

**AN ASSESSMENT: DEFINED CONTRIBUTION
FUNDS AND RETIREMENT.**

by

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Hons. B.Com (Unisa)**

Dissertation submitted in partial fulfilment of the requirements for
the degree

MASTERS IN BUSINESS ADMINISTRATION

in the faculty of

ECONOMICS AND MANAGEMENT SCIENCE

at the

**POTCHEFSTROOMSE UNIVERSITEIT VIR CHRISTELIKE
HOër ONDERWYS**

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Potchefstroom

2003

ACKNOWLEDGMENTS

It has been a great pleasure working with the faculty, staff, and students at the Potchefstroom Universiteit Business School during my tenure as MBA student. This work would never have been possible if it were not for the freedom I was given to pursue my own research interests, thanks in large part to the kindness and considerable mentoring provided by Prof. Ines Nel, my advisor and mentor.

The sufficiency model was developed primarily during the last six months of 2003. It has been influenced by countless discussions with colleagues and advisors within the Pension Fund Industry. I would particularly like to thank Corné Botha for many conversations regarding the model and the programming thereof.

In large part, Channel Life, my employer, has sponsored my studies and I like to thank them for their financial and moral support to complete my studies.

Two people deserve special thanks. My parents, Mr. and Mrs. Eddie Bester, for their support and care over the years.

Finally, and definitely not least I wish to thank all my family for their emotional support throughout the long, long process. There are three persons above all others who deserve my deepest thanks and respect for their continued encouragement during the writing of this dissertation: my husband, Christo and my two sons, Roan and Gustav. I could not have done it without them.

And now the greatest thanks to our God. To God be glory forever and ever.

Abstract

Dramatic changes in medical science and a general improvement in living standards has led to significant reduction in the mortality rate of certain age groups in South Africa. As a result the average age at which people are likely to die increased significantly in the 20th century.

The implications of this has not only to increase the number of people who survive to retirement age, but it has also seen larger numbers of people live for much longer periods in retirement.

Opposite to the above, is the HIV/Aids pandemic, which will increase the mortality rates of individuals at a younger age and undoubtedly affect pension plans and the costs thereof. The effect of all these changes have been the ultimate cost of providing a given pension benefit.

At first the paper examines the trend in retirement saving away from Defined Benefit (DB) towards Define Contribution (DC) funds. It looks at the reasons why this shift has occurred in South Africa, and provided confirmation of the retirement savings plans away from DB structures and towards DC type of plans in South Africa.

Secondly the paper briefly looks at the operation of DC plans in South Africa. The potential consequences of the shift are then reviewed in the context of role-players in the retirement savings decision and personal involvement in retirement planning process.

Upon completion of the literature study, a model was developed in which data from DC funds were used to make projections regarding the sufficiency and adequacy of funding within DC funds.

This study has proved that the shift from DB to DC funds had an enormous impact on provision for retirement. It was found that a significant part of the

population will not be independent at retirement and therefore might potentially become a responsibility of the state.

The paper suggests that the level of personal involvement in the retirement savings decision may be a critical factor in determining the propensity of an individual to save for retirement. As a result research is proposed to consider the importance of the three elements in the involvement of the individual in the retirement savings decision: the perceived ownership of retirement savings, the awareness of the need to save for retirement and the understanding of how to save for retirement.

TITLE: **An assessment: Defined contribution funds and retirement.**

KEY WORDS: Defined contribution funds; fund credit; members; investments.

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Chapter 1

Developments in the Retirement Fund industry

1.1 Introduction

Retirement can be an exciting and fulfilling time in people's lives. Statistics reveal that most people are unable to enjoy the things that they have looked forward to at retirement. They are unable to enjoy an independent retirement without lowering their standard of living. This is because many people have been falsely led to believe that they made sufficient provision for their retirement.

Although saving for retirement is one of the easiest decisions to postpone, never has the issue of saving for retirement been so essential. Saving for a financially stable retirement is a lifelong task.

The traditional concept of retirement has changed, and with that the risk of ensuring sufficient retirement income rests increasingly on the individual instead of employers. Inadequate retirement planning could make retirement a misery, therefore greater planning by funds in general, and individuals in particular, is required.

To have a sufficient income during retirement is critical to the economic and social well being of the residents of South Africa.

1.2 Historical development

Since the industrial revolution up to 1950 earnings of employees were so insufficient that it hardly provided for people's basic needs. During this period it was often the case that, when people were no longer able to work, there were no alternative sources of income. This state of affairs had two results:

- The government instituted a scheme in terms of which persons received a small pension on attaining a certain age. However these so-called "old-age pensions" were - and still are - small, and barely fulfill basic needs.
- The inadequacy of the government pensions, lead to a situation where employees placed their employers under a moral obligation to provide financial aid.

As a result of the second factor, employers sometimes supplied monies from their own current funds to provide for a retired employee. On the other hand, as more employees reached an advanced age, greater demands were made on employers' support. These claims often caused unease to employers either because of inadequate funds available at the time or because the money was otherwise committed.

The thought then arose that regular sums of money should be set-aside during an employee's working life to make provision for retirement. At the same time the need arose for assistance at the death of an employee or when, for medical reasons, he/she became unfit for work. This, in turn, led to new "moral claims" on the employer for financial aid.

Some employers consequently took the functions, of saving money for old age, providing dependants with capital at death, and making an income available on disablement, upon themselves. Other employers who were unable to carry the risk of disability and death, or did not have the necessary skills to administer such a scheme, turned to insurance companies to assist them with the task.

To an ever-increasing degree insurers began making facilities available whereby provision could be made on a regular basis for the needs of workers on retirement, death or disablement. This business developed to such an

extent that employers formed a separate entity called a fund. A fund operates as a legal entity in its own right - to pay out benefits to qualifying employees on retirement, death or disablement, with both employers and employees making regular monetary contributions to the fund. The main purpose of these funds is to help its members to save money for their retirement. Funds also provide their members with death and disability benefits, thus reducing the burden of retirement provision on society and the state. The industry was formalised and the Pension Funds Act was promulgated in 1956 to ensure the orderly regulation of all matters pertaining to these funds.

Soon after the Pension Fund Act was promulgated the industry established itself as a required commodity. As skilled labour became scarcer in modern times, employees chose to work for those employers who offered retirement benefits. So, in order to attract employees, increasing numbers of employers began to institute pension and provident funds. These funds provided fixed benefits with the emphasis on retirement or death. As more employers offered retirement benefits, people no longer stayed at one employer to attain these benefits. People changed jobs more frequently and rarely stayed with one employer.

1.3 The trend towards defined contribution funds

The dramatic change in employment patterns today sees the majority of employees receiving withdrawal or death benefits, rather than reaching actual retirement. This situation leads to a search for a pension structure, where these changes in benefit requirements, will be addressed. New generation benefit structures therefore needs to provide for the full vesting of benefits on termination. This means that the member will receive a return of own and employer contributions plus full fund interest.

1.3.1 Defined benefit (DB) funds initially introduced

Defined Benefit funds promises to pay a specified amount of money to the member on retirement or after retirement till death - the end benefit is defined. The promise to pay a specified pension is based on a calculation that considers the following three factors:

- The member's number of years membership in the fund.
- An accrual factor.
- The member's salary at retirement.

A typical formula to calculate retirement benefits would be: $2\% \times \text{final average salary over the last 3 years} \times \text{number of years membership}$.

In this arrangement, the fund carries the risk of poor investment performance. If the fund's investments perform poorly, or when inflation is high, the employer and/or employee may have to contribute more than budgeted for, in order to meet the defined benefit promise.

1.3.2 Defined contribution (DC) funds, a new generation structure

Defined contribution funds have, due to changes in the environment and pension industry, become popular in recent years. Businesses therefore changed from the "old" defined benefit funds to defined contribution funds.

Defined contribution funds can best be described as a savings account to which both the employee and employer contribute a specific amount on a regular basis during the working life of the individual. These funds are then invested on behalf of the employees.

Retirement fund investments will grow over time, but the end benefit will only be determined on the date of retirement because the benefit equals the total contributions plus a return on investments. The amount available for retirement depends on the performance of the investment over the contribution period and the actual amounts contributed by the employee and employer during this period. If the investment performs well, the member will have more funds available at retirement. If the investment performed poorly less funds will be available for retirement. The member therefore carries the investment risk.

1.3.3 Key differences between defined benefit and defined contribution funds

Defined benefit	Defined contribution
Monthly contributions paid to a pool of funds	Monthly contributions paid to members account
Trustees choose investment strategies	Some organisations allow the members to choose how contributions are allocated among various investment funds
Investment risk assumed by fund	Investment risk assumed by member
Benefit amount fixed by formula	Benefit amount based on member share value

1.4 Other reasons for development towards defined contribution funds.

1.4.1 Aids

Speaking on the effects of Aids on the retirement industry, Metropolitan Life senior manager Deane Moore said the epidemic posed one of the greatest challenges to business development in Africa. (Smith, L. 1998:7)

Aids would have the highest impact on persons aged between 20 and 45, meaning that by the year 2010 older members in DB funds would be subsidising younger workers. At the time of the introduction of defined contribution funds in the late eighties, about 7.4% of the South African workforce was HIV-positive. This was expected to rise to 20% by 2005 and 22,5% by 2010.

The direct cost of the disease on the industry would be felt through escalating employee benefit costs. Cost of death and disability benefits will rise, with premiums ever increasing. These costs of maintaining risk benefits such as death and disability cover could swallow up members' contributions, with the result that little money will remain to make provision for retirement. As costs escalated it became necessary to reconsider the benefit structures of a fund.

There are apparent differences between the different types of schemes (defined benefit and defined contribution schemes) in terms of whether the employer or scheme members bear the risk of the impact of AIDS. In defined benefit schemes, the employees' contribution is fixed, with the fund/employer meeting the balance of the costs. These costs will escalate due to an increasing incidence of lump sum benefits on death in service, spouses and dependent's pensions payable on a member's death either in service or after retirement and ill-health retirement pensions. Increases in the costs of these benefits due to the impact of Aids will result in a reduced allocation toward members' retirement benefits in the case of a defined benefit fund.

The cost associated with Aids, led to the preference to defined contribution funds where the risk is limited to the individual.

1.4.2 Ageing population

“A rapidly ageing population structure will place pressure on the sustainability of retirement funding.” (James, 2000:15.)

According to James (2000:15) by 2030 the proportion of the world's population that will be over the age of 60 would practically double. This trend was particularly strong in developing countries. A disparity between retirees and the working population will arise where the contributing members will not be able to subsidize the members near retirement age, any longer.

Many Trustees were advised that retirement funding be made mandatory and preferably structured on a defined contribution basis where cross-subsidization is no longer an issue. A move towards a DC structure instead of a DB structure would enhance sustainability and economic growth. A DC structure will also guard against benefit promises that were too high as the population aged.

1.4.3 Insufficient investment income

A person's retirement provision fund comprises of employee and employer contributions as well as investment income less costs. According to a Quarterly survey by Fifth Quadrant Consultants and Actuaries (quoted by Kennedy, 2002), the contributions will comprise only 19% of a member's ultimate retirement capital. A full 81% will be made up of investment earnings.

The first and most obvious risk that threatens investment earnings is inflation. Every retirement fund has one principal investment objective - to provide a real pension for the members of the fund when they retire. That is, a pension

that keeps pace with inflation. To achieve this the fund has to generate a return on the pool of assets in excess of inflation - the fund needs to outperform inflation by 3,5 to 5,5 percent per annum.

Over the past five years, funds had returns of 11.93% per annum, before tax, while inflation over the same period was 7% (Alexander Forbes, 2002:1). According to Thomas (2003:5) South African pension funds lost 9% of their value in the first three months of 2003, and their performance over one year has been even worse - a loss of 12%.

Besides the poor performance of investment earnings, the introduction of Retirement Fund tax had a further negative effect on the performance of funds over the past seven years. After the initial implementation of 17% tax, the fund's annual return fell between 1% and 2%. Two years later tax increased to 25% and returns dropped further with 1%.

These investment returns condemned DB funds to a financially tight benefits provision. Under this basis, the fund carries the investment risk. This type of risk contributed to the consideration of alternative benefits structures like the DC fund structure.

1.5 Problem Statement

According to Payne (2002:2) only an estimated 6% of South Africans retire financially independent due to lack of retirement provision or inadequate provision by pension funds.

The difficulty one faces is the uncertainty if retirement provision within the DC fund environment is sufficient to provide for retirement.

1.6 Purpose of research

The purpose of this study is to investigate if defined contribution funds can ensure sufficient income during the retirement period:

A model will be developed to assess defined contribution funds based on selected criteria. The goal of this model is to simulate financial planning activities that will guide the assessment process and provide a framework for making decisions by role players.

Tests on actual member information in DC funds will be done to determine whether sufficient income will be available during retirement. The results obtained from the tests will be used to make recommendations on the management of retirement funds in a DC fund environment.

1.7 Research methodology

The research methodology employed will be a three-step process.

Initially, a theoretical study will be done on the current status and market trends in the Pension Fund industry.

Secondly, the characteristics, which influence current and future funds, will be examined and used to develop a model, which assesses sustainability in the retirement provision of DC funds.

Tests will be done in the model and a gap analysis will be performed.

Finally, a proposal on the changes necessary to fill the gaps will conclude the study.

The data sources will include the following:

- Results of surveys on Pension Funds and member behavior.
- Recurring publications containing up-to-date information on pension funds.
- Annual pension fund reports
- Individual member data.
- Test results of the model developed.

1.8 Summary

In earlier years employees and their families were responsible for the provision for their own retirement. However due to pressure by employees on employers to contribute to the pension provision of employees the pension fund industry started to develop. The current state status is that the pension funds per se and the whole pension industry enjoy attention of government, employers and individuals.

Initially and until a number of years ago almost all pension provision was channeled through the DB fund structure. Due to changes in the environment and demands in the pension environment new DC pension structures were developed. This change led to a situation where DB funds are almost a thing of the past. The new generation DC funds allow much more freedom for individuals to adjust pension plans according to individual circumstances and needs.

The question however remains if these new structures will provide sufficiently for the retirement needs of members. To answer this question the intension is to develop a model to do research on and test the current pension status of individuals contributing to DC funds.

Chapter 2:

Pension Fund Determinants

2.1 Introduction

The determinants of the pension funds in the DC fund environment are characteristics that contribute to the end results obtained in a pension fund.

Pension funds are influenced by characteristics, which can be divided into two main categories namely internal factors and external factors.

Internal factors are factors that are directly linked to the pension fund industry some of the internal factors that need to be considered are contributions, retirement tax, and investment strategies. The internal factors can be influenced and change by various role-players and decision makers in the industry. Each of these factors will be discussed in more detail in this chapter.

The external factors did not necessarily originated from the pension fund industry or directly linked to pension funds but have a huge impact on the industry, the country and the economy as a whole. Usually these factors cannot be influenced by the industry - pension funds can only act on them and manage the impact. Factors to be considered include the ageing population, aids, early retirement etc.

2.2 Internal factors

The internal environment of a pension fund is the interrelated factors of the industry that influence and are affected by a pension fund's actions and the role players in the industry.

2.2.1 Contributions

Membership to a fund gives an individual the opportunity to start saving for retirement by making monthly contributions towards a retirement fund. The full contribution will not be applied towards retirement savings only. A portion of the contributions made to the fund are used to purchase death and disability cover. Typically the provision for risk can range between 4% and 6% of the employees' salary (Sanlam 2002:11). This is a usual death and disability insurance where a monthly premium is payable and is not refunded at any stage.

A member will contribute a percentage of pensionable salary. The percentage is determined by the conditions of employment, to a pension fund wherein the employer is participating. Contributions can be split between employer contributions and employee contributions.

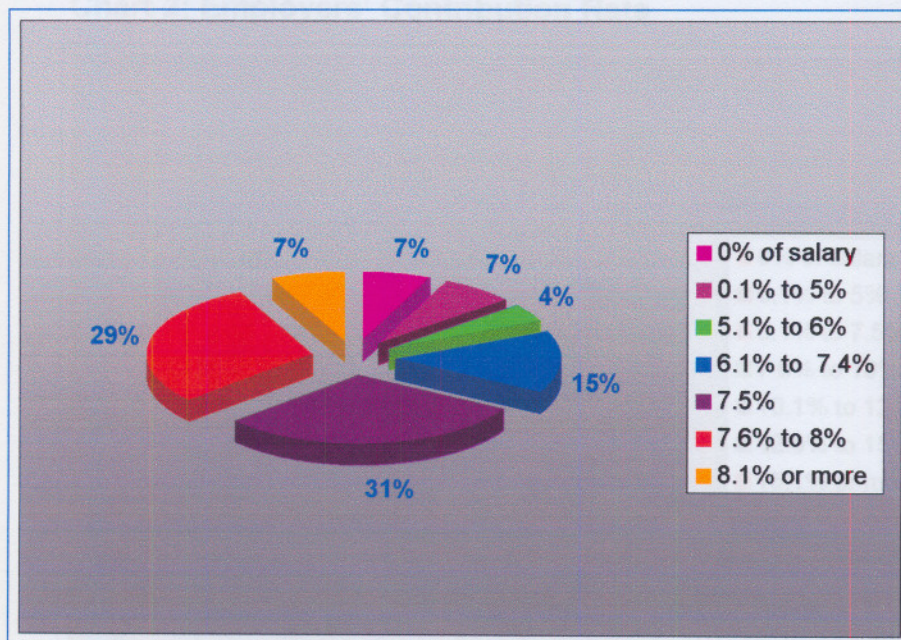
It should also be emphasized that defined contribution plans as described in Chapter 1, in spite of their name, do not require contributions to be defined in advance. Typically employers and employees do have set percentages of earnings as regular contributions but this is not a prerequisite. The distinguishing feature of defined contribution schemes is that the benefits are determined by the contributions paid in, rather than the other way round.

2.2.1.1 Employee contribution

An employee contribution represents a deduction from the salary for the purpose of personally augmenting the company pension plan. According to research done by Sanlam (2002:11) the vast majority of members of defined contribution funds contribute between 6% and 8 % of salaries (see chart 1). It is probably safe to assume that there is a cut-off for most funds at 7.5% (the tax-deductible maximum in the private sector)

If the rules of a fund allow it, one may make additional contributions to the fund, which are currently tax deductible up to a maximum of R1 800 per annum (R150 per month). (Income Tax Act: Act 28/1997, Section 11(k)) The more one contribute, the larger the final benefit is likely to be. According to a survey done by Sanlam (2002:11), 67% of employees pay contributions in excess of 7.5% of salaries.

Chart 1: Employees' Contribution Rate



Source: Sanlam (2002: 4)

Source: Sanlam (2002: 4)

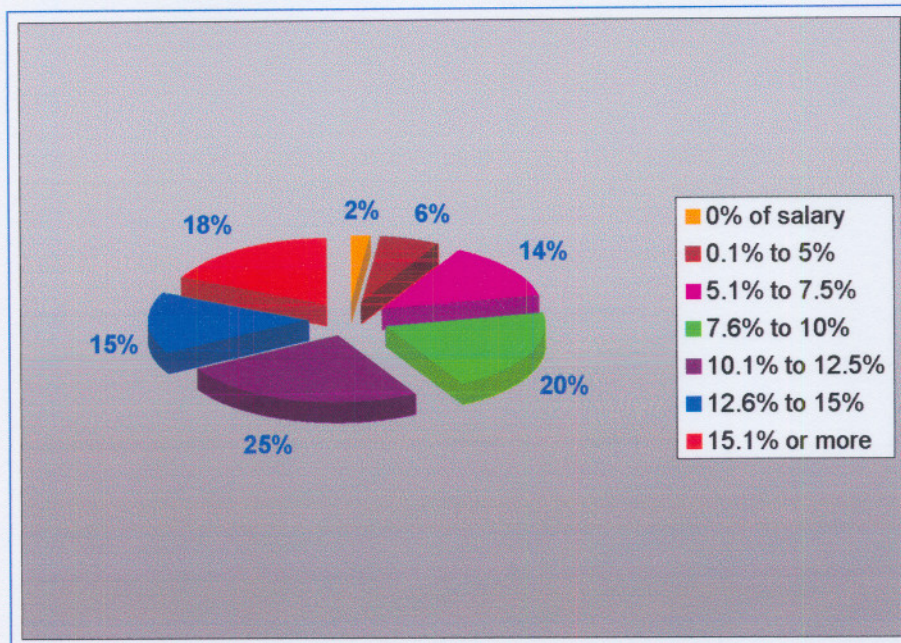
2.2.1.2 Employer contribution

An employer contribution is the amount of company funds to be set aside to ensure that vested employees will receive a benefit payment upon retirement. Employers contribute any percentage between 5% and 20% of members' pensionable salaries. A retirement fund survey done by Sanlam (2002:11) indicated that 78% of employers pay contributions in excess of 7.5% of salaries. Insurance premiums and administration fees will be deducted from this contribution before allocating the net contribution to retirement savings.

Securely employers make their contributions to the pension fund and in addition have to meet the costs of risk and administration. In this instance the employer contributes toward the employees' retirement savings and all costs and insurance premiums will be debited separately for the employers account.

Considering the first option above where risk and administration costs are include in the contribution it is possible that increases in the costs of death and disability benefits due to the impact of AIDS can result in a reduced allocation of employer contributions toward members' retirement funds.

Chart 2: Employers' Contribution Rate



Source: Sanlam (2002: 4)

The total contribution towards employees will be fixed in one of two ways:

A fixed employer's contribution that must cover retirement, risk and administration costs. This means that the employers' contribution minus cost of risk and admin will be allocated to retirement savings. This means the difference between the total contribution and the administration costs and insurance premiums are allocated towards retirement; or

Secondly employers make fixed contributions to the pension fund and in addition have to meet the costs of risk and administration. In this instance the employer contributes toward the employees' retirement savings and all costs and insurance premiums will be debited separately for the employers account.

Considering the first option above where risk and administration costs are include in the contribution it is possible that increases in the costs of death and disability benefits due to the impact of AIDS can result in a reduced allocation of employer contributions toward members' retirement funds.

The switch from defined benefit funds to defined contribution funds can lead to an inappropriate contribution strategy being adopted. The risk with defined contribution schemes is that the member joins the scheme on the basis of a given level of contribution, which is not regularly reviewed to provide for changing circumstances over the member's working life. This "hit and hope" approach to pensions planning will not produce satisfactory results. There needs to be a definite plan, which must be reviewed regularly. In comparison, fortunately, such planning can be much easier and cheaper for members participating in an employer-based scheme than for people participating as individuals in such a pension provision scheme. The reason is that the costs of professional advice can be spread across the scheme as a whole, rather than the individual member having to be borne the cost.

From the above one can conclude that new and innovative pension strategies have to be developed. The latter needs to include the consideration of appropriate planning that will enable members to effectively plan for retirement.

2.2.2 Tax

Individual Income Tax and Retirement Fund Tax need to be considered since it may have an influence on retirement savings or the individual's attitude towards retirement savings. In addition the impact that role players in the pension industry have on changes in the tax environment of pension funds need to be considered.

2.2.2.1 Individual Income Tax

In terms of the Income Tax Act, individuals may deduct any contributions made to an approved pension fund, but the deduction is limited to the greater of R1 750 or 7.5% of income from retirement-funding employment. The employer may deduct contributions made for the benefit of employees to a

pension fund up to 20% of remuneration. (Income Tax Act: Act 28/1997 Section 11(k))

The Government should encourage and promote savings towards retirement through favorable tax treatment. One would propose a retirement savings system that offers generous tax incentives to the member and the contributing employer. If the aim is to encourage people to save for retirement, logic would require that improved tax relieve is granted from the current 7.5% for the employee and 20% for the employer.

Instead of encouraging savings towards retirement funds, the report of the Katz Commission (Katz, 1998:8) into tax reform has proposed that employer contributions to retirement funds be limited to 15% of salary. The present limit is 20%. The Commission feels that a total contribution rate of 22,5% (members 7,5% and employer 15%) will be sufficient to provide a suitable retirement income. As seen in chart 2 many employers are currently contributing more than 15% to retirement funds. Contributions by employers in excess of 15% would be taxed in the hands of the employees in respect of whom they are made.

If the proposals of the Katz Commission would be accepted, it is highly possible that fewer contributions will be made towards retirement and this may have a serious impact on the sufficiency of DC funds in providing employees with sustainable retirement funding.

2.2.2.2 Retirement Fund Tax (RFT)

A retirement fund pays income tax on behalf of a member on any interest, net rental income (rent less costs), or foreign dividends at a current rate of 18%. Retirement Fund Tax was first introduced at a rate of 17% in 1996, increased to 25% in 1998, and reduced to 18% in 2003. This tax is exceptionally high when compared with countries such as Canada that have a 0% tax rate on retirement funds.

RFT has a direct effect on the retirement capital of a defined contribution fund member. Any retirement fund taxes levied at a rate of between 0 and 25%, and considering the asset structure and tax liability of the fund, can if compounded over a 20-30 year period, result in members having 12%-18% less retirement capital.

The effect of the introduction of the retirement-fund tax on the benefit of a member of a defined contribution fund can be illustrated by the following example. Assume that a member's current salary is R8 000/month, contributions towards retirement funding are 15% of salary a month (employer and member contributions combined), the member's salary increases by 10%/year, the member will contribute for 30 years and investment returns of the fund are 10%/year (before retirement-fund tax). In 30 years, the value of the member's savings will be R7 161 541. Based on the same information, but assuming that retirement-fund tax reduces investment returns from 10% per annum to 9% per annum, the value of the member's savings at retirement will be R6 266 212, a reduction of R895 329, or 12,5%.

From the above one can presume that apart from reducing end benefits, the tax also acts as a disincentive for citizens to make adequate provision for their retirement. If this is the case it will place an additional burden on the state. It can be argued that savings levels are presently too low and drastically reducing this tax may assist in increasing these savings levels.

Government needs to do more and act quickly to ensure there is a stable taxation regime in the retirement-fund industry and that the correct incentives to save for retirement are attained.

The reduction of the retirement fund tax rate from 25% to 18% is a positive step towards making retirement fund investments more attractive to a broader spectrum of the population. This will benefit especially the lower income-earners although high-income earners will also benefit from the new rate.

Overall, the reduction gives the message that taxpayers need encouragement to save, particularly towards retirement. (Budget, 2003)

2.2.3 Investments

Typically, only about a quarter of a person's pension comes from contributions; the other three quarters comes from investment return. (Fifth Quadrant 2002:1) Investment performance is therefore a crucial area of retirement fund management in DC funds because of the important role it plays in saving for retirement. At the individual level, the most important thing about pension fund investment is to get the maximum return.

Based on the enormous role investment performance play in the final pension fund value, the investment objective of a fund must be to provide a capital preserving investment with a real rate of return. (Fifth Quadrant 2002:1)

To achieve this objective, funds have to develop an investment strategy. This strategy will involve some investment risk. Investment return is of vital importance, and the highest return will come from investing in risk capital. Given the uncertainties in longevity, in tax, or in public services, the risk of investing in equities is perfectly acceptable, and the advantage of the usual higher return will improve retirement incomes.

Another factor to consider, particularly in defined contribution funds, is that fund managers are drawing up investment strategies in terms of new draft regulations under the Pension Funds Act. It can be concluded that regulating bodies are trying to force fund managers to protect funds from inappropriate investment strategies. The issues raised in the draft regulations affect everyone who belongs to a retirement fund.

The main purpose of the regulations is to ensure that trustees do their best to see that the retirement savings of individuals are invested in a way that reasonable return expectations are met at retirement.

This has become increasingly important now that most members contribute to defined contribution retirement funds. With defined contribution funds, the individual takes the investment risks that will determine whether or not one will receive a reasonable pension at retirement. Because individuals are bearing the risk, they are demanding to have a say in how their pension is being invested.

2.2.3.1 Flexible Investment choice

Flexible investment choice is where the members have a say in how their monies are invested. The options usually vary between the different risk exposures of the different asset classes.

As known in the industry the first flexible investment choice pension and provident fund was launched in 1994. In the last two years several large funds have made the move to flexible investment choice.

The advantage of a flexible investment choice is that the industry is able to keep abreast of market trends. The different needs of the full range of members can be addressed by giving members a greater degree of control over the risk.

The disadvantage of this flexible investment choice is that a member could make a poor selection. Therefore it is essential that members are equipped with the information they need to make informed decisions. Another negative development is that members become so focused on the short-term results that they regularly switch between investment portfolios. Administration fees on these switches are usually based on the value switched and can become very costly. This may have a negative impact on the long-term returns.

Offering members a flexible investment option is preferable where members are financially literate and able to keep a long-term view. Where employees have no idea of what to do with their money, or do not want to be involved in making the choices, they should be offered a "default option". In this option they can have their money managed for them, if they so prefer.

To utilise the advantage of investment choices without the disadvantage of uniformed decisions it can be proposed that members should only be given two basic choices.

2.2.3.2 Two basic choices

The two basic choices must be between investing their portion of the fund in market-linked investments or in capital guaranteed smoothed/stable bonus life assurance products.

2.2.3.2.1 Market-linked investments

In practice market-linked investments are made in a range of asset classes - including shares, bonds, cash (money markets) and property - to provide a diversified low-risk investment.

The object of a long-term investment is to provide a rate of return that would outperform inflation over the period of the investment. What people need from investments is a real return over time.

However, the value of a retirement fund investment is directly linked to the value of the underlying investments made by a fund. If there is a share market crash (as has happened over the past few years) at retirement an individual may receive far less than expected. Trustees must ensure that money in market-linked investments is properly invested and will not be subjected to inappropriate investment strategies.

2.2.3.2.2 Smoothed bonus products

Capital guaranteed smoothed/stable bonus life assurance is a powerful tool in financial planning. This is true either investing as an individual or

as a retirement fund. It is therefore required that the use of these products are appropriately applied and managed.

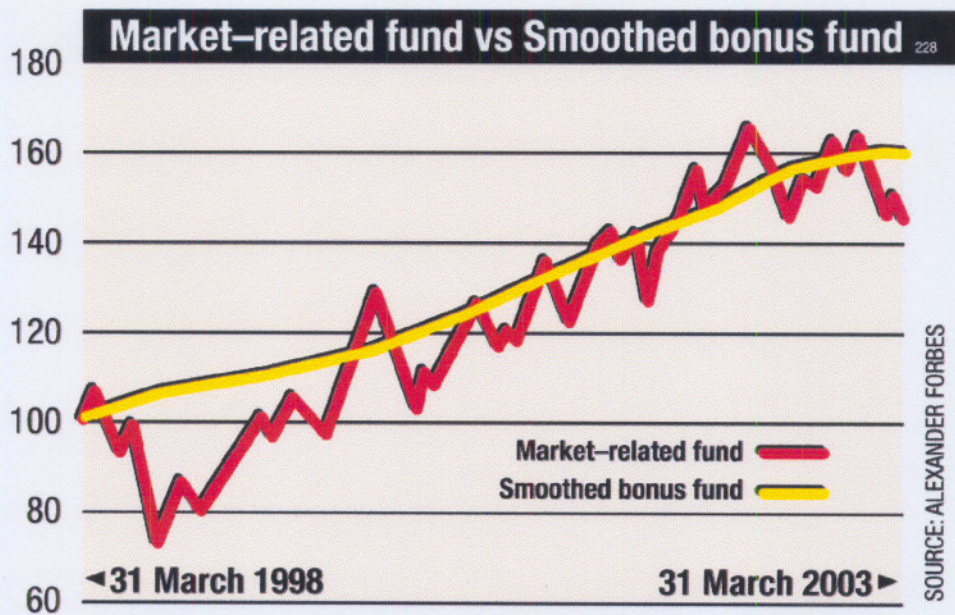
The main feature of these products is that capital (what a member contributes) is guaranteed at retirement. In good investment years, some returns are held back for poor investment years. Returns are paid by way of bonuses.

Traditionally, these bonuses have been declared as vesting bonuses, which once granted cannot be retracted, and non-vesting bonuses, which can be retracted if there is exceptional poor performance either as a result of poor asset management or extreme market conditions. The problem with this structure is that in the years of extremely poor performance, the investment reserves disappear and the capital may not be sufficient to meet the payments implied by bonuses already declared.

The latest generation products enable member's funds to be managed separately, so that there is no cross-subsidisation, but the bonuses are vesting. In other words, both the capital and all historical returns are guaranteed. If there is a shortfall because of market conditions in the actual value of your underlying investment, the shortfall is then made up by the life assurance company using shareholder money.

The other significant factor is that there is a cost for the guarantees offered by smoothed bonus products, which will result in a member receiving a lower average performance than a market-linked investment.

Chart 3: Market-related vs. Smoothed bonus fund



Source: Alexander Forbes

2.2.3.3 An age-appropriate approach

The question is, what to choose and when to choose it. Individuals should have their retirement funds invested in equity-based, market-linked products when they are young. Equity markets will rise and fall, but in the long run they have historically out-performed inflation, and there is no guarantee costs nibbling away returns.

However, at least five years before an employee retire, the individual should start phasing their funds into a capital guaranteed smooth/stable bonus investment to ensure that by the time they retire and want their money, they will not be subject to any violent market fluctuations. One should transfer about 20 percent a year into the smoothed bonus product to smooth out any market fluctuations, rather than switch all the funds at once.

If an employee is really cautious, using a money market fund as the underlying investment in the years before retirement may be an option,

because one will have no equity market risk and consequently the risk of low future bonuses and of non-vesting bonuses will be removed. However, one faces the risk of receiving a return that is less than inflation, particularly after tax.

2.3 External factors

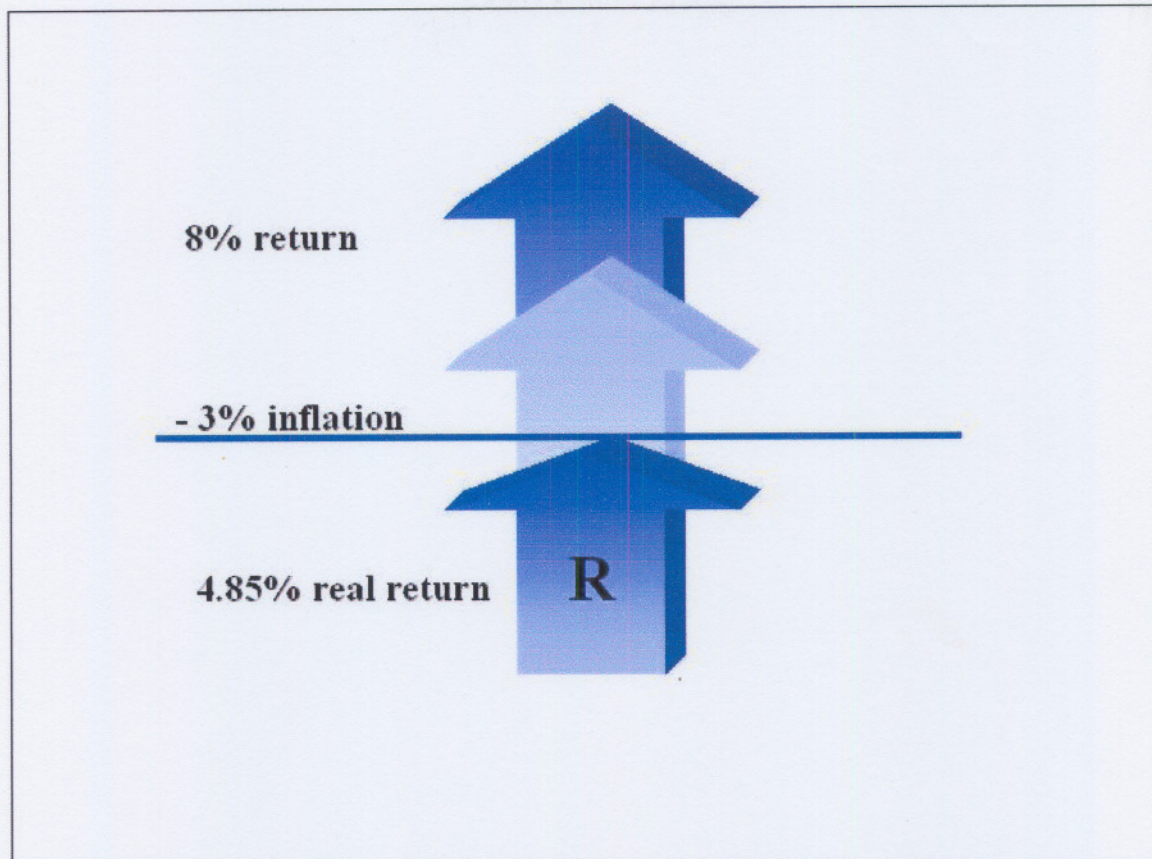
External factors as previously mentioned can have a huge impact on the provision of sufficient retirement funds. The pension fund industry as such does not have control over external factors and can therefore only act on changes or anticipated changes in external factors. The key is to manage the impact these changes have on a fund.

2.3.1 Inflation

In creating a retirement plan; it is crucial to consider the effects of inflation. Inflation means that, as years pass and inflation rises, the purchasing value of money decreases. Within the financial portfolio of a retirement plan, inflation risks should be considered as one of the major risks.

Increases in the cost of living that will outpace the gains which members earn on their investments and erode the future purchasing power of their savings is called inflation risk. To reduce inflation risk, retirement fund investments should earn a positive real rate of return. The real rate of return is the rate of return on investments after the consideration of inflation.

Figure 1: Real return

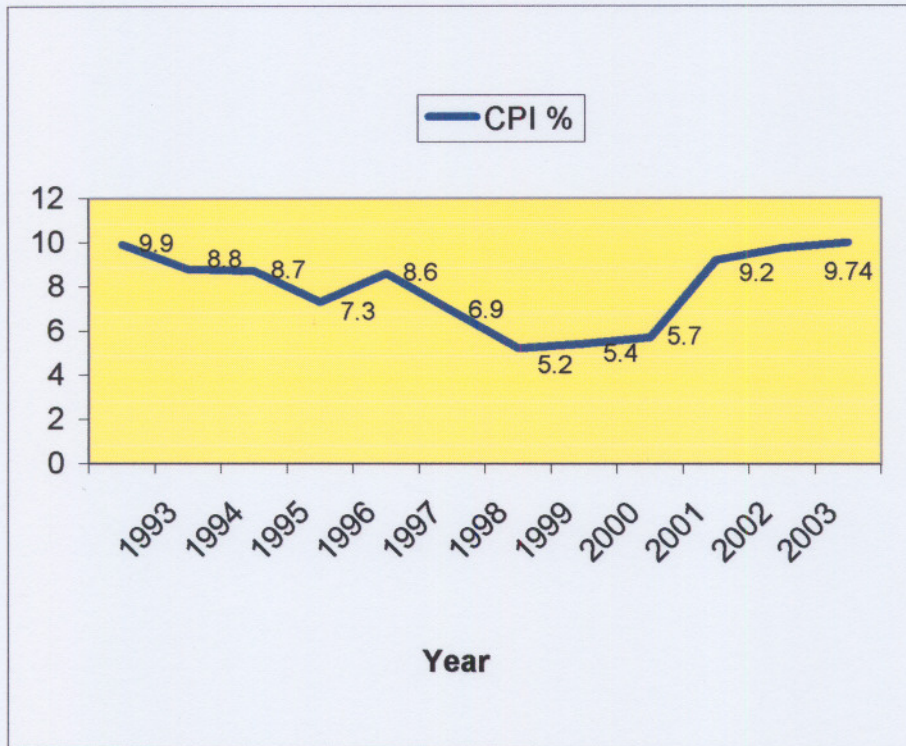


Source: Own

If the inflation rate is 3% in a year in which an investment provides an 8% return, the real return, or return after correcting for inflation, is 4.85%. This is calculated as follows:

$$\begin{aligned}\text{Real return} &= \frac{1 + \text{return}}{1 + \text{inflation}} \\ &= \frac{1 + 0.08}{1 + 0.03} \\ &= \mathbf{4.85\%}\end{aligned}$$

Figure 2: Inflation rate over the past 10 years

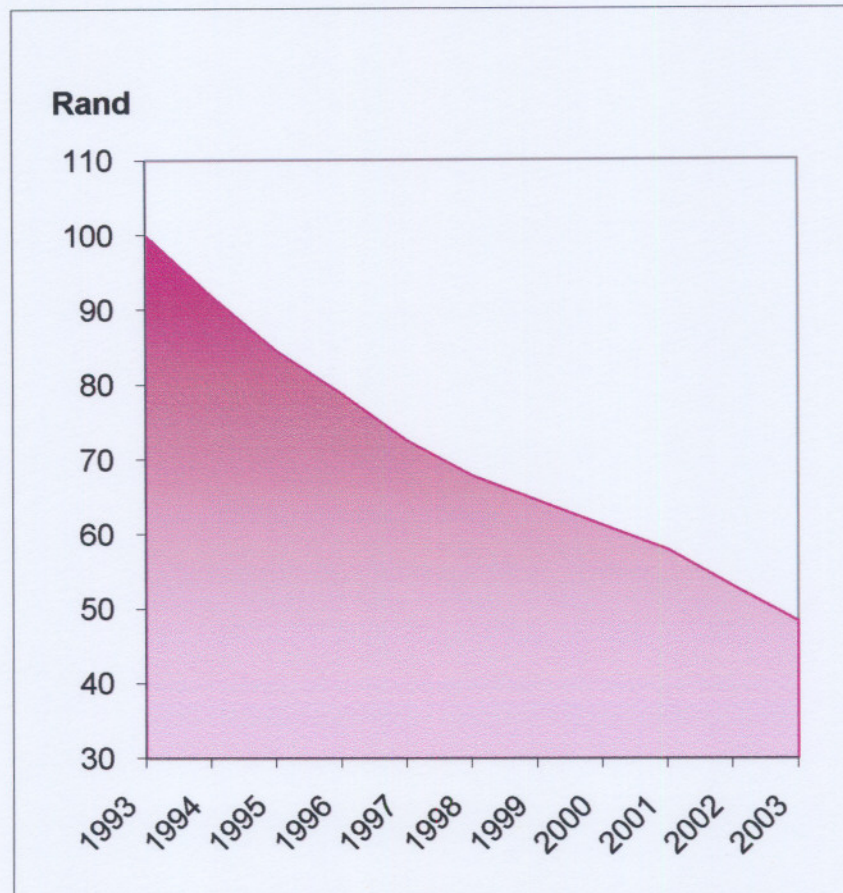


Source: Based on calculations by Statistics SA. (2003: 56)

Figure 2 shows trends in inflation expressed as the average rate for a year in the consumer price index (CPI), calculated by Statistics SA. (2003: 56)

The inflation rates reflected here, measure the annual rate of change of the cost of a bundle of goods and services a representative household bought in a base year. The Consumer Price Index (CPI) is used to compute the inflation rate for South Africa. CPI is based on a calculation by Statistics SA. This is an indication of the change in price level of expenditure by the average SA consumer on goods and services, including housing, food and transport. As the inflation rate climb the buying power of the Rand drops.

Figure 3: Buying power of the Rand over the past 10 years



Source: Based on calculations by Statistics SA. (2003: 56)

Figure 3 points out the decrease of the buying power of money when inflation (as shown in figure 2) occurs. The R100 of the year 1993 is worth only R48.33 in the year 2003 in terms of what it could buy.

A retirement plan must provide for this depreciation of the value of the Rand. Contributions made by the member and the employer should therefore provide for changes in inflation. It is normally the case that contributions are based on a percentage of a members' salary, this means the salary increases usually keep up with inflation. The second and more important factor that needs to be managed is investment performance (real return). The norm should be that investment returns have to be higher than the inflation rate.

Given enough time, even a low annual rate of inflation can erode an investment portfolio.

2.3.2 Ageing population

Gone are the days when people started working at the age of 16, worked until their sixty-fifth birthday and then did not live long enough to celebrate their seventieth. Average life expectancy has continued to rise and improvements in lifestyle and diet, along with medical advances have enabled people to live longer.

Ageing is one of the greatest challenges economies face. When the current contributing generation reaches retirement there will be fewer contributing members for each pensioner this will create greater strain on sustainable pension funding. (Katz, 1998:8) The implications of an ageing population and an over-burdened pension system are coming to the fore.

This ageing process raises some major concerns such as:

- How will the young and currently contributing members be able to support the pension benefits and health care costs of growing numbers of older, retired people while sustaining an upwards trend in their own standard of living and pension provision?
- How should infrastructures for financial markets and funded pension systems be improved to support the income of older people after retirement?

Whatever the answers are, if there is one conclusion that can be drawn, it is that governments are no longer in a position to accept full responsibility for older people in general. Due to financial constraints governments are therefore left with no other option than to adopt policies like taking care of the poorest of the poor first, or the weakest of the weak. However plausible the support of governments in this regard may be, it will definitely not ensure

proper care for all elderly people in general, therefore cost-effective intervention of the private sector is an absolute necessity.

2.3.2.1 Ageing trends in South Africa

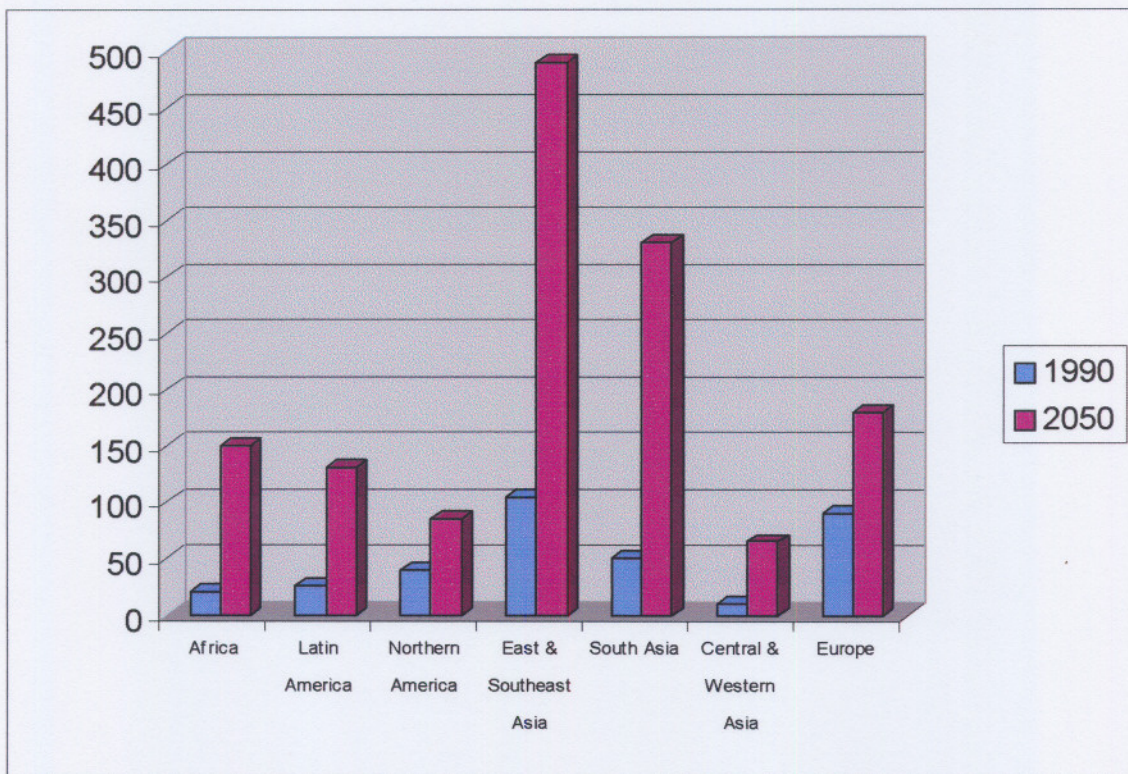
The Smith Committee (Smith, 1995:1) reported that the population of South Africa is ageing increasingly. The pension fund industry then realised that a change in the pension fund industry is required in order to provide pensioners with sufficient pensions given the ageing trend. As in other African countries, the main causes of early deaths are the increase in aids rates since the 1970s and rising life expectancy, especially for the elderly. This is set to reduce the number of workers per retired person to less than two by 2030, down from over three present. Without action, such a shift may slow economic growth and drive up transfers to the elderly, with taxes and social insurance contributions having to rise to pay for pensions and healthcare.

The South African scenario does not differ much from that experienced globally:

- The total population growth rate in South Africa is declining increasingly. (Statistics SA, 2001:24)
- According to a discussion paper (SA, 2001:3) there will be 12 271 400 people above age 50 living in South Africa by 2020, of whom 2 490 800 will fall in the 70+ category. The group of 70+ will therefore constitute 22% of the population.
- An ageing population, high unemployment figures, as reported in the press, a constraint economy and a diminishing tax base may require that the government needs to increase its contributions towards the provision of public pensions. This implies that the public will have to take a serious look at how to use savings and investments to secure a retirement that will offer the necessary retirement security.

Pillay (2002:1.) argued that many DB funds simply do not have sufficient funds to provide for the higher claims in pensions due to the ageing phenomenon. For many funds that have sufficient funds, the membership became so small that it is becoming too expensive to maintain due to administration costs. The latter are factors that contributed towards the development of DC funds.

Figure 4. Population ages 65 and over in the year 1990 and projected to 2050, by region (millions).



Source: World Bank (1994)

It is estimated that this increase in life expectancy has had the effect of cutting pension income by about one fifth. (Smith, 1995:1) This in turn has meant that pension fund investments have had to work much harder just to maintain income levels as in the past. The problem has been compounded by the progressive falls in gilt returns over a similar period of time.

The result of these returns in gilts is a worrying reduction in the annuity rates that determine the amount of pension fund needed to support retirement income. In other words and in real terms, if life expectancy and gilt returns remain the same, it is estimated that a person aged forty-five in 2003 will need to save more than 2.5 times the amount that his father saved at the same age in order to secure a similar retirement income.

If a reasonable assumption is made that longevity will continue to improve in the future, then the consequences for pension costs for both defined contribution and defined benefit pension arrangements are significant.

Against this backdrop, the adequacy for retirement provision of pensions in South Africa needs to be investigated. As people live longer and the savings gap widens, the search for a solution is becoming ever more pressing. One approach is to encourage members to save more than they currently do. Other solutions will be to rise the minimum retirement age from 65 to 70 or beyond.

2.3.3 HIV/Aids (source)

Retirement savings are under threat, not only from volatile markets and increased taxation, but also from the rising cost of death benefits brought about primarily by Aids.

The HIV/Aids pandemic will undoubtedly affect every South African in one way or another. It is expected to have a major impact on the South African economy, but could also change the financial situation of individuals severely.


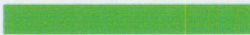

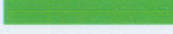
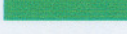





Assessing the impact that the Aids epidemic have on the retirement fund industry, it is possible that even members of defined contribution funds can, due to possible increases in assurance, expect that less funds will be

available on retirement. This can be expected if appropriate action is not taken.

Most retirement funds offer group life assurance to their members, which are typically purchased by a group, such as an employer, for the benefit of their employees. Life assurance purchased in this manner will in general be cheaper than when the individuals are left to take out their own life policies.

The rapid spread of HIV/Aids has resulted in the fact that group life cover has steadily increased by $\pm 15\%$ annually. In the Nelson Mandela/HSRC Study of HIV/AIDS, (2002) they concluded that the reason for this trend is due to the fact that members, on average, are dying younger, because of Aids. Due to the increasing mortality rates of individuals at a younger age, insurance companies must collect more in premiums to facilitate earlier payouts in benefits. Very often it is found that the proportion of retirement funding being allocated to the retirement savings pool is being reduced in order to pay for the additional amount required for the group life cover.

Chart 4: People living with HIV/AIDS in Africa

	Country	Description	Amount
1.	South Africa	5.2 million (2000 est.)	
2.	Ethiopia	3 million (1999 est.)	
3.	Nigeria	2.7 million (1999 est.)	
4.	Kenya	2.2 million (2000 est.)	
5.	Mozambique	1,546,643 (2001)	
6.	Zimbabwe	1.5 million (1999 est.)	
7.	Tanzania	1.3 million (1999 est.)	
8.	Uganda	1.1 million (2001 est.)	
9.	Congo, Democratic Republic of the	1.1 million (1999 est.)	
10.	Cote d'Ivoire	1 million (2000)	

Source: Nation Master (2003)

With the cost of death benefits in some funds expected to drastically increase over the next years the members would have to pay, either in terms of higher contributions, lower retirement benefits or lower death benefits.

2.3.4 Early retirement

An assessment of the retirements from several retirement funds reveals that a greater portion of people retire before the official retirement age. In South Africa this was specifically the situation during the period of restructuring in the 1980s and 1990s. Early retirement schemes were introduced in an attempt to do away with discrimination in the workforce. The idea was to make room for the large inflows of previously disadvantaged groups into the labour force. Today, with other measures in place, incentives for early retirement need to be reduced. Rolling back early retirement has become a priority. Early retirement schemes should be replaced by pre-pension arrangements, shifting the burden of the cost from employers and employees from a sector to the individual worker making the decision.

Still, more needs to be done to reduce the incentives for early retirement. The proportion of the older working age population (55-64) in employment needs to be increased in coming years. Employers could accelerate the phasing-out of early retirement schemes by immediately removing incentive policies regarding early retirement. That way, individuals who decide to retire early would draw a lower pension than were they to accumulate more entitlements by waiting until the official age.

Moreover, eligibility criteria for disability insurance still have to be more strictly enforced as it continues to be used as way to retire early. Some 20% of the population aged 55-64 receives disability benefits. (Van Zyl, 2003:1). A new system for screening applicants need to be progressively phased in, it may be necessary to adopt a more stringent approach.

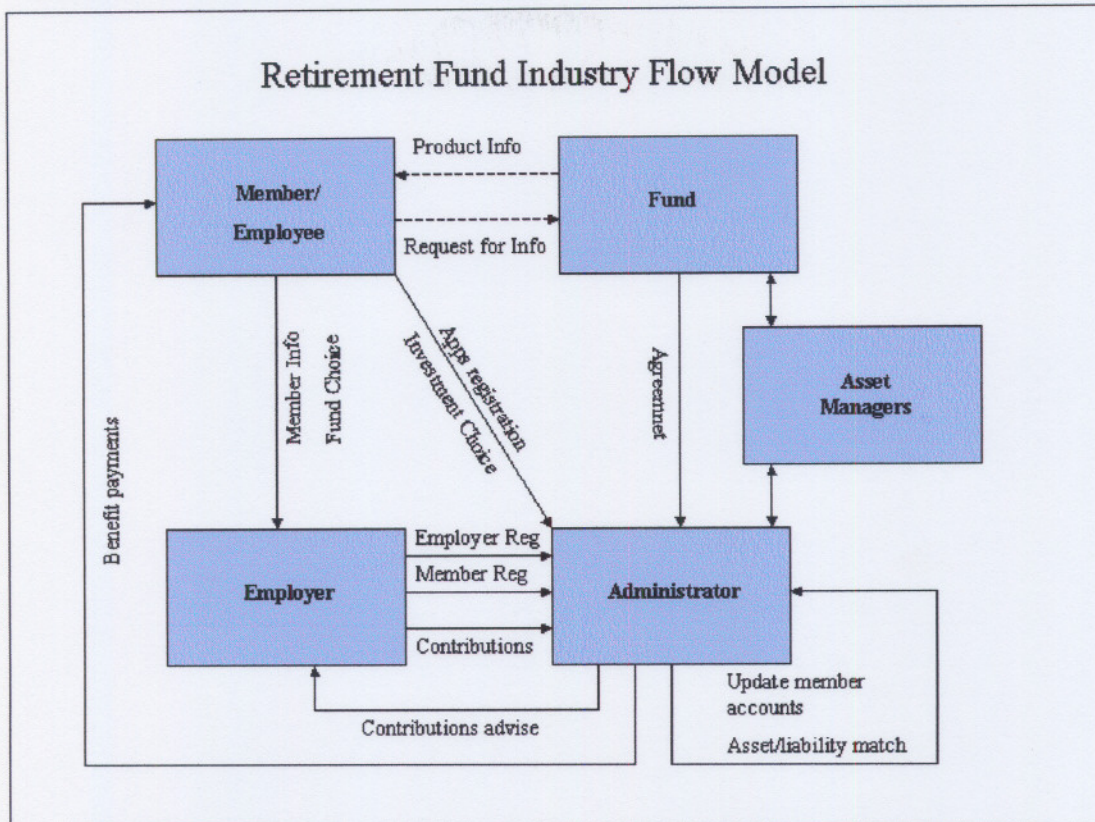
Regular discussions between participants in the industry leads to a general accepted belief in the industry that later retirement and semi-retirement, are seen as essential elements of managing population ageing.

2.4 Role players

The Retirement Fund industry has a number of principal role-players and flows (see figure 5). Retirement funding legislation has effectively delineated the roles of the parties involved in retirement funding - typically the employer and the trustees. It is important to identify and understand the relationships and flows between all these role-players.

The role players influence the internal factors whilst only managing the external factors. To understand these relationships and flows, a Retirement Industry Flow Model was created. The model is illustrated in the Figure 5 below and outlines the different responsibilities and transactions between the key stakeholders in the Retirement Fund Industry. A box in the model represents a key role-player. A line between role-players represents a flow of information/money between the stakeholders, and the arrow on the line shows the direction that the information/money flows.

Figure 5: Retirement Fund Industry Flow Model



Source: Own

As shown in the Retirement Fund Industry Flow Model, the stakeholder groups are partitioned into:

Table 1: Responsibilities and Transactions in the Retirement Industry

Role Views	Responsibilities	Transactions
1. Employer	<p>The employer is responsible firstly to provide details to register with the Fund.</p> <p>Needs to provide the Fund with administration information as to when contributions are intended to be made, and provide employee with contribution amounts.</p>	<p>1. Member Registration</p> <p>2. Employer Registration</p> <p>3. Contributions info</p>

	The employer must advise the administrator of any exits (death, resignation) and the reasons for it.	4. Contributions Advice 5. Withdrawal advise
2. Administrator	Administrators are responsible for the registration of employees' personal details and investment choices. The administrator needs to collect monies in respect of contributions made and apply it to the members' records. The administrator will pay the members' benefits after tax deductions and claims.	1. Applications Registration 2. Investment Choice 3. Collecting contributions records 4. Benefit payments
3. Employee	Employee is responsible for notifying their employers of their personal employment details, investment choice and any other instructions regarding banking authorities.	1. Employee Info 2. Fund Choice 3. Bank A/C

2.4.1 Employers

Most employers do not provide pension benefits on retirement. They simply provide their employees with access to retirement funding in the form of membership of a fund. They then divert portion of their employees' remuneration to the fund in the form of contributions.

If the rules of a fund, to which employees of the employer belong, by virtue of their contracts of employment require the employer to contribute a certain rate, the employer is contractually obliged to contribute to the fund. In terms of the recent amendments to the Pension Funds Act, the employer may be

charged interest if their contributions to the fund are paid late (Pensions Fund Amendment Act: Act 65/2001).

Essentially, employers have the right and responsibility of determining the amount of remuneration and benefits offered to employees and the manner in which these will be funded and provided for.

2.4.2 Member

A member is a permanent employee or a contractor who is employed by a particular employer, and is registered as a member of a retirement fund. A member usually makes monthly contributions to a fund – as previously discussed these contributions are tax deductible to a limit of 7.5% on salary.

Membership to a fund entitles the member to a benefit, as determined by the rules of the specific fund. This is usually limited to the value of the retirement fund account in a DC fund.

2.4.3 Administrator

In general the administrator of a retirement fund is contracted by the Trustees of the fund to act on their behalf, to ensure the fund is run in accordance with the Pensions Fund Act and carry out day-to-day functions such as processing contributions, preparing member statements, and processing transfers in and out of the fund.

With the switch to DC funds - in which each member in effect has his or her own personal savings account - there has also been a switch to member-level accounting and every fee and every cent of retirement fund tax for each member needs to be accounted for on a daily basis.

Many of the current administrators continue to use legacy systems that were developed and are appropriate for defined benefit fund administration to try and administer defined contribution funds. The adaptation of these systems to

provide for defined contribution administration has been problematic. Increasing processing functionality demands from DC funds are exacerbating the situation.

In the South African context the relevant pension fund administrators were held accountable for actions that were prejudicial to members' interests. Cases brought against large pension fund administrators in South Africa, have highlighted the importance of protecting the members' interests in retirement funds.

Some fundamental aspects in providing an effective administration service are:

- On time, accurate and complete record keeping of the fund and its members.
- Regular valuation of investment records, preferably daily.
- Daily reconciliations of bank accounts and member transactions.
- Competent financial management.
- Valid, accurate and on time benefit payments.
- Effective communication and reporting.
- Access to real-time information.
- Effective risk management and compliance.
- Tried and tested business continuity and disaster recovery plans.

An assessment of the Pension Fund Act reveals that South Africans have regulatory protection regarding the way in which retirement funds may be invested; however sound and competent administration remains essential.

2.4.4 Trustees

Trustees are responsible for managing a fund in terms of the rules of a specific fund and within the roles and responsibilities determined for trustees. Given the structure of DC funds, trustees are not responsible for the determination of benefits and strategic issues. Trustees must however be

informed when the employer suggests changes affecting the rules and benefits of the fund.

Trustees play a crucial role in securing members' retirement fund rights. It is essential that they are well briefed and aware of their responsibilities in this increasingly complex environment.

Trustee responsibilities typically include the following:

Maintain the legal requirements and documentation of the fund.

- Select appropriate third party providers to assist in the management, investments, administration and insurance requirements of the fund.
- Monitor and change third party providers where necessary.
- Formulate an investment policy and invest the assets of the fund accordingly.
- Ensure effective communication with fund members.
- Keep appropriate records of fund meetings and decisions.
- Assess the impact of changes in legislation and amend practices and policies where appropriate.

There is now a greater recognition of the fiduciary role of trustees and the consequences of mismanagement. Growing consumerism, complex legislation, corporate failures, here and abroad, and the publication of corporate governance reports, such as the King Report, have all had a significant impact on the responsibilities of retirement fund trustees. In addition, current proposed revisions to Regulation 28 of the Pension Funds Act (24/1956) place additional responsibilities on trustees. These proposed revisions are a significant step in the direction of proper and prudent governance, which will facilitate sound management of retirement fund investments.

2.4.5 Asset manager

The Asset Manager is responsible for managing the investment portfolio in accordance with the mandate from the Trustees. The portfolio's asset allocation is based on the investment choices of the members, and is aimed at generating long-term conservative capital growth.

Selecting the best manager within an investment discipline is a challenging endeavor, with something as critical as pensions; trustees should ensure that the chosen provider has a credible reputation and the expertise and skill to deliver optimally.

2.5 Summary

Along with external factors such as increased life expectancy, HIV and early retirement there are signs of a decline in pension provision by employers as many switch from defined benefit to defined contribution pensions. To compound the problem, financial markets didn't perform as expected. Given that pension funds generally depend on steady returns to pay members, the poor market performance of the past years has exacerbated the problem by losing a significant amount off pension fund assets.

The affect of internal factors such as contributions, tax and investment returns on the final retirement funding was discussed. To limit the investment risk the author proposed two basic investment choices in DC funds.

The returns of a fund have always been the result of the cooperation of the all participants - the asset managers, the employers, the Fund staff, and the contributing employers. The role players were defined and their influence on internal factors was discussed. Together all determinants contribute to built a

fund that is positioned to financially protect employees and their families during their retirement years.

Chapter 3

Retirement Fund sufficiency model

3.1 Introduction

As people enter the 21-st century, demographic, economic, and societal trends have an impact in the way people view and prepare for retirement. The trends were discussed in the previous chapter - people are living longer, aids impact and the shift to DC funds where employers are increasingly shifting responsibility for a financially secure retirement to employees, all contributed to this change in viewpoint.

Once members start thinking about where they should invest their money, they need to ask what their retirement funding target is, what rate of growth they require on their retirement fund assets to meet this target, are additional contributions necessary. To get the answers, members should do a lifestyle and needs analysis.

This chapter will review the role of a model as a tool to determine the sufficiency and adequacy in DC funds based on these lifestyles and needs.

The aim of the modeling is to

- Inform a pension fund of the potential risks they may face if funding is not sufficient and they continue with their present strategy.
- Inform DC fund members of their projected income at retirement.
- Allow existing pension funds and/or members to manage the risks they may face by choosing an investment and contribution strategy, which is consistent with their retirement expectancies and with the current status of the DC-pension account.
- Allow funds to adopt a strategy that, will with high probability; permit their members to retire by a certain age with a comfortable level of pension.

3.2 A DC assessment model

This model will simulate financial planning activities that will reap retirement benefits and to test sustainable funding of the individual. The model contains life style goals based on current living standards. These goals will guide the retirement planning process and provide a framework to determine the adequacy of a fund in providing for retirement.

The goals are reflected as the variables in the model:

- Retirement age
- Money needed at retirement to keep up with living standards
- Standard of living e.g. the percentage of final salary required in order maintaining the same standard of living.

3.2.1 Definitions

Figure 6: Inputs in model

The screenshot shows a software window titled "Retirement Fund Sufficiency Model". The main heading is "Retirement Fund Sufficiency Model". Below the heading, there are two columns of input fields. The left column contains: Name (Member ABC), Current Age (32), Monthly Salary (10000), Pre-Retirement R.O.R. [%] (4), Contribution Rate [%] (7.5), and Expected Inflation Rate [%] (6). The right column contains: Required Standard of Living [%] (50), Retirement Age (65), Age Expectancy (85), Post Retirement R.O.R. [%] (5), Current Retirement Savings (20000), and Expected Salary Increase [%] (8). At the bottom, there is a "Calculate" button, a "Create Data File" checkbox (checked) with a text field containing "C:\Temp\rm_data_file.csv", and a "Done" button.

Variable	Value
Name	Member ABC
Current Age	32
Monthly Salary	10000
Pre-Retirement R.O.R. [%]	4
Contribution Rate [%]	7.5
Expected Inflation Rate [%]	6
Required Standard of Living [%]	50
Retirement Age	65
Age Expectancy	85
Post Retirement R.O.R. [%]	5
Current Retirement Savings	20000
Expected Salary Increase [%]	8

Source: Own

Current age

Current age of a member

Retirement age

Age a member wishes to retire. This calculator assumes that the member make contributions to their retirement savings until retirement age. So if one retires at age 65, the last contribution will be at the end of 65. This calculator assumes that members make their contributions at the end of each month.

Age expectancy

Age expectancy refers to the age one expects until mortality. Based on family and medical history some people might live longer than others. This means retirement income must last until the expected age.

Monthly salary

The total pensionable income.

Current retirement savings

The total amount currently saved towards retirement. Balance of the fund credit of a member.

Pre-retirement rate of return

This is the annual rate of return expected from investments after taxes. It is important to remember that future rates of return can't be predicted with certainty and that investments that pay higher rates of return are subject to higher risk and volatility. The actual rate of return on investments can vary widely over time, especially for long-term investments.

Post retirement rate of return

This is the annual rate of return expected from investments during retirement. It is often lower than the return earned before retirement due to more conservative investment choices to help insure a steady flow of income. It is important to remember that future rates of return can't be predicted with certainty and that investments that pay higher rates of return are subject to higher risk and volatility. The actual rate of return on investments can vary widely over time, especially for long-term investments.

Contribution rate

The percentage of pensionable income one will save towards retirement. This percentage is the total of the member and employer contributions.

Expected inflation rate

What one expects what the average long-term inflation rate will be.

Required standard of living

The income required for retirement, expressed as a percentage of salary in the last year of employment. One can change this amount to be as low as 50% and as high as 150%.

Expected salary increase

Annual percent increase one expects in pensionable income.

Years until retirement

Number of years before retirement.

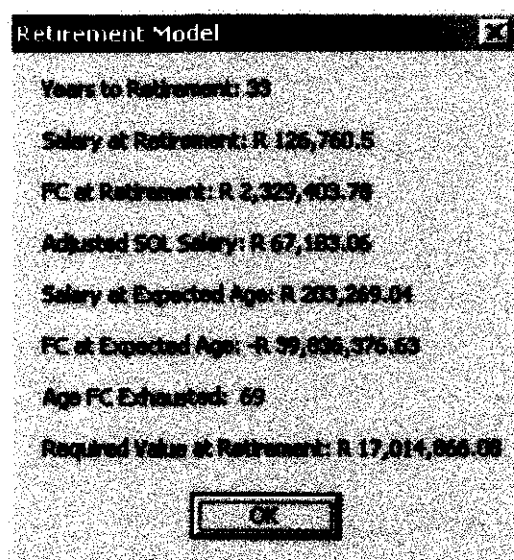
Years of retirement income

Total expected number of years to use retirement income.

3.2.2 Formulas used to calculate results in the model

From the literature to date it became evident that new approaches to pension fund management becomes necessary. Previous developments focused on relatively simple models in understanding the nature of pension fund dynamics. The aim of this study is to give an understanding of some of the important factors in the more complex pension industry and to provide the DC pension fund members with deterministic projections.

Figure 7: Output from model



Source: Own

(FC refers to the Fund Credit or balance of savings and Adjusted SOL salary refers to Standard Of Living salary.)

The fund and member dynamics are:

Age - The age of the member will determine the number of years available until retirement. The assumption is that the member will continue to contribute in these years until retirement age.

$$X = b - a$$

where:

X = Number of years available for savings toward retirement

a = current age

b = retirement age

Example: Member age 32 and preferred retirement age 65

$$X = 65 - 32$$

$$X = 33$$

Years after retirement - This is the number of years between retirement and mortality.

Salary before retirement -The current salary was used to project the future salaries until retirement. Every 12 months there will be a salary adjustment, which will be applicable for the next 12 months. The adjustment is calculated on the expected salary increase, which was inserted in the model. Every salary must be recorded to calculate the contributions according to the contribution rate.

$$S_1 = c \times (1 + d)$$

where:

S₁ = salary for the year

c = previous salary

d = expected salary increase

The calculation will be repeated for every year before retirement.

Example: Member salary R10 000 and expected increase 8%

Salary applicable for month 1 – 12

$$S = 10\,000 \times (1 + 8\%)$$

$$S = 10\,800$$

Salary applicable for month 12 – 24

$$S = 10\,800 \times (1 + 8\%)$$

$$S = 11\,664$$

The calculation will be repeated until month 385 – 396 (for 33 years)

where $S = 126\,761$ (final salary before retirement)

Earnings after retirement -The final salary before retirement was used to project the future salaries until mortality. Every 12 months there will be a salary adjustment, which will be applicable for the next 12 months. The adjustment is calculated on the inflation rate, which was inserted in the model.

The facility exists to adjust the standard of living after retirement. It means that due to a decrease in expenses after retirement a member may elects to adjust the income after retirement to a percentage of salary before retirement.

For the first year after retirement:

$$E_1 = (s \times l) \times (1 + f)$$

where:

E_1 = Earnings year 1 after retirement

s = salary at retirement

l = standard of living

f = inflation rate

and

For the remaining retirement years

$$E = (E_1) \times (1 + f)$$

where:

E = Earnings after retirement

E_1 = previous year's earnings

f = inflation rate

The calculation will be repeated for every year after retirement

Example: Member salary at retirement 126 761, the inflation rate 6% and the standard of living 50%

Earnings applicable for month 1 – 12 after retirement

$$E_1 = (126\,761 \times 50\%) \times (1 + 6\%)$$

$$E_1 = 67\,183$$

Earnings applicable for month 13 – 24 after retirement

$$E = 67\,183 \times (1 + 6\%)$$

$$E = 71\,214$$

The calculation will be repeated until month 229 – 240 (for 20 years)

Contributions - The monthly contribution toward retirement based on the salary of the year.

$$C = r \times s$$

where:

C = monthly contribution

r = contribution rate

s = salary

The calculation will be repeated for every year before retirement.

Example: Member salary R10 800, the contribution rate is 7.5%

Monthly contribution for month 1 to 12

$$C = 10\,800 \times 7.5\%$$

$$C = 810$$

Monthly contribution for month 13 to 24

$$C = 11\,664 \times 7.5\%$$

$$C = 875$$

The calculation will be repeated until month 385 – 396 (for 33 years)

Balance of fund credit - This value is the balance of retirement savings at the end of any year calculated.

Before retirement the fund credit is calculated as follows:

$$F = P \times (1 + i)^n + D \times (((1 + i)^n - 1) / i)$$

where

F = value of the fund credit after n months

P = Current retirement savings

D = amount of each contribution

i = monthly rate of return before retirement

n = number of periods per year

Note: All contributions are assumed to be made at the end of each period

Continue with the savings scenario presented above for the number of years to retirement. The amount of contributions in the formula must be adjusted to the contributions applicable to that year. The current savings (D) for a year will be the end value of savings calculated from the previous year. This will then represent the future value of the retirement savings.

Example: Current retirement savings

$$P = 20\,000 \quad D = 810 \quad i = 0.3333\% \text{ (4\%/12)} \quad n = 12$$

Fund credit end of year 1

$$F = (20\,000 \times (1 + 0.3333\%)^{12}) + (810 \times ((1 + 0.3333\%)^{12} - 1) / 0.3333\%)$$

$$F = 30\,715$$

Fund credit end of year 2

$$F = (30\,715 \times (1 + 0.3333\%)^{12}) + (875 \times ((1 + 0.3333\%)^{12} - 1) / 0.3333\%)$$

$$F = 42\,659$$

The calculation will be repeated until the end of year 33

where F = 2 329 404 (final value in retirement fund)

Balance of savings after retirement - This value is the balance of retirement savings after retirement at the end of any year calculated.

The balance is calculated as follows: (it is exactly the same formula as previously except that the contributions is now replaced by the outflows of monthly earnings)

$$F = P \times (1 + i)^n - D \times ((1 + i)^n - 1) / i$$

where

F = value of the savings after n months

P = Current retirement savings

D = amount of monthly earnings

i = monthly rate of return after retirement

n = number of periods per year

Continue with the savings scenario presented above for the number of years after retirement. The amount of earnings in the formula must be adjusted to the earnings applicable to that year. The current savings (D) for a year will be the end value of savings calculated from the previous year. If the savings account runs into a negative it will imply that a fund provide for a member until that age. (years after retirement)

Example: Current retirement savings

$$P = 2\,329\,404 \quad D = 67\,183 \quad i = 0.4166\% \text{ (} 5\%/12 \text{)}$$

$$n = 12$$

Fund credit end of year 1

$$F = (2\,329\,404 \times (1 + 0.4166\%)^{12}) - (67\,183 \times ((1 + 0.4166\%)^{12} - 1) / 0.4166\%)$$

$$F = 1\,623\,649$$

Savings value 2 years after retirement

where: D = 71 214 (Inflation adjusted required income)

$$F = (1\,623\,649 \times (1 + 0.4166\%)^{12}) - (71\,214 \times ((1 + 0.4166\%)^{12} - 1) / 0.4166\%)$$

$$F = 832\,291$$

The calculation will be repeated until the savings run out (becomes negative). The years after retirement or the age of the member will be an indication until what age the funds can provide sufficiently in the needs of the member. In the above

example savings run out after the age of 67 (2 years after retirement)

Fund credit needed at retirement to provide sufficiently until mortality - This number will represent the amount of funds that a member will need to provide in his/her financial needs until mortality. The mortality age is a variable in the model and may be adjusted to personal family history of health and mortality.

The first step is to calculate monthly earnings discounted to a value at the beginning of the year

$$J = -E (1 - (1 + i)^{-n} / i)$$

where

J = Present value of monthly earnings required for each year of retirement

E = Required monthly earnings

i = post retirement rate of return per month

n = number of periods per year

Continue with the scenario presented above for the number of years until mortality.

Example: Value of monthly earnings discounted to beginning of the year.

where:

$$E = 67183 \quad i = 0.4166\% (5\%/12) \quad n = 12$$

Year 1 of retirement

$$J = -67183 \times ((1 - (1 + 0.4166\%)^{-12}) / 0.4166\%)$$

$$J = -784780$$

Year 2 of retirement

where: $E = 71\,214$

$$J = -71\,214 \times (1 - (1 + 0.4166\%)^{-12}) / 0.4166\%$$

$$J = -831\,867$$

Year 3 of retirement

Where: $E = 75\,487$

$$J = -75\,487 \times (1 - (1 + 0.4166\%)^{-12}) / 0.4166\%$$

$$J = -881\,779$$

Value of salary discounted to age 65

$$W = S (1 + i)^{-n}$$

where:

W = present value of required monthly earnings at age 65

J = value of monthly salaries at the beginning of the year for the year (in previous calculations)

i = monthly rate of return after retirement

n = number of periods per year

Continue with the scenario presented above for the number of years until mortality.

The sum of the values calculated above will represent the Fund credit needed to last until mortality.

$$X = W_1 + W_2 + W_3 \dots\dots W_{20}$$

where:

X = Fund credit needed at retirement (Required value of retirement savings at retirement)

W = value of the required earnings at age 65

Example: Value of annual earnings discounted to age 65 - retirement

Value for J, i and n in previous calculations

Year 1 of retirement

$$P = J (1 + i)^{-n}$$

$$P = -784\,780 (1 + (0.42\%))^{-0}$$

$$P = 784\,780$$

Year 2 of retirement (12 months back to 65)

$$P = -831\,867 (1 + 0.42\%)^{-12}$$

$$P = 791\,379$$

Year 3 of retirement (24 months back to 65)

$$P = -881\,779 (1 + 0.42\%)^{-24}$$

$$P = 798\,033$$

The calculation will be repeated until the mortality age of 85.

The sum of the values is the following:

$$X = 784\,780 + 791\,379 + 798\,033 + \dots$$

$$X = 17\,014\,866$$

3.2.3 Assumptions and methods

The simulation model used in the analysis is essentially a large “what if” financial model. The results for adequacy of funding for each member depend on assumptions made regarding factors influencing pension provision.

For each member, two basic model algorithms can be expressed briefly as follows for any year. The model computes the surplus (or shortage) of the fund credit over the expected (or ideal) balance of years until mortality. A positive represents over funding and a negative represents under funding. The model computes the member’s funded balance on each of its reactors until funds are ‘exhausted’.

Additional funds needed are met by the monthly future contributions over the respective remaining years of each member until retirement. The contribution assumes that a member will increase its most recent contribution, by the expected salary increase and rate-of-return on its funds.

Currency: All results provided by the model are expressed in "Today's Rands", meaning that they reflect the purchasing power in effect today.

Salary increases are assumed to occur annually, the first increase taking place exactly one year after the current age in the model. The pensionable salary is projected over the remaining years of service, based on the expected increase.

The salary increase rate is a variable in the model. An average increase rate of inflation plus 1.33% was assumed to test overall sufficiency. Research done by Renwick Reward (2003) shows a definite relationship exists between inflation and the level of annual salary increases. This research found that the

average salary increases was 1.33% above the inflation rate for the past seven years.

The salary increase will influence the final salary at retirement and determine the standard of living after retirement.

Assumed retirement date: Any permanent termination of employment will be understood as retirement date even when in the context of retirement funds, the general definition of retirement age is 65. However in order to test the member data in the model, a retirement age of 65 was assumed.

Final Earnings: The income after retirement is based on the final salary at retirement according to the chosen standard of living (percentage of income). A default of 75% was used in the test data.

Contributions: The actual contribution rate applicable to a specific fund will be used in the testing data. These rates may vary from 15% to 26% of pensionable salary. The higher the contribution rate, the more provision will be made for retirement and the higher the final value on retirement.

Pre-retirement rate of return: An after tax return of 11% was used in the model. This figure is based on the performance average of asset managers over the last five years as indicated in Alexander Forbes' survey of retirement fund investment managers (2002)

After tax return:

r = pre-tax return (Alexander Forbers' Survey of retirement fund investment managers (2002))

t = retirement fund tax rate

a = portion of assets in equities which is not taxable (Alexander Forbers' survey of retirement fund investment managers (2002))

R = return after retirement tax

Given the above variables the following formula was derived to calculate the after tax return.

Formula used:

$$R = (r \times a) + (r - (rt(1-a)))$$

Where:

$$r = 11.93\%$$

$$t = 18\%$$

$$a = 65\%$$

$$R = (11.93\% \times 65\%) + (r - ((11.93\% \times 18\%)(1 - 65\%))$$

$$R = 11\%$$

It must be stressed that the past history is not necessarily a guide to future performance and therefore this figure may represent a limitation in the model.

Post-retirement rate of return: As previously mentioned the returns after retirement might be lower than before retirement due to the conservative investment choices with low risks involved. The Alexander Forbes short-term fixed interest index (2003) of 11.3% return, was used in the model. The individual will be taxed on these returns, based on their individual marginal tax rates.

Personal tax was not included in the calculations due to the fact that both the member's salary and annuity initially used in the model were used on a before tax basis. The assumption is therefore that one would have to pay tax on a salary earned, as well as on the annuity. The fact that the marginal tax rate might be lower after retirement is discounted for after retirement (standard of living).

Inflation: It is very difficult to estimate the long-term inflation rate. This may also be one of the limitations in the model, due to the fact that the inflation has a huge impact on the calculations.

High road scenario: An inflation rate of 4.5% was used. Research by Standard Bank (2003) indicated an expected inflation rate between 3% and 6.6% for the next few years. To support this view Mboweni (2003) indicated in his speech at the SARB Management Seminar that Government set inflation targets of 3% to 6% for 2004 and 2005.

Low road scenario: Inflation in 1986 was as high as 18.8% (Statistics SA, 2003:56) and the average over the past 20 years was 8%.

Required standard of living

Most retirement calculations presume that individual's commitments will decrease, as they grow older. Their children become financially independent, house and car debt are settled and changes to their lifestyles help to limit their commitments. However, a lower income may not always be sufficient because the cost of medical care rises and the level of medical attention one requires, tends to increase, as one grows older.

According to accepted industry indicators one will need between 70% and 85% of current income in retirement, if one wants to maintain the same standard of living. For the purpose of the model a standard of living of 75% will be used.

Data: Sampling records were taken from ten different DC funds with various investment choices in a fund. This file provides details of age, income, contributions and balance of current fund credits. A data selection was made for members in the higher, middle and lower income groups. To ensure completeness of testing, all ages were represented in the data selected. No personal identifying details were given from the funds. The data set used,

provides a level of accumulation and representation. For the purpose of the model there is no distinction between gender, race or marital status.

Value in pension fund account at retirement/ Fund credit: The fund credit is generally the final sum available at retirement. The value will be calculated based on the investment returns, contributions, expected salary increases and number of years to retirement. Tax legislation (Income Tax Act: Act 28/1997) only allows a member to cash in one-third of the final value as a lump sum. Two-thirds must be used to buy an annuity. In the model the total value will be utilised to buy an annuity and to calculate the sustainability of the funds available for retirement. In practice, individuals may use the lump sum differently, but the purpose of the money is to provide for retirement and therefore it was employed as such.

Current retirement savings will be the balance of the fund credit on calculation date. Data gathered from the pension funds would not take into account any provision made by individuals outside the pension fund. It was evident in the sample data that there were individuals with a low value for retirement savings, but with an age near retirement. This might be the result of changes in employment where funds in previous pension funds were not transferred, but either spent or invested separately.

If an individual wants to use the model for personal purposes, they must add any savings (inside and outside the pension fund) towards retirement in this field.

3.3 Summary

In this chapter the different variables that influence the model was discussed. One important limitation relating to funds available, is that savings outside the fund (individual savings) was not taken into account. This may result in a

conclusion that members are not sufficiently funded for retirement, which might not be the case. However the number of people, who make additional provision for retirement other than in a retirement fund, is very small. The reason is that these types of investments are unattractive as people are paying up to 35 years of commissions. (Cranson, 2003)

Other limitations previously mentioned in the chapter are the significance of the rate-of-return, inflation and salary increases on the end results and the fact that it was based on historical data that might not accurately predict the future. Since these variables changes continuously, it is vital to review the calculations regularly.

Although certain assumptions were made to test sufficiency of DC funds as a whole, individuals might use the model effectively by changing the variables to suit their personal circumstances and needs.

Chapter 4

Results of tests in the model

4.1 Introduction

This chapter presents the results of the sufficiency study for the retirement fund provision. Representative data, as described in previous chapter, was used to obtain the results from the model.

The study provided insights into amounts available for retirement. The unique data available from DC funds were used to provide a level of accumulation and representation. The size of the data is such that it is possible to calculate the optimal solution.

The results are used to discuss the adequacy and sustainability of DC funds to provide members in their years of retirement. The result's aim is to provide insights into salaries, contributions and ages of members in a DC fund.

4.2 Results

The actual and most recent information of 120 members was obtained from 10 different funds (see description of data in previous chapter). Based on the projections done, using very favourable assumptions (see table 2 below), the sufficiency model indicated that only 73% of members can retire financially independently, if mortality is at age 85.

With very positive returns and the low inflation rate used, there are still 27% of the members who will not be able to retire with sufficient funds.

4.2.1 Variables used in testing: Conclusions

As discussed in the previous chapter, to perform retirement projections one needs to make some assumptions. The basis for the assumption was also discussed in the previous chapter.

Table 2: Variables used in testing

Variables	Value / Rate
Retirement age	65 years
Age expectancy	85 years
Pre-retirement rate of return	11%
Post retirement rate of return	11.3%
Expected inflation rate	4.5%
Required standard of living	75% of salary at retirement
Expected salary increase	5.8% (Inflation + 1.3%)

4.2.2 Salary

From the data received from the pension funds, the salary distribution was the following:

Table 3: Salary distribution

Salary bands	% Members tested	% of category who were under funded
Salary < R 5000 per month	17%	20%
Salary between R 5000 and R 10 000	35%	20%
Salary between R 10 000 and R 15 000	28%	15%
Salary > R 15 000	20%	60%

The average and median salary of members with insufficient funds was R 18 398 and R 15 442 alternatively.

It is significant that 60% of members in the high-income category were under funded at retirement. These members' standard of living is much higher than the lower income groups, therefore the funds at retirement must be much higher to maintain the same standard of living after retirement.

4.2.3 Contributions

There is a direct link between members' salaries and the contributions made to a fund. Usually a contribution is based on a percentage of salary.

The data applied from the pension funds indicates that the contribution rates were the following:

Table 4: Contribution rates

Contribution % of salary	% Members tested	% of category who were under funded
Contribution < 15% of salary	17%	64%
Contribution between 15% and 20%	59%	17%
Contribution > 20%	24%	20%

It is evident that the lower the contribution rate, the more likely it is that the member may be under funded. From the table it is clear that 64% of the members with a contribution rate lower than 15% of salary were under funded compared to 20% of members with contributions higher than 20% of salary. Even then the 20% might not be under funded as a result of the contributions but for reasons other than contributions e.g. age.

The conclusion is that members with higher contributions have a lower risk of under funding than members with lower contributions.

4.2.4 Age

The data applied from the pension funds indicates that the age distribution were the following:

Table 5: Age distribution

Age bands	% Members tested	% of category who were under funded
Age between 20 and 30	14%	None
Age between 31 and 40	37%	None
Age between 41 and 50	30%	42%
Age between 51 and 60	17%	65%
Age between 60 and 65	3%	100%

The results are a clear indication that the earlier a member starts saving for retirement, the better the chances are to retire independently. None of the members under the age of 44 were under funded.

The average and median age of members with insufficient funds were 52 and 51 years alternatively with a standard deviation of 5.66.

As mentioned in the previous chapter this may be a result of members resigning from one employer and start contributing in a new fund. In this instances the funds accumulated in the previous funds were not considered.

For individuals using the model they may add savings outside the funds to the accumulated funds when calculating their final values.

Another aspect to consider is the fact that young members' salary projections were based on their current salaries and were only increased by the expected salary increase. Reality is that these members are in the beginning of their careers and their salaries might increase exponentially due to promotions etc.

Given the dynamics mentioned above, the overall result will still be relevant as the data was very representative of what is actually happening with the individual in the pension fund context. The results of the members contributing from a young age will be balanced with members joining at a late stage in their career.

4.2.5 Funds exhausted

The results indicated, the under funded members' funds will only be sufficient until an average age of 78 years.

As discussed in chapter two, people in South Africa are ageing increasingly. Although a mortality age of 85 was assumed in the model it may be necessary to provide until ages in the nineties. If only 27% of DC fund members, as calculated by the model, will have sufficient funds until the age of 78, the responsibility will increasingly lie with government to provide for these individuals after exhaustion of retirement funds.

4.2.6 Required funding

The model was used to calculate the funds each member needs at retirement date, age 65, to provide for retirement income until the age of 85. If the required funds at the age of 65 were compared to the expected funds at the same age the model indicated that the members were under funded on average by 22%.

To obtain the required funds there are various alternatives to supplement the current savings. These alternatives will be discussed in chapter 5.

In the following results all variables were kept constant (see 2.1) in the testing, except for the following:

4.2.7 Investment returns

To test the influence of returns on the final value of retirement, the same member data was applied but the pre-retirement rate of return was changed to 6% (previously 11%) and the post retirement rate to 7% (previously 11.3%). The inflation rate was kept at 4.5% and therefore the returns were still higher than inflation (real rate of return).

The impact of these investment returns changes was phenomenal! More than 90% of the members were under funded with a return of 6%. The number of members who are under funded rose by more than 60%.

The average age when funds were exhausted was 75 years. This indicates that less than 10% of members over the age of 75 years will be financially independent and the burden on the state will become unbearable.

This support the remarks in the literature study that investment returns is one of the most important contributors to funds' sufficiency.

4.2.8 Ageing

Again the same member data was applied to test the influence of ageing on the sufficiency of retirement fund income, but this time the expected mortality age was changed to 90. The percentage of members with insufficient funds rose from 27% to 37%. The impact is an additional 10% of members who will become a financial liability to the state.

Although ageing has a lesser effect on the income sufficiency than investment returns, a 10% increase in the context of a whole population might have disastrous results.

4.2.9 Inflation

Whilst keeping all variables the same, inflation was changed from 4.5% to 8%. (Note that the expected salary increase is the inflation rate + 1.3%) This means that returns still beat inflation by 3% (11% - 8%)

The effect of the increase of inflation was significant. Even though a real rate of return was obtained, the inflation decreased the average age for sufficient funding to 69 years. In this case more than 90% of the members could not retire financially independently.

The importance of a proper monetary policy comes to the fore. Funds cannot directly influence the inflation rate but can only act on it. The only other way to reduce the impact of inflation is to increase investment returns.

4.2.10 Early Retirement

The retirement age was changed from 65 to 55 years, to test the impact of early retirement on funding. The balance of savings on retirement at 65 was compared to those at 55.

On average these savings at age 55 was 72% lower than at the age of 65, and in almost all cases funds weren't sufficient until the age of 85. An additional 10 years of savings resulted in an increase of funds of more than three times the current value.

Early retirement is a major concern if one takes into account the number of people who decides to retire at 55.

4.3 Summary

The purpose was to test overall sufficiency and the major factors that influence this sufficiency in DC funds, but the model can be a useful tool to test the sufficiency of a specific fund or individual. A specific fund may test its sufficiency based on its own performance history and came to conclusions about investment strategies or possible changes in contribution rates.

From the results obtained in the model, various conclusions can be drawn to why DC funds are unable to provide all their members with sufficient income until mortality.

Reasons such as high standards of living, contributions that are too low or the age on which members join a fund were discussed. Other reasons for underfunding may be returns lower than inflation or lower salary increases.

One must keep in mind that returns on savings were assumed in this model and applied to all members/funds. In reality some funds may perform lower than the averages used in the model and might therefore also be a reason why members are underfunded.

As seen in the results in this chapter, changes in the rate of return are the most important factor influencing the final values of funds.

Chapter 5

Conclusions and recommendations

5.1 Introduction

This chapter includes conclusions derived from the findings, recommendation for DC funds and individuals, and recommendations for further research. The conclusions and recommendations are done with consideration of the literature study and the problem statement.

The main purpose of the study was to investigate if defined contribution funds could ensure sufficient income during retirement. This inquiry was considered important because there was a need to identify variables that can be affected in ways to improve sufficiency of income.

Organising and integrating the findings of the data projections and interpreting the meaning of this research met the purpose.

The achievement of the purpose of the study are revealed:

5.2 Conclusions

A few factors were found to be associated with the sufficiency of retirement fund income. These factors were categorised as internal factors and external factors. The following conclusions were derived from these sets of factors.

5.2.1 Internal factors

Salaries: An interesting result was that individuals with higher salaries and therefore a higher standard of living are more likely to be insufficiently funded at retirement age. The higher the standard of living the more difficult it is to provide sufficient retirement income to maintain the same standard of living. Fringe benefits, like housing subsidies and car allowances, are not always included in the portion of the salary on which the pension is calculated.

Contributions: The contribution rate also impacted on the value at retirement. Contributions can be directly linked to salaries; it is significant that members in funds with a higher mandatory contribution rate tend to be less likely to be under funded than in funds with lower contribution rates. This is a logical finding – the higher the savings the higher the value of savings at retirement.

Age: The earlier one starts saving the higher the probability to retire independently. Based on the assumption that no funds will be withdrawn after the age of 30 the model indicates that sufficient funds will be available for retirement until age of 85.

Unless members' have spent most of their life with a single employer the chances are very slim that their pension will provide sufficient income to maintain their standard of living at retirement. It is not without reason that there is a joint attempt between employers and funds to encourage members to early start saving for retirement.

Investment returns: The single most important factor that influences the final savings value at retirement. A small increase or decrease in returns resulted in substantial changes in the final value of savings. The aim is long-term real

returns in order to maintain savings levels.

5.2.2 External factors

Ageing phenomenon: For every year a person lives longer additional funds is needed to provide in their needs. The percentage members with insufficient funds rose by 10% with an increase in mortality age to 90 years and obviously the length of the insufficiency similarly increases with the age increase.

Inflation: The level of inflation affects the buying power of a retiree's income and therefore it is important to have sufficient investment returns to provide for inflationary increases in income after retirement. Results proved that an increase in inflation might eradicate the number of years of sufficient income significantly.

Early retirement: Retirement at 55 had a negative impact on funds compared to what could have been saved if contributing for an additional 10 years. Not only is the savings at retirement much less, the additional years spend in retirement is also much more.

5.3 Recommendations

These recommendations attempt to improve DC fund's operations for the long term, protect the benefits of every member, and substantially reduce fluctuations in payments to the fund by employers. The required primary effect is maximum protection to retirees and members of the fund.

Recommendation 1

Individuals in the higher income groups should go beyond the normal savings in pension fund and make additional provision for retirement. They can

accomplish this by increasing their contributions toward the pension fund. If members cannot add additional funds to an existing fund, they should consider taking out a retirement annuity to supplement the retirement income/capital that will be provided by their existing fund.

Recommendation 2

Keeping funds from soon draining away, in the face of lower investment returns, will require larger contributions. Funds with a low mandatory contribution rate may consider accepting voluntary contributions from members. This will increase the monthly savings toward retirement and eventually increase the value of savings at retirement.

Employers are jointly responsible for the manner in which funds provide for their employees in retirement and therefore the employee need to increase their portion contributions when necessary.

For employers who wish to share the responsibility of providing funds for retirement with their employees a minimum contribution can be required. This recommendation will require employers to make a minimum contribution of 7.5 percent of salary every month, including years in which the investment performance of the fund would make a lower contribution possible. This will help strengthen the fund by increasing its assets and will reduce volatility of employer contributions in future years.

Recommendation 3:

For most of the larger employers membership to a pension fund is mandatory. Therefore employees are in a position to start saving toward retirement at a very young age.

Unfortunately when employees change employment they do not always reinvest their savings from previous funds. Using retirement money for current

needs may satisfy a short-term need, but could cause financial hardship in the long term. It is in these circumstances where people fail to preserve their fund benefits, preferring to use the withdrawal benefit for current needs, might cause members to be under funded at retirement.

Changes in the rate at which premature withdrawals are taxed might have a positive influence on the tendency to use pension benefit for current needs. The current tax regime seems unfair in giving tax incentives on lump-sum payments when a member withdraws or retires from a fund, but none to pension payments. (Income Tax Act, Act 28/1997 Section 7A)

Part of each lump sum is completely tax free, while the balance is taxed at an average tax rate. This tax rate is normally lower than the member's future marginal tax rate.

Retirement funds must aim to encourage people to save for retirement; logic would require part of the pension payments to be tax free instead of part of the lump sum. Tax exemptions can be applied to the first benefits taken from a fund, regardless of whether they are taken as lump sums or pensions.

It seems that the taxability of lump sums, are not enough discouragement to prevent people from using these funds. When members reach retirement age, they are only allowed to take one-third in cash and two-thirds should be used to buy an annuity, which will provide a monthly income. This rule only applies at retirement age. One might consider the same limitations as at retirement for withdrawals prior to retirement. Members from any age will then be forced to transfer at least two-thirds of their benefit to another fund until retirement.

Together government and regulators must act to discourage premature withdrawals in funds, which will lead to more saving in pensions. Employers have a key role to play in educating and helping employees with their pension provision, particularly when employees resign or they appoint new employees. Research by AON (2002,1) also shows that employees trust their employers

far more than the Government to give credible advice on pension matters.

Recommendation 4:

The trustees of a retirement fund are accountable to the members of the fund. They bear responsibility for investment of the fund's assets with a view to maximising value over the long term – subject to an acceptable level of risk. They need to ensure the selection of appropriate investment channels and monitor performance against pre-determined benchmarks, for example, a number of percentage points above the Consumer Price Index over a certain time frame.

The start of the investment process should be the setting of objectives and strategies that, in turn, determine the selection of appropriate channels. Considerations which will impact on strategy and the channels selected will include the member profile, time horizon and appropriate level of risk.

Having taken all of these factors into account, trustees should document their strategy in the form of an investment policy statement, which should be communicated to all stakeholders including the investment managers and fund members.

If on-going monitoring through systematic procedures reveals continuous under-performance on the part of the investment managers, corrective action needs to be taken. Fund members are quite entitled to question trustees in this regard and, if necessary, to demand explanation of ongoing use of a consistently under-performing asset manager.

Recommendation 5:

Early retirements are never desirable for the nation. The government and the business sector and funds should combine to work out measures to address this crucial social problem.

Early retirement incentive programs are now the most popular means companies use to achieve a reduction in the work force. And for companies in the midst of mergers, takeovers, or downsizing, early retirement have been one way of layoffs.

For their part, businesses need to seek efficient and transparent management and expand the part-time job system for the sake of their own survival, while the government has to place top priority on creating more jobs and promote bold changes in industrial and labour policies.

Individuals who do have a choice and still enjoy working, have got a lot of factors to weigh before making such a decision. While it's true that many early-retirement incentive programs look appealing at first glance — incentives may include additional or enhanced pension benefits, retiree medical aid, and lump-sum cash benefits — the individual should keep in mind that the high cost of living and the erosion of purchasing power due to inflation may make such benefits much less attractive in only a few years.

5.4 Limitations in research

The first and most obvious limitation of the study is the level of generalisation embedded in this type of research. Although this may be an inherent aspect of this kind of qualitative research, it must necessarily be explicitly mentioned. Because limited data was utilised, statements about whether the findings of this study can apply with equal validity to a larger population are speculative at best. The justifications for the variables were set out in the beginning and remain valid.

Another limitation is the assumptions that were made in terms of input variables such as rate of return, inflation and mortality age. The history was used to predict the future and although carefully chosen the future might be totally different.

The work represented here is an important first step of a program of study that will attempt to uncover, more broadly, the funding levels of DC funds in providing members with sufficient retirement income.

5.5 Recommendations for further research

There are several directions future research might take, both exploratory and confirmatory. The first exploratory direction would be to repeat this study with a larger number of individuals.

In terms of continuing to study members in DC funds, future research might involve a larger number of funds either in the same industry or in a larger number of industries. This direction would provide a sense of whether the results of this study might be more generally applicable to other individuals. Research along those lines would more accurately answer questions of sufficiency, which are an acknowledged weakness in this research.

Another exploratory direction might be to extend the research to other forms of retirement provisions such as annuity funds and provident funds. A larger number of the population will be covered if sufficiency was tested over a broader spectrum.

Conclusions were supported by assumptions and predictions of the input variables such as rate of return, inflation and mortality age. The testing can be repeated with variables that include low, middle and high road predictions.

The confirmatory research could continue along the same lines in the case of each of the exploratory studies indicated above (e.g. funds in different industries, DC funds vs. annuity funds). Each confirmatory study would likely suggest different hypotheses, but as a whole they would give a more complete picture of the level of sustainability of retirement funding.

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