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INVESTMENTS AND FINANCING CONSTRAINTS: A LESSON TO NIGERIAN PENSION FUND ADMINISTRATORS

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Abstract

A pension system is essentially an income security program, which provides benefits to beneficiaries who may be retirees, pensioners or the destitute. This paper reviews the investments and financial constraints of pension funds from various countries worldwide with the aim of serving as a lesson to the Nigerian pension funds. The paper uses a conceptual approach by employing a literature-based methodology. As such, this study brings its conclusions on deductions made from the reviewed literature, which forms the basis for the proffered recommendations. The study finds that individual country adopts a pension program that suits its economy and easy to implement. As such, the pension reforms embark upon by each country is a going concern. In conclusion, Nigeria, as a country that adopts a contributory pension scheme has a lot of programs to borrow from advanced countries especially Chile and Peru. The paper, therefore, recommends amongst others, 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; the fraction of assets invested in equities should decline with age.

1.1 Introduction

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 improve 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 guide 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. Risk management is thus a process that utilizes internal controls as one of the measures to mitigate and control risks. Risks such as political, technological and legislative that cannot be managed through traditional internal control systems should be addressed using flexibility, forward planning and similar mechanisms.

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 new pension scheme is meant to cover the entire public and private sectors of the country. However, the 1999 constitution permits state Government to enact their individual pension laws. The National council of states adopted the contributory pension scheme for the whole country in July, 2006. The commission therefore prepared a draft state pension law for states and local governments to serve as a framework for drafting their own contributory pension scheme Laws under the regulatory and supervisory umbrella of the National pension Commission.

The global financial crisis has affected virtually all economies. Stock markets all over the world are suffering heavy losses as reflected in the fall of their indices. African countries have also been affected by the global crisis due to fall in commodity prices occasioned by fall in world demand for primary commodities and slowdown in foreign capital inflows, tourism and aid. In most countries, significant proportions of pension fund assets are invested in equities due to their perceived ability to provide higher returns on investment. Thus, the crash in the stock markets has affected pension fund assets globally. Pension funds with the largest exposure to equities were worst hit.

In Nigeria, the limit imposed by the Regulation on investment of pension Assets that only a maximum of 25% of pension assets under management can be invested in quoted equities shielded the largest proportion of the pension assets from becoming seriously affected by the stock market crash. Only the equities of very strong and rated companies that demonstrated positive returns are invested in. The commission in proactive measures to cushion the effect of the volatility of the capital market on those who have already retired under the contributory pension scheme had directed pension operators to establish Retiree Funds. The Retiree funds are only invested in the fixed income securities as the beneficiaries' investment horizons are relatively shorter than those of existing workers. With time, the multiple funds would also be introduced in the pension industry to cater for the different risk appetites of pension contributor

A pension fund's primary is to secure financial of its liabilities at the lowest economic cost, that is with the lowest possible contribution rates for the active workforce and employer. Ideally, the fund's investment strategy tries to match its future cash flows as well as possible and to deliver as high returns as possible. As such, the fund's investment strategy should use all instruments available in the financial market which provide some hedges against its cash flow. Pension funds face many sources of risk: Uncertainties with respect to future developments of financial markets. To manage risks, pension funds and their adviser have developed financial models with which they compute the impact of future capital market developments on their financial position. This is called Assets-liability management models which focused on the decision making problem of pension funds. In order to describe the uncertainties on the model (like future returns on assets) a scenario generator to find futures development of all uncertain parameters was developed.

There are many uncertainties associated with contributory pension fund in Nigeria which the boards of pension funds have to deal with: large pension funds usually invest their assets in internationally diversified portfolio. Currency risk is created by investments which are made in other currencies than the one in which the liabilities of a pension fund are expressed. A second source of risk with respect to the assets portfolio is the risk of default. Pension funds usually invest a fraction of their assets in bonds. There is always the risk that the issuer of the bond is not able to make the promised payment, which is called the risk of default. Also under the assets portfolio risk is volatility risk that is of the returns on the assets classes fluctuate more than expected.

In the same vein, longevity risk can occurs if a participant of the fund lives longer than may be expected on the basis of mortality rates. On the other hand, also risk

of short life is an actuarial risk. This is the risk that a participant lives shorter than expected. In this case, more benefit payment may have to be made to surviving relatives. Another uncertainty is that if the liabilities are valued using a fixed discount rate, and the current interest rate in the financial markets is lower than this fixed rate.

Based on the above assertions, looking at the nature of uncertainties surrounding contributory pension scheme in Nigeria, many contributors have expressed fears and concerns over the potential investment decisions of their PFAs as well as activities of their PFCs, especially as the Act empowers the PFAs to take investment decisions on contributor's behalf. The guidelines seek to address these concerns by providing a uniform set of rules applicable to all operators to guide their investment decisions on assets. This paper centered on these phenomena to unveiling the investment and financial constraints of Nigerian Pension funds.

2.1 Literature Review

A pension system is essentially an income security program, which provides benefits to beneficiaries who may be retirees, pensioners or the destitute (Ako 2006). 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.

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 case, a contributory pension system had been adopted and this is the basis of this study.

Pension funds may be defined as forms of institutional investor, which collect pool and invest funds contributed by sponsors and beneficiaries to provide for the future pension entitlements of beneficiaries (Davis, 2002). They thus provide means for individuals to accumulate saving 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.

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.

Investment can be broadly defined as the acquisition of an asset with the aim of receiving a return (Stiglitz, 1993). It could also mean the production of capital goods; goods which are not consumed but instead used in future production. Arrow (1968) suggests that investment can be considered irreversible in an extreme situation. This implies that investment decisions can be viewed from the perspectives of reversibility and irreversibility. While under conditions of certainty, irreversibility creates a wedge between the cost of capital and its marginal contribution to profit, under uncertainty (where irreversibility has important implications for investment decisions) irreversible investment can be adversely affected by risk factors (Bernanke 1983; McDonald & Siegel, 1986; and Bertola, 1989). This means that under uncertainty, firms acquiring additional capital presently stand the risk of being stuck with excess capacity in the future that cannot be costlessly eliminated. This notion amplifies the importance of uncertainty in investment decision making. The problem of uncertainty is more severe in developing countries where transformations inherent in development such as the establishment of new firms and new industries and the absorption of new technologies heighten uncertainty (World Bank 1993).

Sneessens (1987) views investment as a function of both profitability and demand for output. This approach suggests that investment decisions have two stages viz:

a. The decision to expand the level of productive capacity; and
b. The decision about the capital intensity of the additional capacity (Malinvaud 1982). The first stage depends on the expected degree of capacity utilization in the economy which provides an indicator of demand conditions; while the second stage depends on relative prices such as the cost of capital and labour.

Financial constraints on investment are gaining prominence in the literature. Stiglitz & Weiss (1981), suggest that at the micro level, firms may face binding financial constraints in domestic capital markets because interest rates are controlled or subjected to endogenous credit rationing. Restrictive monetary and credit policies affect investment in two ways. They increase the real cost of bank

credit and by raising interest rates, increase the opportunity cost of retained earnings. Both mechanisms raise the user cost of capital and lead to a reduction in investment.

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, subject to guidelines issued from time to time by Pencom as follows:

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.

3.1 Methodology

The paper uses a conceptual approach by employing a literature-based methodology. Lin (2009) views the literature based methodology as a methodology which entails reading through, analyzing and sorting a lot of literature in order to identify the essential attributes of the subject matter under study. It is generally referred to as the non-contact method as it does not directly deal with the object under study, but indirectly accesses relevant information from a variety of literatures. This makes the study to be a meta-synthesis as it integrates results from a number of different but inter-related qualitative studies (Walsh & Downe, 2005). As such, this study brings its conclusions on deductions made from the reviewed literature, which forms the basis for the proffered recommendations.

4.1 Investment Strategy Considerations

It has been 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. It is matching the characteristics of assets and liabilities that are most important for the management of risk for a pension fund. In general, the liabilities of a continuing salary pension scheme are 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.

4.2 Investment Policy in 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 to the 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 Mayers & Schoors (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. 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 precious 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; and Campbell & Viceira, 2005). After the funding status of a given pension plan improves, the plan assets tend to be invested more in equities, and when the funding status deteriorates the plan assets tends to be invested more in safe assets such as government debt and cash.

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, Mihir & Joshua (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. First, firms may desire to offer pension beneficiaries the good performance in pension assets Sweeting (2005) or access to alterative securities that may not be available to individual investors (Campbell & Viceira 2005).

Second, 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.

Fourth, 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. 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 that examine these incentives, with generally conflicting conclusions. These studies include Friedman (1983) which uses a cross-section of approximately 8000 plans from 1977, Bodie, Jay, Randall & Robert (1985) and Bodie et al (1987) which draw a data set of 939 firms from 1980, Patersen (2003) which uses IRS 5500 data from years 1988-1990, Hortzmann & Hinz (2005) which use a dataset of 176 firms in 1989 and Coronado & Liang (2005) which use 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 correction between risk taking and funding, consistent with risk shifting, whereas Patersen (2003) 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.

4.3 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 allocation, 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 60 percent of their assets in stocks, Japan's pension funds hold 28 percent 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 90 percent of their portfolio in government bonds in 2001, but that percentage had fallen to 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 23 percent: 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; and Ljunqvist & Richardson, 2003).

4.4 Equities versus Bonds

Modern finance theory has provided useful insights for the portfolio decisions of individuals, but some of its implications are inconsistent with the financial advice of industry practitioners. Traditional mean – variance analysis has the implication that all investors should hold the same portfolio of risky assets, a unique and optimal mix of stock and bonds, conservative investors would hold relatively more cash 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. The authors show, using data for the United States between 1926 and 1992, 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. In an attempt to reconcile the principles of portfolio choice with the advice of financial planners, Campbell & Viceira (2005) 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. Also, they show that in the absence of complete financial market a reasonable assumption for emerging markets the time varying nature of the volatility of stock returns warrants a reduction in stocks. Finally the authors 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 – two characteristics typical of emerging market workers.

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. First, historical returns may not be repeated in the future. Second, the evidence on the equity risk premium is based on long-series and even if stocks outperform bonds on average, there is a significant risk that they may fail to do so over shorter periods of time relevant for pensioners. For instance Morkowitz & Vissing-Jorgensen (2001) show that about 25 percent of the time equity investments underperform twenty year inflation- indexed bonds yielding 3.5 percent in real term. Third, Jovion & Goetzman (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 worst performance owing to extreme events such as crisis, wars, expropriation, or political upheaval that led to temporary or even permanent closure of some stocks markets.

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 Waring (2004), increasing asset allocations to local stocks have contributed to support price to book ratios in Argentina, Chile and Peru, and would expect a similar support in primary equity markets. This could justify giving some weight 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 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, Daniela & Serio (2002) have shown 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 (Caslin, 2002). 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, Jorge, Ramana &Anna, 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 (Gorcia- Centera, Steve, Flara & Laura, 2001). 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, 2002). 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, 2001).

Our position is that with recent crises in advanced countries such as Argentina, pension fund companies should not invest the whole of their assets in government bonds rather; they should adopt Bodie's (2001) view. That is the fraction of assets invested in equities should decline with age.

4.5 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 puzzled. Davis (2002) shows that an international investment allows superior performance in terms of risk and return; and pension funds are well placed to take advantage of these benefits.

A recent study by Baxter and King (2001) on the gains from international diversification from the perspective of US. 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 aboard. 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 fewer than 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 aboard. 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.

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 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.

4.6 Measuring Investment Risk in Pension Funds

The investment risk in pension schemes has been contentions and divisive in the actuarial profession in the UK, the US and Canada. The beginning of the debate in its current form can be traced to the work of Exley, et al (1997). In this work, it was brought to an actuarial audience the approach pioneered by Modigliani & Miller (1958) to the financial structure of companies and adapted to the special case of pension funds by, inter alia, Sharpe (1976), Black (1980) and Tepper (1981). Originally, the debate centered on how to value pension liabilities and invest pension funds, but has since grown to polarize the actuarial community into advocates of financial economics and advocates of the traditional actuarial approach.

To simplify the debate to the point of caricature, the financial economist group argues that pension funds should invest primarily in bonds, while the 'traditional actuaries' defend the common high equity exposure. Roldos (2006) observe that another important aspect of the external environment that affects pension fund

investment decisions is the accounting of pension expenses by contributory pension plan sponsors, which have changed substantially over the last two decades. The traditional actuarial approach focused on the long-term stability of established contributions necessary to fund pension payment. Pension funds assets and liabilities were evaluated at fixed, smoothed or long-term expected rates. The market based approach on the other hand, applies market prices to pension funds assets and liabilities thereby enhancing the transparency and comparability of the financial position of the fund. According to advocates of the new approach only the consistent and consequent application of fair value principles enables pension funds to conduct an objective risk assessment. On the other hand, this approach has been criticized for introducing inappropriate volatility to the liabilities and for leading to short-term investment strategies. Some observers also argue that market – based valuations and in particular the UK's FRS17 standard, may have contributed to the decline of Defined Benefit plans.

The new accounting standards also require pension liabilities to be calculated applying the projected unit credit method, thereby leading to a different measure of liabilities compared to regulatory standards which typically require the recognition and funding of the accrued benefits only (without projecting salaries at retirement). Assessing the pros and cons of different regulations and accounting standards requires an evaluation of their impact on funding levels, investment performance and funding cost. Risk management is becoming an increasingly sophisticated and central function within financial institutions. In contributory pension funds, Roldos (2006) assert that risk management involves the measurement and assessment of pension fund risks and the design, monitoring and revision of the fund's parameters (contributions, benefits and investments) in order to address these risks in line with the funds' objectives. The main risk that contributory pension funds are exposed to are investment, inflation and longevity risk. In turn, plan members are exposed to the risk that pension fund assets will be insufficient to cover benefit promises if the plan is terminated (typically, because of bankruptcy of the plan sponsor). In order to meet the needs of both plan sponsors and plan members, risk management should have the following two goals:

i. Minimizing the pension cost to contributors.
ii. Minimizing the risk of benefit cuts to beneficiaries

Blommestein & Spencer (2007) observe that these goals involve trade-offs between contributions, asset allocation and risk, as the objectives of the stakeholders can vary. Plan sponsors are most interested in minimizing the net funding cost of a plan by optimizing the risk – adjusted return on plan assets.

Plan members usually follow multiple goals that change over time: in case of member contributions, they share employers' goal of minimizing pension costs. As active members, they are generally concerned with maximizing their plan benefits without running the risk of losing vested benefits.

Gbitse (2006) posits that retired members usually place higher emphasis on benefit security as they have less or no time left to make up any short falls. As the pension promise is ultimately backed by the employer, insolvency of the plan sponsor forms the most basic risk to beneficiaries. This risk can be either dealt with by pension insurance arrangements (publicly set –up protection funds or private insurance) or via high funding buffers in the pension fund itself. Risk management's task, therefore, consists in unravelling these different objectives and constraints into a consistent combination of benefit and contribution policies and funding and investment strategies that satisfy plan sponsors and plan members, both active and retired.

4.7 Investment Risk and Reward

In practice, the objective of any investment manager will be to find a balanced trade-off between risk and reward. Reward is usually defined as the expected return from an investment, net of tax and expenses (Pennachi & Christopher, 2009). However, risk is not an easy to define. In investment theory risk is usually defined as the standard deviation of return but in actuarial applications it is defined as the likelihood of being unable to meet the liabilities as they fall due.

It is generally assumed to be the case that risk and return are related. If the risk from an investment is high, it is likely that the return will be high too. Investors may be willing to trade a higher level of risk for a higher level of return. The preferences of individual investors in this regard will be different depending on the degree to which investors are risk averse. Investors may also have varying understanding of what is meant by risk. An investor with short-term liabilities to meet may regard an investment category as risky if investments in that category tend to be prone to short-term volatility. On the other hand, an investor with a target real return or a long time horizon ie a pension plan, would be less concerned about the difficulties caused by investments being prone to short-term volatility. Such an investor therefore be prepared to invest in equity based investments at a prospective return that a short-term investor would not accept. It is therefore very difficult to separate the consideration of risk from that of return. In general, it can be said that if an asset class is regarded as having greater risk attached to it, a higher return must be expected.

The investment performance of defined contribution schemes directly affects the benefit received by participants. For this reason, there will likely be great differences among the participants as to risk averseness. Participants near retirement are likely to prefer a more conservative plan than those members who are far away from retirement and have the time to wait for long term expected results to materialized (Brainard 2001). Most pension scheme sponsors address this issue by providing several different investment options with varying risks and returns from which the members can choose. Any individual member may therefore select investment options in phases to suit their situations. Those in the early stage of their pensionable service, who are make-up for any shortfall that may arise from their current investment, may opt for riskier investments. Those near retirement may have built up sufficient funds for their pension and with such little time to retirement, they are unlikely, to be interested in any unnecessary investment risk that may jeopardize whatever funds might have accrued to date.

The end users of the financial system are brought together by a market process known as intermediation. This process brings together the households and firms, who save money, with borrowers who wish to invest in capital projects or finance their consumption over and above current income. The intermediating vehicles i.e. banks, insurance companies and pension funds invest in government bonds, company bonds, domestic and overseas equities, real property and cash instruments.

An overriding consideration for a pension fund, like any other investor, is the ability of the borrower to meet its obligation or for the investment to which the funds have been deployed to meet its expectations. The investor must assess whether the borrower will be able to meet its interest obligations and also to repay principal at maturity. This type of risk is most often discussed in relation to fixed-income investments, although the principle can be applied to equity investments as the reliability of earnings must be considered.
According to Pennachi & Christopher (2009), assessment of credit risk will depend upon a variety of factors including the term of the investment, nature of the borrower's underlying business, expected economic outlook i.e. inflation. For many types of fixed-income investments, the borrower pledges security or collateral to support the loan. Credit risk may also be reduced by government or private sector guarantees or insurance coverage and through diversification. The volatility of returns (nominal returns) is another risk factor to be considered. Will the rate of return be stable or will it fluctuate from year to year? Are investors being compensated by sufficient, increased return for expected volatility? Many investors prefer a stable return so that they will have more predictable earnings or pension costs.

Sensitivity to the volatility factor will be influenced by the accounting basis used. Are market values, book values, values derived from a smoothing technique used? It is also a good idea if the same basis used for the assets is used for liabilities. This may cause some scheme sponsors to accept greater volatility in their investment results as long as the direction of the movement in scheme assets corresponds to the direction of the movement of scheme liabilities. It is necessary to distinguish between liquidity and marketability at this point. In general, an investment can be said to be marketable if there is a reasonable trading volume of the investment under consideration such that an investor can buy or sell a significant quantity of the investment without affecting the market price considerably (Dimson, Marsh & Staunton (2004). The investment can be regarded as liquid if the transaction can be carried out and settled easily and quickly. Thus, longer-term government bonds are neither as liquid nor are they as marketable as short-term governed bonds because of the fluctuation in their prices over time as interest rates change.

The liabilities of most pension funds are sufficiently long term that, the majority of assets, marketability and liquidity is not particularly important for considerations although their significance should not be dismissed. The minimum Funding Requirement (MFR) is essentially a short –term test of funding adequacy based on the market values of assets; it may therefore be the case that pension funds are unwilling to invest in assets to which they cannot easily change their exposure. A more mature scheme may require an ability to liquidate assets in order to pay pensions. The possibility of transfers and other payments being made out of such mature scheme funds also require a degree of liquidity. This may not be the case in young or stable schemes where there will be an excess of contradictions and investment income over benefit outgo.

In another research by Pennachi & Christopher (2009), they observe that another risk that must be assessed is that of asset/ liability matching. That, efforts should be made to have a reasonable matching of assets and liabilities in terms of their characteristics, terms of maturity and currency denomination so that the value of the assets and that of the liabilities will move together in roughly the same amount when interest rates change. Because an actuary would generally regard investment risk as the risk of not meeting liabilities, the nature of the liabilities is perhaps the most important consideration when taking the asset allocation decision. Where liabilities are defined contractually, it may be possible to develop clear guidelines on an investment policy designed to reduce risk. Fixed money assets such as bonds will most appropriately match liabilities that are fixed in money terms. Price index-linked liabilities would be better matched by investments in the real

asset class or by index-linked bonds. Where liabilities are not defined in money or index-linked terms, the nature of the liabilities may be such that changes in the general level of prices will tend to have significant effect on the final money amount of the liabilities. Real asset classes will also be a good investment in respect of such liabilities.

In all, the actuary must ensure that the investments are such that funds are available to meet any guaranteed benefits that may have been promised. Assuming that the correct asset classes have been selected bearing in mind the nature of the liabilities, it is also important to ensure that the term of the assets is appropriate given the term of the liabilities (Adams, 1988). This is to avoid any re- investment risk and it is also particularly clear when considering the case of fixed money liabilities. If the term of the assets is too short, relative to that of the liabilities, the maturity at unknown future rates of interest. If interest rates have fallen between those assumed when assets were allocated, this might have implications for the solvency of the pension fund, as assets will have to be reinvested at lower rates or interest. If the term of the assets is too long, the assets may have to be sold when the liabilities becomes due. This may have to be done at prices determined by a higher yield basis than that on which they were bought. In other words, at a lower price than expected. In this situation also the asset proceeds may be insufficient to meet the liabilities.

In another research, Bodie et al (1999) observed that the short-term returns from some types of investment, such as property and equity can be very uncertain due to the inherent short-term volatility of such markets. They concluded that if liabilities are short-term, therefore, such investment may be inappropriate. If on the other hand liabilities are of a more long term nature, as it is the case with most pension funds, unpredictability of short-term returns may be less important.

For inherently real liabilities that are denominated in a particular currency but are not fixed in that currency, the issues are a bit more complex (Balzer, 1994). Provided movements in relative currency values are determined by relative inflation rates, the real value of an asset or liability calculated in any currency will be unaffected by relative currency movements. In theory therefore, a real asset does not loose its real characteristics simply because the returns are paid in another currency. Similarly, in theory, the particular currency in which an inherently real liability is going to be paid is irrelevant. For these reasons, an institution with real liabilities (such as a pension fund) might be expected to be different between real assets with returns paid in different currencies i.e. between UK property, U.S. property etc. The reality is however quite different. Investors with real liabilities tend to readily invest in overseas equity though they will not

normally fully diversify their portfolios internationally. One reason for this is that currency movements are not determined by relative inflation rates and currency values do not change only in response to relative changes in prices in different countries. There can be significant real changes in exchange rates, particularly over short time periods. Overall, institutions with real liabilities will normally diversity, to some extent, into overseas equities and to a more limited extent, into overseas property where knowledge of foreign property law and the use of overseas property professionals would be required.

Chapman, Gordon & Speed (2001) warn that investors must be aware that, should interest rates drop during the commitment period, the borrower may request or even demand that the interest rate on the loan be reduced to reflect current lower rates. Commitment risk is however not a symmetrical problem since, if interest rates rise, borrowers will be happy to have funds locked in at lower than current rates. Investors should therefore take steps to protect themselves against drop in rates by either doing all they can to shorten the forward commitment period, introducing fees to compensate them for the value of the interest rate option granted or otherwise structuring deals to limit the flexibility for borrowers to select against the lender. This type of investment risk is of little, if any importance to a pension fund.

Investing in foreign securities has grown dramatically in recent years as investors seek new opportunities to improve return and diversify against country risk (Gervera & Andra, 2003). This opportunity to invest in assets that perform in other currencies presents an added risk to the investment decision. Performance in the local currency can be significantly different than performance measured in sterling terms. It should also be noted that most nations strive to manage their trade deficits by affecting their relative currency value. Investors generally recognize that investment in foreign assets involves two investment assessments. The first is the expected performance of the underlying asset measured in local currency. The second issue is that of the currency risk (exchange rate risk). Some investors may be willing to accept the currency risk because they expect it will enhance the overall return or they may have liabilities to offset in that currency. Other investors may choose to eliminate the currency risk by entering into forward or option contracts. Such contracts in combination with the underlying asset will provide a more predictable return when measured in the home currency. As international investment becomes more popular, understanding currency risk will become an increasingly important component of achieving superior or even acceptable results.

Our position is similar to that of Pennachi & Christopher (2009), that efforts should be made to have a reasonable matching assets and liabilities in terms of their characteristics, terms of maturity and currency denomination so that the value of the assets and that of the liabilities will move together when interest rates change.

4.8 Managing and Monitoring Investment Risk for Pension Funds

In setting the investment policy of the fund the trustees of most pension schemes have the following objectives:

i. To ensure the security of members (accrued) benefits on an on-going and discontinuance basis.
ii. To produce a smoothed contribution rate for the sponsoring company.
iii. To achieve high long –term investment returns and hence reduce the contributions required from the sponsoring company.

The first two objectives encourage the trustees to follow a policy whereby the assets are closely matched with the liabilities. The final objective encourages a move away from this matched position into assets that are expected to generate higher returns over the long-term. The scheme's investment policy therefore needs to reflect the extent to which the trustees are prepared to take on the risk of a less stable contribution rate and potentially less security for member's benefits in order to aim for higher returns and lower long-term contributions.

In practice a pension fund sets its investment policy in a two stage process:

i. The trustees establish an appropriate asset mix for the fund. This is the strategic benchmark for the fund and outlines the balance between bonds, equities and property and between domestic and international assets. The strategic (or policy) risk of the fund is the risk of poor performance of the strategic benchmark relative to the value of the liabilities.
ii. The tactical implementation of this strategy involves the selection of one or more managers (if not internally managed) and a decision on the appropriate level of risk that these managers should take relative to this strategic benchmark. This is commonly known as active (or manager or implementation) risk.

In recent years there has been an increased focus on this process. The term 'risk budgeting" has been coined to refer to the process of establishing.

a. how much investment risk should be taken
b. Where it is most efficient to take it in order to maximize returns.

There has also been an increased focus on how investment managers go about managing the active risk of the fund.

5.1Conclusions and Recommendations

It has been observed that, the objective of any investment manager will be to find a balanced trade-off between risk and reward. Assessment of credit risk will depend upon a variety of factors including the term of the investment, nature of the borrower's underlying business, expected economic outlook i.e. inflation. Another risk that must be assessed is that of asset/ liability matching. That, efforts should be made to have a reasonable matching of assets and liabilities in terms of their characteristics, terms of maturity and currency denomination so that the value of the assets and that of the liabilities will move together in roughly the same amount when interest rates change. To simplify the debate, the financial economist group argues that pension funds should invest primarily in bonds. Despite these recent arguments against a large share of equities in pension funds' portfolios and the recent dismal performance of equities worldwide, 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 share safer in the long run than in the short – run-mean reversion – is likely to provide some relief to equity portfolios that suffered recent loses but are held for the long run. With recent crises in advanced countries such as Argentina, pension fund companies should not invest the whole of their assets in government bonds rather; they should adopt Bodie's (2001) view. That is, the fraction of assets invested in equities should decline with age.

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