

**DETERMINANTS OF FINANCIAL SUSTAINABILITY OF PENSION FUND
ADMINISTRATORS IN NIGERIA**

BY

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DECLARATION

I, Muhammad Shehu TIJJANI, hereby declare that this research work entitled “Determinants of Financial Sustainability of Pension Fund Administrators in Nigeria” has been carried out by me in the Department of Accounting, under the supervision of Professor P. S. Aku, Professor Sani Alhaji Abdullahi and Dr. Salisu Mamman. To the best of my knowledge and belief, this work has never been submitted or accepted in this or any other institution for the award of any degree or certificate of whatever kind.

All contributions and borrowed materials are duly, properly and adequately acknowledged in the text and a list of bibliography provided. Any error, either of omission or commission is not with intent, and is highly regretted.

Realizing the fact that complete accuracy is not always possible as a result of human weaknesses, I personally take the sole responsibility for any shortcomings and errors contained herein.

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CERTIFICATION

This Dissertation entitled “Determinants of Financial Sustainability of Pension Fund Administrators in Nigeria” by Muhammad Shehu TIJJANI meets the regulations governing the award of the degree of Doctor of Philosophy (PhD) in Accounting and Finance of the Ahmadu Bello University, Zaria, and is approved for its contribution to the knowledge and literary presentation.

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DEDICATION

This Dissertation is dedicated to my late parents Malam Ahmad Tijjani Adesope and Malama Rafatu Ajinni Tijjani and also my nuclear family

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All praise is due to Almighty Allah, and may Allah's peace and blessings be upon His final messenger, his pure family, noble companions and all those who follow them with righteousness until the Day of Judgement. My sincere gratitude goes to Almighty Allah for the successful completion of this dissertation.

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ABSTRACT

Financial sustainability of pension funds are often cited as essential determinants for ensuring the provision of safe and reliable pension for retirees and pensioners. Whether pension fund administrators will become part of a lasting solution to the pension financing problems in Nigeria or not depends on their ability to continue to grow, expand and sustain themselves over the course of time. Contemporary literatures on pension reforms identified financial sustainability as the key challenge of Pension Fund Administrators. This study, therefore, examines the determinants of financial sustainability of pension fund administrators in Nigeria. A positivism thought to epistemology guided by quantitative parametric pooled regression were used as paradigm and technique of analysis respectively . A data set of fifteen sampled pension fund administrators taking cognizance of Contribution, Size, Net income, Age, Board size And composition and GDP as independent variables were pooled and regressed against Sales scaled by total assets. The results indicate a positive and significant contribution of age, size, net income and contribution to financial sustainability of pension fund administrators. On the contrary, GDP, Board composition and board size, though, not significant displayed a negative contribution to financial sustainability of pension fund administrators in Nigeria. Conclusively, the result inferred that the level of sustainability today will affect the sustainability tomorrow regardless of where the pension fund administrator stands in its life cycle or developmental stage. Therefore, the study recommends amongst others a close monitoring and swift actions to remedying any weakness in Pension Fund Administrators.

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ACRONYMS AND ABBREVIATIONS

NPF	=	National Pension Fund
CPS	=	Contributory Pension Scheme
NSITF	=	The Nigerian Social Insurance Trust Fund
PAYG	=	Pay-as-you-go
NPC	=	National Pension Commission
DB	=	Defined Benefits
PFC	=	Pension Fund Custodian
CPAs	=	Closed Pension Fund Administrators.
GDP	=	Gross Domestic Product
DC	=	Defined Contributory
ISA	=	Investments and Securities Act.
FS	=	Financial Sustainability
X₁	=	Age
X₂	=	Size
X₃	=	Net Income
X₄	=	Contribution
X₅	=	GDP growth
Pencom	=	Pension Commission
ADF	=	Augmented Dickey Fuller Statistics

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Before April 1974, gratuity and pension for public servants were not treated as rights but as privileges in Nigeria.. However, from 1974, with the amendment of section 6 (1) of the pension law, they became rights which an entitled public servant could claim from the government. This general Pension scheme for civil servants was financed from government general revenue on a ‘pay –as-you-go’ basis and not from a special fund established for the purpose. Under the pensions Act of 1979, both gratuity and pension were salary rate related and were financed wholly by the government without any contribution by the workers. In contrast, government parastatals tended to operate separate funded schemes which required setting aside on an annual basis, a percentage of the total basic salaries of their staff in a special fund under the management of a board of trustees.

The National Provident Fund (NPF) Act provided for private sector pension schemes. Originally, NPF, a contributory scheme, which was established in 1961, also covered public servants. It was wound up for public servants after it has lost N17bn in corruption. Unlike the public sector, most in-house pension schemes in the Nigerian private sector were funded by both the employers and employees (Ije, 2001). The employees contributed a percentage of their monthly salaries, subject to a maximum and the employers also contributed certain percentage of employees’ salary to the scheme. Considering the benefits resulting from the statutory scheme, individual companies tended to operate their own company and administered contributing gratuity schemes to supplement the statutory retirement gratuity scheme.

According to Ije (2001) in the last two and a half decades, most pension schemes in the public sector had been poorly funded, owing to inadequate budget allocation. The

administration of the scheme was generally weak, inefficient and non-transparent. There was no authenticated list or data-based on pensioners, while about fourteen different documents were required to file pension claims. Also, restrictive and sharp practices in the investment and management of pension fund exacerbated the problem of pension liabilities to the extent that pensioners were dying on verification queues and most of the over three hundred parastatals schemes were bankrupt before the new scheme (contributory pension scheme) came on board. The private sector (The Nigeria Social Insurance Trust Funds) schemes had been characterized by very low compliance ratio due to lack of effective regulation and supervision of the system. Many private sector employees were not covered by any form of pension scheme.

Based on the enumerated pension problems, the federal government constituted committee to look into the menace of pension schemes and proffer solutions. Thus, the Pension Reform Act 2004 was signed into law in 2004 and effective from January, 2005. The Act brought a Defined Contribution System that is fully funded, privately managed and based on individual accounts for both the public and private sector employees. The Act also establishes the National Pension Commission (NPC) as the sole regulator and supervisor on all pension matters in the country.

The contributory pension scheme is a marked departure from the pay-as-you-go Defined Benefit (DB) schemes that existed in the public sector and it improves the pension situation in both the private and public sectors by making full funding of all schemes compulsory. The new scheme is a defined contribution scheme in which monthly funded contributions are made by employers and employees. These contributions are held by a Pension Fund Custodian (PFC) and managed and administered on the contributor's behalf by a Pension Fund Administrator (PFA) of the employee's choice.

National Pension Commission, as one of its primary roles and responsibilities under “the Act”, has developed investment guidelines after due consultation with the key operators of the schemes (PFAs and PFCs) to control investment activities of the Pension Fund Administrators in order to ensure that the pension funds are invested safely and securely in accordance with international best practices in investment management and also to ensure the growth and protection of retirement benefits under the Act. The underlying principles behind the guidelines are to ensure a broad asset allocation, diversification within asset classes, risk management, liquidity, opportunities and competitive returns on investment.

As at December 2012, the pension commission has issued licenses to 35 operators comprising 24 PFAs, 7 Closed Pension Administrators, and 4 PFCs. It has also given approval to 18 organizations to continue with their existing schemes. To ensure that only fit and proper persons managed and keep pension assets, the commission sought and obtained the support of various regulatory authorities, law enforcement and security agencies before issuing the licenses. The commission supervises the investment of pension assets on a daily basis. The PFAs render electronically daily returns to the commission on how the pension assets are invested. That has availed the commission the opportunity of monitoring pension fund investments to ensure compliance with stipulated rules and regulations and take prompt corrective actions where the need arises. The commission also raised the capital requirement of PFA from ₦150m to ₦1b and demanded compliance by June, 2012 (Ahmad, 2011).

Over the past few years, many countries including Nigeria have recognized the urgency of making pension systems financially stable in view of the limited window of opportunity that exists before the large population takes effect. In this context, an approach based on raising employment rates, reducing public debt levels and reforming pension system had been widely incorporated in countries’ strategies. A few countries have changed their public pension systems to notional defined contribution system, with the aim of stabilizing

contribution rates across generations and incorporating better incentives to work, thus contributing also to meet the objective of higher employment rates.

Sustainability has become a major issue for corporations to consider today as they try to reconcile financial goals with environmental and societal goals. The movement towards sustainability has been developing over a number of years (Hart, 1995). A business can be described as sustainable if it can sustain itself indefinitely and create profit for its shareholders, while protecting the environment and improving the lives of those with whom it interacts (Savitz & Weber, 2006). Nidumolu, Prahalad & Rangas-wami (2009) suggest that sustainability, when considered strategically, can be a source of competitive advantage and a key drivers of innovations for firms.

According to Thapa, Chalmers, Taylor & Convoy (1992) , Financial sustainability refers to the ability of pension fund to cover all its costs from its own generated income from operation without depending on external supports. Financial sustainability of funded provision , therefore depends on the sound governance of the funds and on the performance of financial markets. The risks for funded pension provision can be greatly reduced through effective supervision and prudent asset management. The financial sustainability of public pension systems is, also, to a large extent linked to the sustainability of public finances as a whole. This is due to the fact that pensions are a major component in the total expenditure of all federal governments and the financing of pensions often involves interventions from the federal government budgets.

International Federation of Pension Fund Administrators (2003), observe that in a few countries, public pension systems are organized almost completely within the federal government sector, while, in some other countries, the administration of public pension systems is organized jointly for the whole social security sector. Even in the case where pensions are financed by ear-marked contributions and managed separate funds, these

contributions are part of the total tax burden, and their increase would be equivalent to a tax increase, unless they give rise to better benefit entitlements.

Challenges faced by countries in their public pension systems varies. This is due to many factors, such as different underlying designs of the pension system, the strength and nature of reforms taken to date, the overall situation of public finance and the size and timing of demographic changes ahead. Nonetheless, all the countries recognize the challenges in their national strategy reports and are preparing strategies for the future.

Borella & Fornero (2007) remarks that in all countries, the earnings-related part of the public pension system is generally financed by contributions levied on earned income. In Ireland, the Netherlands and the United Kingdom, the flat rate basic pensions are financed by contributions and only Denmark finances first pillar pensions through taxes. Under current policies, additional needs for public financing will arise in almost all countries which will require increased contributions, higher retirement age, lower benefit, larger transfers from the general budget or other measures to support financial sustainability.

The strongest commitment to preventing increases in taxes and contributions can be found in Sweden where the contribution rate to the new system is fixed and necessary adjustments can only be made on the benefit side. Germany is committed to keeping contribution rates below 22% and government is obliged to propose appropriate measures to parliament if the fifteen- year projections indicate that this objective will not be reached. The Netherlands intends not to raise the contribution rate above 18.25%. The deficit in the pension system will be covered by transfers from the reserve fund or the general budget. The adjustment of the Luxembourg pension system will be made through the contribution rate which is very sensitive to a possible decline in the number of cross-border workers: if the system can maintain a relatively high growth trend in terms of the number of contributors, the impact of the ageing national population can be offset to a large extent.

In some countries, the strategy regarding the contribution rate is not very clear. The National Strategy Reports do not provide precise information on the expected evolution of the contribution rate and appear to suggest that the contribution rate is one parameter which can be adapted according to financial need. In many countries, an increase in contribution rates on wages of between five and ten percentage points would be required, corresponding to an increase in the total tax burden by several percentage points of GDP. According to projections by the International Federation of Pension Fund Administration (2003), public pension spending will rise by between three and five percentage point of GDP in most countries over the next few decades under the baseline scenario which assumed that the policies in place in 2000 would remain unchanged.

Whitehouse (2000) notes that sustainability comprises not only financial sustainability, but also adequate organization and management, planning, and policy making. However, in the case of pensions, concerns about financial sustainability are particularly acute. Factors intrinsic to many pension funds which may affect their financial sustainability include: small risk pools which mean that a relatively small number of expensive cases could damage pension finances; and, weak financial management systems which may leave pension funds particularly prone to fraud and financial abuse.

There has been recent interest in the potential of social reinsurance for helping to stabilize the finances of pensions. Whelan (2004) discusses potential sources of financial instability of pension schemes, arguing that reinsurance would only be effective in protecting schemes from random sources of risk, whereas there were multiple random factors (such as scheme management) which substantially influence financial stability. Furthermore, in order to promote scheme sustainability, it is important to have a clearer empirical understanding of the sources of financial instability.

Whether pension fund administrators will become part of a lasting solution to the pension financing problems in Nigeria or not depends on their ability to continue to develop, expand and sustain themselves over the course of time. They will have to prove that they are not simply pension development “meteors” that are destined to shine brightly for a while but are ultimately not sustainable. This therefore, prompted the need to evaluate the situation empirically.

1.2 Statement of the Problem

Financial sustainability of pension funds are often cited as essential determinants for ensuring the provision of safe and reliable pension for retirees and pensioners. Yet, the concept of financial sustainability and how it translates into estimates for revenue requirements are frequently misunderstood. The reason is that financial sustainability can take on different levels, particularly if one makes a distinction between a short and long-term horizon. Thus, financial sustainability of pension systems is a necessary precondition for an adequate provision of pensions in the future, while ensuring adequacy is a precondition for obtaining political support for the necessary reforms of pension system. Nigeria is moving towards financially sustainable pension systems that will be able to provide adequate pensions in future, in particular at the time when population ageing accelerates.

Whether future pensions will be adequate depends on the ability to secure a sustainable financing of pension systems in the face of rapidly ageing societies. The future of pension fund administrators in Nigeria to the contributors looks uncertain as they fear the safety of their contributions. While some contributors of pension fund believe that the level of contributions to pension fund is not adequate enough to take care of the retirees and the profit being declared by the PFAs does not guarantee any reliable assurance, others assert that lack of sound administration of pension funds has led to financial insustainability. Hence, an important question here is what should be done to make these pension fund

administrators sustainable and to ensure sustainable provision of pension fund services and sustainable poverty reduction through outreach after retirement.

Several studies such as Christen (2002) , Woller (2000), Christen (2000) and Woller & Schreiner (2002) have attempted to determine the factors affecting financial sustainability of pension fund administrators using large and well developed pension funds in various countries.

However, most of the previous studies like Christen (2002), CGAP (2005) amongst others were biased as they examined only successful pension funds. The number of the observations were also too small to draw statistically reliable conclusions. Some other studies combined both pension fund custodians with pension fund administrators. In this regard, differences in pensions fund backgrounds and operations are likely to make such their studies to be biased as more than 60% of the studied pension funds were representing pension custodians which used a model different from other pension fund administrators studied. Notwithstanding the above, no study, to the best of our knowledge, has been conducted in Nigeria on sustainability of pension fund administrators.

The literature on social reinsurance has not been based on empirical evidence of the determinants of financial sustainability of pension schemes. In other words, despite all the arguments about the sustainability of pension schemes, there is very little empirical evidence using Nigerian data to rationalize the discourse. The studies so far conducted in Nigeria on pension fund such as Ije, (2001); Arun (2005), Gbitse (2006), Maude (2006) and Sulaiman (2006) seemed to ignore the aspect of financial sustainability of pension fund administrator. This study, therefore, is a modest attempt to bridge this knowledge gap.

1.3 Research Questions

The following research questions are raised:

- i. What is level of dependence of financial sustainability on age of pension fund administrator in Nigeria?
- ii. To what extent is financial sustainability of pension fund administrator dependant on pension fund contributions in Nigeria?
- iii. To what extent does size of pension fund affect financial sustainability of pension fund administrators in Nigeria?
- iv. How does net income of pension fund Administration (PFAs) affect their financial sustainability in Nigeria?
- v. To what extent is financial sustainability dependent on GDP growth rate in Nigeria?
- vi. What is the effect of board attributes on financial sustainability of PFAs in Nigeria?

1.4 Objectives of the Study

The overall objective of this study is to examine the determinants of financial sustainability of pension fund administrators in Nigeria. However, the specific objectives are to:

- i. determine the effect of age of pension funds administrator on its financial sustainability in Nigeria.
- ii. find out whether pension fund contribution has significant on financial sustainability of PFAs in Nigeria.
- iii. determine the impact of size of pension fund administrator on its financial sustainability in Nigeria.
- iv. examine the effect of net income of pension fund administrator on its financial sustainability in Nigeria.
- v. assess the effect of GDP growth rate on financial sustainability of PFAs in Nigeria.

- vi. determine the effect of board attributes on the financial sustainability of PFAs in Nigeria.

1.5 Statement of the Hypotheses

From the objectives of this study, the following hypotheses have been formulated:

- H0₁: Pension fund administrator's age has no significant effect on its financial sustainability in Nigeria.
- H0₂: Pension fund contributions has no significant impact on its financial sustainability in Nigeria.
- H0₃: Pension fund administrator's size has no significant impact on its financial sustainability in Nigeria.
- H0₄: Net income of pension fund administrators has no significant impact on its financial sustainability in Nigeria
- H0₅: GDP growth rate has no significant impact on PFAs' financial sustainability in Nigeria.
- H0₆: Board attributes has no significant impact on financial sustainability of PFAs in Nigeria.

1.6 Scope of the Study

This research work centers around the determinants of financial sustainability of Pension Fund Administrators in Nigeria. The research covers the activities of Pension Fund Administrators for seven years, 2006 to 2012 to enable critical assessment to be carried out. This time is chosen because the payments and registration of the PFAs commenced from 1st January, 2005. Further, the study is restricted to financial sustainability of PFAs in view of the fact that contributors are entertaining fears on the sustainability of the PFAs in Nigeria.

1.7 Significance of the Study

There have been numerous studies on sustainability of pension fund in other countries where pension funds are relatively large and well developed with clear evidence on what affect their financial sustainability, but this is not available in Nigeria. Understanding the factors that affect the financial sustainability of pension funds administrators in Nigeria is a prerequisite to providing a guide on achieving financial sustainability. The findings of this study help to unveil the nature of the relationship and clearly depict what affects the financial sustainability and how.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

This chapter brings to clarity the determinants of financial sustainability of pension fund administrators in Nigeria. The investment of the pension fund has been assessed through the review of the relevant literature. The various theories of determinants of financial sustainability as it relates to pension fund are also be critically analyzed. To make this chapter what it is supposed to be, various authorities that have worked in the theory and operations of pension scheme are brought into light.

2.2 The Concept, Aims and Reform of Pension System

A pension system is essentially an income security program which provides benefits to beneficiaries who may be retirees, pensioners or the destitute. The benefits may be defined or flat. A defined benefit is benefit whose value payments vary according to established rules for participation whereas a flat benefit is one that pays a unitary value to beneficiaries (Ako, 2006).

Furthermore, within pension programs, a distinction exists between a defined benefit plan and a defined contribution plan. In a defined benefit plan, only the employer is responsible for funding of the plan whereas in a defined contribution plan, both the employer and the employee make defined contributions to fund the plan. As such, pension systems can be broadly categorized as contributory and noncontributory. In Nigeria, the contributory pension system has been adopted and this is the focus of this research.

The primary aims of a pension system should be to provide adequate, affordable, sustainable and robust retirement income while seeking to implement welfare-improving schemes in a manner appropriate to the individual country. An adequate system is one that provides benefit that are sufficient to prevent old age poverty on a country specific absolute

level in addition to providing a reliable means to smooth lifetime consumption for the vast majority of the population (Horts Orzmann & Hinz, 2005). An affordable system is one that is within the financing capacity of individual and the society and does not unduly displace other social or economic imperatives or have untenable fiscal consequences (Andrew, 2004). A sustainable system is one that is financially sound and can be maintained over a foreseeable horizon under a broad set of reasonable assumptions (Gbitse, 2006). A robust systems, according to Les (2003), is one that has the capacity to withstand major shocks, including those coming from economic, demographic and political volatility.

The design of a pension system or its reform explicitly recognizes that pension benefits are claims against future economic output. To fulfill their primary aims, pension system must contribute to future economic output. Reforms should, therefore by designed and implemented in a manner that supports growth and development and diminishes possible distortions in capital and labour markets.

2.2.1 Principle Of Pension System

Pension today has become a topical issue, one that has engaged the commitment of government, attention of employers and workers not only in Nigeria but also in many developing and emerging economics of Africa, Asia and Latin America. In fact, the global trend is a total paradigm shift towards definite and fully funded contributory schemes. In most countries, public pension plans are defined – benefit plans financed on a pay – as – you – go (PAYG) basis, through payroll taxes that can be adjusted periodically to ensure that revenues are sufficient to meet current pension obligations.

Hortzmann and Hinz (2005) advanced this principle as necessary condition for any successful reform. All pension systems should have elements that provide basic income security and poverty alleviation across the full breadth of the income distribution. This suggests that each country should have provisions for a basic pillar which ensures that people

with low life time incomes or who only participate marginally in the formal economy are provided with basic protections in old age.

If the condition is right, pre-funding for future pension commitments is advantageous for both economic and political reasons and may be undertaken for any pillar. Economically, pre-funding requires the commitment of resources in the current period to improve the future budget constraints of government and may contribute to economic growth and development as it results in net additions to national savings. Politically, pre-funding may better guarantee the capacity of society to fulfill pension commitments because it ensures that pension liabilities are backed by assets protected by legal property rights.

A mandated or fully funded second pillar provides a useful benchmark (but not a blue print) against which the design of a reform should be evaluated. It serves as a reference point for the policy discussion and as a means to evaluate crucial questions about welfare improvement and the capacity to finance the transition from pay- as-you-go to funded regimes.

2.2.2 Types of Pension Reform Options

According to Robalino (2005), pension reform options are broadly of two types: parametric and structural/systemic. Parametric changes involve adjustments to the parameters of the pension systems, such as retirement age, contribution rate, vesting period etc. Robalino (2005) reports that majority of pension reforms have involved adjustments to the parameters of Defined Benefit (DB) pension systems (or points systems). He notes that between 1995 and 2005, 18 countries increased retirement age, 57 increased contribution rates, 28 modified benefit formats, 10 changed vesting periods and 14 changed the contributory base and/or indexation mechanisms. He concluded that parametric changes can be a stand alone reform as in Jordan or a part of a systemic reform as in Latin America and Eastern Europe.

Systemic reform on the other hand, involves a complete shift in the pension systems by a country. For instance, a shift from a DB system to a Defined Contributory (DC) scheme or social pension or voluntary pension scheme. Depending on the level of mix or combination of the various systems, the reform may be a single pillar or multi-pillar. A research conducted by Hotzmann and Hinz (2005) recommends pension reforms with multi-pillar designs that contain some funded elements as a means of achieving effective old-age protection in a fiscally responsible manner.

2.3 The Concept of Sustainability and Financial Sustainability

Sustainability has become a major issue for corporations to consider today as they try to reconcile financial goal with environmental and social goals. The movement towards sustainability has been developing over a number of years. Bogan, Johnson & Mhlanga (2007) argue that corporate social responsibility and sustainability, when looked at strategically, can be a source of competitive advantage. Adongo & Stock (2006) suggest that specific sustainable practices can lead to specific competitive outcomes. Draxler & Mortensen (2009) similarly note that sustainability is now the key driver to innovation for firms.

Financial sustainability of pension fund is the key dimension of pension fund sustainability. It refers to the ability of pension fund to cover all its costs from its own generated income from operations (Thapa, Chalmers, Taylor & Convoy,1992) without depending on external support (e.g. subsidies). The costs here include present costs incurred to support current operations and those incurred to support growth. Dunford (2003) defines financial sustainability as the ability to keep on going towards pension fund objective without continuing donor support. These definitions centre on one main point, that is, the ability to depend on self-operations. The definitions also imply the possibility of making profit out of the pension fund operations.

The concept of sustainable business has appealed to many investors and has become an investment consideration for a number of pension funds. Due to its importance in the pension fund literature, the term “financial sustainability” has been used to define institutional sustainability of pension fund system (Hollis & Sweetman, 1998). Achieving financial sustainability means reducing transaction costs, offering better products and services that meet client needs, and finding new ways to reach the retirees.

Financial sustainability can be measured in two stages (Meyer 2002) namely: operational sustainability and financial self-sufficiency. According to Meyer (2002), operational sustainability refers to the ability of the pension fund to cover its operational costs from its operating income regardless of whether it is subsidized or not. On the other hand, pension funds are financially self-sufficient when they are able to cover from their own generated income both operating and financing costs. That is, to cover its costs if its activities were not subsidized and if it raised capital at commercial rates (Balkenhol, 2007). The self-sustainability requires the pension funds to be able to cover at least opportunity cost of all factors of production and assets from self generated income (Chaves and Gonzalez-vega, 1996). Pension fund self-sufficiency is a non-profit equivalent of profitability (Woller & Schreiner, 2002).

The above explanations of financial sustainability imply that a loss making pension fund (pension fund with poor financial performance) will not be classified as financially sustainable. Again, a profit making pension fund, whose profitability is determined after covering some of the operating costs by subsidized resources or funds, will also not be considered as financially sustainable.

As a venture, pension fund can be propped up or sustained by subsidy as being practiced in developed countries (e.g Chile) which will not make it financially viable. A

viable pension fund can be equally sustainable. On the other hand, a pension fund sustained by subvention or even by fees and charges may not necessarily be viable.

2.4 The Concept of Pension Funds

Pension funds may be defined as forms of institutional investors, which collect, pool and invest funds contributed by sponsors and beneficiaries to provide for the future pension entitlements of beneficiaries (Davis, 1995). Thus, pension funds provide means for individuals to accumulate savings over their working life so as to finance their consumption needs in retirement, either by means of a lump sum or by provision of an annuity, while also supplying funds to end-users such as corporations, other households (Via securitized loans) or governments for investment or consumption. Pension funds have grown strongly in recent years in many countries as well as in emerging markets, both relative to GDP and compared to banks.

Navajas (2000) posits that since early withdrawal of funds is usually restricted or forbidden, pension funds have long term liabilities, allowing holding of high risk and high return instruments. Accordingly, monies are intermediated by pension funds into a variety of financial assets, which include corporate equities, government bonds, real estate, corporate debt (in the form of loans or bonds), securitized loans, foreign holdings instruments, money market instruments and deposits as forms of liquidity.

Pension funds are typically sponsored by employers, such as companies, public corporations, industry or trade groups. Accordingly, employers as well as employees typically contribute. Funds may be internally or externally managed. Returns to members of pension plans backed by such funds may be purely dependent on the market (defined contribution funds) or may be overlaid by a guarantee of the rate of return by the sponsor (defined benefit funds). For both types of fund, the liability is real (inflation adjusted) terms. This is because the objective of asset management is to attain a high replacement ratio at

retirement (pension as a proportion of final salary) which is itself determined by the growth rate of average earnings.

Most countries adopt an expenditure tax treatment for pension funds, exempting pension saving from taxes on contributions and assets returns, while taxing retirement income and lump sums drawn from such tax-favoured assets. Pension saving is generally treated more favourably than other institutional saving, thus leading to greater flows of saving being directed through this channel. It is clear that such fiscal provisions boost the demand for saving via pension funds. Moreover, growth of pension funds is also typically dependent on the generosity of public social security pensions. In countries such as Germany, France and Italy, where social security is relatively generous, pension fund development is less marked than elsewhere (Davis, 1997).

The above mentioned tax exemption of contributions and asset returns are special features distinguishing pension from other such reserves in most countries and making funding attractive to firms as well as individuals corporations can be expected to manage pension funding and investment to maximize benefit to shareholders (Schreiner, 2000). Besides tax exemption, attractions of funding to the firm include the fact that sponsors may in certain circumstances use surplus assets as a contingency reserve.

Defined contribution plans have tended to grow faster than defined benefit in recent years, as employers have sought to minimize the risk of their obligations, while employees seek funds that are readily transferable between employers. This study employs defined contribution plans-type of pension funds in Nigeria.

2.4.1 Background to the Pension Fund Administrators (PFAs) in Nigeria

Pension fund administrator is defined by section 102 of Pension Reform Act 2004 as any corporate body licensed by the commission as pension fund administrator and includes the Nigerian Social Insurance Trust Fund (NSITF). PFAs are limited liability companies duly

licensed by pension commission as special purpose vehicles to carry out pension business only. They are at the core of the funded pension system and their ability to manage contributions over time in a manner that produces real returns to savers after deduction of inflations and management fees determines future pensioners' prospects.

In the Nigeria regulatory system, PenCom issues guidelines on the maximum share of investment that PFAs are allowed to take out in different asset classes-i.e. government bonds, money market instruments issued by domestic banks and selected domestic equities- and the Pension Fund Custodian (PFC) holds savings on trust to separate asset holdings from the PFAs investment function. For their services, PenCom and PFC separate asset holdings from the management fee that used to amount overall to 3 per cent and was cut to 2.25 per cent in the second quarter of 2009. Currently, 1.6 per cent of the management fee goes to the PFA, 0.4 per cent goes to the PFC and 0.25 per cent goes to PenCom.

Judging from the proliferation of PFAs since the start of the reform, management of pension investment in Nigeria appears to be a good business proposition—at least as far as the PFAs themselves are concerned. Since an earlier survey on 23rd October (Cassey and Dotal 2008: 254), the number of PFAs has increased from 13 to 26 and the number of PFCs has increased from four to five (data from 13 September, 2009). It is likely that the number of competing PFAs in the small Nigerians market with less than four million subscribers is in relative terms the highest in the world.

A survey of PFAs websites by Iglesias & Robert (2001) shows that many have not been updated for at least two years. Moreover, virtually all PFAs breach the PenCom guidelines to publish the rate of return of their RSA Funds at the end of each financial year and to make unit prices of their RSA funds readily accessible on their websites. In fact, only 15 PFAs (out of 26) provide any recent information about the value of their respective RSA units on their websites. Amongst the 15 PFAs, seven offer out-of-date or even undated unit

prices that lacked information value. Amongst the remaining seven PFAs that provide some recent data on the value of their RSA units, only three provide sufficient data to calculate approximate rates of return and only a single PFA provide full coverage of the value of the company's RSA unit since its inception which allows calculating the actual rate of return. The silence on rates of return appears to be no coincidence, as it covers up negative returns once inflation and management charges are focused in. Taking the single case in which a PFA company provided sufficient information, the real rate of return after inflation and charges between 2nd of May 2006 and 2nd of September 2009 was negative. This is significant since the company in question has been an acknowledged industry leader.

The PFAs open retirement savings account for employees, manage the pension funds as the commission may from time to time prescribe, maintain books of accounts on all transactions relating to the pension funds under their management, provide regular information to the employees or beneficiaries and pay retirement benefits to employees in accordance with the provisions of the Pension Reform Acts 2004. Other functions are to provide information on investment strategy, market and other performance indicators to the commission and employees or beneficiaries of the retirement savings account.

The Act as an enabling legislation contains several provisions that deal with investment of pension fund assets and risk management. According to the Act, pension funds must be invested with the objectives of safety and maintenance of fair returns. Specifically, section 73 of the Act specifies the category of instruments which pension funds can be invested in. This is subject to guidelines issued from time to time by Pencom. The instruments are:

- i. Bonds, bills and other securities issued or guaranteed by the Federal Government or the Central Bank of Nigeria.

- ii. Bonds, debentures, redeemable preference shares and other debt instruments issued by corporate entities and listed on a Stock Exchange registered under the Investments and Securities Act 1999 (ISA) .
- iii. Ordinary shares of public limited companies listed on a stock exchange registered under the ISA with good track records having declared and paid dividend in the preceeding five years.
- iv. Bank deposits and securities
- v. Investment certificates of closed-end investment funds or hybrid investment funds listed on a stock exchange registered under the ISA with a good track record of earning.
- vi. Units sold by open-end investment funds or specialist open-end investment funds listed on the stock exchange recognized by the commission.
- vii. Real estate investments.
- viii. Such other instruments as may be prescribed by the commission from time to time.

Section 74 of the Act states that pension assets may also be invested outside Nigeria with the approval of the president as recommended by Pencom from the foregoing, the Act complies with best practices of pension fund management aimed at ensuring the growth of assets without compromising security and liquidity. The focus on exchange traded securities and government guaranteed debt instruments will assure the quality of investments that pension funds can be deployed in and transparency in the acquisition of such asset thereby providing safety of the pension funds.

2.4.2 Pension Fund Governance

The governance of private pension plan and funds involves the managerial control of the organizations and how they are regulated, including the accountability of management

and how they are supervised. The basic goal of pension fund governance regulation is to minimize the potential agency problems, or conflicts of interest, that can arise between the fund members and those responsible for the fund's management, and which can adversely affect the security of pension savings and promises. Good governance goes beyond this basic goal and aims at delivering high pension fund performance while keeping costs low for all stakeholders.

In meeting these goals, pension fund governance is structured in different ways in different countries. All autonomous pension funds have a governing body or board, which is the group of persons responsible for the operation and oversight of the pension fund. The governing body may be internal or external to the pension fund, it may have a single or dual-board and may delegate certain functions to professionals.

Ambachtsheer, Capelle and Lum (2006) show how good governance and good performance are linked. Using pension funds based in Australia, New Zealand, Canada, the United States and Europe, their analysis is based on pension funds executives' own opinions and how well their governance is working as a proxy for good governance, with pension fund returns over a passive asset benchmark taken as a performance proxy. They conclude that "the poor –good governance gap, as assessed by pension fund CEOs (or their equivalents) themselves, worth as much as 1-2% of additional returns per annum", and the authors think this is probably an underestimation. In a later article, Ambachtsheer et al. (2007) identify the main governance weaknesses as poor selection processes for members of the governing board, a lack of self-evaluation of board effectiveness, and weak oversight by the board. Other specific problems include lack of delegation clarity between board and management responsibilities, board micro-management, and non-competitive compensation policies in pension funds.

Good governance can also bring indirect benefits to pension funds. It can spare them the costs of overregulation and it can facilitate supervision by the authorities. The stronger the governance of the fund, the better the risks (such as operational risk, investment risk) will be managed and controlled. The supervisory approach is increasingly dictated by their assessment of a pension fund's risk profile, with funds judged to pose less risk likely to receive a lighter supervisory touch. This could mean that more of the day to day governance or supervision of the fund is left to the governing board itself. The links between pension fund governance and corporate governance have been recognized by, among others, Clapman (2007) from the perspective of the United States.

Various studies and surveys have also identified general governance problems that affect broadly and deeply the pension fund industry. For example, a survey by Mercer (2006) on the governance of global retirement plans offered by multinational corporations reveals that sponsoring employers are very concerned about the lack of governance of their benefit plans in the different countries in which they operate. The International Organization of Pension Supervisors (IOPS 2003) recently surveyed its members to ascertain which governance issues they find the most challenging. Initial results suggest that pension fund supervisors are particularly concerned with transparency and the disclosure of information to pension fund members and the competency and expertise of the governing body and internal controls.

Country specific surveys include a report by Marr, Blackwell and Donaldson (2006) highlighting administrative problems in governance practices in the United Kingdom, claiming that 1 in 3 pension funds still have administrative problems (from using the wrong index level, or wrong salary to calculate pension benefits to allocating spouse benefits to the wrong account). Clark (2007) examines trustees' ability in solving problems relevant to their investment responsibilities and results show that trustees are more cautious with other

peoples' money than theirs, which may be an impact of the predominance of the prudent person rule in UK common law.

Cocco and Volprin (2005) examine DB plans in the UK and find that pension plans of indebted companies with more 'insiders' (i.e. executive directors of the sponsoring company) on the trustee board invested more in equities, contribute less to the pension fund and have a higher dividend payout ratio. The conclusion drawn is that when finances get tough, conflicts of interest may arise and impartial trustee are needed on the board to make governance work. However, other explanations could be found such as trustees who are also directors of the sponsorship company potentially having greater investment knowledge which could allow them to maximize returns and, therefore, lower funding demands for the sponsor.

Two recent studies by (Bridgen & Meyer 2005, and Borella & Fornero 2007) have specifically focused on the issue of the differences between the levels of DB and DC governance in the United Kingdom. A recent NAPF survey concludes that trustees are not doing enough to explain that there may well be better ways for members to deploy their funds (NAPF, 2007b). A report on reluctant investors by (Byrne, Harrison, Blake (2007) points out that, with the exception of senior executives, it is unusual for employers to pay for face-to-face regulated investment advice (due to cost). In its DC consultation work (Pensions Regulator 2007c), the Pensions Regulator has concluded that two of the areas where there are opportunities for improvements are with member understanding and member choices, and the Regulator has stated that it will issue guidance for trustees with the aim of raising standards in those areas. The guidance will be targeted primarily at trustees, encouraging them to take a more pro-active role in member education.

In Ireland, the Pensions Board produced a review in 2006 of the trustee structure of governance (Pensions Board, 2006). The Irish Report identified some weaknesses such as the small size of some schemes, wide variation in awareness and understanding of trustee

responsibilities and conflicts of interest among trustees, particularly among employer nominated trustees of defined benefit plans. In addition, the Pension Board's review finds evidence that ongoing, quality trustee training is an exception rather than the rule.

Governance problems also affect countries that have mainly contract-based private pension arrangements, where pension funds take a contractual form. In most Central and European countries like Poland and Slovak Republic and Latin American countries, such as Mexico, mandatory pension funds are managed by financial institutions that are faced with potential conflicts of interest. Given the low level of education of the population and the generally low interest in pension matters, there is an incentive for pension fund managing companies to engage in costly marketing campaigns to attract membership. Such campaigns often provide little benefit in terms of improved investment performance but lead to high administration costs and fees paid by the plan members.

Governance reviews have also been carried out in some non-OECD countries with occupational pension systems. For example, Dias (2006) argues that in Brazil, sponsoring employers tend to dominate decision-making at pension funds, even though nominally the main decision-making body is the so-called deliberative council (a kind of supervisory board). There are also some instances in which the one-third member representation of members in the deliberative council is not being met.

Rusconi (2008) reviews pension fund governance in South Africa and identifies major knowledge gaps in trustee boards, weak board discipline, and conflicts of interest among consultants and asset managers that are going unaddressed, leading to a prevalence of active over passive management and higher fees than would otherwise be the case. Such conflicts reach even training programmes for trustees as these are mostly delivered or financed by asset managers and consulting firms.

In summary, several main challenges relating to pension fund governance remain primarily in trustbased and contract-based pension systems. First, trustees and fiduciaries generally lack suitable knowledge, experience or training, which additionally hinders them from being able to understand and challenge advice they receive from outside experts. Second, conflicts of interest still remain, both within boards and in relation to independent, commercial trustees. Finally, the problem of how to ensure that suitable governance mechanisms are in place for contract-based DC schemes is also yet to be solved.

2.5 Investment Strategy Considerations by PFAs

Pension scholars such as (Dunford 2003) have noted that the precise mechanism for taking investment decisions will depend on the size and nature of the pension scheme. The trustees are responsible for the pension fund and will lay down guidelines for the investment managers after due considerations with them and the actuary. Generally, trustees would not interfere with the day-to-day decisions of the investment managers.

In another development, the investment managers will aim to achieve a return relative to some valuation assumption. Investment risk for a pension fund can, therefore, be viewed in terms of the risk of the fund having a deficiency with a given funding rate. In whatever way, we choose to view this risk, it is matching the characteristics of assets and liabilities that are most important for the management of risk for a pension fund.

According to Dunford (2003), the liabilities of a continuing final salary pension scheme are for very long-term and depend on unknown future wage levels. However, pensions in payment will often be fixed in monetary terms although trustees may desire to grant discretionary increases in line with price inflation. For most of the liabilities of a pension fund, the investment manager will aim to protect the fund from inflation. This can be done by investing in assets such as equities, property and index linked gilts that provide a long term hedge against inflation. Deferred pensions, for members who have left the scheme,

generally have price indexation up to a maximum limit. There is no conventional investment that exactly matches such liabilities.

As a fund matures, it will have a greater proportion of fixed liabilities made up of pensions in payment, the liabilities will also be shorter in term. The fund can reflect this in its investment policy by investing a greater proportion of its assets in bonds. In controlling the level of risk, a pension fund will diversify its investments between appropriate categories of investment (Dunford, 2003).

2.5.1 Investment Policy by Corporate Pension Plans

Corporations with some probability of defaulting on their debt face conflicting incentives with respect to the management of cash flow risks. On the one hand, shocks to cash flows for financially constrained firms can lead to bankruptcy and inability to take profitable investment projects in the future. In a series of research conducted on the need to ensure sufficient funds to avoid financial distress Smith & Stulz (1985) and to be able to undertake capital investments Mayer, Schoors & Yafeh (2003) generate a motivation for firms to reduce cash flow risks, especially those risks that drain financial resources when firms are in greatest need of liquidity for profitable projects (Froot, David & Jeremy, 1993; and Almeida, Murillo & Michael, 2006). In, contrast, the theory of asset substitution Jensen & Meckling (1976) suggest that managers can increase the value of shareholders equity by raising the volatility of the firm's assets when there is a significant probability of default.

The liabilities of the pension plan resembles regular secured corporate debt in that limited liability protects shareholders from having to transfer or liquidate non-corporate assets to compensate the creditors or workers in the event of bankruptcy (Sharpe, 1976 and Tveynor, 1977). If the risk assets perform well and the firm avoids bankruptcy, then the resulting improvement in pension funding reduces the need to fund the pension out of liquid corporate assets. Furthermore, since the creation of the federal Pension Benefit Guaranty

Corporation (PBGC) in America in 1974, if a firm enters bankruptcy with insufficient pension assets to cover its liabilities to workers, the US government provides plan recipients with their annual pensions up to a statutory maximum amount. The security the PBGC receives is generally limited to the firms dedicated pension assets, as the PBGC has a low priority in bankruptcy thereafter, so that general corporate assets are protected. Given the control that corporate boards and management exercise over pension fund asset allocation in the U.S. it has long been argued that these institutions create incentives for firms to underfund pension plans and invest the assets in risky securities, thereby shifting the risk of poor pension performance onto the (PBGC) and the beneficiaries.

An important constraint on this moral hazard is that should the firm avoid bankruptcy but face poor performance in its pension fund, it must continue to fund the pension plan with liquid resources. In America, the Employee Retirement Income Security Act (ERISA) of 1974 and several rounds of later legislation established a system of mandatory pension contributions, intended to ensure adequate funding of DB pension plans. Cash drains from required contributions, depress capital investment at the firm level (Rauh 2006). The system of required contributions thus creates an incentive to limit risk taking in pension plans, as large mandatory contributions may affect the ability to invest in attractive projects. This influence against risk taking in pension funds has been ignored by previous literature which instead has emphasized the tax benefits of funding with debt Black (1980), and Tepper (1981) as a countervailing force against the moral hazard associated with pension investment Sweeting (2005), Campbell & Viceira (2005). After the funding status of a given pension plan improves, the plan assets tend to be invested more in equities, after the funding status deteriorates the plan assets tends to be invested more in safe assets such as government debt and cash.

Firms with better credit ratings and lower expected costs of financial distress take more risk in pension plans than firms which have higher expected costs of financial distress (Sweeting 2005). The allocation to safe assets rises and the allocation to risky assets declines within a given firm over time if the credit rating deteriorates and vice versa if the credit rating improves. There is no evidence that pension fund asset allocation varies with balance sheet debt ratios among U.S. firms. The percentage of pension assets allocated to equity declines as the probability of bankruptcy increases, while the percentage allocated to safer assets rises. Again, this is consistent with risk management but not with risk shifting as firms draw closer to bankruptcy.

Much of the theoretical literature starts from the demonstrations under certain assumptions, the goal of shareholder maximization is accomplished by investing the pension fund entirely in bonds Black (1980), Tapper (1981), and Bodie (1990). On average, however, large U.S pension sponsors invest roughly 60% of pension fund assets in equity securities, suggesting that additional theories are necessary to explain pension fund investment. Bergstresser, et al (2006) show that the earnings impact of risky pension investment strategies creates an incentive to invest pension assets in more volatile securities. There are numerous reasons why firms invest in equity at all in pension funds. Firstly, firms may desire to offer pension beneficiaries the upside to good performance in pension assets Sweeting (2005) or access to alternative securities that may not be available to individual investors (Campbell & Viceira (2005). Secondly, firms, may wish to maximize the short term earnings impact of selecting an equity investment strategy that allows for the assumption of high rate of return on pension assets (Bergstresser et al, 2006). Thirdly, according to Sundavesan & Zapatero (1997) and Lucas & Zeldes (2006), firms may invest in equity to hedge against increases in projected benefits owed to employees, these projected benefit are a function of real wages which are likely correlated with the stock market.

Fourthly, some observers have proposed that decisions about funds are made in a vacuum with respect to the rest of the firm's operation. This last explanation is contradicted by conversations with industry insiders as well as in voluntary disclosures about the pension investment governance process. The board of the corporation and committees of its managers are responsible for setting pension fund investment policy and appointing or hiring investment managers to execute it. Many firms have entire internal divisions responsible for investing pension assets (Denmark 2006).

Firms' contributions to pension plans are greatest when the plans are more underfunded, consistent with the fact that this is when mandatory contribution requirements are the strongest (Lucas & Zeldes 2006). Firms also make larger contributions when they have more cash on hand and more cash flow. The unrestricted nature of asset allocation in pension funds makes it a more fruitful area for consideration. While voluntary decisions and asset allocation are probably made jointly, most firms in the current regime contribute to underfunded plans at the statutory minimum and do not contribute at all to overfunded plans.

There have been a number of previous empirical studies of pension funding and asset allocation with generally conflicting conclusions. These studies include Friedman (1983) which uses a cross-section of approximately 8000 plans from 1977, Bodie et al (1985, 1987) which draw a data set of 939 firms from 1980, Petersen (1996) which uses IRS 5500 data from years 1988-1990, Hsieh et al (1997) which uses a dataset of 176 firms in 1989 and Coronado & Liang (2005) which uses a cross section of 363 observation from 2002. These studies have reached conflicting conclusions about both the degree integration of corporate pension policy with real corporate decisions and the direction of the effects. For example, Bodie et al (1987) find a negative correlation between risk taking and funding, consistent with risk shifting, whereas Petersen (1996) finds a positive correlation. The primary obstacle has been that until now a sufficient panel dataset has never been compiled to study these issues in

a way that allows the consideration of both cross-sectional relations and relations within firms and plans over time.

2.5.2 Investment Restrictions on Pension Fund

Most pension reforms have been accompanied by strict regulations aimed at protecting workers future pension benefits. These regulations have included among others, aspects of the industry structure, asset allocations and relative performance. These constraints have important effects on the funds, asset allocations and hence on the development of local securities markets. While restrictions on the industry structure and relative performance appear to be relatively strict, general conclusions on the lightness of portfolio restrictions are harder to establish. A comparison between portfolio restrictions in mature and emerging markets (such as Nigeria) reveals that there are large differences across countries. In some countries, pensions funds are required to follow “prudent man rules” that is, assets should be invested in a manner that would be approved by a prudent investor. While no emerging market is allowed to follow the prudent man rule, four of the big countries (Argentina, Brazil, Hungary and Poland) are allowed to invest up to half of their portfolio in stocks, and another group (Chile, Colombia and Peru) has a ceiling of 30-40 percent. The exception is Mexico, which together with a number of smaller countries in the region, does not allow pension funds to invest in equities.

The differences are somewhat more striking in the actual portfolio allocation. While U.S. and UK pension funds hold around sixty (60) percent of their assets in stocks, Japan’s pension funds hold twenty-eight (28) percentage and Germany’s almost none. It is interesting to note that in two small mature markets, Denmark and the Netherlands, Pension funds hold around half of their assets in equities (OECD 2003).

Countries that have reformed their pension systems hold a large share of their portfolios in government bonds, with the exception of Peru and Chile. In the most recent

reformer, Mexico, pension funds held almost ninety (90) percent of their portfolio in government bonds in 2001, but that percentage had fallen to eighty-one (81) percent by end 2002. Argentina and Colombia's pension funds held around half of their portfolios in government bonds by end 2001. Mature market's pension funds seem to hold slightly larger allocations in foreign assets than their emerging market counterpart. That is twenty-three (23) percent: nine (9) percent.

In sum, emerging markets pension funds have relatively larger holdings of domestic bonds and smaller allocations in stocks and foreign securities than most mature market. Smaller countries also have relatively large foreign assets allocations. Thus, a key policy issue is whether emerging markets should gradually liberalize some of the tighter investment limits and how much weight to give to the development of local securities markets in shaping up pension fund regulations. While loosening restrictions on equity investments could contribute to the development of local securities markets, relaxing those on foreign investments could have the opposite effects (Cochrane 2001, Ljungqvist & Richardson 2003).

Traditional mean – variance analysis upholds that all investors should hold the same portfolio of risky assets, a unique and optimal mix of stock and bonds. In the vein, conservative investors would hold relatively more cash (and less of the same, unique portfolio of risky assets) than aggressive investors. This strong implication of a unique portfolio is the mutual fund theorem of Tobin (1958). As noted by Canner, Mankiw & Weil (1997), this contrasts sharply with the advice given by financial planners.

Pension scholars such as (Markowitz 1952 and Bodie, Jay, Randall & Roberts,1987) conducted researches, using data for the United States between 1926 and 1992, conclude that the optimal portfolio should hold stocks and bonds in a ratio of 3 to 1. In contrast, they also show that asset manager and financial planner differ sharply in their advice on asset allocation to clients, depending on investor's degree of risk aversion. On average,

conservative investors tend to be advised to hold a much higher allocation in bonds than in stocks. This is, because, bonds in environment of low inflation uncertainty are much safer for the long term investor.

In an attempt to reconcile the principles of portfolio choice with the advice of financial planners, Campbell & Viceira (2002) modify the traditional analysis of portfolio choice in several ways. In particular, they show that the optimal portfolio of long term investors may be quite different from that of short term investors and that a long horizon analysis assigns a much more important role for bonds in the optimal portfolio. For instance, cash, or more precisely money market funds or treasury bills, are assumed to be risk –free assets in the traditional analysis, while they constitute risky assets for long-term investors, as they must be rolled over at uncertain future interest rates. Conventional long-term bonds in environments of low inflation uncertainty, or inflation-index bonds, are much safer assets for the long term investor.

Finally, Campbell & Viceira (2002) also show that while it is optimal for young investors to hold more stocks, this advice has to be nuanced when investors have insecure jobs and/or are close to subsistence levels of consumption. One of the main reasons behind large equity allocations in some of the mature markets is the existence of high excess returns in stocks, especially in the United States. Despite the fact that the existence of such an equity premium is not very well understood, there are a number of reasons why it may not be appropriate to extrapolate this historical evidence to the future and/or to other countries. Firstly, historical returns may not be repeated in the future. Secondly, the evidence on the equity risk premium is based on long-series (covering sometimes more than a hundred years) and even if stocks out perform bonds on average, there is a significant risk that they may fail to do so over shorter periods of time relevant for pensioners. Thirdly, Jorin & William (1999) argue that the result for U.S equity markets suffer from "survivorship bias", that is the

fact that other stock markets around the world had a much worse performance owing to extreme events such as crisis, wars, expropriation, or political upheaval that led to temporary or even permanent closure of some stock markets.

Moreover, the string of emerging market crises since 1994 and the recent bursting of Technology, Media and Telecommunications (TMT) stock market bubble, combined with structural changes in global stock markets, have been a stark reminder of the risks associated with equity investments. The bear market in equities has shrunk trading volume everywhere and the combination of a drop in IPOs associated with the reduction in privatization and a spate of delisting has called into question the viability of several stock exchanges in emerging markets (Mathieson, 2004). In several emerging markets, there are only a handful of stocks that have the market capitalization and liquidity that would satisfy the demands of a prudent fund manager.

Despite these recent arguments against a large share of equities in pension funds' portfolios and the recent dismal performance of equities world wide, diversification arguments suggest that local equities should definitely have a role in local pension fund portfolios. Investors with a relatively long horizon, such as those just entering the labour force, are likely to benefit from the risk-return configuration of stocks, where the risk is measured relative to the existing portfolio. Moreover, the property that makes shares safer in the long run than in the short – run-mean reversion – is likely to provide some relief to equity portfolios that suffered recent losses but are held for the long run.

In sum, portfolio regulations on equity holdings in most pension reform countries appear not to be too restrictive and currently low allocations to equities may not have been a bad decision. Going forward, there may be scope for further liberation of restrictions on equities, perhaps with a greater role for allocations in foreign stocks or mutual funds. As shown by Ljungqvist & Richardson (2003), increasing asset allocations to local stocks have

contributed to support price to –book ratios in Argentina, Chile & Peru, and would expect a similar support in primary equity markets. This could justify giving some weights to the market development argument in allowing for a larger share of investment in local stocks. However, it remains unclear how effective the demand from pension’s funds could be in the development and growth of local stock markets that are under strong competitive pressures from regional and global markets. In particular, Claessens, et al (2002) show that countries that follow the right policies to develop their own local stock markets also experience the highest degree of migration of capital raising, listing and trading activity to international stock exchanges. Nevertheless, even though it is very difficult to assess the long term evolution of trading practices and consolidation of exchange IMF (2001), the largest emerging market stock exchanges are likely to continue to be a viable source of trading for investors and funding for corporations.

The relatively large portfolio allocation in government bonds is a natural outcome of the early stages of a pension reform, but it creates an undesirable concentration of risk in the sovereign. There are three arguments that support the relatively large portfolio allocation in government bonds. First, increased government bond issuance would smooth the transition to a funded system and attenuate the problem that the transitional generation would have to “pay twice”, that is to pay contributions to the PAYG systems to finance the benefits of those who are already retired while also saving for their own future retirement (Campbell & Viceira, 2005). Second, in the early stages of reforms, pension fund managers are relatively inexperienced in risk management and need to follow a learning process that would start with less- risky government bonds. Third, local bond markets are generally underdeveloped and it is appropriate for the government to take the lead and establish a yield curve that would help price corporate sector bonds, as well as contribute to the acceptance and use of indexed bonds (Mathieson et al 2004).

However, the recent Argentine crisis has highlighted the risks involved in a concentrated exposure to the sovereign. As the government tried to decrease the cost of servicing its debt in 2001, pension fund companies and banks were forced to make asset allocation decisions that they probably would not have made in other market conditions (Gordon & Jarvis 2003). The subsequent default, devaluation and pacification of deposits and local bonds have raised concerns about increased government intervention in the industry.

Some analysts have asked whether emerging markets should go as far as to dismantle specific relations on portfolio limits and move to the “prudent man rule” but have concluded that most of them are not yet ready for such option (Iglesias & Robert, 2001). A somewhat more sophisticated practical guideline states that the fraction of assets invested in equities should decline with age. It generally applies the rule of thumb that the percentage in equities should be 100 minus one’s age – a person of thirty years old should invest 70 percent in equities and one aged seventy should invest 30 percent in equities (Bodie & Robert, 2001).

In view of the fact that preference is given to bond issued by Federal government of Nigeria, our position is that with recent crises in advanced countries such as Argentina, pension fund administrators should not invest the whole of their assets in government bonds, rather, they should adopt Bodie & Robert (2001) View. That is the fraction of assets invested in equities should decline with age.

2.5.3 Domestic Versus Foreign Securities

International portfolio theory suggests that there are substantial gains to be achieved by diversifying abroad, mainly because of additional diversification of non systematic national risks. Grauer & Hakansson (1987) suggest that gains from international equity – portfolio diversification are large, but the “home bias” in most mature market investors’ portfolios remains a puzzle. Davis (2002) shows that international investments allow

superior performance in terms of risk and return and that pension funds are well placed to take advantage of these benefits.

A recent study by Baxter & King (2001) on the gains from international diversification from the perspective of U.S. investors note two important sources of benefits. First, there is the standard diversification benefits that improve the risk return trade off of the domestic portfolio by adding to international stocks and bonds. Second, the authors note that human capital is a much larger fraction of wealth than financial assets and that labour income is much more correlated to domestic financial asset returns than to foreign asset returns. Hence, international investment provides also hedging benefits to labour income.

Despite the importance attached to the development of local securities markets, some of the pension reformers have seen the need to increase their limits on foreign investment for diversification purposes. Once again the experience in Chile is a good example. Only a decade after the inception of the private pension funds were they allowed to invest in foreign assets, up to 3 percent of their portfolio. The limit was then increased to 9 percent in 1995, 12 percent in 1997, 20 percent in 2001 and has been at 30 percent since June 2002. Pension funds did not diversify abroad in a meaningful way in the first half of the 1990s, owing to high domestic asset returns. But following two years of large negative returns in the local stock market, a strong reallocation towards foreign assets began in 1997 and the funds currently hold around 25 percent of their assets abroad. This has also been accompanied by a recovery in the funds annual returns, aided in part by the depreciation of the local currency.

In other countries that have loosened limits to foreign investments, asset managers have at times been reluctant to increase allocations of foreign assets. For instance, in Hungary, where the limit has been set at 30 percent of total assets for several years, actual allocations are under 5 percent as a result of bad experiences with losses in the aftermath of the bursting of TMT bubble. In Colombia, funds were allowed to invest in international

equity mutual funds in April 2002, but market participants argue that allocations are under 2 percent because of the fear of not meeting required minimum returns even when funds are at the maximum limit of their holding of government bonds.

Some analysts have considered Chilean regulations to be too stringent and suggested that other reformers could follow a somewhat less gradual approach in loosening regulations. In sum, it is feasible and desirable for private pension funds to diversify abroad. Even when the development of local markets is an important policy objective, funds should be allowed to invest abroad to achieve adequate diversification levels and avoid undue pressures in local markets. A natural vehicle for this diversification abroad- one used intensively by Chilean funds- is to invest in global mutual funds.

According to Bodie & Robert (2001), two macro economic implications of pension fund diversification abroad are worth mentioning. First, the reduction of limits on foreign investments by local pension funds amounts to a removal of capital controls on outflows and care should be taken about the macroeconomic consequences, in particular, as the Chilean and Canadian experiences have shown, a sudden shift of pension fund allocations abroad can lead to a substantial exchange rate depreciation. In Chile, the increase in the share of foreign assets, from 2 percent by end 1997 to 12 percent by end 1999, was associated with a roughly 20 percent depreciation of the peso. In Canada, an increase of the foreign investment limit from 20 percent in January 2000 to 30 percent on January 2001 contributed, to some extent, to an increase in capital outflows and a 10 percent depreciation of the Canadian dollar in the period January 2000 through January 2002. Second, pension funds' accumulation of foreign assets provides a natural supply of foreign exchange hedge for corporate that borrow abroad, contributing to the development of derivatives markets and to a more balanced aggregate international position.

2.6 Pension Fund Development Stages and Sustainability

The development of pension fund can be seen in three stages namely; start-up, growth and maturity stages. The life cycle theory is used to explain the three stages of development of pension fund and their respective financing needs. The life cycle theory posits that the sources of pension fund financing are linked to their respective stages of development and, thus, their sustainability (Lapenu & Zeller, 2001; Farrington & Abrahams, 2002). It is therefore, reasonable to assess sustainability of pension fund based on their respective stages of development.

In this study, using the life cycle theory of pension fund development, the effects of the determinants of financial sustainability on sustainability of pension funds at start-up and growth stages is explained. The life cycle here is not used to refer to a certain standard time of operation, but rather on the development stages themselves. It is bear in mind that, although the actual timing may differ from one pension fund to another given a pension fund's background and operating environment, still all pension funds go through the same three developmental stages. It is, equally, recognize that, there is possibility that pension fund development stages may not be linear. Thus, the study focuses on what affects financial sustainability at various stages of development using indicators of financial performance and sustainability at each of the development stages. The focus is not to explain whether the pension funds are in a certain stage but what affects their sustainability at different stages.

The general standard benchmark for life cycle definition is: 0-4 years for start-up stage; 5-8 years for growth stage; and above 8 years for mature stage (Robinson, 2001). With the life cycle theory, pension funds are expected to attain operational sustainability at their growth stage. That is, between 5 and 8 years from their initial operations. They are also expected to become financially sustainable at their maturity stage 8 years after their initial operation.

Studies however indicate different timing for the pension fund to attain certain levels of sustainability. Davis (2002) for example reports that the start-up stage takes 3 years or more. According to CGAP (2005), it takes an average of 5-10 years for a pension fund to attain operational sustainability. Johnson & Rogaly (1999) suggest that it takes 7 to 10 years after their initial operation for pension fund to attain operational sustainability. Moreover, while some of pension fund could take five years to attain operational sustainability (Khandker, Khalily & Khan, 1995), other (in the same country) could take eight months to attain the same level of sustainability (Rutherford, 1995). The difference between the two lies on how well a pension mobilizes its members (clients) and their contributions.

The above timing differences in attaining sustainability reveal that years or age of a pension is neither a significant determinant of financial sustainability nor is it a key determinant of stage of growth.

2.7 Pension Fund Efficiency and Financial Sustainability

According to Woller (2000), there are two factors which affect pension funds self-sufficiency and their financial sustainability. These are: institutional efficiency and return on portfolio. These two form a major part in a pension fund's financial performance. Efficiency refers to attaining more output at the same level of input. Thus, a pension fund will be considered efficient if compared to other pension funds, at the same level of input, more output is achieved. Woller (2000) defines efficiency as the most effective way of delivering pension to the retirees. There are several indicators of pension fund's efficiency. These can be categorized into three namely: asset and liability management; human resources management and loan portfolio quality. These measures of efficiency indicate that the more the output at a given level of input the better the contribution towards financial sustainability. On the other hand, while pension funds are required to be efficient, they are also expected to earn a positive return from their operations. This is measured by the return on portfolio. The

return on portfolio is commonly measured by portfolio yield and interest spread. The portfolio yield refers to effective interest rate. This is measured by total interest income over average loan portfolio. The interest spread indicates the extent to which a pension fund is pricing its products to cover its total costs also known as administrative cost (Woller, 2000). That is, the extent to which the interest income covers cost incurred. The interest spread is obtained by taking the difference between portfolio yield and administrative expenses to average portfolio ratio. The efficiency parameters of pension fund are controllable by pension fund management. These factors, are therefore, refer to as internal factors. Some factors are external to a pension fund and, therefore, cannot be influenced by internal management. There are external factors; one of these factors is the regulatory framework of pension fund. This represents the environment within which a pension fund operates.

The roles of regulatory framework and how it may affect the efficiency of a pension fund needs to be considered when assessing the efficiency of a pension fund. According to Logotri (2006) if pension funds are to be financially sustainable they have to be registered under a suitable legal form to ensure a sufficient equity base. This means that pension funds need to be properly regulated.

Regulation refers to the set of government rules that apply to pension fund. The regulation of pension fund may take any of the following forms: investment guidelines, assets kept with a custodian, winding up exercise among other requirements. Statta (2007) suggests that regulation of pension fund strengthens their financial sustainability.

Pension fund operators that take deposits need prudential regulation. This type of regulation protects their financial soundness to prevent them from losing contributor's money and damaging confidence in the financial system. It involves monitoring and protecting the core health of a pension fund (Arun, 2005; and CGAP, 2003).

The regulation of pension fund is meant to provide a fair playing ground confidence to pension fund stakeholders (Arun, 2005). The ability of pension fund to exist and expand will depend on financial policies in a country in which it operates. That is, an enabling environment, and fair regulations will give a pension fund better access to commercial and non-commercial sources of funds for equity and debt, better ways to achieve growth and outreach goals, improved standards of control and reporting, improved ability to offer product, such as contributions and transfers, and enhanced legitimacy in the financial sector and with clients. All these contribute positively towards attaining financial sector and with clients. They also contribute positively towards attaining financial sustainability. On the other hand, Hartaska (2005) argues against ambiguity in regulatory discretion in the interpretation of the legal basis for disbursement activity.

2.8 Profit and Financial Sustainability

Pension fund profit is linked to their financial sustainability. According to Woller & Schreiner (2002) financial self-sufficiency is the non-profit equivalent of profitability. All things being equal, profits can be considered to be a key variable in measuring a firm's financial sustainability (Glautier & Underdown, 2001). The capital maintenance concept requires that profit should be considered as a residual available for distribution once provision have been made for maintaining the value of capital intact (Bodie, 2009; Glautier & Underdown, 2001; and McCullers & Schroeder, 1982).

Considering profit as residual, Hicks' (1946) definition of income has been incorporated in financial accounting (Harvey & Keer, 1983). Implementing the capital maintenance requirement, the development of accounting professional has gone hand in hand with recognizing the changes in value of assets and liabilities (Bodie et al, 2009; Glautier & Underdown, 2001; Porwal, 2001; Smith, Keith & Stephens, 1986). Thus, with capital

maintenance concept in mind, it can be confidently linked the financial sustainability of pension funds with their profitability.

According to Porwal (2001), the maintenance of capital by a firm is necessary in order to survive or become sustainable. Moreover, if profit is considered as a residual (Glautier & Underdown; and McCullers & Schroeder, 1982), then profitability can be used as a proxy measure of financial sustainability as it considers covering all costs incurred in earning income plus any costs necessary to at least maintain the current level of operation. Likewise, Larson, Wild & Chiappetth (1999) define profitability as “the ability to provide financial rewards sufficient to attract and retain financing. For pension funds that depend solely on their own generated funds to keep their current level of operations, and yet be able to reach their desired level of growth, profitability can be considered as a measure of financial sustainability.

Previous studies such as (Hauner, Daniel & Michael, 2007) in pension fund field have defined sustainability from profitability point of view. They consider profitability as a high standard measure of pension fund performance (Hauner, Daniel & Michael, 2007; Brau & Woller, 2004; and Chaves & Gonzalez-vega, 1996). Using this approach, pension funds are considered sustainable if and only if they are able to cover all their operating and financing costs from their own generated revenue. They further defined sustainability as the stage of financial operations where all costs of the lender are fully met from the interest charges, and where such charges are not subsidized, partly or fully met from outside sources (Thapa, et al, 1992).

2.9 Pension Fund Financial Sustainability Approaches

There are two competing views as to which goal of pension fund should be given higher priority in as far as welfare package is concerned. These are Welfarists (Poverty

lending) and the Institutionists (also known as financial system) approaches (Brau & Woller, 2004 and Arun, 2005).

2.9.1 Welfarists' Approach

The welfarists emphasize on poverty lending as measured by depth outreach. That is, reaching not just a large number of clients (breadth of outreach) but a large number of poor clients also known as depth of outreach (Brau & Woller, 2004). It follows, therefore, that, welfarists views pension fund as established for poverty reduction, their objective being to empower the poorer of the economically active poor and thus, depth of outreach should be given a higher priority. Pension fund, should be, as much as possible, able to serve as many as possible poor clients, even when it may appear not profitable. The deficit in operations should be filled with donor and government support or social investors (Woller, Dunford & Warner, 1999).

2.9.2 Institutionists Approach

Institutionists on the other hand focus mainly on financial sustainability of pension funds. According to Woller et al (1999), the institutionists view financial deepening as the main objective of pension fund. Here financial deepening refers to creating sustainable financial intervention for the retirees. Institutionists assert that the financial sustainability as measured by financial self-sufficiency (profitability) should be given higher priority by all pension funds (Brau & Woller, 2004). Their arguments comes from the fact that in most cases donor dependence is not certain and thus, unless a pension fund is able to sustain itself financially it will not be able to serve the retirees in the long run.

Contrary to promoting financial sustainability, there is a potential tension that over emphasis on financial self sustainability may lead a pension fund into moving away from its poverty reduction objective (Stack & Thys, 2000; and Drake & Rhynem, 2002). This is known as mission drift (Copestake, 2007 and Aubert, Janvry & Sadoulet, 2009).

A close examination of the arguments put forward by institutionists and welfarists can reveal that it is a financing issue. On one hand, the institutionists would like to see pension funds meeting all their costs from self-generated funds with a possibility of making profit (without using any external funds). This is what they would call a sustainable pension fund. On the other hand, welfarists are not concerned with where the funds come from. Provided the pension fund can continue with operations and thereby meet their social objectives they have attained sustainability. Their focus is on targeted depth of outreach rather than scale (breadth of outreach) or financial self-sufficiency (Conning, 1999 and Brau & Woller, 2004). Thus, as Woller, et al, (1999) argue, what matters is how subsidies are used and not whether they are used or not.

2.10 Theories of Pension Funds

There are many theories of pension funds that exist in the literature. The most common ones are: utility theory, theory of immunization, theory of absolute matching and theory of intermediation. Others are theory of pooling, accounting profitability theory and life cycle theory.

2.10.1 Utility Theory

Utility theory provides a means for making choices when faced with uncertainty. it can be used as the basis for analyzing investment risk. Proponents of the theory Diamond (2002), Drake & Rhyne, (2002) Bergstresser (2006) and Rauh (2006) suggest that the determination of the value of income is not based on the amount of income value on the utility but the amount of income provided.

2.10.2 Theory of Immunization

Theory of immunization in pension funds was studied under which an investor is protected against small changes in the rate of interest. The proponents of this theory Lucas & Zeldes (2006) posit that, a pension fund should choose assets to back liabilities such that the

financial factors that affect the value of the liabilities affect the assets in a similar way. According to Petersen (1996), to derive conditions under which the fund will be immunized against losses, it is assumed that:

- a. The rate of interest that the pension fund can earn on its assets is compatible with that which it uses to value its liabilities.
- b. The assets are exactly sufficient to meet future liabilities.
- c. All the assets are invested in fixed interest securities and that they are held to meet liabilities fixed in a specific currency.

Dusek & Juraj (2008) observe that if there is a small movement, either up or down, in the force of interest, the pension fund will make a surplus in the sense that the change will lead to the value of the assets rising by more than the value of the liabilities (or falling by less).

2.10.3 Theory of Absolute Matching

The theory of absolute matching was demonstrated by Sweeting (2005) and Yemo (2007). The theory depicts a point at which the investor has some critical planning purpose such as the repayment date of a substantial liability. At the beginning of an investment process the investor makes decisions regarding the asset mix, liabilities and the financial goals of a substantial liability. At the beginning of an investment process the investor makes decisions regarding goals of the institution. Setting an investment strategy to control the risk of failing to meet financial objectives would therefore involve a method of taking the variation in the assets with the variations in the liabilities into account simultaneously (Mayer et al 2003 and Borella & Fornero 2007).

2.10.4 Theory of Intermediation

As noted by Allen & Santomero (1998) the traditional theory of financial intermediation is focused on the real-world market features of transactions costs and

asymmetric information. In the context of the discussion on the theory of intermediation, Allen & Santomero (1998) point to financial development related to deregulation improved information provisions via technological advances and financial innovations which have reduced transactions costs and improved investor information. These imply that the traditional arguments are no longer sufficient to justify intermediaries existence and continued growth.

Accordingly, a sound theory of intermediation should in their view also take into account the activity of risk transfer and risk control between and by intermediaries on the one hand , and facilitation of participation in market by individuals on the other. Scholtens & Wensveen (1999) suggest in addition that dynamic aspects of financial innovation and adaptation of institutions to gain competitive advantage should play a central role.

We contend that a suitable framework for assessing the role of pension funds as intermediaries and the boost they give to capital markets is via consideration of the overall functions of the financial system. This in effect encompasses the above reasons for existence of intermediaries such as pension funds and allow a richer menu of activities to be covered by the subject of intermediation. It also provides a basis for judging the extent to which pension funds are acting as agents of financial change by fulfilling the functions of financial systems more efficiently than the alternatives (such as banks and individuals investors). In this context, growth of certain types of financial intermediary (or market) such as pension funds is partly explicable in terms of a changing comparative advantage in terms of the functions they fulfill. These advantages of pension funds tend to be complementary to capital markets but substitutable for the services of banks.

The supporters of current theory of intermediation Balkenhol (2007) and Franco & Nicola (2009) argue that, the role of pension funds is clearly not to facilitate exchange of goods, services and assets directly. This is because, unlike banks, money market funds, and

to a lesser extent long term mutual funds, they do not offer liquid liabilities. Nevertheless, pension funds have had an important indirect role in boosting the efficiency of the financial systems, by influencing the structure of securities markets. This effect on micro-structure links to their demand for liquidity, i.e. to transact in large size without moving the price against them, anonymously, and at low transactions costs.

By demanding liquidity, pension funds help to generate it, firstly by their own activity in arbitrage, trading and diversification, secondly via the fact that liquidity is a form of increasing return to scale, as larger markets in which pension funds are active attract more trading, reducing cost and improving liquidity further. A third effect arises from funds countervailing power as they press for improvement in market structure and regulation. These include deregulation and reduction in commissions, advanced communication and information systems, reliable clearing and settlements systems, and efficient trading systems, all of which help to ensure that there is efficient arbitrage between securities and scope for diversification. They also demand adequate public disclosure of information and a market oriented accounting system. In this regard, pension funds have considerable leverage as they are extremely “footloose” and willing to transfer their trading to markets offering improved conditions. This renders the market for securities trading service “contestable”, regulation permitting. Any excess profitability is vulnerable to “new entry” by other markets; and markets need to innovate (e.g. by setting up futures exchanges or electronic trading) to retain pension funds business.

2.10.5 Theory of Pooling

Pooling and diversification are fundamental characteristics of pension funds, given their size and consequent economics of scale. In this context, it may be noted that the mutually reinforcing development of securitization of individual assets (such as loans), which has provided a ready supply of asset in which pension funds may invest instead of

banks holding them on their balance sheets. In addition, participation costs of market activity may also be of major importance in determining the demand for services of pension funds.

The traditional theory of pooling suggests that transactions costs in securities markets, including the bid-ask spread and “minimum size investment barriers,” make it difficult for households of average means to diversify via direct securities holdings. Meanwhile, risk incurred if diversification is insufficient is not compensated by higher return, because such risk is diversifiable to the market as a whole (Matheson, Jorge, Ramana & Anna 2004). Historically, this either meant that individuals took excessive risk or were obliged to hold lower-yielding assets such as bank deposits.

The idea of participation costs complements that of transactions costs, and helps explain why pension funds have continue to grow even as transactions costs have come down. The basic idea is that there is a fixed cost to learning about a company, and also an ongoing cost of being active in the market and remaining up to date, which may discourage individuals from holding sufficient shares for adequate diversification (Allen & Santomero 1998). Furthermore, the skills needed to undertake risk management may be too costly for individuals to acquire (Allen & Santomero 1999).

Bridgen & Meyer (2008) observe that, pension funds offer much lower costs of diversification by proportional ownership. One reasons for this is that there are economies of scale in large transaction, related partly to the fixed costs involved. Pension funds can also offer the possibility of investing in large denomination and indivisible assets such as property which are unavailable to small investors. Furthermore, pension funds reduce the cost of transacting by negotiating lower transactions costs and custodial fees. They conclude that individuals are likely to switch to pension funds from direct holdings of securities and from bank deposits. Therefore forced pensions saving will tend to boost their overall saving particularly markedly (Bergstresser, Mihir & Rauh 2006).

Portfolios pension funds vary widely, but in most cases they hold a greater proportion of capital uncertain and long term assets than households, while households, have a much larger proportion of liquid assets (Whelan 2004). These differences can be explained partly by the time horizons. Also as noted by Whelan (2002) pension funds compensate for the increased risk, by pooling at a lower cost across assets whose returns are imperfectly correlated. The implication is that pension funds increase the supply of long term funds to capital markets, and reduce bank deposits even abstracting from changes in aggregate saving, so long as households do not increase the liquidity of the remainder of their portfolios fully to offset growth of pension fund assets. Research on household asset holdings at a micro level such as Kortleve, Nyman & Ponds (2006) find little such offsetting.

2.10.6 Accounting Profitability Theory

Based on the accounting profitability theory, the reviewed literature indicates that several factors could affect the financial sustainability of pension fund administrators. These factors can be grouped into two: those related to pension fund outreach and those related to pension fund efficiency.

The accounting profitability theory is used to explain various factors that can affect the number and riskness of client, the income and expenses of a pension fund administrator and therefore their profitability. Efficiency refers to the ability to produce maximum output at a given level of input (Chua & Lianto, 1996). Woller (2000) defines efficiency as the most effective way of delivering benefit to the retirees. This involves among others, cost minimization at a given level of operation. Pension fund administrators can reduce their total expenses at a given level of operations or increase income at the same level of operation or both. This is what we refer to as efficiency in as far as pension fund income and expenses are concerned. According to Glautier & Underdown (2001) profit can be used to ensure efficiency of an organization. This is particularly true under competitive condition and

therefore, fairly applicable to pension fund administrators in Nigeria which operates under perfect competition condition.

The expenditure (costs) and income (revenue) of the pension fund administrations can be affected by either internal or external factors or both. The level of the impact that these factors cause on profitability may vary from one factor to another regardless of whether they are internal or external factors. There are also other factors that may drive the level of income or expenditure of pension fund administrators, which are not controllable within the pension fund administrators. According to Schreiner (2000), profitability is a stepping stone to financial sustainability. It has also been widely used as a measure of financial sustainability. Many scholars have conducted series of researches to confirm this (Woller & Schreiner, 2002; CGAP, 2003; Musalem & Robert 2004; Adongo & Stork, 2006; Armendariz & Morduch, 2007 and Hauner et al, 2007;).

2.10.7 The Life-Cycle Theory

The life-cycle theory of savings is often used as a framework in the analysis of pensions (Bailliu & Reisen, 1997). The theory, in its simplest form, states that individuals prefer to smoothen their consumption, so the main motivation for saving during their working life is to meet their consumption obligation when they retire. In addition to the above statement, the theory posits that people make intelligent choices about how much they want to spend at each age, only limited by the resources available over their lives. By building up and running down assets, working people can make provisions for their retirement, and more general, tailor their consumption patterns to their needs at different ages, independently of their incomes at each age.

Since the theory assumes that individuals are guided by rational expectations, they will as a matter of necessity saving during their active working life for the aforementioned purpose. If all individuals were to behave as if they were guided by the theory, there would

not have been any need for pension schemes, for rational behaviour would indicate that they save and be able to meet their consumption requirements in their old age.

However in practice, people hardly behave according to this dictate of the life cycle theory. Certain factors especially permanently low level of income of some workers makes it practically difficult or rather impossible to save for their old age. Because of this and other related reasons, many countries around the world have instituted pension schemes that make it mandatory for workers to participate in and benefit from same when they retire. Many studies have been conducted by pension fund scholars thus, Robinson (2001) Bogan et al (2007) and Hauner et al (2007) find that the age of a pension fund administrator although significantly positively affecting the breadth of outreach, it does not affect the financial sustainability. This study also adopts this theory.

2.10.8. Human Capital Spillover Theory

Human Capital Spillover Theory: Sala-I-Martin (1996) argues that human capital depreciates with age so the elderly tend to have less than average human capital. It follows that the elderly have a negative impact on the productivity of the young. The young, therefore, have incentives to induce the elderly to work less or even retire. This is why Social Security (SS) programs are introduced and why they tend to induce retirement. In other words, it is Pareto-improving for the young to trade money for the jobs of the old.

Payroll taxes typically provide the vast majority of revenue for SS expenditures. It seems that the old generations have a stake in the earning power of the working age generation: the more the workers earn, the more revenue obtained from taxing payroll at a given rate, and the more revenue available for subsidizing the old. Based on this observation, it has been suggested (Pogue and Sgontz 1977 and Becker & Murphy 1988) that social security is nothing more than a dividend paid to the old for human capital investments they made when the current workers were of schooling age. And these observers have pointed out

that government are also involved in educational investments which have grown over time public pensions.

2.10.9. Prodigal Father Prob. Theory

The first version assumes that parents were not looking forward enough when they were young. According to his version, people make “mistake” when they are young and they save too little. Diamond (1977) suggest several possible “reasons” for this: (i) people may lack the information necessary to judge their needs in retirement; (ii) people may be unable to make effective decisions about long-term issues because they are not willing to confront the fact that one day they will be old; and (iii) they may act “myopically”. As a result, it may be desirable for the government to act paternalistically and force citizens to save the appropriate amount.

Diamond (1977) suggests that the solution to the prodigal father is a fully funded program, and one that needs not be administered by the government. We believe that the solution may involve a pay-as-you-go program since, when the program is first created, it is too late to force the first old generation to save and (presuming society still wants to help the poor old) revenue is immediately needed to pay them. However, this reasoning cannot explain why even the richer members of the initial old generation would receive subsidies. As a forced saving program, it may explain why benefits are not means-tested-the program is not designed to redistribute, just to ensure people leave some of their resources for their old age. Feldstein (1985) suggest that, as opposed to the SS programs used in practice, the optional solution to the prodigal father problems involves means-testing and a low level of retirement benefits.

The second version of the theory seems to be exactly the opposite: parents were forward looking to such an extent when they were young that they anticipated not only their needs for retirement, but how their children and others in society would react to those needs

(Laitner 1988). In particular, they expect society to aid them in desperate situations (e.g. poverty) even when those situations are self induced. One way to solve the time inconsistency problems and achieve a Pareto optimal allocation is to force citizens to save when they are young and give them the resources back when they are old, a scheme whose steady state would look something like social security with resources being taken from the young and payments being made to the old.

2.10.10. Keynesian Saving Extraction Theory

Thomas Sargent (in Feldstein 1998,p.306) suggest that SS was created to purposefully reduce national saving in a moment in which aggregate demand was low (the Great Depression) and, following the Keynesian prescriptions, consumption needed to be stimulated. The point is based on the belief that SS programs tend to reduce national saving (Feldstein 1998). This theory is consistent with the fact that SS is usually run by the government. Keynesianism also explains why proof of disability is not required.

If the Keynesian explanation is modified by assuming that policy-makers are wrong to believe in Keynesianism as Sargeant (1998) suggests, then forced savings can improve welfare in the long run. If life expectancy grew or workers increased their demand for early retirement, the Keynesian policymaker might decrease the government retirement age in order to counteract the corresponding increase in private saving.

2.10.11 Theory of Contribution Density

For hundreds of millions of middle-class people around the world, consumption in old age depends on the contributory system promoted by the state, through either meditates or fiscal incentives. However, if a substantial share of participants have a low density of contribution, the pension replacement rate will be inadequate, even if the benefit formulae are generous for a high density participant.

Low coverage of contributions is prevalent in many countries, despite mandates. Important examples are China – 48% of urban employees contributed in 2005 (Salditt et al 2007), Poland – 68% contributes through ZUS, South Korea – only 58% of the labour force contributes (World Bank, 2000), Brazil – only 49% of the employed contribute, and Mexico – only 38% of employed contributes every two months (Rofman and Lucchetti, 2006). Moreover, average coverage rates like these are misleading when a country exhibits uneven density of contribution, since large groups of rural workers or urban self-employed (most of them poor) are effectively exempt from the mandate, in addition to women engaged in home production. Bucheli et al (2007) use survival analysis to estimate density from individual panel data, starting from incomplete individual historical from Uruguay.

In a situation of uneven density, some middle-income people fall into both absolute and relative poverty in old age, due to inadequate contributory pensions relative to former earnings. This situation may undercut the public's support for contributory pension. For example, in the debts that led to the 2008 reform in Chile, the argument that inadequate replacement rates are due to uneven density, and that this is a result of incomplete economic development, was criticized as an excuse to preserve an inadequate status quo.

In such situations, it may be tempting to introduce pay-as-you-go finance to grant large supplement to middle class people with inadequate pensions, to be paid by future generations, including the future poor. Since those middle class people did earn enough when active, this outcome is inequitable. It is also inefficient, since introduction of pay-as-you-go finance reduces national saving (Diamond, 1965), reduces the efficiency of the labour market in the future (Abel et al, 1989), induced a decline in fertility (Cigno and Werding, 2007) and may favor populist competition in offering subsidies (Godoy and Valdes-Prieto, 1997). Thus, uneven density of contribution reduces the political stability of pension funds.

2.11 Empirical Studies on Determinants of Financial Sustainability

Several empirical studies have attempted to assess the performance of pension funds and explain the determinants of their financial sustainability. All the researches in the reviewed literature used quantitative data analysis approach to determine factors affecting financial sustainability. For example, Christen (2002) conducts a study on eleven successful pension funds using simple regression (one independent variable) models with eleven observations each. The study however was biased in that it examines only successful pension funds. The number of observations was also too small to achieve statistically reliable conclusions and, therefore, generalizability is questionable. Moreover, by using a simple regression model it ignores the simultaneous effect of other relevant determinants of financial sustainability.

Woller (2000) studies factors driving the financial self-sufficiency of nine pension funds. He uses financial ratio analysis and a series of bivariate correlations between financial self-sufficiency in the sample funds. The methodological weakness of the study is that, the simple correlation just indicates whether or not two variables move together in the same or opposite direction, it does not necessarily mean that one should be causing the other (Mendenhall & Sincich, 1989; Dietman, 1991; Whitehead & whitehead, 1992; McClave, 2008; and Sincich, 2008).

Christen (2000) modifies the methodology from simple to multiple regression model to determine factors influencing financial sustainability of pension funds using financial parameters on data. Following this trend, Schreiner (2002) in his famous work “Aspects of Outreach: A Framework for Discussion of the Social Benefits of Pension Fund” expands the outreach variable to what he called seven aspects of outreach by integrating the financial and social parameters in pension fund financial sustainability.

Woller & Schreiner (2002) examine determinants of financial self-sufficiency using thirteen pension fund operators (8 pension fund custodians and 5 PFAs). The study improves on the previous methodology by adding the number of pension funds to thirteen and time period of study to three years, and focusing on aspects of outreach proposed by Schreiner (2002). However, differences in pension fund backgrounds and operations may lead this study to be biased as more than 60 percent of the studied pension funds were representing pension custodians which use a model different from other pension fund administrators studied.

Olivares-Polanco (2005) focuses his study on commercialization and outreach on 28 Latin American pension funds. The study uses Ordinary Least Square multiple regression analysis to investigate whether there exists a trade-off between depth of outreach and financial sustainability by exploring the determinants of disbursement size. The methodological weakness of this study is that analysis did not have multi-period observations and was dominated by a simple regression approach. It included only an observation from each pension fund for two different years.

The study by Makamme & Murinde (2006) was set to explain cognitive dissonance around pension fund outreach and sustainability. Specifically, the study was meant to show how the pension fund outreach and their sustainability levels are explained by commercialization factors. Their study is built on the work by Olivares-Polanco (2005). Instead of a single period cross-section analysis, they introduce a balanced panel analysis to overcome the methodological weaknesses in Olivares-Polanco (2005). Their study is based on data obtained mainly from pension fund information exchange (PIX) organization for 33 pension funds in five East-African Countries. The study therefore, excludes pension funds which are non-members of the market Pix which could have enriched it.

Hauner et al (2007), as with Woller & Schreiner (2002), use multiple regressions model with a relatively large sample compared to previous studies. Their sample size was 124 pension funds made up of large pension funds from 49 countries. This study, however, focuses most on financial performance and outreach, using three dependent variables (financial self-sufficiency, operational self-sufficiency, and return on asset), one at a time, with a limited number of independent variables.

A recent study by Kyereboah-Coleman & Osei (2008) examines how governance indicators impacts on pension funds' outreach and profitability data analysis based on secondary data from 52 conveniently sampled' pension funds operating in Ghana for at least ten years. The study however, focused only on the role of governance on profitability and outreach of pension funds. Thus, other factors that could impact on outreach and profitability were not covered in the study.

Reviewing pension fund literature that the study has to-date one would say there is but few (if any) systematic study with focuses specifically on how pension funds' efficiency affects their financial sustainability. Few studies that this study has known have indicated the relationship between efficiency and financial sustainability by looking at various costs and revenue elements (Christen et al, 1995; Rosenberg, 1996; Christen, 2000; Woller, 2000; and Hauner et al, 2007). Some studies have also used the personnel productivity measures as part of their analysis (Christen et al, 1995; and Woller & Schreiner, 2002). Other studies have linked pension fund efficiency with commercialization (Richardson & Lennon, 2001; and Hishigsuren, 2007) and still some relate it with pension fund best practice (CGAP, 1996; Gonzalez-Vega, 1998; Woller et al, 1999; and Woller, 2000;).

2.11.1 Size and Financial Sustainability

One of the factors that affect the level of outreach of a pension fund is its size. The size of pension fund administrator is measured by the value of its assets (Bogan, Hartarska,

2005; Lafourcade, Isern, Mwangi & Brown, 2005; Johnson & Mhlanga, 2007; Hermes, Lensink & Meesters, 2008; Mersland & Storm, 2008; and Mersland & Storm, 2009). According to Hauner et al (2007), the size of a pension fund is significantly positively linked to its financial performance. Large pension fund administrators have lower measures of outreach (Hauner, et al, 2007). This is probably due to scaling up of pension fund whereby most pension funds motivated by higher profit motives (Chriten, 2000 & Woller, 2002). This is consistent with the worry that the move towards financial self-sufficiency could lead to mission drift, where the beneficiaries are not served.

Hauner et al (2007) suggest that whether or not large institutions serve an absolutely greater number of the retirees can be well answered with disaggregated data. Getting disaggregate data, however, has not been an easy task. As a result, studies have used the number of retirees to measure the relationship between outreach (number of retirees reached) and profitability (Schreiner, 2000; Woller, 2000; Hishgsure, 2004; Lafourcade et al, 2005; Hermes et al, 2008; Kyereboah-Coleman & Osei, 2008; Mersland & Storm 2008; and Mersland & Storm, 2009;). They also use the number of retirees to measure whether the size of pension fund affects its outreach (Lafourcade, et al, 2005; Hermes, et al 2008; Mersland & Storm, 2008; and Mersland & Storm, 2009).

While Hartarska (2005) finds that the size of a pension fund administrator did not significantly affect its financial sustainability, recent studies by and Bogan et al (2007) Mersland & Storm (2009) report that the size of a pension fund administrator is associated with its financial sustainability. Furthermore, the size of pension fund administrator could also imply that large pension fund administrator have larger capital and therefore, can reach a relatively bigger number of clients than small pension fund as supported by (Kyereboah & Osei 2008). In their study on outreach and profitability of pension fund administrator in

Ghana, they find that the size of a pension fund administrator had significant positive impact on profitability.

2.11.2 Capital Structure and Financial Sustainability

The composition of the various sources of capital to an organisation is known as capital structure (Puxty & Dodds, 1990; Martin, Petty, Keown & Scott, 1991; Brealey, Myers & Allen, 2006; Bodie et al, 2009). That is, the different sources of a capital structure of a pension fund. According to Amidu (2007), the size of pension fund administrator will determine their capital structure. Robinson (2001) asserts that a large number of clients depend on pension fund commercial sources of funds, which in turn depends on pension fund sustainability. This suggests that pension fund administrators with higher capital are expected to have more clients than those with less capital. Apart from the volume of capital, that is the amount of capital of a pension fund administrator, the combination of various components of the capital could also affect profitability and therefore, sustainability of pension fund administrators.

Studies have been conducted to explain whether the capital determine the sustainability of pension fund administrator. Bogan et al, (2007) and Kyereboah-Coleman, (2007) find that the capital structure affects the outreach of a pension fund administrator. They also find that highly leveraged pension fund administrators have higher ability to deal with moral hazards and adverse selection than their counterparts with lower leverage ratios. Bogan et al (2007) conduct a study to ascertain whether capital structure affects the financial sustainability of a pension administrator. They find that pension fund administrator's capital structures were associated with their financial sustainability.

2.11.3 Ownership and Financial Sustainability

Ownership structure of a firm can be viewed as the nature in which the ownerships of the firm's equity holdings are structured. It can also be viewed as stakeholder ownership

proportion in the firm. The literature documents some forms of ownership, among which are ownership concentration, institutional investors, foreign investors and managerial ownership. Institutional investors are large investors such as insurance firms, banks, pension funds financial institutions, investment firms, and other nominee firms associated with the mentioned categories of institutions (Koh, 2003).

The pension fund administrator's capital structure may also explain the ownership of the pension fund administrators especially where the providers of capital are not donors but investors. Whether pension fund administrator's ownership can affect its performance and financial sustainability has been a question of concern among researchers. Mersland & Storm (2008) conduct a study to explain whether shareholders owned pension fund administrators perform better than governmental pension fund administrators. In their study, they find that ownership had minimal effect on the performance of a pension fund administrators.

On the other hand, studies indicate that non-governmental pension fund administrators perform better in outreach and in profitability when compared with other pension fund administrators (Hartarska & Nadolnyak, 2007 and Mersland & Storm, 2009). This study analyses the relationship between ownership structure and explain whether the ownership structure, captured by PFAs affects their financial sustainability.

2.11.4 Age and Financial Sustainability

Sustainability could also relate to the age of pension fund administrator. The age refers to the period that a pension fund administrators has been in operation since its inception. Studies indicate that the pension fund administrator's age relates to their efficiency and growth in terms of outreach especially in the early years of operations (Hauner et al, 2007; Gonzalez, 2007; and CGAP, 2009). Robinson (2001) finds that experienced pension fund administrators in Chile (those with age above six years) are 100 percent financially self-sufficient. Those which are in 3 to 6 years of age are 86 percent financially self-sufficient,

while it is 69 percent for those in operation for less than 3 years. The findings by Robinson (2001) imply that the age of pension fund administrators can affect its financial sustainability level. Moreover, Bogan et al (2007) and Hauner et al (2007) also find that the age of a pension fund administrator relates to its financial sustainability.

In contrast to the findings by Robinson (2001), Gonzalez (2005) and Bogan, et al (2007), a study by Kyereboah-Coleman & Osei (2008) reports that the age of a pension fund administrator is insignificant in determining the level of outreach. The contradictions between these studies pose a knowledge gap as to whether for pension fund in Nigeria, the age of pension fund administrator is relevant in determining its financial sustainability or not, and how the same affects its sustainability.

2.11.5 Net Income and Financial Sustainability

As earlier explained, profitability is highly linked to sustainability. In other words, profitability is a stepping stone to financial sustainability (Shreiner, 2002). It has also been widely used as a measure of financial sustainability (Von Pischke, 1996; Woller & Schreiner, 2002; CGAP, 2005; Adongo & Stork, 2006; Armendariz & Mordach, 2007; Hauner et al, 2007; and Gonzalez-vega, 2007).

Gonzalez-Paramo (2005) argues that, many pension fund administrators are inefficient because they think in terms of levels of speed of collections, not in term of operational costs. Cost reduction is thus, as important as increasing revenue. Few studies have indicated the relationship between efficiency and financial sustainability by looking at the various cost and revenue elements (Rosenberg, 1996; Christen, 2000; Woller, 2000; Hauner et al; 2007 and Christen, et al, 2007).

Interests accrued from the investments engaged in are the major sources of revenue to most PFAs (Takayama 2003). Armendariz & Morduch, (2007) and Shankar (2007) in their

researches find that income of a PFA is made up of all of its own generated income including fees and charges, fines, and interest earned on loans.

PFA's expenses are the second item used to determine profitability and financial sustainability. In this regard, PFA's expenses can be categorized into three main categories namely; operating expenses, administrative expenses and financing expenses (Shankar, 2007).

Some studies find that Net Income of a Pension Fund Administrator affects financial sustainability (Christen, 2000; Woller & Schreiner, 2002; Hauner et al, 2007 and Knell, 2005). An efficient pension fund administrator will operate at a reduced financing and overall PFA's expense. The same will also increase profitability and, therefore, lead to its financial sustainability.

2.11.6 GDP Growth and Financial Sustainability

Whitehouse & Zaidi (2008) conduct a research and find that a one-percentage point deviation in long-term GDP growth would have very strong implications for the poverty alleviation function in a country. They conclude that the impact of lower GDP growth is slightly smaller than that of higher GDP growth. In their words, the substantial changes induced by GDP assumptions to future pension wealth in a country should be noted. If GDP growth in a country is lower than projected, the pension entitlements of future generations will fall very significantly, and vice-versa. All this has implications for financial sustainability. High GDP growth may result in greater fiscal pressures in a country.

While claims on future workers are decreased if the place of pension accrual is lower than expected, the drop will not be linear, as minimum pensions provide significant underpins to pension expenditure.

2.11.7 Board Size and Financial Sustainability

Board size refers to the number of directors on the board. The relationship between board size and firm financial sustainability has attracted the interest of many researchers. While there may be no one size-fits-all recommendation for the optimal size on board, a board size of ten is recommended (Sanda, Mikailu and Garba, 2005). Empirical studies on board size have established that there is a negative relationship between board size and financial sustainability of pension fund administrators. The basic argument is that the cost implication involved in decision making of PFAs with large board size overwhelms its benefit. Jensen (1993) notes that large boards are easier for chief executive officers to manage as they place more emphasis on politeness and courtesy. Hence, a reduced number of directors implies a higher degree of coordination and communication between them and managers. If this argument is true, then, we expect board size to be positively related to financial sustainability. However, larger boards are also argued to have better financial expertise and information edge over smaller boards (Yermack, 1996; Xie et al, 2003). These two conflicting arguments present a controversial issue that calls for an investigation of the effect of board size on the financial sustainability in the Nigerian context.

The relationship between board size and financial sustainability in the developed countries is impressive (Jensen,1993; Zhou & Chen, 2002; Xie et al, 2003; Wang, Chuang & Lee, 2010). However, the findings have yielded inconsistent results. Zhou and Chen (2002), examine the relationship between board size and financial sustainability in insurance companies. Using 798 U.S insurance companies for the period of 2001-2006, they conclude that board size and independence influence board efficiency and therefore lead to less financial sustainability.

2.11.8 Board Competence and Financial Sustainability

The competence of the members of board can be used as a tool for improvement in an organization. In other words, boards that are mostly constituted of highly competent members may lead to a better financial sustainability (Yermack, 1996). Xie et al (2003) find that high proportions of competent directors were associated with high level financial sustainability. Garcia, Garcia & Penalva (2005) report that where the competence of a firm's board members does not conform to expected functions of the firm may lead to insustainability.

Board of directors who are competent are expected to be able to maximize financial sustainability activities. Chtourou, Bedard and Courteau (2001) provide evidence that firms with experienced external directors show significantly high level of financial sustainability compared to other firms. This is consistent with Xie, et al (2003) who find that the relationship between experienced board of director with discretionary accruals is low.

Years of experience serving as a board member provides an opportunity for the member to understand the firm. This experience would help them developing better governance (Park & Shin, 2004). Chtourou, et al (2001) provide evidence that the length of directorship is negatively related with financial sustainability.

2.12 Theoretical Framework

This study is based on the theory of pooling, intermediation, accounting profitability and life cycle. The theories are adopted firstly, because most of the researches conducted using the theories are in developed economy, hence the adoption of the theories in Nigeria is very imperative. Secondly, the theories are adopted to see whether in Nigeria's situation, they could offer the possibility of investing in large denomination and indivisible assets such as property which are unavailable to small investors. Also, to verify whether pension funds could compensate for the increased risk, by pooling at a lower cost across assets whose returns are imperfectly correlated. In the same vein, the intermediation theory was adopted to

enable the researcher establish whether pension funds are acting as agents of financial change by fulfilling the functions of financial systems more efficiently than the alternative such as banks and individual investors; which the methodology of this study seeks to address.

Using the profitability theory, pension fund administrators are considered sustainable if and only if they are able to cover all their operating and financing costs from their own generated revenue, mainly through contributions. Moreover, while we make use of the accounting profitability as a measure of financial sustainability, it is valuable to mention that using profitability as a measure of financial sustainability as used in pension fund literature and in this study strongly depends on the assumption that the pension fund administrators are going concerns, maintaining the same, or achieving higher performance. Without this assumption, using one year or few years' profitability to measure long term sustainability may be at its outset inappropriate. For pension fund administrators that depend solely on their generated funds to keep their current level of operations, and yet be able to reach their desired level of growth, profitability can be considered as a measure of financial sustainability.

In adopting the life cycle theory, it was discovered that the development of pension fund can be seen in three stages namely, start-up, growth and maturity stages. We employ life cycle theory, because it is used to explain the three stages of development of pension fund administrators and their respective financing needs. The life-cycle theory posits that the sources of pension fund administrator's financing are linked to their respective stages of development and thus, their sustainability (Lapenu & Zeller, 2001 and Farington & Abrahams, 2002). It is, therefore, reasonable to assess sustainability of PFAs based on their respective stages of development.

In this study, using the life cycle theory of PFAs development we explain the effects of the determinants of financial sustainability on sustainability of PFAs at start-up and growth stages. The life cycle here is not used to refer to a certain standard time of operations, but

rather on the development stages themselves. We bear in mind that, although the actual timing may differ from one PFA to another given a PFA's background and operating environment, still all PFAs go through the same three development stages. We also recognized the possibility that PFAs development stages may not be linear. Thus, in this study, we focus on what affects financial sustainability at various stages of development using indicators of financial performance and sustainability at each of the development stages. The focus is not to explain whether the PFAs are in a certain stage but what affects their sustainability at different stages.

2.13 Summary

The chapter reviewed various conceptual framework related to the study. Some empirical studies works conducted on the determinants of financial sustainability of pension fund administrators are considered along with their methods and findings. Majorly, hypotheses of the study were thoroughly reviewed with their findings and conclusion. The chapter also highlighted the theoretical framework of the study and other theories and approaches available for the study.

Finally, the knowledge gap which the review was able to establish is that previous studies used multiple regressions models with a relatively large sample mainly financial performance and outreach. Others focused only on the role of governance on profitability and outreach of pension funds. Thus, other factors such as Net income, Contributions and GDP growth that could impact on outreach and profitability were not covered, hence the need to bridge the gaps.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

An adequate research methodology is necessary at this level to indicate the pathway to be undertaken in carrying out this study. This chapter therefore, presents the plan or blue print which specify how data relating to the research is been collected and subsequently analyzed.

3.2 Research Design

The design of this research is correlation. The design is employed because it enables an assessment into the nature and extent of relationship between two or more variables. In this case, correlational research design will provide a basis for understanding the relationship between financial sustainability of pension Funds Administrators and its determinants

3.3 Population Design

The population of the study consists of all the 20 pension fund administrators operating in Nigeria as at 31st December, 2012 The study covers a period of 2006 through 2012. This period marks the beginning of contributions to the pension fund by both the employer and the employee at the rate of 7.5% from each respectively. The names of the pension fund administrators in Nigeria as at 31st December, 2012 which represented the population of this study is depicted in Table 3.1:

TABLE 3.1 LIST OF POPULATION PFAs IN NIGERIA

S/NO	PFAs	AGE
1	Penman Pension Ltd.	October, 2005
2	First Guarantee Pension Ltd.	August, 2006
3	ARM Pension Managers (PFA) Ltd	December, 2005
4	Fidelity Pension Managers Ltd.	September, 2004
5	Stanbic IBTC Pension Managers Ltd.	October, 2004
6	NLPC Pension Fund Administrators Ltd.	January, 2005
7	Crusader Pension Ltd.	October, 2004
8	Pension Alliance Ltd.	April, 2005
9	Trust Fund Pension Ltd.	December, 2004
10	Premium Pension Ltd.	December, 2005
11	Legacy Pension Managers Ltd (PFA)	April, 2005
12	Sigma Vaughn Sterling Pensions Ltd.	August, 2004
13	OAK Pensions Ltd.	December, 2004
14	IGI Pension Fund Managers Ltd.	October, 2004
15	Leadway Pensure PFA Ltd.	October, 2004
16	Aiico Pension Managers Ltd	February, 2005
17	GTB-AM Pension Ltd	June, 2007
18	Apt Pension Fund Managers Ltd	December, 2004
19	IEI-Anchor Pension Managers Ltd	November, 2004
20	Future Unity Glanvills Pensions Ltd	June, 2007

Source: Pencom (2012)

3.4 Sample Size and Sampling Techniques

The population of this study comprises all the (20) Pension Fund Administrators operating in Nigeria as at 31st December, 2012. In this study, a sample of fifteen PFAs in Nigeria was studied using a certain necessary criteria.

The use of filtering was employed in which a PFA is disqualified if it has no any Annual report/financial statement as part of its reports directed by Pension Commission in Nigeria. Based on these criterion, only those PFAs that meet these conditions were selected as sample for this study. In addition to this, IGI Pension fund manager Ltd failed to meet up recapitalization requirement, First Guarantee Pension Ltd is under regulatory intervention and Penman Pension Ltd has problem with website security certificate . The sample size of this study, therefore, is 15 Pension Fund Administrators in Nigeria as presented in Table 3.2

TABLE 3.2: List of Sampled PFAs

S/NO	PFAs	AGE
1	Aiico Pension Managers Ltd.	February, 2005
2	APT Pension Fund Managers LTD .	December, 2004
3	ARM Pension Managers (PFA) Ltd	December, 2005
4	Crusader Pension Ltd.	October, 2004
5	Fidelity Pension Managers Ltd.	September, 2004
6	Future Unity Glanvills Pension Ltd.	June, 2007
7	IEI-Anchor Pension Managers Ltd	November, 2004
8	Leadway Pensure PFA Ltd.	October, 2004
9	Legacy Pension managers Ltd (PFA)	April, 2005
10	NLPC Pension Fund Administrators Ltd.	January, 2005
11	Oak Pensions ltd.	December, 2004
12	Pension Alliance Ltd..	April, 2005
13	Premium Pension Ltd.	December, 2005
14	Stanbic IBTC Pension Managers Ltd.	October, 2004
15	Trust Fund Pension Ltd.	December, 2004

Source: Generated by the author from the population of the study (2012)

3.5 Methods of Data Collection

The research data gathered in this study were from secondary sources only. The research used data originally meant for different purpose as secondary sources. The sources

were divided into: Published data and unpublished data. Documentary data have been collected via statistical bulletin, pension funds releases and annual reports from pension funds administrators.

3.6 Data Analysis and Techniques

To investigate empirically, the determinants of financial sustainability of pension fund administrators in Nigeria, panel data regression model is adopted to estimate the relationship among the variables of this study which is widely used in the literature. The model is estimated using generalized least square method and allow for fixed effect and random effect.

Model Specification

The model is presented as follows:

$F_s(x_1, x_2, x_3, x_4, x_5)$

$$F_{sit} = X_{it} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + U$$

Where;

F_s = Financial Sustainability

X_1 = Age

X_2 = Size

X_3 = Net Income

X_4 = Contribution

X_5 = GDP

X_6 = Bcomp

X_7 = Bsize

Dependent Variable is financial sustainability.

Financial sustainability = Total Liabilities / Total Asset.

TABLE 3.3: INDEPENDENT VARIABLES AND MEASUREMENT

S/NO	VARIABLES	MEASUREMENT
1.	Age	Measured by determining the years of operations of each PFAs in Nigeria. This gives the number of years each of the PFAs has been in operation.
2.	Size	Measured by log of revenue
3.	Net Income	Measured by net income before tax. Scaled by firm's previous year's sales.
4.	Contribution	From 2006 to 2008, it is retirement saving account balance. Year 2009 to 2010, it is retirement saving account balance plus retiree fund balance. Scaled by previous year's sales.
5.	GDP	Measured directly from statistical bulletin of CBN
6.	Bcomp	Measured by ratio of board members with financial expertise (experience in banking/investment, insurance and/or pension), to total of the board members
7.	Bsize	Measured by the number of board of directors

3.7 Justification of the Methodology

The study utilizes secondary data, because it was collected directly from the annual reports and websites of the individual PFAs and was complemented by Pencom. Thus, its validity and reliability is not questionable since it is prepared by those meant to prepare it. The descriptive approach is justifiable because it describes and interprets what is being researched upon on the one hand and on the other hand, it establishes the condition or relationship that exists. The historical approach becomes imperatives because it involves application of scientific techniques for analysis of past events especially the annual and statistical reports.

Regression is a statistical technique which has been widely used in econometric analysis and other social science research to model the dependence of a variable on one or more independent variables. The technique has been utilized to analyze complex data such as

time series, cross sectional, panel and pooled data (Pindyck & Rubinfeld, 1998). This method allows for the formulation of models to test hypotheses and forecast behavior of variables under study.

In this study, the accounting profitability and the related accounting measures are used to measure financial sustainability. Accounting measures however, are affected by accounting conventions for valuing assets and liabilities and for revenues and income recognition, changes in which may affect the reported financial performance. This has been the main drawback against using the accounting measures to assess performance. While this is true however, the accounting measures can still be considered more appropriate especially for the long-term studies. This is because, while managers can influence the reported financial performance by merely changing the accounting policy on the applicability of accounting conventions for a certain accounting period, their ability to manipulate statements for longer period is limited (Collier, 2006).

3.8 Summary

This chapter discussed with the research methodology adopted for this study. The population and sampling techniques chosen for the study were presented with rationale behind each one of them. Methods of data collections and type of research method adopted for the study are also highlighted. The specific model applied for the study was equally explained and both the dependent and independent variables with their measurement are presented. Finally, the chapter provided justification for the methods and techniques used for the study.

CHAPTER FOUR
DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents and descriptively analyses the data collected for this research. It further tests the research hypotheses formulated earlier and discusses the findings of the research as well as highlights the policy implications of the result.

4.2 Descriptive Statistics and Normality Tests

The model of the study uses eight variables in testing the five hypotheses raised for the work. One dependent variable (Financial Sustainability) and seven independent variables – Age, Size, Net Income, Contribution, GDP growth, BCOMP and BSIZE were used for the model. The results of descriptive analysis for these variables employed are given in Table 4.1.

TABLE 4.1 DESCRIPTIVE STATISTICS

	FS	AGE	NETINCOME	SIZE	CONTRI	GDP	BSIZE	BCOMP
N	105	105	105	105	105	105	105	105
Mean	0.655105	5.333333	0.043902	5.391967	36.02626	0.058357	7.152381	1.345238
Median	0.540000	5.000000	0.190000	5.700000	20.89000	0.067000	7.000000	1.320000
Maximum	2.537250	9.000000	5.560000	8.027140	292.6160	0.079000	14.00000	2.100000
Minimum	0.000000	0.000000	-8.9000	2.500000	0.002000	0.007000	3.000000	0.780000
Std. Dev.	0.505012	2.191183	1.114217	1.240562	50.14795	0.023674	2.368791	0.249114
Variance	0.328395	5.377747	0.210125	1.028115	3936.579	0.000198	6.318335	0.077196
Skewness	1.133628	-0.08286	-3.89882	-0.64576	2.979879	-1.39529	0.541424	0.859373
Std. Error	0.289167	0.289167	0.289167	0.289167	0.289167	0.289167	0.289167	0.289167
Kurtosis	4.380216	2.141453	46.24795	2.900112	14.18967	3.586500	3.278974	4.356345
Std. Error	0.570925	0.570925	0.570925	0.570925	0.570925	0.570925	0.570925	0.570925
Range	2.53225	9	14.46	5.52714	292.614	0.072	11	1.32

Source: author’s computation using SPSS

From Table 4.2, it is observable that the mean of each respective distribution is not exactly situated at the middle (median) of the distribution. Except for CONTRIBUTION, the mean of every other data set is not far away from their respective medians values. This

indicates that majority of the individual firms have observations for each respective variable, close to the average observation. This is true as regards to every variable other than CONTRIBUTION, whose mean is far above its respective median, suggesting that the majority of the firms have contribution figures lower than average contribution. This presupposes that only few firms carry the large proportion of the total contributions in the industry. It suggests high concentration or dominance of few on the many, thereby making competition difficult for the smaller firms or firms that might have newly enter the industry.

Looking at the standard deviation on the basis of the assertion that 60% of a normally distributed data set falls within the range of ± 1 , it is evident that FS, GDP and BCOMP satisfied this while AGE, SIZE, NETINCOME, CONTRIBUTION and BSIZE have standard deviation values out of this range. On the basis of standard deviation therefore, it can be concluded that FS, GDP and BCOMP are normally distributed, while AGE, SIZE, NETINCOME, CONTRIBUTION and BSIZE are not normal. Except for FS, CONTRIBUTION, BSIZE and BCOM, the skewness indices for all the other data sets seem to be negative, indicating more observations to the right of the normal curve. As it is, data outlier is normally associated with negative skewness. With regards to kurtosis, all the variables have extreme peaks that are above normal peak, as their kurtosis figures are above the normal kurtosis of 0 or near 0. On the basis of skewness and kurtosis, none of the data sets can be qualified as normally distributed.

So far, the evidences of normality obtained are from non-theoretical tests. In addition to the above, a theory-driven test for normality was conducted using Jarque-Bera. The test statistic measures the difference of the skewness and kurtosis of the series with those from the normal distribution. The statistic is computed and distributed as chi-square with 2 degrees of freedom under the null hypothesis of a normal distribution.

TABLE 4.2: NORMALITY TEST USING JARQUE-BERA

VARIABLES	Jarque-Bera	Probability
FS	30.82382	0.000000**
AGE	3.344961	0.187781
NETINCOME	8448.948	0.000000**
SIZE	7.341208	0.025461**
CONTRI	703.1829	0.000000**
GDP	35.57469	0.000000**
BSIZE	5.470436	0.064880
BCOMP	20.97269	0.000028**

** indicates significance at 5% level (i.e. $p < 0.05$)

Source: author's computation using Eviews7

Table 4.2 shows the outcome of the Jarque-Bera test. The reported Probability is the probability that a Jarque-Bera statistic exceeds (in absolute value) the observed value under the null hypothesis—a small probability value leads to the rejection of the null hypothesis of a normal distribution. Thus, if the P- value is significant, the null should be rejected and the data be regarded as not normally distributed.

From table 4.2, it can be evident that financial sustainability is not normally distributed. The statistic is significant at 5% (i.e. $p < 0.05$). Looking at the remaining variables, except for age and Bsize which are not significant; the other variables are significant even at 1%. On the basis of significant probabilities, all the data sets are hereby statistically qualified as not normally distributed.

As pointed out in econometric literature, parametric tests like linear regressions are better carried out with data that are normally distributed, and data that deviate from normality have tendency to bias coefficients by extending the non-normality to the residuals (Roberts, 2008). In addition, Roberts (2008) continues that taking log of the data reduces the data outlier and makes the data to appear to be normal.

4.3 Hypotheses Test Result

Since we used a longitudinal data in the modeled regression equation, it is only appropriate if we test for the unobservable firm characteristics which may be fixed in entity (fixed in panel) and time periods (fixed effect) and also test for whether some of these effects may be constant over time but vary among panels, while others may be fixed among panels but vary over time (random effect). Thus, we estimated two separate regression equations allowing for fixed and random effects and use Hausman test to select the best results from these equations. The Hausman test tests the null hypothesis that the coefficients estimated using fixed effect model do not systematically differ from the coefficients estimated using random effect model. If the null hypothesis is rejected then the fixed effect is appropriate, but if it turns otherwise then the random effect model is the most appropriate. The result of the Hausman test appended in the appendix does not provide sufficient evidence to reject this null hypothesis at 5% level of significance as can be seen that the probability value of the test is less than the critical value of 0.05. Therefore, we uphold that difference in coefficients is not systematic and hence, the random effect model is the most appropriate model. With that, we adopted the result in which we controlled for random effect. A summary of this result is presented in Table 4.3 and following it is the discussions on the result (refer to Appendix for full results of the three tests).

TABLE 4.3: SUMMARY OF RESULT

Variable	Random Effect			Fixed Effect		
	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
C	-0.408406	-1.008851	0.3156	0.353250	0.563397	0.5747
AGE	0.088785	3.250411	0.0016**	0.158904	3.104403	0.0026**
SIZE	0.188437	3.838836	0.0002**	0.202158	3.684336	0.0004**
NETINCOME	0.062013	2.383752	0.0191**	0.067561	2.449356	0.0164**
CONTRI	0.034033	2.005694	0.0477**	0.033758	1.944319	0.0552
GDP	-2.287754	-1.344500	0.1819	-3.051126	-1.536605	0.1282
BCOMP	-0.330650	-1.154742	0.2510	-0.399689	-1.252551	0.2139
Bsize	0.010870	0.251497	0.8020	-0.138988	-1.417350	0.1601
R ² Square		0.566574			0.534301	
F-Statistic		20.42122			6.681905	
Prob(F-stat)		0.000000			0.000000	
Durbin-Watson		1.685555			1.6888085	

** indicates significance at 5% level (i.e. $p < 0.05$)

Source: author's computation using Eviews 7

From the Table 4.3, for the random effect result, the coefficient of the intercept is negative. This indicates that at any given point of time where these explanatory variables are held constant, the financial sustainability of the pension fund administrators are at jeopardy- i.e. it assumes negative value. This shows that without these variables, the pension fund administrators will not be financially sustainable. However, this result is not significant as the likelihood ratio of such happening (as indicated by p-value of 0.316) is infinitesimally low.

As revealed from this table, the sign of most of the parameters of the model are in line with a priori expectation. While age, size, netincome, contribution and Bsize are positive as expected, GDP and Bcomp are negative but insignificant. This implies that improvement in these five positive variables can give rise to improvement in financial sustainability.

4.3.1 Age and Financial Sustainability

The hypothesis examines the impact of Age on financial sustainability. The hypothesis stated in null form reads:

H01- Pension Fund Administrator's age has no significant impact on financial sustainability in Nigeria.

Table 4.3 shows the summary of result and indicates that the coefficient of AGE is positive and statistically significant at 5%, indicating that older PFAs are more financially sustainable. This is in line with the argument put forward by Robinson (2001) that the age of a pension fund administrator can affect its financial sustainability level. This is cogent when we consider the number of years covered by this study. While life cycle theory propounded that the effect of age on firm's financial sustainability is more pronounced at their maturity stage (which is 8 years), our study covered seven years for each of the PFAs (which is approximately 8 years).

In support of the above findings and argument, Bogan, Johnson and Millage (2007) find that the age of a pension fund administrator relates to its financial sustainability. Other scholars on the same findings are CGAP (2009); Cull, Demirguc and Morduch (2007) and Gonzalez, (2007). Their findings might not be unconnected to the number of firms and years covered by their studies which is 8 years and above.

Conversely, a study by Kyereboah-Coleman and Osei (2008) report that the age of a pension fund administrator is insignificant. This study therefore, confirms that age as a variable also affects financial sustainability of a pension fund administrator in a significant manner. This is so considering that the p-value obtained by our study, is significant even at 1%. Based on the findings, this study has sufficient evidence to reject the hypothesis raised in respect of age.

4.3.2 The Impact of Pension Fund Contributions on Financial Sustainability.

The summary of result (Table 4.3) is used to test hypothesis two. This hypothesis is formulated to examine the impact of pension fund contribution on financial sustainability. This hypothesis in null form states that:

H02- Pension fund contribution has no significant impact on financial sustainability in Nigeria.

Table 4.3 contains the result of the relationship between pension fund contribution and financial sustainability. It shows that the coefficient of contribution has a positive relationship with financial sustainability. This relationship is significant at 5%. Based on this finding, we hereby reject the null hypothesis that states Pension fund contribution has no significant impact on financial sustainability in Nigeria and accept the alternative hypothesis.

This result is in line with Rutherford (1995) findings, that the success of a PFA lies on how well a PFA mobilizes its members (clients) and their contributions. The more contributions by both the employers and employees, the better for financial sustainability of a PFA.

4.3.3 The impact of Pension Fund Administrator's size on Financial Sustainability

The summary of result (Table 4.3) is used to test hypothesis three. This hypothesis examines the impact of Pension Fund Administrator's size on financial sustainability. The hypothesis stated in null form reads:

H03- Pension Fund Administrator's size has no any significant impact on Financial Sustainability in Nigeria.

Table 4.3 contains the results and shows that the size of a PFA has a positive coefficient and is significant at 5%. For every one unit change in financial sustainability of

these PFAs, 0.18 is attributed to the SIZE of these PFAs in positive direction. The rational explanation to this findings is the position of some scholars that the size of pension fund administrator is measured by the value of its assets (Mersland & Strom, 2009; Hermes, Lensink & Meesters, 2008; Mersland & Storm, 2008; Bogan, Johnson & Mhlanga, 2007; Hartarska, 2005; Lafourcade, Isern, Mwangi & Brown, 2005). According to Hauner et al (2007), the size of a pension fund is significantly positively linked to its financial performance. Amidu (2007) posits that the size of pension fund administrator will determine their capital structure. Robinson (2001) also asserts that a large number of clients depend on pension fund commercial sources of funds, which in turn depends on pension fund sustainability. This suggests that pension fund administrators with higher capital are expected to have more clients than those with less capital. Apart from the volume of capital, that is the amount of capital of a pension fund administrator, the combination of various components of the capital could also affect profitability and therefore, sustainability of pension fund administrators.

In support of the above arguments is the work of Hauner, Demirguc and Morduch (2007) which explain that larger firms i.e. larger pension fund administrator's size is significantly positively linked to its financial performance. The work suggests that whether or not large PFAs serve an absolutely greater number of the retirees can be well answered with disaggregated data. They have also used the number of retirees to measure whether the size of a pension fund administrator affects its outreach. Recent studies by Mersland & Storm (2009) and Bogan et al (2007) have reported that the size of a pension fund administrator is associated with its financial sustainability. They also confirm that, the size of pension fund administrator could also imply that large pension fund administrator have larger capital, and, therefore, can reach a relatively bigger number of clients than small pension fund administrator. Our finding confirms that size of a PFA has significant impact on its financial

sustainability. Based on this finding, we hereby reject the null hypothesis as the study has obtained sufficient evidence.

In contrast, Hartarska (2005) finds that the size of a pension fund administrator does not significantly affect its financial sustainability.

4.3.4 The impact of Net Income on Financial Sustainability

The summary of results (Table 4.3) is used to test hypothesis Four. This hypothesis examines the impact of Pension fund administrator net income on financial sustainability. This hypothesis in null form states that:

H04-The Net Income of Pension Fund Administrator has no significant impact on financial sustainability in Nigeria

Table 4.3 contains the results and shows that the Net Income has a significant positive impact on financial sustainability of Nigerian PFAs and the likelihood of such a happening by chance is 5%. The implication here is that the higher the PFAs are able to generate extra income after paying off their operational expenses, the more likely that the PFAs will be financially sustainable. This is cogent given that the term financial sustainability in itself emanates from a firm's ability to generate extra income in excess of its expenses. Some studies conducted by Rosenberg, 1996; Christen, 2000; Woller, 2000; Hauner et al, 2007; Christen et al (2007) unanimously find that there is a significant relationship between efficiency and financial sustainability by looking at various cost and revenue elements. They conclude that an efficient pension fund administrator will operate at a reduced financing and overall pension fund administrator's expenses; that, the same will also increase profitability and therefore, lead to its financial sustainability.

In this regard, their findings confirm our study and stand. Based on this, we reject the null hypothesis.

4.3.5 The impact of GDP growth rate on financial sustainability.

The summary of result (Table 4.3) is used to test hypothesis Five. This hypothesis examines the impact of GDP growth rate on financial sustainability. This hypothesis stated in null form reads:

H05- The GDP growth rate has no significant impact on financial sustainability in Nigeria.

Table 4.3 contains the results and shows that the coefficient of GDP growth rate has negative impact on its financial sustainability. However, it is not significant even at 10%. This finding contradicts that of MC Morrow and Roeger (2003) that GDP growths do affect the financial sustainability of a pension fund administrator. As such, the financial sustainability does not depend much on GDP growth. Based on our findings, the study could not obtain sufficient evidence to reject the hypothesis raised in respect of GDP growth.

The rationale behind this could be explained by the fact presented by scholars that, if GDP growth in a country is lower than projected, the pension entitlements of future generations will fall very significantly, and vice-versa. All this has implications for financial sustainability. High GDP growth may result in greater fiscal pressures in a country.

Robustness tests

A good number of model diagnostics checking reveals that the model estimated for this study is robust and to a large extent sound for hypothesis testing. From the result in Table 4.3, it can be observed that R^2 is about 0.56. This value implies that 56% of the variation in financial sustainability is explained by the independent variables. It shows a good fit for the model since greater variation of the dependent variable is accounted for by the variables in the model. The F-test which tests the significance of R^2 and the joint significance of parameters is statistically significant at 5%. This fact confirms the goodness of fit implied by the R^2 ; and shows that all the independent variables put together contribute in influencing

financial sustainability. That further means that although GDP, Bsize and Bcomp are statistically insignificant, we cannot remove them from the model. A formal test- redundant test was performed to determine whether these variables can be removed from the model, the statistic value of 1.133 as shown in table 4.4 does not, at conventional significance levels, lead us to reject the null hypothesis that GDP, Bsize and Bcomp are redundant in the unrestricted specification.

TABLE 4.4: REDUNDANT VARIABLES TEST

Redundant Variables: GDP BSIZE BCOMP			
	Value	df	Probability
F-statistic	1.132600	(3, 97)	0.3398
F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	0.365856	3	0.121952
Restricted SSR	10.81027	100	0.108103
Unrestricted SSR	10.44441	97	0.107674
Unrestricted SSR	10.44441	97	0.107674

In terms of residual test, the model is free from serial correlation. As revealed in table 4.3, the Durbin-Watson statistic of 1.68 is within the acceptable range of 1.5 to 2 for a sample of at least 50 observations. In addition, the multi-colinearity test shows that our independent variables have accommodating colinearity as they interact together. This is indicated by the magnitude of the Variance Inflation Factor (VIF) and the tolerance values which respectively show consistent values below 10 and 1. Thus, multicollinearity is not an issue.

4.4 Implications of the Findings

The conclusion made on the finding implies that, a PFA's age is inadvertently linked with its financial sustainability. Impliedly, younger PFAs are less sustainable financially. This is plausible because as the saying goes, "it takes more than a generation to build an empire". Firms generally do not grow strength over night. They derive their strength from the

accumulated efforts over long years of planning, building goodwill and market confidence. The findings therefore emphasize that this is actually inherent in the PFAs

The finding in respect of SIZE also suggests that PFAs' survival financially, cannot be achieved without adequate revenue (SIZE is measured using sales volume); and that PFAs with larger revenues are more financially sustainable. Here also, there is cogency in the implication, inasmuch as the PFAs need income to cater for their day-to-day operations. The same thing applies to NETINCOME only that while SIZE (sales) provides the basis for generating profit, it does not guarantee the realization of the profit. Thus, sustaining current capacity (market share) as well as expanding the capacity all depend on the extra cash generated above the expended capital. The more extra cash (NETINCOME) a PFA generates, the more chances of financially sustaining itself, as well as expanding/growing itself.

The finding in respect of the CONTRIBUTION suggests that firms with more market share are more likely to be financially sustainable. This could be true considering that CONTRIBUTION could be the foundation upon which a PFA's financial sustainability could be built because it poses as a guaranteed source from which PFAs derive their income and consequently their profit. By the nature of the business, a fixed sum of money as administrative fees is monthly charged for every contribution received by a PFA. In addition, it is the revenue generated from investing the contributions, that a fixed percentage management fee is charged. Therefore, contribution, as the foundation for PFAs' income and profit, ought to be connected with the PFAs' ability to remain in business, since it serves as the "cow" that provides the "milk" for the "house-hold" to nourish, sustain and grow itself.

4.5 Summary

In this chapter, data presentation and analysis were carried out in respect of the hypotheses raised. The five hypotheses formulated for the study were tested. The test results were discussed, in view of the literature reviewed earlier on. Prior to the hypotheses tests, the

data used for the tests were first subjected to tests for stationarity and normality to fathom how findings should be qualified-whether valid for long or short run (in case of stationarity test) and also to determine the extent of data conducted for hypothesis one to facilitate the estimation of the variables (financial sustainability) that has finally constituted our dependent variables in the hypotheses tests.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study examines the determinants of financial sustainability of PFAs in Nigeria. In accomplishing this, the study has carried out a conceptual and theoretical, as well as an empirical review of financial sustainability studies. Various techniques available for detection and measurement, as well as the findings of previous researches, on the relationship that exists between financial sustainability and other variables were also examined. Before the review the study developed five objectives and five hypotheses.

In line with major findings of the study and the associated deductive discussions, the study finds that there exists significant relationship between financial sustainability and contribution of pension fund administrators. The study also establishes significant positive impact of size on the financial sustainability of PFAs in Nigeria. The study confirms that Net Income also has a significant impact on the financial sustainability of PFAs in Nigeria. In addition, the study confirms that age as a variable also affects financial sustainability of a pension fund administrator in a significant manner. The study on the other hand, finds that GDP has a negative impact and not significant.

While the board size has positive impact on financial sustainability but not significant, the board competence has negative impact and not significant too. The study documents that empirical evidence obtained from the econometric result reveals that pension fund administrator contribution affects the financial sustainability.

The study reveals positive statistically significant relationship between the financial sustainability and the outreach of a PFA in Nigeria. This implies that a PFA that is financially sustainable will perform better in outreach than the PFA which is not. That is, the more

profitable the PFA becomes, the higher it will achieve the outreach. We therefore conclude that, financial sustainability improves the breadth of outreach.

The procedures employed in testing each of the five hypotheses were guided by the requirements of the methodologies we adopted for each. Prior to the hypotheses tests, we subjected our data to some tests, one of which is normality test.

In testing for hypothesis one, the result indicates that the coefficient of age is positive and statistically significant at 5%, indicating that older PFAs are more financially sustainable. Looking at size as our second hypothesis, it has a positive co-efficient and a significant Z-score. Also, on the third hypothesis (Net income), the result shows that net income has a positive impact on financial sustainability of Nigerian PFAs and the likelihood of such a happening by chance is 5%. While the coefficients of contribution shows positive impact, that of GDP reveals negative impact on the variable being explained. It is the Z-score of contribution that is significant at 1%, GDP is not significant even at 10%.

The fact that our data-sets were initially proved to be not normal we first went for corrective transformation of the data and a re-run of the five equations. The first option (Logarithmic Transformation) proved not forthcoming, as one of our variables was deleted when the transformation command was issued. We thus, resorted to transforming the remaining independent variables and re-run the five hypotheses test-equations using logistic regression. The null hypothesis in this test (HO: constant variance) was retained owing to the lack of probability significance.

Based on the findings, we observed that, with positive impact results obtained on the financial sustainability, accounting researchers could be encouraged to search more on this phenomenon. The results obtained also has put to rest, our fears that none of the variables was likely to come out positively. With this, it has been evidently confirmed that the variables adopted for the study are adequate and reliable.

5.2 Conclusion

This study focuses on the determinants of financial sustainability of Nigerian PFAs with the aims of ascertaining the significant relationship that exists between the financial sustainability and the variables employed. Having seen the results of the relationship, the following conclusions are made based on the outlined objectives viz-a-viz the hypotheses formulated to test the said objectives.

As revealed from the table 4.3 above, the sign of most of the parameters of the model are in line with a priori expectation. The age, size, netincome, contribution and Bsize are positive as expected, and, as such, we therefore, conclude by rejecting the hypotheses formulated in their respect. The rejection is so because the relationship is strongly significant at 1% and 5% respectively. GDP and Bcomp are negative but insignificant. Based on this, the study could not obtain sufficient evidence to reject the hypotheses raised in respect of GDP. The study concludes that improvement in the five positive variables can give rise to improvement in financial sustainability.

5.3 Recommendations

Based on the findings and conclusions, the following recommendations are forwarded:

- i) As implied in the findings, attaining financial sustainability is not a one shot event. The level of sustainability today will affect the sustainability tomorrow regardless of where the PFA stands in its life cycle or development stage. The factors that affects financial sustainability at start-up and growth stage, affects even more the sustainability at maturity stage. Thus, financial sustainability needs to be ensured and monitored throughout the life time of PFAs. That is, any weakness noticed at any stage must be addressed immediately.

- ii) As the study has shown the extent at which contributions had made a pension fund administrator to be financially sustainable, the more contributions a pension fund administrator could obtain from the contributors, the better for it. Thus, PFAs must geared efforts to ensure that, this is always on the increase.
- iii) When looking into the future, the policy makers and contributors need to reassure themselves not only that pressure on constraints is being managed properly, but also that the pension system remains effective and is in a position to achieve the goals for which it is devised.
- iv) The conclusion made on the finding implies that, to be financially sustainable, pension fund administrators in Nigeria should first make sure that their income always outweighs the expenses. This will enable them to earn enough profits that will lead to financial sustainability. However, this should be done with caution considering the impact of omitting some expenses relevant to the operations of pension fund administrators. This may lead to excessive profits.
- v) Investment criteria issued by the PenCom should be carefully observed so as not to risk the contributions of the contributors. Moreover ,for the policy makers and those advocating the replications in the pension fund best practice, the finding of this study implies the need to scrutinizing what is applicable and what is not before embarking on the replications.
- vi) The conclusions made on how the determinants of financial sustainability affect the sustainability at early stages of development imply the following for the sustainability of pension fund administrators at start-up stage: for higher net income, PFAs in Nigeria should strive to keep lower the portfolio at risk, improve staff productivity,

strive to operate at relatively costs, maintain higher liquidity to meet short-term obligations, as they fall due and for the smooth running of the PFAs.

- vii) For the growth stage, the conclusion implies the need for the pension fund administrators to promote higher staff productivity and to reduce staff costs per naira. To combat the high cost per collections of contributions associated with higher average disbursed pension size, the PFAs, should promote higher contributions to reduce higher defaults. Moreover, how successful the start-up stage is will influence the success in the growth and maturity stages. This implies that sustainability needs to be built from an initial stage (start-up stage).

5.4 Limitations of the Study

The following are the limitations of the study: first, the study intends to examine the determinants of financial sustainability of pension fund administrators in Nigeria. The fact that contributory pension fund in Nigeria is still at its embryonic stage, and the achievement of regression line requires a wide range of data, the use of samples for the study did not permit taking all the variables the study intends to examine into consideration. Based on this, the parameter estimates of the regression equation are restricted.

Second, the study adopts only secondary data which are directly collected from the financial statements of the observed PFAs in Nigeria. Notwithstanding the above listed limitations, the validity of the findings and the reliability of the methodology followed to arrive at the study's conclusions are not affected. Users can rely on the study's findings for their various applications.

5.5 Areas for Further Studies

In this study we attempted to determine factors affecting financial sustainability of pension fund administrators in Nigeria. The research design, therefore, was specifically focused to address, the specific PFAs problems. Thus, the findings in this study may not

apply to other PFAs in other countries. The areas such as Building a secure, Sustainability and Modern Retirement Income System etc that were not at the centre of this study's design are good avenues for future research. These are, amongst others; the applicability of the findings in this study to incoming PFAs in Nigeria.

This study also used seven years data to determine factors affecting the financial sustainability. However, the seven years period may be too short to allow some detailed econometric analysis. More observations, given longer study period would have helped to isolate the time effects on profitability even before explaining the determinants of financial sustainability. Thus, future studies may consider taking longer period. The longer study period may help to unveil what was probably not unveiled in this study.

5.6 Contribution to Knowledge Made By the Study

The key contributions to knowledge made by this study are: first, it is the first attempt to determine factors affecting financial sustainability of PFAs in Nigeria. Applying the accounting profitability theory, the study has shown that both outreach and efficiency related factors affect the financial sustainability of PFAs in Nigeria.

Second, the study reveals that there exists simultaneous causality relationship between financial sustainability, and independent variables. When this relationship is not considered in determining factors affecting financial sustainability there may be inconsistent evidence on the existence of mission drift.

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DATA

Firm	id	year	FS	BSize	B.Compt	Size	NETINCOME	CONTRIB	GDPGRO	AGE
	2	2006	0.5	5	1.1	5.7	0.2	0.56	0.079	3
	3	2006	0.69	4	1.17	4.52	0.28	69.82	0.079	2
	4	2006	0.655	6	1.16	6.04	0.23	63.75	0.079	3
	5	2006	0.295	3	1.18	5.12	-0.71	33.22	0.079	3
	6	2006	0.985	4	1	6.91	0.58	98.26	0.079	0
	7	2006	0.535	5	1.41	5.84	0.307	44.54	0.079	3
	8	2006	0.61	6	1.36	5.7	0.18	59.67	0.079	3
	9	2006	0.565	6	1.52	5.88	0.12	55.21	0.079	2
	10	2006	0.5	7	1.83	6.4	0.1	22.56	0.079	2
	11	2006	0.735	3	1.32	6.19	0.32	113.74	0.079	3
	12	2006	0.54	5	1.5	5.88	1	40.25	0.079	2
	13	2006	0.735	9	1.44	6.19	0.32	103.74	0.079	2
	14	2006	0.69	6	1.12	4.52	0.28	69.82	0.079	3
	15	2006	0.5	11	1.42	5.7	0.52	0.56	0.079	3
	1	2007	0.085	7	1.59	2.64	0.12	1.81	0.007	2
	2	2007	0.025	5	1.1	3.05	-0.86	0.04	0.007	4
	3	2007	0.125	5	1.2	3.5	0.099	0.278	0.007	3
	4	2007	0.385	7	1.16	2.5	-0.3	19.62	0.007	4
	5	2007	0.04	3	1.18	3.82	-0.63	0.091	0.007	4
	6	2007	0.45	5	1.2	3.95	0.211	1.34	0.007	1
	7	2007	0.185	6	1.4	2.73	0.027	0.312	0.007	4
	8	2007	0	7	1.39	2.87	-0.8	0.049	0.007	4
	9	2007	0.495	6	1.52	4.84	0.01	0.58	0.007	3
	10	2007	0.085	8	2	4.9	0.15	0.39	0.007	3
	11	2007	0	3	1.32	2.87	-0.88	0.057	0.007	4
	12	2007	0.085	6	1.14	4.9	0.015	39.18	0.007	3
	13	2007	0.025	9	1.44	3.05	-0.86	1.04	0.007	3
	14	2007	0.085	7	1.33	2.64	0.03	0.81	0.007	4
	15	2007	0.325	11	1.42	5.62	0.053	0.134	0.007	4
	1	2008	0.5	7	1.59	4.88	0.21	10.12	0.075	3
	2	2008	0.005	5	1.1	3.16	-0.59	0.002	0.075	5
	3	2008	0.535	5	1.2	4.12	0.107	65.51	0.075	4
	4	2008	0.985	7	1.16	3.15	0.49	45.13	0.075	5
	5	2008	0.11	4	1.2	5.19	5.56	64.85	0.075	5
	6	2008	0.5	5	1.2	5.7	0.14	48.8	0.075	2
	7	2008	0.545	6	1.4	4.95	0.108	24.44	0.075	5
	8	2008	0.12	7	1.39	5.02	0.018	0.71	0.075	5
	9	2008	0.575	6	1.52	5.71	0.13	23.13	0.075	4
	10	2008	0.325	8	2	5.62	0.053	13.34	0.075	4
	11	2008	0.12	3	1.32	5.02	0.18	45.14	0.075	5
	12	2008	0.325	6	1.14	5.62	0.03	13.34	0.075	4
	13	2008	0.005	9	1.44	3.16	-1.59	0.047	0.075	4
	14	2008	0.5	7	1.33	4.88	0.21	0.12	0.075	5
	15	2008	0.66	11	1.42	5.92	0.24	13.15	0.075	5

1	2009	0.495	8	1.62	4.92	0.23	0.38	0.05	4
2	2009	0.045	6	1	4.3	-1.26	45.92	0.05	6
3	2009	0.26	6	1.4	4.97	-0.91	20.29	0.05	5
4	2009	0.05	8	1.17	4.4	-8.9	33.37	0.05	6
5	2009	0.495	4	1.2	6.03	0.101	18.13	0.05	6
6	2009	0.505	6	1.24	5.74	0.21	2.61	0.05	3
7	2009	0.485	7	1.42	5.51	-0.003	3.64	0.05	6
8	2009	0.4	8	1.4	5.56	-0.26	0.52	0.05	6
9	2009	0.495	7	1.43	5.97	0.071	0.84	0.05	5
10	2009	0.66	9	1.92	5.92	0.24	13.15	0.05	5
11	2009	0.4	4	1.25	5.56	-0.26	29.37	0.05	6
12	2009	0.66	7	1.29	5.92	0.24	13.15	0.05	5
13	2009	0.045	11	1.36	4.3	-0.26	0.045	0.05	5
14	2009	0.495	8	1.5	4.92	0.01	0.38	0.05	6
15	2009	0.665	12	1.21	6.02	0.25	52.87	0.05	6
1	2010	0.5	8	1.62	5.58	0.19	1	0.067	5
2	2010	0.73	6	1	4.32	0.31	17.17	0.067	7
3	2010	0.625	6	1.4	5.79	0.2	47.93	0.067	6
4	2010	0.105	8	1.17	4.78	-0.78	37.6	0.067	7
5	2010	0.995	4	1.2	6.82	0.5	244.05	0.067	7
6	2010	0.52	6	1.24	5.77	0.204	3.42	0.067	4
7	2010	0.605	7	1.42	5.58	0.18	55.62	0.067	7
8	2010	0.54	8	1.4	5.74	0.07	54.62	0.067	7
9	2010	0.5	7	1.43	6.31	0.11	19.6	0.067	6
10	2010	0.665	9	1.92	6.02	0.25	52.87	0.067	6
11	2010	0.54	4	1.25	5.74	0.107	20.89	0.067	7
12	2010	0.665	7	1.29	6.02	0.25	52.87	0.067	6
13	2010	0.73	11	1.36	4.32	0.31	100.17	0.067	6
14	2010	0.5	8	1.5	5.58	0.51	1	0.067	7
15	2010	0.8	12	1.21	6.13	0.55	1.75	0.067	7
1	2011	0.75	9	1.78	6.14	0.2033	1.09	0.074	6
2	2011	1.095	7	1	4.75	0.3317	18.7153	0.074	8
3	2011	0.9375	7	1.43	6.37	0.214	52.2437	0.074	7
4	2011	0.1575	9	1.2	5.26	-0.8346	40.984	0.074	8
5	2011	1.4925	5	1.2	7.5	0.535	266.015	0.074	8
6	2011	0.78	7	1.29	6.35	0.21828	3.7278	0.074	5
7	2011	0.9075	8	1.5	6.14	0.1926	60.6258	0.074	8
8	2011	0.81	9	1.44	6.31	0.0749	59.5358	0.074	8
9	2011	0.75	8	1	6.94	0.1177	21.364	0.074	7
10	2011	0.9975	10	2.1	6.62	0.2675	57.6283	0.074	7
11	2011	0.81	4	1.25	6.31	0.11449	22.7701	0.074	8
12	2011	0.9975	8	1.25	6.62	0.2675	57.6283	0.074	7
13	2011	1.095	12	1.45	4.75	0.3317	109.185	0.074	7
14	2011	0.75	9	0.78	6.14	0.5457	1.09	0.074	8
15	2011	1.2	14	1.14	6.74	0.5885	1.9075	0.074	8
1	2012	1.8615	9	1.78	6.57	0.221597	1.199	0.0613	7

2	2012	1.5938	7	1	5.08	0.361553	20.5868	0.0613	9
3	2012	0.2678	7	1.43	6.81	0.23326	57.4681	0.0613	8
4	2012	2.5373	9	1.2	5.63	-0.909714	45.0824	0.0613	9
5	2012	1.326	5	1.2	8.03	0.58315	292.616	0.0613	9
6	2012	1.5428	7	1.2	6.79	0.2379252	4.10058	0.0613	6
7	2012	1.377	8	1.5	6.57	0.209934	66.6884	0.0613	9
8	2012	1.275	9	1.44	6.76	0.081641	65.4894	0.0613	9
9	2012	1.6958	8	1	7.43	0.128293	23.5004	0.0613	8
10	2012	1.377	10	2.1	7.09	0.291575	63.3911	0.0613	8
11	2012	1.6958	4	1.25	6.76	0.1247941	25.0471	0.0613	9
12	2012	1.8615	8	1.25	7.09	0.291575	63.3911	0.0613	8
13	2012	1.275	12	1.45	5.08	0.361553	120.104	0.0613	8
14	2012	2.04	9	0.78	6.57	0.594813	1.199	0.0613	9
15	2012	1.53	14	1.14	7.22	0.641465	2.09825	0.0613	9

Results

Dependent Variable: FS

Method: Panel EGLS (Cross-section random effects)

Sample: 2006 2012

Periods included: 7

Cross-sections included: 15

Total panel (balanced) observations: 105

Wansbeek and Kapteyn estimator of component variances

Period weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.408406	0.404822	-1.008851	0.3156
AGE	0.088785	0.027315	3.250411	0.0016
SIZE	0.188437	0.049087	3.838836	0.0002
NETINCOME	0.062013	0.026015	2.383752	0.0191
CONTRI	0.034033	0.016968	2.005694	0.0477
GDP	-2.287754	1.701564	-1.344500	0.1819
BCOMP	-0.330650	0.286341	-1.154742	0.2510
BSIZE	0.010870	0.043222	0.251497	0.8020

Effects Specification		S.D.	Rho
Cross-section random		0.332751	0.4825
Idiosyncratic random		0.344631	0.5175

Weighted Statistics			
R-squared	0.595747	Mean dependent var	0.238802
Adjusted R-squared	0.566574	S.D. dependent var	0.498424
S.E. of regression	0.328138	Sum squared resid	10.44441
F-statistic	20.42122	Durbin-Watson stat	1.685555
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.532272	Mean dependent var	0.655105
Sum squared resid	12.40593	Durbin-Watson stat	1.419050

Dependent Variable: FS
Method: Panel Least Squares
Sample: 2006 2012
Periods included: 7
Cross-sections included: 15
Total panel (balanced) observations: 105
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.353250	0.627000	0.563397	0.5747
AGE	0.158904	0.051187	3.104403	0.0026
SIZE	0.202158	0.054869	3.684336	0.0004
NETINCOME	0.067561	0.027583	2.449356	0.0164
CONTRI	0.033758	0.017362	1.944319	0.0552
GDP	-3.051126	1.985628	-1.536605	0.1282
BCOMP	-0.399689	0.319100	-1.252551	0.2139
BSIZE	-0.138988	0.098062	-1.417350	0.1601

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.628336	Mean dependent var	0.655105
Adjusted R-squared	0.534301	S.D. dependent var	0.505012
S.E. of regression	0.344631	Akaike info criterion	0.891243
Sum squared resid	9.857952	Schwarz criterion	1.447311
Log likelihood	-24.79025	Hannan-Quinn criter.	1.116572
F-statistic	6.681905	Durbin-Watson stat	1.688086
Prob(F-statistic)	0.000000		

Correlated Random Effects - Hausman Test

Equation: EQ01

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	7	1.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
AGE	0.158904	0.088785	0.002249	0.1393
SIZE	0.202158	0.188437	0.001138	0.6842
NETINCOME	0.067561	0.062013	0.000055	0.4547
CONTRI	0.033758	0.034033	0.000059	0.9715
GDP	-3.051126	-2.287754	1.354036	0.5118
BCOMP	-0.399689	-0.330650	0.054466	0.7674
BSIZE	-0.138988	0.010870	0.009081	0.1158

Cross-section random effects test equation:

Dependent Variable: FS

Method: Panel Least Squares

Sample: 2006 2012

Periods included: 7

Cross-sections included: 15

Total panel (balanced) observations: 105

Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.353250	0.627000	0.563397	0.5747
AGE	0.158904	0.051187	3.104403	0.0026
SIZE	0.202158	0.054869	3.684336	0.0004
NETINCOME	0.067561	0.027583	2.449356	0.0164
CONTRI	0.033758	0.017362	1.944319	0.0552
GDP	-3.051126	1.985628	-1.536605	0.1282
BCOMP	-0.399689	0.319100	-1.252551	0.2139
BSIZE	-0.138988	0.098062	-1.417350	0.1601

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.628336	Mean dependent var	0.655105
Adjusted R-squared	0.534301	S.D. dependent var	0.505012
S.E. of regression	0.344631	Akaike info criterion	0.891243
Sum squared resid	9.857952	Schwarz criterion	1.447311
Log likelihood	-24.79025	Hannan-Quinn criter.	1.116572
F-statistic	6.681905	Durbin-Watson stat	1.688086
Prob(F-statistic)	0.000000		

Sample: 2006 2012

	FS	AGE	NETINCOME	SIZE	CONTRI	GDP	BSIZE	BCOMP
Mean	0.655105	5.333333	0.043902	5.391967	36.02626	0.058357	7.152381	1.345238
Median	0.540000	5.000000	0.190000	5.700000	20.89000	0.067000	7.000000	1.320000
Maximum	2.537250	9.000000	5.560000	8.027140	292.6160	0.079000	14.00000	2.100000
Minimum	0.000000	0.000000	-8.900000	2.500000	0.002000	0.007000	3.000000	0.780000
Std. Dev.	0.505012	2.191183	1.114217	1.240562	50.14795	0.023674	2.368791	0.249114
Skewness	1.133628	-0.082856	-3.898819	-0.645758	2.979879	-1.395293	0.541424	0.859373
Kurtosis	4.380216	2.141453	46.24795	2.900112	14.18967	3.586500	3.278974	4.356345
Jarque-Bera	30.82382	3.344961	8448.948	7.341208	703.1829	35.57469	5.470436	20.97269
Probability	0.000000	0.187781	0.000000	0.025461	0.000000	0.000000	0.064880	0.000028
Sum	68.78600	560.0000	4.609684	566.1565	3782.757	6.127500	751.0000	141.2500
Sum Sq. Dev.	26.52383	499.3333	129.1138	160.0554	261540.9	0.058290	583.5619	6.454019
Observations	105	105	105	105	105	105	105	105

Redundant Variables Test
Equation: EQ01
Specification: FS C AGE SIZE NETINCOME CONTRI GDP BCOMP
BSIZE
Redundant Variables: GDP BSIZE BCOMP

	Value	df	Probability
F-statistic	1.132600	(3, 97)	0.3398

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.365856	3	0.121952
Restricted SSR	10.81027	100	0.108103
Unrestricted SSR	10.44441	97	0.107674
Unrestricted SSR	10.44441	97	0.107674

Restricted Test Equation:
Dependent Variable: FS
Method: Panel EGLS (Cross-section random effects)
Date: 07/21/14 Time: 06:40
Sample: 2006 2012
Periods included: 7
Cross-sections included: 15
Total panel (balanced) observations: 105
Use pre-specified random component estimates
Wansbeek and Kapteyn estimator of component variances
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.782575	0.144825	-5.403588	0.0000
AGE	0.101365	0.015096	6.714806	0.0000
SIZE	0.154211	0.031223	4.939088	0.0000
NETINCOME	0.057851	0.024403	2.370688	0.0197
LOG(CONTRI)	0.029883	0.014633	2.042174	0.0438

Effects Specification		S.D.	Rho
Cross-section random		0.332751	0.4825
Idiosyncratic random		0.344631	0.5175

Weighted Statistics			
R-squared	0.581586	Mean dependent var	0.238802
Adjusted R-squared	0.564850	S.D. dependent var	0.498424
S.E. of regression	0.328790	Sum squared resid	10.81027
F-statistic	34.74945	Durbin-Watson stat	1.602113
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.522405	Mean dependent var	0.655105
Sum squared resid	12.66764	Durbin-Watson stat	1.367206