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THE INFLUENCE OF INFLATION ON PENSION INCOME WITH THE CONTRIBUTORY PENSION SCHEME IN NIGERIA

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ABSTRACT

The inflation rate reduces the value of the income of fixed income earners such as wage and pension. This calls for continuously increasing the income to ensure that employees standard of living is not rapidly depleted. Contributory pension scheme in Nigeria contributes fifteen percent of the employee's emolument to the retirement account. The contribution made in the early years of employment adds very little to the total fund at the time of retirement because of the continuous growing wages. The study develops an equation between the present value of the expected pension annuity with fund contributed from wages and present value of the regulation. The study finds that a close one hundred (100%) percent of the employee's wages will be required to be contributed to the retirement savings account to guaranteed employee's reasonable standard of living at retirement.The study recommends that since the interest cannot be influenced, the contribution percentage should be substantially increased immediately to save the future of the employees.

Keywords: *Pension, Inflation Rate, Wages, Retirement and Interest rate.*

Introduction

The study examines the effect of inflation on the real value of the income expected from pension as promised by the Contributory Pension Scheme currently operating in Nigeria. The rate of inflation, interest rate and pension are used to determine the present value of the sum of all wages and pension annuity for the analysis. The equation of present value of the 15% of the wages contributed to the pension fund to present value of expected pension annuity at inflation rate was developed. The equation formed will help to explain the standard of living expected for current pension system with ratio of the equation. The present value of the pension contribution from the total wages for the entire working life and the expected pension are determined at the assumed interest rate. The present value of the pension fund contributed is evaluated at the rate of inflation to know if it can guarantee a reasonable standard of living at retirement.

Contributory Pension Scheme provides for contributions of fifteen percent (15%) of the employee's emoluments to the employee's retirement saving account. The Contributory Pension Scheme was passed into law in 25th May, 2004 by the former President OlusegunObasanjo to replace the old non-contributory pension scheme. The objectives among others include uniform and universal pension scheme for employees in both public and private sectors in Nigeria. This was to help to terminate the multiple crises associated with the old scheme. For instance, the pension debt as at the time of the reform was over three billion naira (Odia&Okoye, 2012)

The new scheme came with the intention of relieving the burden of the unbearable challenges of the old scheme. Inadequate budget provision, corruption, administrative deficiency were common resulted to heavy pension debt, which perhaps, led to poor standard of living, sickness and untimely death of some of the pensioners.

However, despite the good intention of the new scheme it may not be totally free of crises as inflation which cannot be separated from economics seem not to be adequately considered in the design of the Contributory Pension Scheme as currently operated in Nigeria. For instance, is is contrary to the fundamental assumption of Allison and Winklevoss (1975) on the roles of risk premium and inflation premium in designing the pension scheme makes little or no provision for inflation rate. The continuous rise in price of consumers good and service has unpleasant result on real income of the fixed income earners. Consequently employees, as fixed income earners, are one of the major victims of the falling currency value resulting from inflation through their labour union pressurizing the employers with their available weapons for wages adjustment to reduce the impact of inflation on their standard of living through increase in their wages. Thus continuous reviewing in wages over the time creates a wide difference between the first and the last wages.

However, the case of the pensioners is different as they are at the mercy of the society. Pensioners are therefore protected against inflation by incorporating measures which include pension indexed against inflation (Love, 2007:151) benefits integrated to inflation (Bulow, 1982: 123) availability of inflation protected bonds (Siegmann, 2007:9) etc.

The contributory pension scheme in Nigeria does not sufficiently provide for inflation rate neither does it specify the right of contributors to fund earnings. In a country where wages are frequently upward adjusted due to continuous fall in currency value may not unlikely expose beneficiaries to lower standard of living.

This study intends to evaluate if and to what extent the new scheme exposes the beneficiaries to risk of lower standard of living. The study is divided into six sections. The second section briefly reviews pension. The third section examines the concept of inflation. Theoretical framework is discussed in the fourth section. The model is presented in the fifth section, the conclusions and recommendation are presented in the sixth section.

Pension

Pension is both social and legal concept in the industry. It has been defined from different perspectives. Oladipo and Fashagba (2012) defined pension as ‘a monthly benefit that the employer pays to their retired employees in their old age. At retirement, old employees are entitled to continued monthly income in pension.

Also Fashagba (2012) saw pension as ‘an additional post employment benefit to the retirees. It is a regular payment earned by previously working for the employer. It is usually a monthly affair.

Neil (1977) views pension as a benefit that may be provided in retirement, due to attainment of certain age, ill-health. Pension is earned provided that certain age condition is met. Traditionally, it is on the basis that one has attained certain age or has worked for a required number for years that qualifies one for pension. However, ill-health may take precedence over the condition of age. Age here refers to either one of two things: the age of the employees and the length years in service.

Rotimi and Fashagba (2013) perceived pension as a post retirement entitlement paid to a disengaged employee by the employer. Pension is a post employment benefit. This implies that the right to pension is derived from the fact that an employee has worked for an employer. The second is that pension is paid on attainment of certain age as well as meeting other conditions

Baker, Logue and Rader (2005) identified two broad types of pension plans as Defined Benefit and Defined Contribution plans and the justification for provision of pension to include helping people to save for their old age at retirement

Olqdipo, Fashagba and Akindele (2011) recognized that pension predated any legislation on pension. This probably means that all legislations on pension only came to enhance the proficiency of its operation. Pension serves the purpose of helping people to save for retirement which employer uses for payment of severance benefit as well as helping to restructure the workforce,

Inflation Concept

Inflation is a major concept in economics and important to stakeholders in the economics management. Inflation, is argued, if it is moderated is not inimical to the economy as it is inevitable companion to the measure to revive economy for recession and solve the problem of unemployment. Inflation is the reduction in purchasing power of a currency. The concept has been differently defined by different authors. Oner (2010) views inflation as “the rate of increase in price over a given period of time". The general prices shift up over time. The rate of the shift is referred as inflation. Maku and Adelowokan (2013:3) see inflation as a process of lower standard of living consequence upon a lesser quantity being consumed tomorrow than consumed today with the same amount. The same amount of income simply purchases lesser goods and services necessitating adjustment of consumption.

Labonte (2011) notes that inflation as "the general rise in prices of goods and services". A rise in prices of some goods relate to others may not be considered as inflation. It can only be inflation when general prices are involved. Bayo (nd) also provided view that inflation is applicable only to general rise in price.

A systematic relationship can be identified between inflation and economics. Inflation has been argued to be consequence of increase in supply of money (Labonte, 2011; Arshraf, 2014:24) and Howith,2013).

Theoretical Framework

There have been attempts to identify the effect of inflation on pension. It is not out of place to see some Defined Benefit plan being indexed for inflation to reduce the impact of inflation on the real value of the fund.

Grubbs (1979) observed that inflation is one of the major problem of private pensions. The inflation gradually reduces the retiree's real income. He noted: "workers who retired 12 years ago on what they thought was an adequate retirement income have seen their pensions cut in half by inflation" As inflation continues to raise prices of goods and services, the pensioners suffer and the value of their real income reduces.

Bulow (1982:124) noted that "benefits are generally indexed for inflation after retirement". This is against the background that workers real income reduces after retirement than expected by the force of inflation rate. The income is fixed at retirement while inflation rate continues to reduce the value.

Allison and Winklevoss (1975,p198) identified inflation rate as component of both long-term salaries and long-term increase rate. Inflation premium should be provided along other risk premium in pension cost. Siegmann (2007:4) argues that since inflation is surrounded by uncertainty, it is a source of risk for a Defined Benefit Pension fund. Inflation is as a matter of fact relevant to all pension plans. The employees are the beneficiaries with timely payment of full pension benefit may survive or not depending on how the effect on the rate of inflation is managed now.

Real money balances normally fall substantially during inflation crisis. Also real wages found to suffer during inflation crisis. The inflation of the funding is the reduction in the purchasing power and lower standard of living. Inflation is given adequate consideration in other pension plan. Love (2007) note that 401(k) has 344,000 the upper limit 2006 with 100% of sorely which rise with inflation. With this plan, inflation is of little or no significance.

Model

The study identifies three major variables that are relevant for the evaluation as inflation rate, contribution from wages to pension saving account and the pension payment. It is important to mention that these variables occur at different time space, there is need to convert their measurement to the same time using interest rate. This is possible by measuring them at present value of money. Interest rate thus becomes inevitable. The following assumptions are used:

All measurements are taken to be one year. This may not be strictly applicable in real life as salary for instance is paid usually on monthly basis in Nigeria just like interest can be earned not necessarily on annual basis.

Interest rate will assume to be fixed over the period of the employee working life and beyond. Also inflation rate be fixed over the entire time of relevance for the study.

Employees are to work for the 35 maximum working years before being disengaged and live for another 30 years to receive pension payment. The whole fund in the pension saving account will be used to purchase pension annuity. In the real sense the, the retiree receives one quarter (1/4) of the fund at the time of retirement while the remaining three-quarter (3/4) of the total saving is used for the purchase of pension annuity (Pension Reform Act, 2005).

Inflation is the rise in the general price level. The rate of inflation is defined as R

Pension fund contribution is defined as the employees' regular contributions to the retirement pension funds.

Pension annuity is used as the regular payment of the pension in substitute of the wages that are terminated at retirement.

Inflation Rate and Function

Inflation rate affects the general price level. It causes the currency toloose it value and purchases less over the time. The value of currency is measured as $(1+r)^t$for t period.

The inflation function measures the value of currency for t years and it is denoted by (1 + r)t

where: r = the rate of inflation

t = number of year

since t cannot assume negative value, the least possible value of t is zero (0) implies that at time zero $(1 + r)^0 = 1$, the value of currency is the face value and worth (1+r r)t at the end of the year t. In other words, every one naira (₦1)) in base year has a real value one naira (N1) multiply by (1 + r) t at the year or one naira at t year can only buy 1/(1 + r)t of a naira in the base year.

Contribution from wages to pension fund

Employer and employee are expected to jointly contribute 15% of employees' emolument to retirement pension fund. This can be expressed as 15%wa.

where: wa = employees annual wages

*Wage***s**

Employee wages is assumed to be total emolument. For simplicity, the study assumed that there is no annual increment and wage only increase at a regular interval of five years due to pressure from labour union to cope with inflation. The amount of increment will be defined 'I'. We will also define annual wage and sum of wages for the entire employee working life as Wa and Ws respectively.

Employer and employee are expected to jointly contribute fifteen percent of employee total emolument. The total amount on the employee saving account at the time of retirement will be fifteen percent of the sum of all wages for the working years (i.e 15%Ws). It should be noted that this is nominal value of the amount contributed over the entire workong period.

Inflation function

The study earlier defined inflation function as $(1+r)^t$. The employee maximum working years in Nigeria is 35 years. The t value therefore ranges from zero to thirty five years. The function will be equal to one at year one (i. e. $1=(1+r)^0$) when t is zero and $(1+r)^t$ in year 35 at retirement (i. e. t = 35).

This function of inflation shows the equivalent value of one at any t year. And with the function, the future equivalent of one naira of the employee's first salary on the job can be determined for any t year. Thus, the amount requires for employee first wage purchasing power for any year t is as follow:

$Wa\,(1+r)^t$

For example, employees will requires wa(1 + r to buy the same quantity of goods and services in the fifth with wa in the first year

Employee wage and pension contribution

Employee's annual wage, initial wage and total wage are defined as Wa, Wo, and Ws respectively.

Or

$$Wa.a_{35\urcorner} + V^5Ia_{30\urcorner} + V^{10}Ia_{25\urcorner} + V^{15}Ia_{20\urcorner} + V^{20}Ia_{15\urcorner} + V^{25}Ia_{10\urcorner} + V^{30}IQa_{5\urcorner}$$

Since 15% of all wages is paid to the pension saving account, the present value of sum of total wage is 15% of $Woa_{n\urcorner}$

$$=15\% \,[\, Wa.a_{35\urcorner} + V^5Ia_{30\urcorner} + V^{10}Ia_{25\urcorner} + V^{15}Ia_{20\urcorner} + V^{20}Ia_{15\urcorner} + V^{25}Ia_{10\urcorner} + V^{30}Ia_{5\urcorner} \,]$$

The expression of the present value of the sum of all annual wages (Wsa_{35}) can be separated into two components. The first component shows the present value of the amount of starting wage (Wa) as $Waa_{35\urcorner}$. However, the first regular increment (I) commences after the first five years and continues at the same regular interval for the remaining 30 years. The payment of I for 30 years has present value of Ia_{30} and discounted for five years for the delay of five years hence $v^5a_{30.}$ The same explanation is true for others regular increment.

The other component, therefore, is the present value of all the increments. Ws represent the total employee receive in 35 years while 15% of Ws is the total amount contributed to employee pension saving account of the 35 year working. The employee receives a total wage (Ws) over the 35 years working life. This is distributed as shown in figure presented below.

The employee receives annual wage of Wa for the first five years and Wa+I for the next five years(6th to 10th year) and continues to Wa+6I for the last five years (i.e 31st to 35th year. The addition of all these series is:

Ws=5Wa+5(Wa+1) +5(Wa+2I) +5(Wa+3I) +5(Wa+4I) +5(Wa+5I) +5(Wa+6I)

The present value of sum of total wages defined as Ws35 for the employee 35 working years is given as follows:

$W_{sa\overline{35}|} = VWa + V^2Wa + V^3Wa + V^4Wa + V^5Wa + V^6 (Wa + I) + V^7 (Wa + I) + (Wa + I)$............. $V^{34} (Wa + 6I) + V^{35} (Wa + 6I)$

$= Waa_{\overline{5}|} + V^5 (Wa+I) a_{\overline{5}|} + V^{10} (Wa + 2I) a_{\overline{5}|} + V^{15} (Wa + 3I) a_{\overline{5}|} + V^{20} (Wa +4I) + V^{25} (Wa + 51) a_{\overline{5}|} + V^{30} (Wa + 6I) a^{15}$

Pension Computation

At the point of retirement, the payment of$va_{\overline{n}|}$ amount (p) commences. Itis earlier assumed that pensioners will bepaid for 30 years which produce a present value of as at the time of retirement is

$V^{35}Pa_{\overline{30}|}$

$v^n$and $a_{\overline{n}|}$ are adopted for the present value and present value of annuity respectively from Kellison (1977). The amount needed to maintain the same standard all the time of retirement at the defined rate of inflation is cope with the inflation is $V^{35}Wa(1+r)^{35}$ and the total amount in the pension fund account is:

$15\times(Waa_{\overline{35}|} +V^5Ia_{\overline{30}|} +V^{10}Ia_{\overline{25}|} +V^{15}Ia_{\overline{20}|} +V^{20}Ia_{\overline{15}|} +V^{25}Ia_{\overline{10}|} +V^{30}Ia_{\overline{5}|}$. Hence the 15% of the sum of all wage (15% of Wa) must be greater or equal to $V^{35}PQ_{\overline{30}|}$ that is (=) $\geq V^{35}Wa^r(1+r)^{35}$

Hypothetical relationship with numerical example for the above expression to be realistic either of two options will be required. The first option is to make the wages increment large enough. This option seems difficult as before any increment, there is usually a series of labor crises. The other option is to increase the percentage of contribution and reduce the status of the fund. This will ensure that employees' fund earn interest.

I assume that employee starting annual wage Wa is I, the annual interes rate i is 5%; the annual inflation rate is 2%, and, five year increment is 10%. The purchasing power of one naira (₦1) at 2% in rater is equivalent to $(1+0.02)^{35} = 1.99989$ or ₦2. The employ will require about two naira to maintain the live standard of one naira when he takes a job with when he quit 35 years later. This is due to the fact that the naira has been lost due to inflation. This however, has a present value of 0.3626 or 36k (i.e $V^{35} \times 1.99989$).

The employee receive wage of the sum of wages received by the employee is ₦19.7629 (₦19.76). The 15% of it is 15% × 19.76 = ₦2.96. The present value amount required for the pension annuity payment for 30 years after 35 year of service is $V^{35}PQ_{30\rceil}$. Thus to be inflation protected, it should not be less than 30 times of the present value of the inflation protected future amount.

$^{30}PQ_{35\rceil} = 30 \times 0.3626 = 10.878$

$V^{35}15.3725P = 10.878$

$0.18129 \times 15.3725P = 10.878$

$2.78688P = 10.878$

$P = 10.878 \div 2.7869 = 3.90$

P = ₦3.90

To protect employees against inflation, amount of ₦3.90 should be provided for annual pension P which requires a sum of ₦10.88 as the present value for 30 years. If the amount is compared to the present value of the amount in pension fund at the time of retirement ₦2.96.This show that

Nigeria contributory pension scheme is grossly under funded. The amount in the fund $2.96 \div 10.88 \times 100\% = 27.21\%$

To reduce the problem, the total pension fund contribution requires immediate and significant increase so as not to leave Nigeria present employees into future untold suffering.

Conclusion and Recommendations

The study found that inflation rate is an issue to pension benefits. Wages are continuously to keep pace with the rate of inflation growth. This ensures that workers standard of living is not rapidly depleted. Pension payment non contributory pension scheme is even more seriously as found to purchase the annuities are contributed from a growing wages. An equation is derived for pension that promise good standard of living after retirement. The left side of the equation represents present value of the fund available for pension payment while the right side shows the present value of inflation rate.

The left side must be substantial close enough to right side to ensure lower standard is not procured for the future of the employees. For this happen, the contributions now must closed 100% of employees' wages. The fifteen presently operated is shown in the hypothetical examples as grossly under fund that ask for urgent attention of the stakeholders.

The study recommends immediately review of percentage contribution from wages to avoid a nearly calamity in pension payment. Pensioners need not depend social way for survival. This is due to the fact that fund contributed in the early years unemployment would have significantly reduced by the force inflation rate.

REFERENCES

Allison, G. D. &Winklovoss, H.E (1975). The Relationship among inflation rates, salaries, interest rate and pension cost. *Transaction of Actuary Vol. 27*

Baker, A. J., Logue, D. E. & Rader, J. S. (2005).*Managing Pension and Retirement Plans: A Guide for Employers, Administrators, and Other Fiduciaries,* Oxford: Oxford University Press.

Bayo, F. (ND). Determinant of inflation in Nigeria: An empirical Analysis. *International Journalof Humanities and Social Science Vol. 1 (18)*www.ijhssnet.com

Bulow, J. I. (1982). The Effect of Inflation on the Private Pension; System, in R. E. Hall, *The Effect of Inflation; Causes and Effects, University of Chicago URL: wtp://www.nber.orglchapters/e11455.*

Fashagba, M. O. (2011). An Appraisal of the Development of Pension Scheme in Nigeria, *JABU International Journal of Social and Sciences 3 (1)*

Grabbs, O.S,,Basselt, P.C., Cole, R. E., and Dreher, W.A. (1979). The Impact of Inflation on Pension Plans.*Record of society of Actuaries* Vol. 5 No.4

Kellison, S. G. (1977). *Theory of Interest*, Homewood: Richard D. Irwin, Inc.

Laborte, M. (2011). Inflation: Causes, cost, and current status CRS Report for the congress

Love, D.A. (2007). What can life-cycle model tell us about 401(K) contributions and participation? Journal of pension economics and finance doi:10.1017/31474747206002617

Maku, A.O. and Adelowokon, O.A. (2013). Dynamics of inflation in Nigeria: An Autoregressive Approach. European Journal of Humanities and Social Sciences 22 (1)

Mbutor, M.O.(2014). Inflation in Nigeria: how much is the function of money? Journal of economics and international finance 6 (1)

Neil, A. (1977). *Life Contigencies,*Londom: Heinemann

Odia, J. O. &Okoye, A. E. (2012). Pension Reform in Nigeria: A Comparison Between the Old and New Scheme, *Afro Asian Journal of Social Sciences.*

Oladipo, J. A. &Fashagba, M. O. (2012). Evaluation of Compliance With the Stipulation of the Contributory Pension Scheme: A Case Study of Quasi-Government Institution in Nigeria: *Africa Research Review*.

Siegmann, A (2007). Optimal investment policies for defined benefit pension funds. Cambridge University Press doi:10.1077/51474747205002398