second tier in the ILO's pension system design. Nevertheless, the World Bank added a non-contributory zero pillar to deal explicitly with the poverty alleviation objective in its five-pillar system proposed in 2005.

The ILO's multi-tier model design (Gillion et al. 2000) would comprise a number of tiers:

- i. A bottom anti-poverty tier means tested, and financed from general revenues, which would provide income support for those without other means;
- ii. A second pay-as-you-go defined benefit tier, mandatory and publicly managed, which would provide a moderate replacement rate (say around 40 or 50 per cent of lifetime average earnings) for all those who had contributed to it, and which would be fully indexed;
- iii. A third tier which would be defined contribution based, mandatory up to a determined ceiling, possibly managed by private pension agencies, and which would provide a pension by means of annuities;
- iv. A fourth tier which would be defined contribution based, voluntary, without ceiling and also managed by private pension agencies.

3.2.3 Comparative Assessment of the World Bank and ILO Pension Models

This section looks at the similarities and differences between the World Bank multi-pillar pension system model and the ILO multi-tier pension system model.

Table 1. Summary of similarities and differences between World Bank and ILO Pension Models.

World Bank Multi-Pillar	ILO Multi-tier Model
<p>The World Bank followed the ILO's lead in pension system design by introducing a new pillar in 2005 to address poverty alleviation. Since there was a first pillar pay-as-you-go pension already in its previously proposed three-pillar model, the World Bank named this new pillar "zero pillar".</p> <p>2. The World Bank expanded its pension model from both bottom side down and top side up.</p>	<ol style="list-style-type: none"> 1. The ILO advocated anti provisions, so its first tier in a pension system is the bottom anti-poverty tier. 2. The ILO has not extended its pension tiers upwards yet – it has stopped at the voluntary tier – equivalent to the third pillar with the World Bank while the World Bank expanded their models upwards, they proposed different fourth pillars.

3. The multi-pillar approach of the World Bank follows closely portfolio theory for financial market investment, paying attention to diversification to reduce and manage the risks of aging, which is claimed to deliver retirement income more effectively and efficiently.

- The mandatory first pillar addresses the risks of individual myopia, low earnings, and

inappropriate planning horizons due to the uncertainty of life expectancies, and the lack or risks of financial markets. It is also subject to demographic and political risks.

- The mandatory second pillar can subject the participants to financial and agency risks as a result of private asset management, the risk of high transaction and administrative costs, and longevity risks.
- The voluntary third-pillar compensates for rigidities in the design of other systems but includes similar risks as second pillars.
- However, with this three-pillar structure, the first pillar offers a promised basic pension, the second pillar delivers the primary source of retirement income, and the third pillar is supplementary. There is hardly a role for diversification in such a portfolio of pensions, as perceived in stock market investment. Given its nature, the first pillar involves no diversification. As "the third-pillar includes similar risks as second pillars", there is little diversification between them.
- The new conceptual framework for a five-pillar pension system (World Bank 2008) recognized the inadequacies in the original three-pillar system.
- Two new pillars were proposed accordingly. The World Bank did not deliberate on the risks associated with these two new pillars though.
- As the zero pillar is designed for poverty alleviation to provide all of the elderly with a minimal level of protection, it does not seem to involve risks. However, it is indicated that zero pillar social pensions would be available when "fiscal conditions permitting" (World Bank 2008). Therefore, the proposed zero pillar pensions are highly likely to be subject to political, social and budgetary risks.
- Likewise, there are great uncertainties in access to informal support and other formal social programs in the fourth pillar. The associated risks are also positively,

3. In contrast, the ILO addresses the bottom tier/pillar and the top pillar differently.

A bottom anti-poverty tier of the ILO is proposed to be means tested and financed from general revenues, which would provide income support for those

without other means. It is not subject to budgetary constraints and is designed to be independent of fiscal conditions and immune to budgetary risks.

sometimes highly positively, correlated with the risks in the second and third pillars.

Consequently, the fourth pillar contributes little, if any, to the diversification of the pension portfolio. Therefore, its function is mainly to provide additional supplementary retirement income to the lower pillars, which is most likely to be inversely proportionate to the need.

3.3 Pension Benefits

Most pension schemes fall under one of the following broad categories of benefit mechanisms, namely: Defined Benefit (DB) Scheme; Defined Contribution (DC) Scheme and Combination or Hybrid Scheme.

3.3.1. Defined Benefit Schemes

A Defined Benefit (DB) Scheme specifies the formula for the determination of benefit entitlements and employees are promised a “guaranteed” or “defined” amount of pension. It is calculated on the basis of the member’s salary in the final years of employment and the number of years of service. It may be based on the employee’s final salary or the average of the salary earned over a number of years.

There are three common types of defined benefit pension schemes: -

- i. Flat Benefit Pension Scheme
- ii. Career Average Earnings Pension Scheme
- iii. Final Average Earnings Pension Scheme

Flat Benefit Pension Scheme

The annual pension under a flat benefit or uniform benefit pension scheme is a specified amount stated in the scheme’s benefit formula for each year of service. For example, the benefit formula may be GH¢ 20.00 per month for each year of service, so that a member of the scheme with 10 years of service would receive an annual benefit of GH¢ 20.00x10x12 or GH¢ 2,400.

The flat benefit formula ignores differences in earnings. The flat amount of pension is established in terms of wage levels and cedi values at the time the benefit level is set despite the fact that most of the pensions will not be paid until a future date when wage levels and dollar values are likely to have increased. For this reason, most flat benefit schemes are subject to periodic upgrades in their benefit formula in an attempt to reflect increases in inflation and wage levels.

Career Average Earnings Pension Scheme

Under a career average earnings pension scheme, the member’s pension is calculated as a certain percentage of earnings in each year of scheme membership. If a member earned GH¢50,000 in 2005 and GH¢ 55,000 in 2006, then under a 2% career average scheme the benefit accrued for 2005 would be 2% of GH¢ 50,000 or GH¢ 1,000 for a total accrued benefit of GH¢ 2,100 at the end of 2006.

The career average earnings formula gives equal weight to employment earnings in each year of the employee's working lifetime and, therefore, may provide a low pension relative to employment earnings just prior to retirement. This is particularly evident in the case of an employee who has made significant advancements over his or her career or for all members if inflation is high. This problem is often overcome by updating the earnings base which will produce results similar to those calculated under a final average earnings scheme. (Final earnings schemes are described below).

As an example, a scheme may be improved such that, for all service accrued prior to 2006, the benefit is calculated as 2% of 2005 earnings times years of service up to 2005. Thus, earnings for each year prior to 2005 are deemed to be equivalent to the earnings in 2005 for benefit calculation purposes.

Final Average Earnings Pension Scheme

Under final average earnings pension schemes, the member's pension is based on the length of service and average earnings for a stated period before retirement. For example, the scheme formula may be 1.5% of average earnings in the 5 years immediately prior to retirement, multiplied by the years of service accrued. Thus, for a member with final average earnings of GH¢50,000 and 25 years of service the annual benefit would be calculated as $1.5\% \times \text{GH¢}50,000 \times 25$ or GH¢18,750. In order to protect employees whose earnings decline as they approach retirement, some schemes may use a best average earnings base in the benefit calculation. An example of this would be the five consecutive years of highest earnings in the last ten years before retirement.

A final average earnings pension scheme best meets the basic objective of providing continuity of income after retirement such that the pensioner may maintain a standard of living after retirement comparable to the one he enjoyed while in active employment. It recognizes the long-term changes in the value of the cedi, up to the employee's retirement age, and the fact that most employees receive promotions during their working lifetime.

3.3.2. Defined Contribution Schemes

A Defined Contribution (DC) Scheme is a scheme in which an employee's benefits during retirement depends on the contributions made to and the investment performance of the assets in his or her account, rather than on the employee's years of service or earnings history. The level of benefits received at retirement is determined by the accumulated value of the assets in the pension fund into which contributions are made. This is sometimes referred to as the investment reserve.

Individuals in a Defined Contribution Scheme have individual separate investment accounts which must be used to provide benefits for the individuals. There are no cross subsidies between individual members, as in defined benefit schemes. Like a typical savings account, a defined contribution account contains a specific balance at any given time, which is equal to the market value of the assets accumulated in the account.

One of the most significant variables affecting the benefit outcome under a Defined Contribution Scheme is the investment return achieved. This is reflected in the fact that at the end of a typical career of 30-40 years, as much as two-thirds (67%) of the member's final retirement account could be made up of accumulated investment returns, with just one-third (33%) being total contributions paid.

There are two basic types of Defined Contribution Pension Schemes:

- i. Money Purchase Pension Scheme
- ii. Profit Sharing Pension Scheme

a. **Money Purchase Pension Scheme**

This type of Defined Contribution scheme is an employer-sponsored arrangement where employer and employee contributions are defined. They may be noncontributory schemes (fully paid for by employer) or contributory schemes (which require employee contributions as well). The employer's contribution may be conditional to and/or vary with the employee's contribution. Contributions may be a fixed percentage of earnings, a fixed cedi amount, or a specified amount per year of service.

b. **Profit Sharing Pension Scheme**

A profit-sharing pension scheme is a type of Defined Contribution scheme where employer contributions are linked to the profitability of the company. The employer's total annual contribution is determined using a formula related to profits. Allocation of profits among Scheme Members may be based on a points system, where points are assigned in relation to service, earnings or on both. Investment earnings and forfeitures are allocated to employees in proportion to their account balances.

This type of scheme may act to motivate employees and lead to increased productivity. However, the only drawback of this arrangement is that contributions are linked to profit and this increases the uncertainty associated with the level of retirement income. From the employer's perspective, costs are linked to the company's ability to pay.

3.3.3. Differences between Defined Benefit and Defined Contribution Schemes

The fundamental difference between a Defined Benefit Scheme and a Defined Contribution Scheme is the certainty of the former's benefits compared with the latter's exposure to market investment returns. Because future investment returns are not predictable and potentially may be highly volatile, the eventual benefits for individuals may vary significantly from projected outcomes. Under a Defined Contribution scheme, the participant bears all the economic and investment risks, even if all required contributions are made on schedule. Defined Benefit schemes however, place the risk of benefit delivery on the sponsor; who is the employer in the case of occupational pension schemes, or the State in the case of social security schemes.

A key point to emphasize is that allocation of risks and responsibility for the delivery of the promised benefits marks the important distinction between a Defined Benefit and a Defined Contribution scheme. A decision to move from Defined Benefit to Defined Contribution pension scheme involves the transfer of investment risks from the employer to the member.

Table 2. Summary of key elements of Defined Benefit Schemes and Defined Contribution Schemes

	Defined Benefit (DB)	Defined Contribution (DC)
Philosophy	To provide members with lifetime retirement income.	To help individuals accumulate retirement savings during their active career.
Contributions	<p>Typically, members and employers contribute a set percentage of the member's salary.</p> <p>Member and employer contributions are invested in a pension fund and used to pay the member's lifetime pensions.</p>	<p>Typically, individuals and employers contribute a set percentage of the individual's salary.</p> <p>Monies are deposited in a personal account set up in the individual's name.</p>
Investment Decisions	Professionals manage all investments based on strict guidelines established to protect scheme members.	Individuals decide how their money is invested, usually based on a range of available investment options.
Income at retirement	<p>Pension income is based on earnings and service in the scheme —the more service, the bigger the pension will be.</p> <p>Once members start receiving their pension, they receive it for life.</p>	<p>The money in the individual's account is used to buy an annuity.</p> <p>The size and length of this income will depend on various factors such as total contributions, investment returns, and interest rates. It is not certain the income will last for life.</p>
Ancillary benefits	Many Defined Benefit schemes offer additional benefits such as: inflation protection, early retirement benefits, survivor benefits, and disability benefits.	At retirement, individuals may be able to buy a lifetime annuity that includes some additional benefits such as inflation protection — but these extras tend to be expensive, which reduces the amount they will have available to provide an income stream.

Table 2 (Continued). Summary of key elements of Defined Benefit Schemes and Defined Contribution

Cost variability/risk	<i>Employer assumes investment and possibly preretirement inflation risk</i> and therefore annual scheme costs are less predictable. While costs might be higher than anticipated, pension costs in a booming stock market may be zero because of investment returns on past contributions.	<i>Employer assumes none of the investment risk</i> on retirement fund assets. As a result, annual costs are more predictable although the employer cannot take advantage of high stock market or other investment returns on retirement schemes assets.
Benefit provided at retirement	Benefits are usually paid in the form of life annuities.	Benefits are usually paid in the form of lump-sum distributions, which employees may spend as they please.
Scheme termination	Can be very costly if scheme is underfunded.	Not applicable, because defined contribution schemes are by definition never underfunded
Access to funds.	No preretirement access to accounts is usually provided.	Preretirement access to accounts is often provided.
Benefit provided at retirement	Benefits are usually paid in the form of life annuities.	Benefits are usually paid in the form of lump-sum distributions, which employees may spend as they please.

Table 2 (Continued). Summary of key elements of Defined Benefit Schemes and Defined Contribution

Advantages	<ul style="list-style-type: none"> • Since the pension level is related to the employee's earnings immediately prior to retirement, it is supposed to guarantee (with sufficient service), a standard of living in line with what the beneficiary was enjoying prior to retirement. • The investment risks and rewards associated with the pension promise and the payment of expected benefits at retirement rest with the Scheme Sponsor (government/employer), rather than with the employee. The employer will usually make good any shortfall in the financing of the Scheme. • There are cross subsidies/solidarity among members. • Older employees can still receive adequate benefits, even after a few years of contribution. • It is easier to provide targeted benefits to participants by an adjustment of the benefit formula. 	<ul style="list-style-type: none"> • Allows greater flexibility to employees to tailor their retirement package to suit their own circumstances. For instance, an individual could decide to increase his or her level of contributions or pay a lump-sum into the fund, subject to tax laws, to meet changing needs. • Employees, rather than employers, would be required to bear the investment and mortality risks associated with defined contribution schemes. • Provides a more equitable arrangement for the employees, as it would more accurately represent income earned during the course of each person's whole career, not just salary at retirement, (<i>which favours those with favourable promotion progression</i>). In addition, defined contribution schemes tend to deliver a relatively higher benefit to those who experience a lower level of salary progression over their career. • Allows the contributor to draw some money from the fund prior to retirement. • Provides a clearer picture of year by year costs, thereby making budgeting easier for employers. • The Scheme Sponsor, the employer or the State avoids investment and mortality risks. • Younger employees can accumulate substantial funds for retirement needs.
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Table 2 (Continued). Summary of key elements of Defined Benefit Schemes and Defined Contribution

<p>Disadvantages</p>	<ul style="list-style-type: none"> • Pensions are seen as deferred, not extended earnings. It is generally accepted that pensions represent deferred earnings; a portion of the remuneration package that is set aside or saved in order to provide for the individual's old age. If that is the case, it would be more appropriate that pensions are correlated with earnings all through the beneficiary's service, rather than with his/her earnings at retirement. • The final salary principle employed for benefits computation favours those whose careers offer a high salary during the final phase of their career. This approach raises questions as regards the fairness of the system. It also raises cost issues for the employer. • Manipulation of Final Earnings ("gaming") There is the risk that the final salary principle may encourage manipulation of an employee's earnings for the purpose of achieving an excessively high pension. • Uncertainty of Costs In a Defined Benefit scheme the final cost of pension cannot be predicted. Detailed actuarial calculations, usually based on uncertain assumptions, are necessary to ascertain the long- <p>it is the employer who bears the risk if the costs are higher than estimated.</p>	<ul style="list-style-type: none"> • For any individual, the amount of future benefits to be earned on retirement would be difficult to quantify. On a broader level, there could be a concern that the contributions made would not be sufficient to provide the same level of benefits as under the existing scheme; • in many cases, particularly for those retiring early and who experience high salary progression, benefits would not be comparable with existing arrangements. The final salary principle applicable in defined benefit schemes acts as a greater incentive for the employee to earn promotion, than a defined contribution scheme. • Older employees usually cannot accumulate enough funds because of the shorter period remaining before retirement.
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- Extra fees are required for periodic actuarial valuations. This adds to the cost of administration and the tendency for scheme operators to avoid this important responsibility.

4.0 Financing Options for Pensions

While the first pension-system objective, that of poverty reduction, may be financed through general revenues, consumption smoothing is typically financed by contributions from both employers and workers. Usually, workers make contributions based on their incomes and expect to receive pensions that are also based on their incomes.

Financing mechanisms for pensions are generally of two types: Pay-As-You-Go (PAYG), where pension costs are met from current revenue; and pre-funding (fully-funded or partially-funded), where pensions are paid out of a fund built over a period of years from members' contributions. Partial funding represents a continuum between PAYG and fully-funded schemes.

4.1 Pay-As-You-Go Schemes

In PAYG schemes, current workers make contributions based on their current earnings. These contributions are immediately used to pay benefits for current recipients; the worker who is making the contribution only receives a promise from the government that it will pay benefits related to these contributions when the worker becomes eligible for a pension.

Public sector pension arrangements provided by the State in many countries are usually funded on a PAYG basis. This system of payment does not require any Reserve Fund. Unlike funded schemes, there is no adjustment made in respect of the accruing cost of pensions, i.e. the future cost of the pension benefit earned at the end of their public service. Government therefore has responsibility to raise funds through taxation to secure pension liabilities. The State is therefore the ultimate guarantor.

A major implication of a PAYG system is that it relaxes the constraint that the benefits received by any generation must be matched by its own contributions. Samuelson (1958) showed that with a PAYG scheme it is possible in principle for every generation to receive more in pensions than it paid in contributions, provided that the rate of growth of total real earnings exceeds the interest rate indefinitely; this can happen when there is technological progress and/or steady population growth and excessive capital accumulation (Aaron 1966). Since this does not appear to be empirically relevant over the longer term, the real role of PAYG is to redistribute across generations and to share risks across generations.

4.2 Pre-funded schemes

In contrast, pre-funded schemes, such as those operated by the private sector, set aside funds/-contributions and invest them to meet future liabilities. Funding is thus a method of accumulating financial assets, which are exchanged for goods at some later date. While pre-funded schemes can take many forms, in principle they always have sufficient reserves to pay all outstanding financial liabilities (or equivalently, liabilities are defined by available funds).

If there is no redistribution across generations, a generation is constrained by its own past savings and a representative individual gets out of a funded scheme no more than he has put in. If, in addition, there is no direct redistribution across individuals, when an individual retires, the pension fund will be holding his past contributions, together with the interest and dividends earned on them. This accumulation finances the person's consumption in retirement, through an annuity or in some other way.

4.3 Relative merits of Pay-As-You-Go and Pre-funding Arrangements

Arguments generally made in favour of the PAYG system are: the State has a continuing commitment to provide pension for its employees, whereas for the private sector, it must be jointly funded by the employer and employee; PAYG is easy to operate and the administrative costs are usually low; PAYG is in keeping with the government's budgetary system.

On the other hand, there are glaring limitations to the application of the PAYG arrangement, as it fails to highlight the long-term cost of pensions; conveys a false impression about the affordability/sustainability of pensions, as no assets are set aside; and fails to bring home to governments, as employers, the true cost of pension liabilities.

PAYG systems can be quite risky, because current workers support today's retirees with the understanding that these efforts will be repaid by tomorrow's workers. There is no way for today's workers to bargain and contract effectively with unborn generations, so there is always a fear that tomorrow's workers might revolt. The fear becomes more credible when the ratio of retirees to workers rises, either because of demographic changes or because workers are allowed to retire with attractive pensions at younger and younger ages. On the other hand, an increase in the number of retirees, and workers close to retirement, implies an increase in the number of voters who defend an existing pension system.

The arguments made in favour of **pre-funding** emphasize the need for transparency in pension costs and include making advance provision for future liabilities; contribution rates would bring home to members of the Scheme, the value of their pension entitlements and to employers, the real cost of recruitment; funding would give a more stable profile of costs to the government over time, compared with pay-as-you-go; the inherent sustainability, in that promises can be kept, the tax burden and benefits are distributed fairly and the GDP is maximized.

5.0 Design of Pension Systems

5.1 Essential features of Pension System design

Several features of pension plans must be understood in order to evaluate whether a plan is performing well or poorly (Mitchell and Fields, 1996). The first issue is how and to whom pension benefits are paid. A second question is how and from whom the money to pay the benefits is raised. And third, the linkage between benefits and contributions must be examined. Under any type of pension system, it is usually the case that only those retirees who contributed to the plan during their work lives can receive benefits in old age. In the developing countries, the ability to tax workers is far from universal, which means that if the contribution principle is followed, retirement benefits are perforce limited to a fraction of the elderly population. It is also usually the case that a worker is eligible to receive a retirement pension only upon reaching a minimum age and/or years of service requirement with the employer.

5.2 Sources of risk to consider in designing Pension Systems

In thinking about how to design pension systems, it is important to take into account five types of risk confronting retired workers, against which they desire protection. (Mitchell and Fields, 1996). These are: individual risk, employer risk, investment risk, country risk, and international risk. Each is discussed in turn, along with their implications for pension design.

Individual risk arises for a variety of reasons. People are uncertain about their own earning capacity during their working years, because of such factors as unemployment, skill obsolescence, and poor health, as well as family disruption and premature death of the family breadwinner(s). They also face uncertainties in regard to their consumption needs when they are old: they do not know what they will need (because of the risks of poor health and disability) or for how long (because of uncertain remaining lifetime). There is evidence that many people seek to follow the accumulation pattern prescribed by the life cycle model – that is, they try to save enough when young so as to be able to maintain consumption when retired (Hurd 1990) - but the uncertainties in earning capacity can result in under saving relative to the no-uncertainty “ideal”. In addition, even well-intentioned people have been found to lack self-control, resulting in inadequate saving for retirement (Thaler 1994). Depending on the way it is structured, a pension can be a partial answer to many of these individual-specific uncertainties. For instance, a defined benefit pension with a large flat benefit component reduces the uncertainty caused by variable or low earnings during one's work life, inasmuch as it offers a minimum guaranteed retirement income. Of course, redistribution of this sort is only viable if participation in the plan is mandatory. Otherwise, the “ex-post lucky” would opt out of the redistributive plan leaving only those who turned out to be “ex-post unlucky”, and the plan would not be able to meet its promises – a problem known as “adverse selection”.

Employer risk arises to the extent that the pensions promised are not backed up by a well-diversified asset pool segregated from employer assets. If the firm fails, the pension promise becomes valueless.

Investment risk arises in the case of funded pension systems. The monies contributed during peoples' working years are invested by a pension fund in the hopes of earning a positive rate of return. These risks are correlated across individuals, because in the event that the investments do not work out well, all those who invested with a particular pension fund lose out. (Of course, the correlation of risks is highest when there is only a single pension fund.) Investment risk can be mitigated, although not eliminated, by carefully prescribing the investments that pension funds can make.

National (or economy-wide) risk is a matter of concern because retirees desire some insulation against economic and other shocks affecting the economy as a whole. For example, inflation in Eastern Europe has greatly eroded the value of retirees' real pensions (Atkins 1991; Diamond 1992). Similarly, in Argentina, inflation eroded benefits to the point where social unrest resulted (FIEL 1994). Especially in transition economies but elsewhere too, workers and retirees face the additional risks of national political upheaval, restructuring of public and private institutions, change of government regime, civil war, and other complex developments (Szalai 1991). Designing pension systems to better protect against these national risks requires figuring out how to hedge the country-specific macroeconomic and political risks just described. Experts suggest that this can partly be achieved by requiring that pension systems be funded, so as to reduce the risk of not having sufficient assets, and that the funds be invested in an internationally diversified portfolio of assets independent of that one country's economic and political state (Bodie and Merton 1992; Davanzo and Kautz 1992; Fields and Mitchell 1993; Kotlikoff 1994). Some government experts express reservations about such a proposal, fearing that it would reduce their control over monetary policy, and might expose the country to excess economic volatility as funds respond to small differences in international capital market returns (Davis 1993; Arrau and Schmidt-Hebbel 1994).

International risk, or risk due to catastrophic global events, is the final type of risk confronting retirees. These essentially undiversifiable shocks might arise through worldwide depression, global weather shifts or environmental pollution, international epidemics, or wide-scale conflicts such as nuclear war. When an event like this occurs, there is no unaffected population and hence no one to risk-share with. In this case, even a well- designed pension plan cannot do much to guarantee retirement security.

5.3 Designing Pensions to protect against old-age economic insecurity

Having outlined the most important risks confronting retirees, Mitchell and Fields discuss how to design a pension system which can help protect against these risks. They focus on common features which must be taken into account irrespective of the particular economic and institutional conditions of the country in question. It is essential to consider benefits and financing simultaneously when designing a pension system, in order to be sure that the plan achieves the goal of enhancing retiree security, that it is sustainable, and that it does not have undesirable effects on labor market incentives and income distribution. With this in mind, Mitchell and Fields make the following recommendations:

1. **Mandatory or voluntary participation:** Pension participation should be mandatory. A laissez faire approach to old-age economic security would be to let each worker designate his own benefit target and save accordingly.

However, a more proactive pension designer might suggest some target contribution levels if there is concern that people save too little, perhaps because they are too myopic, they do not understand life expectancy statistics, or they simply find it difficult to exert self-control (Poterba 1994). A related concern arises if a country has a means-tested antipoverty program. If pension contributions are voluntary, people may not save all their lives and rely on the noncontributory retirement income system when they are old (Hubbard et al. 1994). To overcome these potential problems, it would be appropriate to establish a minimum contribution, and hence a minimum benefit, for those who would otherwise tend to save too little.

2. **Minimum retirement age:** Pension benefits should be paid only to the old. Requiring that benefits be limited to those older than age 60 or 65 ensures that people will continue working as long as they can and limits younger peoples' access to the funds too early in life. Limiting access curtails peoples' efforts to cash out their plan due to shortsightedness or shortcoming in self-control. In sum, if participants cannot obtain benefits until they are old, the money is more likely to be there to support old-age consumption needs, which after all is the purpose of the pension system.
3. **Benefit form:** Pension benefits should only be paid in the form of a life annuity. This protects against the risk of living too long in an economic sense, whereas lump-sum benefits do not. Permitting lump-sum benefits also is subject to moral hazard (people might spend the lump-sum benefits right away) and to adverse selection (those who reach retirement in poor health will take the lump-sum benefit, while those in good health will elect an annuity, jeopardizing the financial soundness of the retirement income system).
4. **Pension coverage:** Pension benefits should be paid only to those who have paid into the system. This reduces the moral hazard of people working off the books so as to avoid paying contributions, later trying to claim retirement benefits from the system. Countries differ with regard to the size of the pension coverage pool: most developed countries mandate that all citizens be in the national pension pool, while poorer nations often exclude rural workers or laborers in the informal sector, thereby covering only a minority of the work force. In any event, requiring that benefits be offered only to those who paid into the plan increases the incentives to enter and remain in the system, curtailing moral hazard. Some might object to these benefit guidelines on the grounds that they do not guarantee pensions to those who never worked or who worked only in the informal sector. For this reason, Mitchell and Fields recommend:
5. **A single national anti-poverty program:** The same poverty alleviation program should be offered to everyone in the population, old and young alike. In the absence of such a program, pension schemes will be diverted from their primary purpose, which is to insure against economic insecurity in old age.
6. **Links between benefits and contributions:** Promised pension benefits should be linked to the contributions made by the individual and his/her employer.

5.4 Evaluation criteria for Pension Systems

The World Bank's conceptual framework to assess pension systems and reform evaluates the range of overall systems designs through the application of a combination of primary and secondary criteria (Holzmann, Hinz and Dorfman, 2008)

The primary criteria for evaluating pension systems within this framework are adequacy, affordability, sustainability, equity, predictability, and robustness:

- i. An adequate system provides benefits sufficient to prevent old-age poverty (at a country-specific absolute level) to the full breadth of the population in addition to providing a reliable means to smooth lifetime consumption for the vast majority of the population;
- ii. An affordable system is one that is within the financing capacity of individuals and the society and does not unduly displace other social or economic imperatives or have untenable fiscal consequences;
- iii. A sustainable system is one that is financially sound and can be maintained over a foreseeable horizon under a broad set of reasonable assumptions;
- iv. An equitable system is one that provides the income redistribution from the lifetime rich to the lifetime poor consistent with the societal preferences in a way that does not tax the rest of society external to the system and provides the same benefit for the same contribution;
- v. A predictable benefit is provided by a system where the benefit formula is specified by law and not subject to the discretion, the defined benefit formula is designed to insulate the individual from inflation and wage adjustments prior to retirement or the defined contribution investment policy can insulate the beneficiary from material effects on benefits from asset price adjustments prior to retirement; and the benefit is automatically indexed during retirement so as to shield the worker from effects of price adjustments; and
- vi. a robust system is one that has the capacity to withstand major shocks, including those coming from economic, demographic and political volatility.

The secondary evaluation criteria are the system's capacity to: (i) minimize labor market distortions; (ii) contribute to savings mobilization; and (iii) contribute to financial market development.

Because pension benefits are claims against future economic output, it is essential that over output to support the promised benefits.

In addition to the above criteria, it is essential that for the individual the pension scheme design allows for flexibility, portability, simplicity and provides security for the pension scheme assets.

To allow for flexibility, the pension structures should be able to offer choices to employees in relation to their pension packages and retirement decisions. They should also be capable of dealing with the position of temporary and contract employees and those with variable earnings.

The scheme should be portable, allowing contributors to transfer their contributions and benefits without difficulty or costs.

In terms of simplicity, the pension computations, benefits and necessary contributions should be easy to understand.

To provide security, the assets in the pension scheme should be held in safe custody and professionally managed. It should be excluded from litigation in the event of bankruptcy, unless there is evidence of fraudulent intent.

Socio-Economic Considerations: The pension system must also be designed to take into consideration the socio-economic and cultural environment.

For example, in Africa and most developing countries, there are certain cultural values and practices within the traditional society that cannot be ignored. It is imperative to note that long before any formal system of social protection came into being, there existed in every community, traditional forms of social protection which provided security against unforeseen contingencies such as sickness, unemployment, old age, disability and unexpected natural and human hazards.

Additionally, in the absence of well-structured socio-economic systems, individuals on retirement need a certain quantum of money to provide facilities which ordinarily should have been made available to them during their working life, e.g. houses, vehicles, health insurance, etc.

The peculiarities of these socio-cultural environmental demands make it necessary for the income replacement ratio to remain at a level which enables the retiree to meet the additional social responsibilities.

6.0 Conclusion

This paper has looked at the subject matter of pensions from the basics to provide the reader with a general appreciation of the need for pensions. It considered three criteria normally used to classify pension systems around the world:

1. how the coverage is decided (Employment-related, Universal and Means-tested);
2. how benefits are calculated (defined contribution or defined benefit), and
3. how benefits are financed (Pay-As-You-Go or Fully Funded).

The paper has also reviewed the two models of pension systems by two leading international organizations, the World Bank and the International Labour Organisation (ILO). The World Bank applies a multi-pillared approach towards pension system modalities to address the needs of target populations. The ILO applies a multi-tiered model design.

The paper also discussed the essential features of pension system design and the sources of risks to consider in the designing pension system. It further looked at some criteria for evaluating pension systems.

It is anticipated that the paper will serve as a source of reference for subsequent papers on pensions.

7.0 Glossary of Pension Terms

Accrued Benefits: the amount of accumulated pension benefits of an individual as of a specified date, determined in accordance with the terms of a pension plan.

Annuity: This is a fixed amount of money paid each year until death. It might be split into more than one payment, for example monthly payments. Many schemes use an annuity to pay pensions. When an individual retires, his/her pension scheme can make a single payment, usually to an insurance company. This company will then pay an annuity to the member. The money paid to the member is what people usually call their pension.

Benefit rate: The ratio of the average pension to the average wage, which could be expressed as relative to the economy wide average wage or to the individual's specific average or final wage.

Citizen's pension: This is a guaranteed minimum income in old age based on citizenship/residency rather than previous formal contributions. It must be legislated, adequate and regular.

Defined Benefit Scheme (DB): a pension plan providing a defined benefit formula for calculating benefit amounts without regard to contributions.

Defined Contribution Scheme (DC): a pension plan in which the contributions are made to an individual account for each participant. The retirement benefit is dependent on the investment experience and in the case of profit-sharing plans, amounts which may be allocated to the amount owing to forfeitures by terminating employees.

Demogrant: Same as a universal flat benefit, where individuals receive an amount of money based solely on age and residency.

Dependency ratio: The dependency ratio is an age-population ratio of those typically not in the labour force (the dependent part) and those typically in the labour force.

Funding: a systematic program under which contributions are made into a pension fund and assets accumulated in order to pay pension benefits.

Indexation: the method by which pension benefits are adjusted to take into account changes in the cost of living (e.g. prices and/ or earnings).

Intergenerational distribution: Income transfers between different age cohorts of persons.

Intragenerational distribution: Income transfers within a certain age cohort of persons.

Means-tested benefit: A benefit that is paid only if the recipient's income falls below a certain level.

Minimum Pension Guarantee: A guarantee provided by the government to bring pensions to some minimum level, possibly by "topping up" the capital accumulation needed to fund the pensions.

Occupational Pension Scheme: An arrangement by which an employer provides retirement benefits to employees.

Old-Age Dependency Ratio. The ratio of older persons to working-age individuals. The old-age dependency ratio may refer to the number of persons over 60 divided by, for example, the number of persons aged 15–59, the number of persons over 60 divided by the number of persons aged 20–59, and so forth.

Pay-As-You-Go (PAYG): The payment of pension benefits out of current revenues without an advance accumulation of funds for future liabilities.

Provident Fund: A fully funded defined contribution scheme that pays out the contributions made, and interest accumulated as a lump sum on retirement or other predetermined circumstances. Participants may be able to receive part in cash and part as an annuity. Typically, equal contributions are made by both employer and employee.

Replacement Rate: The value of a pension as a proportion of a worker's wage during a base period, such as the last year or two before retirement, or the entire lifetime average wage.

Scheme: This is the same as Pension scheme (British) or "Plan" (American).

Support Ratio: The opposite of the system dependency ratio, i.e. the number of workers required to support each pensioner.

System Dependency Ratio: The ratio of persons receiving pensions from a certain pension scheme divided by the number of workers contributing to the same scheme in the same period.

Universal Flat Benefit: Pensions paid solely on the basis of age and citizenship, without regard to work or contribution records.

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