

Comparative Analysis Of The Benefits Of The Nigerian Pension Act No. 102 Of 1979 And The Pension Reform Act Of 2004

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Abstract

The history of pensions in Nigeria started with the 1951 Pensions Ordinance. Between that time and 2004, several types of Pension schemes were legislated or decreed into law by successive governments. In 1979, the then Military Government passed the Pension Decree 102 for civil servants. As a result of the general outcry of the people following the maladministration of the scheme, the Federal Government enacted the Pension Reform Act in 2004 to replace all other existing Pension Schemes. The new pension has been adjudged better than the old one in several respects and is expected to remedy, in particular, the non-payment or delay in payment of retirement benefits. This paper aims at comparing the quantum of monetary benefits payable to retirees between the old and new schemes. Three different groups of employees with ages spread between 20 and 60, and with different years of service were randomly generated to represent three different organizations. Actuarial methods of estimating benefits using probability, statistics and life contingency mathematics were used to determine and compare the benefits of both schemes. The calculations so far indicate that the ratio of gratuity paid by the old scheme and that of the new scheme is a minimum of about 3.5:1 while the pension benefits stand at the minimum ratio of 2.3:1. The old pension scheme is hence proved better in terms of benefits payable to retirees.

Key words: Actuarial valuation, annuity, mortality table, present value, accumulated value.

INTRODUCTION

Today, the Pension Act No. 102 of 1979 is being referred to as "Old Pension scheme" while the Pension Reform Act of 2004 is referred to as "New Pension scheme" In our discussions below, we shall be referring to them as such.

The old pension scheme was a non-contributory Defined Benefit scheme. This means that the employer only was paying into the fund and the benefits to be paid to any retiring employee who was entitled to pension or gratuity were pre-determined (see Appendix A) in percentages of

final salary on date of retirement and number of years of service with the employer.

The new pension Act, on the other hand, is a contributory 'Defined Contribution' scheme. This means that:

- (i) the employer and the employee contribute agreed (from the on-set) percentages of the employee's emolument into the scheme periodically. The Act stipulates that the employee pays 7½% monthly while the employer pays the same 7½% on behalf of the employee into the employee's retirement savings account throughout the employee's working career with the employer,
- (ii) the amount of benefit accruing to the employee at retirement or cessation of employment depends on the total amount of contribution in his retirement savings account at date of cessation of employment and the interest accumulated thereon. Consequently, the benefit rate at retirement is undefined and is regarded as a variable.

Statement of the Problem

The Pension Reform Act, 2004, came into being with a view to reducing the difficulties encountered by retirees under the old scheme and correcting some or all of the problems associated with the smooth running of the scheme. While the new scheme has been adjudged to be 'better' than the old in various respects such as funding, membership, management, tax exemption, claiming of retirement benefit etc, Odi and Okoye (2012). However, comparisons by most writers so far have been qualitative. To the best of my knowledge, no mention has been made in terms of the monetary value or quantum of benefits payable to retirees, and this is the gap which this paper seeks to fill.

Purpose Of The Study

Apart from all the qualitative advantages that may have been orchestrated regarding the Pension Reform Act of 2004, the questions that, to the best of my knowledge, have not been asked, or answers provided, are the following:

- (1) are the monetary benefits from the two schemes equal or unequal? or,
- (2) is one more paying to the retiring employee than the other?
- (3) And by what ratio?
- (4) In the event that the Old Scheme pays more to the retiring employee than the New Scheme, what advice/suggestion can be proffered to enhance the New Scheme so as to retain its relative advantage of wider coverage as acknowledged by most writers.

These are the questions this research is set to attempt answering.

Today, Trade Unions and the academia express concerns that the benefits to be earned from the current 15% employer and employee contributions may not be adequate (as the benefits of the Old Pension scheme) to serve as a retirement benefit after 35 years of service or at age 60.

The objective of this paper is to show the quantum of benefits advantage any of the two schemes has over the other using the concepts of probability and statistics and actuarial mathematics. Suggestion will also be made on the possibility of bringing the two at par, at least, if differences in quantum are observed.

REVIEW OF RELEVANT LITERATURE

According to Trebilcock and Reeve (1988), the first laws aimed at providing any form of social security as it is called today was the Poor Laws in the reign of Queen Elizabeth 1 of England in the 17th century. In 1712, the first superannuation fund was set up for the benefit of certain civil servants and was financed on the pay-as-you-go principle, that is, pensions were paid out of the contributions collected from those still at work.

Pension scheme was introduced into Nigeria during the colonial era to provide old age income for and security to British citizens working in the country upon their retirement. Nigeria's first ever legislative document on pension in Nigeria was the 1951 Pension Ordinance which has retroactive effect

from January 1, 1946. The Ordinance provided public servants with both pension and gratuity, (Ahmed, 2006; Odia and Okoye, 2012).

In the private sector, most multinational organizations as the oil companies, the UAC group and insurance companies with foreign background operated pension schemes for their employees on the Defined Benefit basis and employed foreign Actuaries to conduct actuarial valuations as required.

The National Provident Fund (NPF) scheme established in 1961 was the first legislation enacted to address pension matters of Private Organizations. The NPF was a Defined Contribution scheme. By law, the contributions by employee and employer were pegged at 25% of the employee's salary. The Joint Tax Board, a subsidiary of the Federal Board of Internal Revenue, was the government's organ responsible for the supervision and approval of all retirement schemes for tax purposes.

The NPF was followed 18 years later by the Pension Act No. 102 of 1979, as well as the Armed Forces Pension Act No. 103 of the same year. Other Pension Acts, including the NSITF established by Decree No. 73 of 1993, were established prior to the Pension Reform Act of 2004.

Problems of The 1979 Pension Act (The Old Scheme)

The problems associated with the 1979 Pensions Act were mainly on implementation. Just prior to the enactment of the 2004 Pension Reform Act (PRA), Legalbrief Africa (2004) observed that the collection of retirement benefits in Nigeria had continued to cause a lot of sufferings to retirees, their dependants and nexts-of-kin, especially the retirees in the public sector of the economy. He added that there were reports of many beneficiaries who died in retirement benefit queues after waiting for days, without food or water, to collect their benefits. Still on the same situation, Ezeala (2004) added that the issue of rewarding Nigerian workers

after years of active service had been a source of concern to the various tiers of government. He observed that in a country where life expectancy approximates to the commencement of real active life in other climes, the issue of pension and gratuity had become even more challenging; and that many died even before they were due for retirement while some others slumped and died on queues while waiting to process their pension and gratuity.

In tracing the problems that made the old pension scheme unpopular, Odia and Okoye (2012) cited demographic challenges, funding of outstanding pensions and gratuities, administrative bottlenecks, bureaucracies, corrupt tendencies and inefficiencies in the public service as some of the challenges that led to the non-payment of pension and gratuity benefits as and when due.

Orifowomo (2006) cited the comments of Professor Julius Ihonvbere, the then Special Adviser to the President on Policy and Programme Monitoring as saying that despite efforts made by the Federal Government to mop up the backlog of the liabilities, it still owed about ₦2 trillion to its workers. In December 2005, the Director-General of National Pension Commission reportedly put the Federal Government's pension liability at ₦2.56 trillion. Retired Federal Ministry and Parastatal workers were owed ₦2 trillion, while the accumulated pension arrears for military, police and paramilitary retirees amounted to ₦56 billion.

As laudable as all the arguments were, a fundamental problem that appeared not to have received a deserved attention is the fact that the issue of actuarial valuation appeared not to have been advised from the onset or commencement of the implementation of the 1979 Act. An actuarial valuation at the commencement of a pension scheme would have informed the sponsors, Federal and State governments of all the liabilities for past and future services and the proper amortization schedules for the unfunded liabilities which continued to mount from year to year. These were consequences of not seeking actuarial advice before the take-off of the 1979 pensions.

Actuarial valuations were also supposed to have been subsequently carried out, at least, triennially or even after any special salary award/escalation to determine the new funding rate created by such awards/escalation so that Government would know its liability each time. About 1994, it was discovered that the Boards and Parastatals under the Federal Ministry of Health were operating the 1979 Pension scheme as an Endowment Assurance scheme, advising the government to be paying 25% of staff salaries 'into the fund of selected Insurance companies' as advised by their Insurance Broker (not by an Actuary). Other Boards and Parastatals may have been similarly involved.

Despite the wrong committed in the determination of the funding level, there was also the issue of near-lack of funding. The corrupt tendencies of those who were involved with the monies did not help matters. At the end, stories of lack of funding, lack of payment of pensioners' benefits etc, were commonplace.

The Pension Reform Act 2004 – The Chilean Model

The foregoing crisis associated with the running of the old pension scheme necessitated the enactment of the Pension Reform Act in 2004 which was a carbon-copy of the pension and social security scheme operated in Chile. While Nigerians are still commending this scheme with little or no complains, Dostal and Cassey (2007) have been cited by Odia and Okoye to have noted that Nigerian Government went ahead to emulate and copy the Chilean model of pension and social security at a time that the government of Chile was about changing to an alternative pension model because of the criticism by supporters of the scheme. Similarly, the World Bank had concluded that the reform model of Chile had not, from the beginning, delivered the anticipated benefits due to the too many assumptions embodied in the planning. The extent to which this model – the new pension scheme – will be better or otherwise in terms of financial benefits (the take-home benefits in the pockets of the retirees) is what this paper intends to show.

COMPARISON BETWEEN THE OLD AND NEW PENSION SCHEMES (Provisions)

In the Table of Pensions and Gratuity attached to the Pensions Act 1979, employees become entitled to Gratuity in their fifth year of service, and to pension in their tenth year. Thus at the end of five years of service, an employee covered under the 1979 Pensions Act becomes entitled to 100% of his annual emolument as gratuity in that year if he ceases to work for the employer. Similarly he becomes entitled to pension after completing 10 years of service. After 35 or more years of service, he becomes entitled to 300% of his last annual emolument as gratuity and 80% of same salary as his annual pension. We are concerned with pension and gratuity only in this paper and the foregoing are the main issues the average Nigerian is more concerned with.

With the Pension Reform Act 2004, the 'pension' and 'gratuity' to be received by a retiring employee will depend on the accumulated contribution at the date of retirement. The Act provides for 25% of the accumulated contribution to be paid lump sum (as gratuity) and the balance of 75% to purchase annuity from an insurance company or the like and be paid as pension.

FORMULAE AND METHODOLOGY

Let l_x represent the number of lives, who, according to the mortality table, survive to age X in service next birthday.

The probability that a life aged X will survive to age

$X + t$ is denoted by $\frac{l_{x+t}}{l_x}$ which is also denoted

by ${}_tP_x$.

The value of ₦1 (one Naira) payable annually for n years can be discounted to the present time at

interest rate i with value as $(1+i)^{-n}$ which is also denoted as v^n .

Hence $(1+i)^{-n} = v^n$.

The present value at age X of N1 (one Naira) paid to a life every year he survives is the sum of all the probabilities that he survives each year, multiplied by N1 for each of the years, (i.e. his expectation), discounted to the present age X and is given by

$$\sum_{t=0}^{\infty} v^t {}_tP_x = \frac{1}{l_x} \sum_{t=0}^{\infty} v^t l_{x+t} = \sum_{t=0}^{\infty} \frac{v^{x+t} l_{x+t}}{v^x l_x} \dots\dots\dots(1)$$

We define $v^x l_x = D_x$ and

$$D_{x+t} = v^{x+t} l_{x+t}.$$

Hence equation (1) can be written as $\sum_{t=0}^{\infty} \frac{D_{x+t}}{D_x}$ (2)

Again, we define $\bar{D}_x = \frac{1}{2}(D_x + D_{x+1})$

and $\sum_{t=0}^{\infty} D_{x+t} = N_x$.

Similarly, we define $\sum_{t=0}^{\infty} \bar{D}_{x+t} = \bar{N}_x$.

We introduce the salary scale function on the bases that whatever type of earnings is involved, the salary scale will provide a basis for the projection of

future earnings. The type of function used in practice is a relative scale representing the ratio of average annual earnings in each future year to present average annual earnings. It consists of a series of numbers S_x defined for all X such that, for a group of members of exact age X , S_{x+t} / S_x is the assumed ratio of the average earnings in the year of age $X + t$ to $X + t + 1$ to the average earnings in year of age X to $X + 1$.

This scale in practice usually covers (i) those increases which would, on average, be expected because of the progress of individuals within their career if overall levels of earnings remained stable, and (ii) increases representing changes in the general levels of earnings on account of inflation.

We then have $s_{x-1} D_x = {}^s D_x$ and

$$s_x N_x = {}^s N_x.$$

The present value of future contribution for members aged X nearest birthday is given by

$${}^s \bar{N}_x / {}^s D_x.$$

LIFE ANNUITY: A life annuity, or annuity, is a series of payments made at equal intervals of time, normally yearly, if not otherwise stated, during the lifetime of a given life.

For a life aged X , the 'immediate' life annuity is

given by $a_x = \sum_{t=1}^{\infty} \frac{D_{x+t}}{D_x} = \frac{N_{x+1}}{D_x}$.

Hence the value of an immediate annuity at age 60 is denoted as a_{60} .

In this exercise, we will restrict ourselves to pension and gratuity only. We will not include deferred pension benefits since the analysis is easily adapted to include deferred benefits.

Assumptions:

An interest rate of 3% is assumed. It is believed that this will not affect the result of our comparison since the same rate is applied in the old and new pension calculations.

The mortality table used is the a(55) which is used by the Institute of Actuaries (UK).

In calculating the pension amount payable under the New Pension Act 2004, 75% of the accumulated contribution at retirement is divided by the sum of two values discounted to the retirement age of 60:

(a) $a_{\overline{5}|} = \frac{1 - v^5}{i}$ for $i = 3\%$ to take care of the 5-year annuity certain, and

(b) $\frac{D_{65}}{D_{60}} \ddot{a}_{65} = \frac{D_{65}}{D_{60}} a_{65} + \frac{1}{2}$ for the present value at age 60 of a life annuity due commencing at the end of the certain period at 65. Their combined value is 8.2470.

We choose three different groups of employees. A stable staff age distribution is assumed to follow the normal distribution, gradually rising in staff strength with increasing age and declining about the same rate.

The current years of service is randomly generated and does not exceed the difference between the radix age of employment (age 20) and the current age.

Three different sets of employee data are used; two sets had employees with past service benefits while the employees of the third set are all assumed to have been employed in the year of commencement of the scheme, hence no past service benefits were granted.

All the employees are assumed to have remained in employment to their retirement ages and retired with their benefits – gratuity and pensions for those so entitled.

The gratuity rate in relation to pension yearly payment (from attached table, APPENDIX “A”) gives a ratio of 3.6:1 in the Old Pension scheme. Hence if the pension rate is X, the gratuity rate is 3.6 X.

The statistical test of significance is done to ascertain if there is a significant difference between the results of the old and new pension schemes.

Past service contributions are estimated as a ratio of mean past service salaries to current salaries to represent the average salaries for previous years. The rates are chosen from a random sample of employees in long-existing Federal and private establishments.

An accumulation rate is given by $s_{\overline{n}|} = (1 + i)^{n-1} + (1 + i)^{n-2} + \dots + 1$.

Future Contributions

The earnings expected to be received during the year of age y to y+1 by a member now aged X are $(AS) s_y / s_{x-1}$ where AS is the member’s annual emolument

The **accumulated value** of a contribution equal to 15% of earnings is thus given by

$$(.15)(AS) \frac{\sum_{t=0}^{60-x} v_{x+t+1/2} s_{x+t} + l_{x+t+\frac{1}{2}}}{s D_{60-x}}$$

Where past service benefit has been estimated, the resulting benefits are added to the future benefits.

The 15% of the salary of each employee is estimated using the above formula. The value so obtained is then divided into two: 25% of the total

(past and future benefits) is calculated to be paid as gratuity under the New Pension Scheme while the balance of 75% is used to pay for a life annuity with five years certain period.

For the Old Pension Scheme, the percentages for Pension and Gratuity as contained in Appendix "A" (of the 1979 Pension Decree) are applied to the estimated salaries.

For each set of employees, retirement benefits are calculated for every employee under the Old and New schemes.

The ratios of the Gratuity (Old scheme Vs New scheme) are calculated in each case.

Statistical Analysis: Test of Significance.

The benefits under the Old and the New Pension Schemes were subjected to the Student's t-distribution test to determine if the differences in the benefits were significant, using significance levels of 0.05 and 0.01. We assumed (in our null hypotheses) that there were no differences between the gratuities calculated under the old and the new pension plans, and also the pensions benefits under the old and new plans within each group of employees.

The t-score used is given by the equation:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sigma \sqrt{1/N_1 + 1/N_2}}$$

where $\sigma = \sqrt{\frac{N_1 s_1^2 + N_2 s_2^2}{N_1 + N_2 - 2}}$,

and where the sigma is the estimate of the population standard deviation and N_1 and N_2 are the sample sizes with two degrees of freedom.

RESULTS OF THE ANALYSES

1. From the calculations of the pension benefits for the three groups of employees,

the ratio of the OLD PENSION SCHEME to THE NEW PENSION SCHEME is as follows:

Group 1

Old Gratuity/New Gratuity = 3.27 :

1. Old Pension/New Pension = 2.4 : 1

Group 2

Old Gratuity/New Gratuity = 5.55 :

1. Old Pension/New Pension = 4.1 : 1

Group 3

Old Gratuity/New Gratuity = 3.60 :

1. Old Pension/New Pension = 2.4 : 1

2. The Tests of Hypotheses showed that there were very significant differences between the benefits paid using the provisions of the Old Pension (The Pension Decree of 1979, No. 102) and those of the New Pension (The Pension Reform Act of 2004) as all the calculated t-values (13.42, 12.89, 7.50, 6.61, 7.50 & 4.86) were far greater than the tabulated t-values at 0.01 and 0.05 levels and the appropriate degrees of freedom.
3. Our null hypothesis that there was no significant difference in each case was rejected and the alternative hypothesis that there were significant differences was accepted.

CONCLUSION

The Pension Reform Act, 2004 was introduced with good intentions. It was designed to ensure that retirees get their retirement benefits without the type of undue delay and the horrible experiences highlighted by many writers and mentioned above.

However, the overall cash benefits to the retirees with the New Scheme is considerably less than that

provided by the Old Scheme in both the gratuities and pension payments. The ratios in the above table indicates that the Old Gratuity benefits are over three times more than the New Gratuities while the Pension benefits of the Old Scheme are about two and a half times more than those of the New Scheme.

The old pension scheme which is the Defined Benefit type is known to be more expensive to the plan sponsor because of the actuarial and other incidental costs.

With the new scheme, funds are accumulated over a long period of time. The investment income earned by the fund depends on the investment performance of the fund. A good performance will enhance the accumulated value of the contributions and hence the values to be earned as pension.

If retirement benefits were being paid to retirees as at when due, the old scheme would have been better for them than the new scheme.

If the Old Pension Scheme had been actuarially valued at its commencement and subsequently, triennially, as required by law, this would have ensured adequate funding. In terms of benefits to retirees, it is better than the new scheme. Another problem with the old scheme is coverage. It covered mainly civil servants. Government could extend the coverage to include private sector employees on contributory basis rather than non-contributory.

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			TABLE 1B		FUTURE SERVICE CONTRIBUTION						
1	2	3	4	5	6	7	8	9	10	11	12
		Ann. Sal.	Ann. Salary	Duration			contrib	Estimated contr.	Estimated Salary	Salary per	Pension Contrib.
AGE	No. of	of each	for all Ees	to	${}^s D_x$	${}^s \bar{N}_x$	functions	with interest	for each age	Employee at	(by 2004 Act)
(x)	Ees	Ee(N'000)		Retirem't			${}^s \bar{N}_x - {}^s \bar{N}_{60}$	& survivorship	group at age	age 60	at 15% sal
		col. 2 x col. 3	60 - (1)				${}^s D_{60}$	benefit	col. 9 x 1000	(col.10/col2)	(col. 11*15%)
								col.4 x col.8			
20	30	2,400.00	72,000.00	35	58,889	2,479,326	45	3,248,352	3,248,352,000	108,278,400	16,241,760
25	20	2,800.00	56,000.00	35	58,889	2,192,668	52	2,889,534	2,889,534,350	144,476,718	21,671,508
25	35	3,000.00	105,000.00	35	58,889	2,192,668	52	5,417,877	5,417,876,906	154,796,483	23,219,472
30	30	3,000.00	90,000.00	30	63,842	1,876,233	44	3,936,549	3,936,548,855	131,218,295	19,682,744
35	20	3,200.00	64,000.00	25	66,358	1,542,409	35	2,268,681	2,268,680,940	113,434,047	17,015,107
35	15	3,400.00	51,000.00	25	66,358	1,542,409	35	1,807,855	1,807,855,124	120,523,675	18,078,551
35	5	6,800.00	34,000.00	25	66,358	1,542,409	35	1,205,237	1,205,236,749	241,047,350	36,157,102
40	20	3,400.00	68,000.00	20	65,213	1,207,315	27	1,844,521	1,844,520,689	92,226,034	13,833,905
40	10	3,600.00	36,000.00	20	65,213	1,207,315	27	976,511	976,510,953	97,651,095	14,647,664
45	20	3,400.00	68,000.00	15	61,350	886,357	19	1,302,443	1,302,442,700	65,122,135	9,768,320
45	30	3,600.00	108,000.00	15	61,350	886,357	19	2,068,585	2,068,585,465	68,952,849	10,342,927
45	5	6,000.00	30,000.00	15	61,350	886,357	19	574,607	574,607,074	114,921,415	17,238,212
50	30	4,000.00	120,000.00	10	55,356	591,313	12	1,419,056	1,419,056,182	47,301,873	7,095,281
50	35	5,000.00	175,000.00	10	55,356	591,313	12	2,069,457	2,069,456,932	59,127,341	8,869,101
55	5	10,000.00	50,000.00	5	47,605	331,575	5	268,714	268,713,675	53,742,735	8,061,410
55	10	6,000.00	60,000.00	5	47,605	331,575	5	322,456	322,456,411	32,245,641	4,836,846
60	10	6,000.00	60,000.00	0	40,262	115,196	0	0	60,000,000	6,000,000	900,000
60	5	6,200.00	31,000.00	0	40,262	115,196	0	0	31,000,000	6,200,000	930,000
60	5	10,000.00	50,000.00	0	40,262	115,196	0	0	50,000,000	10,000,000	1,500,000
										1,667,266,086	250,089,913

TABLE 1D :- CALCULATION OF PENSION & GRATUITY UNDER OLD SCHEME.

1	2	3	4	5	6	7	8	9	10	11
AGE	Ann. Sal. of each Ee (N'000)	No. of years to Retire (35 yrs max)	FINAL SALARY AT AGE 60	No. of past service yrs	Future years of service	Total Service Years	Age Pension Percentage Rate (%)	Gratuity Percentage Rate (%)	GRATUITY payable at age 60 (OLD PENSION ACT) (col.4 x col.9)/100	ANNUALPENSION payable from from age 60 (col.4 x col.8)/100
20	2,400	35	6,753,270	0	40	40	80	300	20,259,810	5,402,616
25	2,800	35	7,878,815	4	35	39	80	300	23,636,445	6,303,052
25	3,000	35	8,441,587	5	35	40	80	300	25,324,762	6,753,270
30	3,000	30	7,281,787	6	30	36	80	300	21,845,362	5,825,430
35	3,200	25	6,700,089	6	25	31	72	268	17,956,240	4,824,064
35	3,400	25	7,118,845	4	25	29	68	252	17,939,489	4,840,815
35	6,800	25	14,237,690	10	25	35	80	300	42,713,070	11,390,152
40	3,400	20	6,140,778	19	20	39	80	300	18,422,335	4,912,623
40	3,600	20	6,502,000	24	20	44	80	300	19,506,001	5,201,600
45	3,400	15	5,297,089	23	15	38	80	300	15,891,268	4,237,671
45	3,600	15	5,608,683	21	15	36	80	300	16,826,048	4,486,946
45	6,000	15	9,347,804	23	15	38	80	300	28,043,413	7,478,244
50	4,000	10	5,375,666	26	10	36	80	300	16,126,997	4,300,532
50	5,000	10	6,719,582	31	10	41	80	300	20,158,746	5,375,666
55	10,000	5	11,592,741	28	5	33	76	284	32,923,384	8,810,483
55	6,000	5	6,955,644	37	5	42	80	300	20,866,933	5,564,516
60	6,000	0	6,000,000	30	0	30	70	260	15,600,000	4,200,000
60	6,200	0	6,200,000	39	0	39	80	300	18,600,000	4,960,000
60	10,000	0	10,000,000	33	0	33	76	284	28,400,000	7,600,000
			144,152,071						421,040,302	112,467,679

TABLE 1E:COMPARISON OF OLD & NEW GRATUITY & PENSION						
1	2	3	4	5	6	7
AGE(X)	GRATUTY	GRATUITY	RATIO	PENSION	PENSION	RATIO
	OLD SCHEME	NEW SCHEME	OLD V NEW	OLD SCHEME	NEW SCHEME	OLD V NEW
20	20,259,810	4,060,440	4.99	5,402,616	1,477,061	3.66
25	23,636,445	6,404,698	3.69	6,303,052	2,329,828	2.71
25	25,324,762	7,118,590	3.56	6,753,270	2,589,520	2.61
30	21,845,362	6,274,006	3.48	5,825,430	2,282,287	2.55
35	17,956,240	5,498,988	3.27	4,824,064	2,000,360	2.41
35	17,939,489	5,411,273	3.32	4,840,815	1,968,451	2.46
35	42,713,070	13,043,626	3.27	11,390,152	4,744,862	2.40
40	18,422,335	6,586,819	2.80	4,912,623	2,396,078	2.05
40	19,506,001	7,699,658	2.53	5,201,600	2,800,894	1.86
45	15,891,268	5,617,354	2.83	4,237,671	2,043,417	2.07
45	16,826,048	5,655,434	2.98	4,486,946	2,057,270	2.18
45	28,043,413	9,912,978	2.83	7,478,244	3,606,030	2.07
50	16,126,997	5,217,337	3.09	4,300,532	1,897,904	2.27
50	20,158,746	7,216,644	2.79	5,375,666	2,625,189	2.05
55	32,923,384	9,866,536	3.34	8,810,483	3,589,136	2.45
55	20,866,933	7,192,805	2.90	5,564,516	2,616,517	2.13
60	15,600,000	4,572,000	3.41	4,200,000	1,663,150	2.53
60	18,600,000	5,219,625	3.56	4,960,000	1,898,736	2.61
60	28,400,000	8,233,125	3.45	7,600,000	2,994,953	2.54
	421,040,302	130,801,938	62.09	112,467,679	47,581,643	45.60
			3.27			2.40

TABLE 2A: PAST SERVICE CONTRIBUTION - NEW PENSION SCHEME											
1	2	3	4	5	6	7	8	9	10	11	12
						Current					
	Current	Current	Yrs of Past	Ratio of mean	Total salary	Duration to	Accum of	ESTIMATED	Contrib. to	PAST SERVICE	
	No. of	Monthly	Ann. Sal.	service/Ee	past sal. To	for past serv.	Retirement	col. 7 to Ret.	SALARY	new pension	CONTRIBUTION
AGE	Ees	Sal./Ee	per Ee	in age group	current sal.	cols. 2x4x5x6	60/55-col. 1	@ 3% int. rate	AT RETIREMENT	at 15%	PER EMPLOYEE
		(N'000)	(N'000)			(N'000)		(N'000)	col.9*1000		at 15%
								(7)*(1.03)^(8)			
20	15	35	420	0	1	-	35	-	-	-	-
23	12	65	780	0	1	-	35	-	-	-	-
25	10	138	1,656	0	1	-	35	-	-	-	-
25	8	150	1,800	3	0.835	36,072	35	101,502	101,501,646	15,225,247	1,903,156
30	53	165	1,980	4	0.835	350,500	30	850,755	850,754,525	127,613,179	2,407,796
30	28	176	2,112	3	0.835	148,136	30	359,564	359,564,177	53,934,627	1,926,237
35	23	190	2,280	7	0.7925	290,911	25	609,103	609,102,822	91,365,423	3,972,410
40	61	205	2,460	12	0.755	1,359,544	20	2,455,487	2,455,486,970	368,323,045	6,038,083
40	85	215	2,580	5	0.835	915,578	20	1,653,635	1,653,634,809	248,045,221	2,918,179
43	35	230	2,760	15	0.7413	1,074,144	17	1,775,396	1,775,395,871	266,309,381	7,608,839
45	33	310	3,720	22	0.695	1,877,000	15	2,924,305	2,924,305,464	438,645,820	13,292,298
50	5	356	4,272	29	0.64	396,442	10	532,784	532,784,360	79,917,654	15,983,531
50	18	370	4,440	25	0.6575	1,313,685	10	1,765,483	1,765,482,789	264,822,418	14,712,357
50	14	400	4,800	18	0.7225	873,936	10	1,174,497	1,174,496,905	176,174,536	12,583,895
55	8	410	4,920	30	0.64	755,712	5	876,077	876,077,329	131,411,599	16,426,450
55	9	430	5,160	28	0.645	838,706	5	972,291	972,290,585	145,843,588	16,204,843
60	15	460	5,520	33	0.638	1,743,271	0	1,743,271	1,743,271,200	261,490,680	17,432,712
60	8	475	5,700	37	0.62	1,046,064	0	1,046,064	1,046,064,000	156,909,600	19,613,700
										2,826,032,018	153,024,485

TABLE 2B: FUTURE SERVICE CONTRIBUTION - NEW PENSION SCHEME												
1	2	3	4	5	6	7	8	9	10	11	12	13
		Current	Current		Current			Contrib.				
		Monthly	Ann. Sal.	Duration	Total salary			Function	Accum to age	ESTIMATED	ESTIMATED	Contrib. to
	No. of	salary/Ee	of each Ee	to Retire't	for age group			$\frac{s\bar{N}_x - s\bar{N}_0}{sD_0}$	Ret. With int.	ANNUAL SALARY	ANNUAL SALARY	pension per
AGE	Ees	N'000	in age group	60/55-col.1	(N'000)	sD_x	$s\bar{N}_x$	$\frac{s\bar{N}_x - s\bar{N}_0}{sD_0}$	& SURVIVORSH	AT RETIREMENT	AT RETIREMENT	Ee at 15% SAL
		(N'000)		col.3 x col.4					col. (6 x 9)	col. 10 *1000	PER EMPLOYEE	(9)*.15*1000/(2)
									(N'000)		col.11 ÷ col. 2	
20	15	35	420	35	6,300	55,368	2,479,326	45	283,500	283,500,000	18,900,000	2,835,000
23	12	65	780	35	9,360	56,015	2,312,159	48	449,280	449,280,000	37,440,000	5,616,000
25	10	138	1,656	35	16,560	58,889	2,192,668	52	854,477	854,476,586	85,447,659	12,817,149
25	8	150	1,800	35	14,400	58,889	2,192,668	52	743,023	743,023,119	92,877,890	13,931,683
30	53	165	1,980	30	104,940	63,842	1,876,233	44	4,590,016	4,590,015,965	86,604,075	12,990,611
30	28	176	2,112	30	59,136	63,842	1,876,233	44	2,586,575	2,586,575,034	92,377,680	13,856,652
35	23	190	2,280	25	52,440	66,358	1,542,409	35	1,858,900	1,858,900,445	80,821,758	12,123,264
40	61	205	2,460	20	150,060	65,213	1,207,315	27	4,070,423	4,070,423,157	66,728,248	10,009,237
40	85	215	2,580	20	219,300	65,213	1,207,315	27	5,948,579	5,948,579,224	69,983,285	10,497,493
43	35	230	2,760	17	96,600	63,178	1,012,228	22	2,152,235	2,152,235,140	61,492,433	9,223,865
45	33	310	3,720	15	122,760	61,350	886,357	19	2,351,292	2,351,292,145	71,251,277	10,687,692
50	5	356	4,272	10	21,360	55,356	591,313	12	252,592	252,592,000	50,518,400	7,577,760
50	18	370	4,440	10	79,920	55,356	591,313	12	945,091	945,091,417	52,505,079	7,875,762
50	14	400	4,800	10	67,200	55,356	591,313	12	794,671	794,671,462	56,762,247	8,514,337
55	8	410	4,920	5	39,360	47,605	331,575	5	211,531	211,531,405	26,441,426	3,966,214
55	9	430	5,160	5	46,440	47,605	331,575	5	249,581	249,581,262	27,731,251	4,159,688
60	15	460	5,520	0	82,800	40,262	115,196	0	82,800	82,800,000	5,520,000	828,000
60	8	475	5,700	0	45,600	40,262	115,196	0	45,600	45,600,000	5,700,000	855,000
											989,102,708	148,365,406

TABLE 2C : SUMMARY OF CONTRIBUTIONS - 2004 PENSION & GRATUITY CALCULATIONS							
1	2	3	4	5	6	7	8
AGE	Ann. Sal. of each Ee ('000)	PAST SERVICE CONTRIBUTION OF 15%	FUTURE SERVICE CONTRIBUTION OF 15%	GRAND TOTAL CONTRIBUTIONS PER EMPLOYEE col. 3 + col. 4	25% G. TOTAL AS GRATUITY (2004 RP ACT) col. 5 * 25%	75% PAYABLE AS PENSION 2004 RP ACT col.5 * 75%	AMOUNT OF ANNUAL PENSION col.7/8.2470
20	420,000	-	2,835,000	2,835,000	708,750.00	2,126,250.00	257,821.03
23	780,000	-	5,616,000	5,616,000	1,404,000.00	4,212,000.00	510,731.17
25	1,656,000	-	12,817,149	12,817,149	3,204,287.20	9,612,861.60	1,165,619.21
25	1,800,000	1,903,156	13,931,683	15,834,839	3,958,709.84	11,876,129.51	1,440,054.51
30	1,980,000	2,407,796	12,990,611	15,398,407	3,849,601.76	11,548,805.29	1,400,364.41
30	2,112,000	1,926,237	13,856,652	15,782,889	3,945,722.16	11,837,166.47	1,435,330.00
35	2,280,000	3,972,410	12,123,264	16,095,673	4,023,918.37	12,071,755.11	1,463,775.33
40	2,460,000	6,038,083	10,009,237	16,047,320	4,011,830.00	12,035,489.99	1,459,377.95
40	2,580,000	2,918,179	10,497,493	13,415,672	3,353,917.96	10,061,753.87	1,220,050.18
43	2,760,000	7,608,839	9,223,865	16,832,704	4,208,176.08	12,624,528.25	1,530,802.50
45	3,720,000	13,292,298	10,687,692	23,979,989	5,994,997.28	17,984,991.85	2,180,792.03
50	4,272,000	15,983,531	7,577,760	23,561,291	5,890,322.70	17,670,968.10	2,142,714.70
50	4,440,000	14,712,357	7,875,762	22,588,118	5,647,029.60	16,941,088.79	2,054,212.29
50	4,800,000	12,583,895	8,514,337	21,098,233	5,274,558.13	15,823,674.38	1,918,718.85
55	4,920,000	16,426,450	3,966,214	20,392,664	5,098,165.94	15,294,497.83	1,854,552.91
55	5,160,000	16,204,843	4,159,688	20,364,531	5,091,132.70	15,273,398.09	1,851,994.43
60	5,520,000	17,432,712	828,000	18,260,712	4,565,178.00	13,695,534.00	1,660,668.61
60	5,700,000	19,613,700	855,000	20,468,700	5,117,175.00	15,351,525.00	1,861,467.81
							-
	COL TOTALS	153,024,485	148,365,406	301,389,891	75,347,472.70	226,042,418.11	27,409,047.91

TABLE 2D : CALCULATION OF PENSION & GRATUITY UNDER OLD PENSION SCHEME									
1	2	3	4	5	6	7	8	9	10
	Ann. Sal. of each Ee (N'000)	No. of yrs. of past service	Years of Future service	Maximum service yrs	ESTIMATED SALARY AT RETIREMENT	Age Pension Percentage Rate (%)	Gratuity Percent Rate (%)	GRATUITY payable at Retirement Old Pension Act (cols.6*8)/100	PENSION payable at Retirement Old Pension Act (cols. 6*7)/100
20	420,000	0	40	35	1,181,822	80	300	3,545,467	945,458
23	780,000	0	37	35	2,194,813	80	300	6,584,438	1,755,850
25	1,656,000	0	35	35	4,659,756	80	300	13,979,269	3,727,805
25	1,800,000	3	35	35	5,064,952	80	300	15,194,857	4,051,962
30	1,980,000	4	30	34	5,409,172	78	292	15,794,784	4,219,155
30	2,112,000	3	30	33	5,601,732	76	284	15,908,919	4,257,316
35	2,280,000	7	25	32	5,871,189	74	276	16,204,481	4,344,680
40	2,460,000	12	20	32	6,334,704	74	276	17,483,782	4,687,681
40	2,580,000	5	20	25	5,401,947	60	220	11,884,284	3,241,168
43	2,760,000	15	17	32	7,107,228	74	276	19,615,950	5,259,349
45	3,720,000	22	15	35	10,467,568	80	300	31,402,705	8,374,055
50	4,272,000	29	10	35	12,020,820	80	300	36,062,461	9,616,656
50	4,440,000	25	10	35	12,493,549	80	300	37,480,648	9,994,839
50	4,800,000	18	10	28	10,982,053	66	244	26,796,209	7,248,155
55	4,920,000	30	5	35	13,844,203	80	300	41,532,610	11,075,363
55	5,160,000	28	5	33	13,686,050	76	284	38,868,382	10,401,398
60	5,520,000	33	0	33	14,640,891	76	284	41,580,129	11,127,077
60	5,700,000	37	0	35	16,039,016	80	300	48,117,048	12,831,213
								438,036,421	117,159,179

TABLE 2E: COMPARISON OF THE PENSION & GRATUITY BENEFITS BETWEEN THE OLD & NEW PENSION SCHEMES

1	2	3	4	5	6	7
AGE (X)	GRATUITY	GRATUITY	RATIO	PENSION	PENSION	RATIO
	OLD SCHEME	NEW SCHEME	OLD/NEW	OLD SCHEME	NEW SCHEME	OLD/NEW
20	3,545,467	708,750	5.00	945,458	257,821	3.67
23	6,584,438	1,404,000	4.69	1,755,850	510,731	3.44
25	13,979,269	3,204,287	4.36	3,727,805	1,165,619	3.20
25	15,194,857	3,958,710	3.84	4,051,962	1,440,055	2.81
30	15,794,784	3,849,602	4.10	4,219,155	1,400,364	3.01
30	15,908,919	3,945,722	4.03	4,257,316	1,435,330	2.97
35	16,204,481	4,023,918	4.03	4,344,680	1,463,775	2.97
40	17,483,782	4,011,830	4.36	4,687,681	1,459,378	3.21
40	11,884,284	3,353,918	3.54	3,241,168	1,220,050	2.66
43	19,615,950	4,208,176	4.66	5,259,349	1,530,803	3.44
45	31,402,705	5,994,997	5.24	8,374,055	2,180,792	3.84
50	36,062,461	5,890,323	6.12	9,616,656	2,142,715	4.49
50	37,480,648	5,647,030	6.64	9,994,839	2,054,212	4.87
50	26,796,209	5,274,558	5.08	7,248,155	1,918,719	3.78
55	41,532,610	5,098,166	8.15	11,075,363	1,854,553	5.97
55	38,868,382	5,091,133	7.63	10,401,398	1,851,994	5.62
60	41,580,129	4,565,178	9.11	11,127,077	1,660,669	6.70
60	48,117,048	5,117,175	9.40	12,831,213	1,861,468	6.89
			99.99			73.52
	438,036,421	75,347,473	5.81	117,159,179	27,409,048	4.27
			5.5549025			4.084514

TABLE 3A: PROJECTION OF FUTURE BENEFITS - (NO PAST SERVICE BENEFITS)													
1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Current	Current	Current	Duration	COMMUTATION FUNCTIONS							
AGE	No. of	Monthly Sal.	Annual	Total annual	to Retire't					$\frac{s\bar{N}_x - s\bar{N}_0}{sD_0}$	Projected sal with	Estimated sal.	2004 Pen. Act
x	Ees	of each	Salary of	sal in age	age (35yrs	$S_{x }$	D_x	$S_{x+1}D_x$	$S\bar{N}_x$	or $\frac{sD_0}{sD_{55}}$	int. & surviv'ship	per Ee in age	Contribution
		Ee (N'000)	each Ee N'000)	group(N'000)	max serv.)						benefit at age 60.	group at Ret.	at 15% of sal.
				(cols.2*4)							(col.4 x col.11)	(col.12/col.2)	col.13 x 15%
20	3	18	216	648	35	1,000	55,368	55,368	2,479,326	45.12	29,237,760	9,745,920	1,461,888
20	4	25	300	1,200	35	1,000	55,368	55,368	2,479,326	45.12	54,144,000	13,536,000	2,030,400
25	7	30	360	2,520	35	1,404	41,944	58,889	2,192,668	52.58	132,500,555	18,928,651	2,839,298
25	8	130	1,560	12,480	35	1,404	41,944	58,889	2,192,668	52.58	656,193,226	82,024,153	12,303,623
27	21	150	1,800	37,800	33	1,594	38,334	61,104	2,068,719	49.44	1,868,926,866	88,996,517	13,349,478
30	50	189	2,268	113,400	30	1,864	34,250	63,842	1,876,233	44.57	5,054,329,068	101,086,581	15,162,987
33	41	275	3,300	135,300	27	2,116	31,126	65,863	1,677,126	39.53	5,348,615,044	130,454,025	19,568,104
35	55	320	3,840	211,200	25	2,274	29,181	66,358	1,542,409	36.12	7,628,948,536	138,708,155	20,806,223
38	34	268	3,216	109,344	22	2,496	26,457	66,037	1,340,416	31.01	3,390,712,857	99,726,849	14,959,027
40	17	281	3,372	57,324	20	2,634	24,758	65,213	1,207,315	27.64	1,584,486,081	93,205,064	13,980,760
43	12	345	4,140	49,680	17	2,826	22,356	63,178	1,012,228	22.70	1,127,902,350	93,991,863	14,098,779
45	6	850	10,200	61,200	15	2,944	20,839	61,350	886,357	19.52	1,194,478,834	199,079,806	29,861,971
45	8	510	6,120	48,960	15	2,944	20,839	61,350	886,357	19.52	955,583,067	119,447,883	17,917,183
50	5	492	5,904	29,520	10	3,204	17,277	55,356	591,313	12.05	355,723,060	71,144,612	10,671,692
53	3	670	8,040	24,120	7	3,336	15,259	50,904	430,696	7.99	192,601,048	64,200,349	9,630,052
55	6	705	8,040	24,120	5	3,414	13,944	47,605	331,575	5.48	132,091,354	22,015,226	3,302,284
60	10	812	8,040	24,120	0	3,684	10,725	39,511	115,196	0.00	24,120,000	2,412,000	361,800
													202,305,548
	290											1,348,703,654	

TABLE 3B: CALCULATION OF GRATUITY & PENSION UNDER PENSION REFORM ACT 2004.								
1	2	3	6	7	8	9	10	11
		Current annual	Duration to	Estimated sal.	Contribution	GRATUITY:	75% BALANCE	Amount of
AGE	No. of	Salary of	Retirement	per Employee	to pension	25% of Col. 8	TO BE PAID	ANNUAL
x	Ees	each Ee N'000)	age (35 yrs	at Retirement	at 15% of sal.	(2004 Pen Act)	AS PENSION	PENSION/EE
			max. serv.)			(col.8*0.25)	(col. 8*0.75)	(col.10/8.2470)
20	3	216	35	9,745,920	1,461,888	365,472	1,096,416	132,947
20	4	300	35	13,536,000	2,030,400	507,600	1,522,800	184,649
25	7	360	35	18,928,651	2,839,298	709,824	2,129,473	258,212
25	8	1,560	35	82,024,153	12,303,623	3,075,906	9,227,717	1,118,918
27	21	1,800	33	88,996,517	13,349,478	3,337,369	10,012,108	1,214,030
30	50	2,268	30	101,086,581	15,162,987	3,790,747	11,372,240	1,378,955
33	41	3,300	27	130,454,025	19,568,104	4,892,026	14,676,078	1,779,566
35	55	3,840	25	138,708,155	20,806,223	5,201,556	15,604,667	1,892,163
38	34	3,216	22	99,726,849	14,959,027	3,739,757	11,219,270	1,360,406
40	17	3,372	20	93,205,064	13,980,760	3,495,190	10,485,570	1,271,440
43	12	4,140	17	93,991,863	14,098,779	3,524,695	10,574,085	1,282,173
45	6	10,200	15	199,079,806	29,861,971	7,465,493	22,396,478	2,715,712
45	8	6,120	15	119,447,883	17,917,183	4,479,296	13,437,887	1,629,427
50	5	5,904	10	71,144,612	10,671,692	2,667,923	8,003,769	970,507
53	3	8,040	7	64,200,349	9,630,052	2,407,513	7,222,539	875,778
55	6	8,040	5	22,015,226	3,302,284	825,571	2,476,713	300,317
60	10	8,040	0	2,412,000	361,800	90,450	271,350	32,903
							-	
	290			1348703654	202,305,548		151,729,161	18,398,104

TABLE 3C : CALCULATION OF PENSION & GRATUITY - OLD PENSION SCHEME							
1	2	3	4	5	6	7	9
AGE	Total yrs of service at age 60	Annual Salary of each Ee N'000)	Estimated sal per Ee at Retirement	Gratuity Benefit %	Pension Benefit %	Value of annual Pension OLD SCHEME	Value of Gratuity Benefit OLD SCHEME
x			{3*(1.03)^col.2}			(4)*(6)/100	(4)*(5)/100
20	35	216	607,794	300	80	486,235.43	1,823,383
20	35	300	844,159	300	80	675,326.99	2,532,476
25	35	360	1,012,990	300	80	810,392.39	3,038,971
25	35	1,560	4,389,625	300	80	3,511,700.34	13,168,876
27	33	1,800	4,774,203	284	74	3,532,910.54	13,558,738
30	30	2,268	5,505,031	260	68	3,743,421.27	14,313,081
33	27	3,300	7,330,254	236	64	4,691,362.38	17,299,399
35	25	3,840	8,040,107	220	58	4,663,262.20	17,688,236
38	22	3,216	6,162,189	196	52	3,204,338.05	12,077,890
40	20	3,372	6,090,207	180	48	2,923,299.40	10,962,373
43	17	4,140	6,842,789	156	42	2,873,971.46	10,674,751
45	15	10,200	15,891,268	140	40	6,356,507.06	22,247,775
45	15	6,120	9,534,761	140	40	3,813,904.24	13,348,665
50	10	5,904	7,934,482	100	30	2,380,344.69	7,934,482
53	7	8,040	9,888,186	116	0	-	11,470,296
55	5	8,040	9,320,564	100	0	-	9,320,564
60	0	8,040	8,040,000	0	0	-	-
			112,208,609			43,666,976.45	181,459,955

TABLE 3D: COMPARISON OF PENSION & GRATUITY BETWEEN THE NEW & OLD PENSION SCHEMES						
1	2	3	4	5	6	7
AGE (X)	GRATUITY	GRATUITY	RATIO	PENSION	PENSION	RATIO
	OLD SCHEME	NEW SCHEME	OLD/NEW	OLD SCHEME	NEW SCHEME	OLD/NEW
20	1,823,383	365,472	4.99	486,235	132,947	3.66
20	2,532,476	507,600	4.99	675,327	184,649	3.66
25	3,038,971	709,824	4.28	810,392	258,212	3.14
25	13,168,876	3,075,906	4.28	3,511,700	1,118,918	3.14
27	13,558,738	3,337,369	4.06	3,532,911	1,214,030	2.91
30	14,313,081	3,790,747	3.78	3,743,421	1,378,955	2.71
33	17,299,399	4,892,026	3.54	4,691,362	1,779,566	2.64
35	17,688,236	5,201,556	3.40	4,663,262	1,892,163	2.46
38	12,077,890	3,739,757	3.23	3,204,338	1,360,406	2.36
40	10,962,373	3,495,190	3.14	2,923,299	1,271,440	2.30
43	10,674,751	3,524,695	3.03	2,873,971	1,282,173	2.24
45	22,247,775	7,465,493	2.98	6,356,507	2,715,712	2.34
45	13,348,665	4,479,296	2.98	3,813,904	1,629,427	2.34
50	7,934,482	2,667,923	2.97	2,380,345	970,507	2.45
53	11,470,296	2,407,513	4.76	-	875,778	0.00
55	9,320,564	825,571	11.29	-	300,317	0.00
60	-	90,450	0.00	-	32,903	0.00
	181,459,955	50,576,387	3.59	43,666,976	18,398,104	2.37