

Retirement funding and collectivism: Pooling risk to help define benefits for defined contributions

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ABSTRACT

This paper considers the evolution of retirement funding structures and explores how future scheme design may improve retirement benefits in South Africa. It is motivated by a perceived inadequacy and uncertainty of retirement outcomes in a system dominated by defined contribution arrangements – where individual members bear the full burden of investment, longevity, and annuitisation risk.

Historically, defined benefit schemes provided greater certainty regarding retirement income but exposed employers to uncertain costs. In contrast, defined contribution schemes offer predictability of contributions (cost) but shift the benefit uncertainty onto individuals in terms of the ultimate income they receive.

The paper outlines the key characteristics of defined benefit and defined contribution funding arrangements and as well as collective 'pooling' arrangements – such as Collective Defined Contribution (CDC) schemes in the United Kingdom. CDC combines fixed contributions with collective risk-sharing mechanisms that can allow members to target a more stable lifelong income, without requiring employer guarantees. By pooling longevity and investment risks, CDC introduces an element of cross-subsidy that can smooth outcomes and improve overall retirement security.

Drawing on international experience from countries such as the Netherlands, Denmark, and the United Kingdom, the paper outlines key design features and governance principles of collective systems. These include clear communication to manage expectations around variable outcomes, transparent benefit adjustment mechanisms and strong governance frameworks.

The South African context considers fund size, risk pooling, and annuitisation to manage consistent retirement incomes. Collectivism is considered as a mechanism to share risks and improve the stability of retirement outcomes at adequate levels.

We assess the potential quantitative and qualitative benefits of risk pooling (a term we use interchangeably with the term 'CDC').

We conclude that incorporating collective risk-sharing mechanisms into retirement funding offers a credible pathway to achieving more certain and sustainable retirement outcomes.

KEYWORDS

Retirement income; defined benefit; defined contribution; risk-sharing; collective defined contribution (CDC); target benefit; guarantees; pension reform; sustainable income; annuitisation

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1. INTRODUCTION

1.1 Background and problem statement

1.1.1 Over the past three decades South Africa has shifted the bulk of occupational retirement provision from defined benefit (DB) to individual defined contribution (DC) arrangements. In doing so, investment and longevity risk transferred from employers (who sponsor these funds) onto individual members.

1.1.2 The DC model provides cost certainty for employers, portability, and transparency of the individual account. But it also transfers risk to individuals, who may be ill-equipped to manage it. Typically, members may select contribution rates and investment portfolios and must navigate complex options to convert a lump sum into income at retirement. The result is volatile and often inadequate retirement outcomes, a preference for lump sums over regular income and a general lack of engagement with and trust in the retirement system.

- 1.1.3 We consider pension design in this environment where:
- Retirement adequacy is under sustained pressure: many members reach retirement with income replacement ratios well below target (or expectations).
 - Structurally, a large proportion of members are exposed to significant market and longevity risk and do not leverage risk sharing sufficiently to potentially improve outcomes.

- The regulatory landscape is evolving through the introduction of default regulations for retirement funds and the recent two-pot reform. This has highlighted the need for a default framework for retirement fund members and focuses attention on preservation as well as turning savings into retirement income.

1.2 Research objectives

1.2.1 This paper aims to assess whether collective pooling, such as in Collective Defined Contribution (CDC), can help address some of the perceived shortcomings with DC benefit provision. It also considers how collective risk pooling arrangements may be implemented in a South African context.

1.2.2 This latter point can hopefully lead to the development of solutions within our well-established individual DC (IDC) market that incorporate the risk-sharing principles of CDC arrangements currently being debated (and rolled out) in the United Kingdom (UK).

1.2.3 To meet these objectives the study integrates a quantitative strand (modelling retirement outcomes under DC and risk-sharing frameworks) with a qualitative strand (need for reliable and sustainable benefit outcomes, governance, member engagement, advice and communication).

1.3 Scope

1.3.1 The paper focuses on second-pillar occupational retirement provision. It does not attempt to redesign the state old-age grant or first-pillar policy, and it treats the two-pot reform as context rather than a separate subject.

1.3.2 It considers international CDC evidence and aims to model similar outcomes for a South African example. This modelling helps demonstrate how collectivism may be used and developed to manage (and potentially improve) IDC outcomes.

2. LITERATURE REVIEW AND THEORETICAL FOUNDATIONS

2.1 What are Collective Defined Contribution funds?

2.1.1 A CDC scheme is an occupational arrangement in the UK, where employers and members pay fixed (defined) contributions into a single collective fund that is invested as a pool. CDC aims to provide each member with a target income for life calculated from rules set in advance. The income is not guaranteed by the employer. Investment and longevity risks are borne collectively by the membership, and benefits (including pensions already in payment) are adjusted upward when funding is strong and downward when it is weak, so that the fund stays in balance against its target liabilities.

- Contributions are fixed (as in DC), so the employer has cost certainty and no additional balance-sheet liability.
- Assets are pooled and managed collectively (as in DB), rather than sitting in individual member accounts.

— The benefit is a target that can change. Benefits are adjusted through indexation and experience, and, in adverse conditions, can be reduced. Under DB the employer bears the risk associated with funding the benefits; under individual DC the saver bears the risk as an individual; under CDC the membership collectively bears the risk, with no employer guarantee – and no individual account (in the UK version).

TABLE 1. CDC compared with DB and individual DC

Feature	Defined benefit (DB)	Individual DC	Collective DC (CDC)
Contributions	Undefined and variable; sponsor tops up deficits, can have contribution holidays	Defined, members can vary	Defined, members can vary
Benefit	Guaranteed formula based	Variable, whatever the accumulated pot buys	Targeted, not guaranteed but less variable than IDC
Investment risk	Sponsor	The individual member	The collective membership
Longevity risk	Sponsor	The individual member	Pooled across members
Assets	Pooled	Individual accounts	Pooled
Income for life?	Yes	Only via life annuity / managed drawdown	Yes
Can benefits be cut?	Only on sponsor insolvency	Yes – pot rises or falls	Yes – by design but less likely / frequent than IDC
Sponsor/employer balance-sheet risk	High / open-ended	None	None
Typical investment stance	De-risked to bonds	Life stage glide to lower growth assets	Growth-tilted, longer and higher growth asset exposure

2.1.2 *The cost, benefit and risk identity: why DB and DC can fund the same benefit*

2.1.2.1 There is a direct relationship between the contributions paid into a scheme to fund benefits and the benefits that can ultimately be paid, and this relationship holds under any scheme design. If two schemes receive the same contributions and earn the same investment return, and actual benefits are paid as expected, each can pay an identical benefit.

2.1.2.2 We make this obvious point to highlight that the same theoretical cost-and-benefit outcome can be produced by different structures (DB or DC). The essential difference is which element is defined (the benefit or the contribution) and the way risk is managed to deliver the benefit.

2.1.2.3 It follows that benefits are more certain under DB while cost is more variable; and that cost is more certain under DC while the benefit outcome is more variable. Investment and longevity risk are pooled under DB (and ultimately borne by the employer) but borne by the individual under DC. As a result, the collectivism of DB introduces a cross-subsidy of individual experience that individual DC largely removes.

2.1.2.4 Cross-subsidy is often viewed as a drawback of collective arrangements

when set against the individual ownership of DC. In practice, it is the mechanism that shares investment and longevity experience to spread risk – to produce more consistent outcomes than any one member is likely to achieve alone. CDC reintroduces risk-sharing while keeping contributions defined. It is this relationship (broadly the same cost and potentially the same benefit, but a different allocation of risk) that motivates collective designs that we examine in this paper.

2.2 How the mechanism works

2.2.1 Each year an actuary compares the value of assets with the value of the target benefits. Surpluses are distributed as benefit enhancements, while shortfalls may result in a reduction to the expected benefits – target benefits and pensions in payment.

2.2.2 Because there is no employer guarantee to support, a CDC fund does not need to manage the implications of investment risk for the sponsor, as may be the case for a DB fund. Typically, this may result in a DB fund de-risking the investment strategy into bonds to mitigate the investment risks associated with pensions in payment.

2.2.3 Theoretically, the CDC design can have a higher, more persistent allocation to growth assets across the whole life of the fund, based on the logic that the scheme is ongoing. New members keep joining to replace members who pass away so that the investment horizon for the pool is longer than that of an individual member.

2.2.4 A higher allocation to growth assets results in a higher expected return to fund an expected benefit/income uplift. The scheme collective can absorb short-term volatility and adjust member benefits rather than rely on funding from an external guarantor.

2.3 Academic and policy perspectives: claims and evidence

Table 2 summarises normative and empirical claims around CDC.

TABLE 2. Arguments for and against CDC, by type and strength of evidence

Claim	Type	Evidence
Longevity pooling raises income vs self-insuring	Empirical / actuarial	Strong
Employer carries no funding risk	Structural fact	Strong (definitional)
CDC pays ~35–70% more than annuitised DC	Modelling	Mixed; assumption-sensitive
A long horizon makes higher equity prudent	Contested theory	Weak / disputed
Income is smoother than individual DC	Modelling + experience	Moderate; breaks under shocks
Intergenerational risk-sharing is welfare-enhancing	Theory + modelling	Moderate (well-designed only)
Cross-subsidies can be unfair to the young	Empirical / actuarial	Strong (design-dependent)
CDC channels capital into productive assets	Normative / policy	Weak-to-moderate; contested
Members understand target ≠ guarantee	Behavioural	Weak; comms risk documented
Long-run resilience of whole-of-life CDC	Empirical	Weak — no multi-decade record

2.3.1 The strongest arguments in favour of CDC are:

- (a) longevity pooling, which pays a lifelong income without each member having to buy an annuity or guess their lifespan;
- (b) the ability to hold growth assets for longer, which consultancy modelling translates into a sizeable expected-income uplift (Willis Tower Watson's central projection is roughly 55% more than DC-plus-annuity for the same cost; the Department of Work and Pensions' 2025 work on decumulation CDC cited boosts up to ~60%);
- (c) smoother income than individual DC;
- (d) cost certainty and zero balance-sheet risk for employers;
- (e) scale, low cost and access to productive long-term assets; and
- (f) behavioural simplicity, since most members never move out of defaults.

2.3.2 The major criticisms are equally important and must be addressed:

- (a) the 'no free lunch' objection (Ralfe, 2018) that for a given asset allocation CDC's investment risk is identical to DC, so any uplift is the reward for risk or a transfer between cohorts;
- (b) intergenerational cross-subsidy, which peer-reviewed work on the Royal Mail design (Armstrong et al., 2026) shows can systematically favour early cohorts under flat accrual;
- (c) the dependence on new members, or 'Ponzi/pyramid' concern;
- (d) the fact that benefits, including pensions in payment, can be cut;
- (e) governance, communication and mis-selling risk; and
- (f) the possibility that simpler pooled-annuity designs achieve similar outcomes without the intergenerational machinery.

3. INTERNATIONAL EXPERIENCE AND BEST PRACTICES

Genuine, legally defined CDC remains rare. A small number of countries have either CDC by name (the United Kingdom), collective risk-sharing systems that are CDC-like in function (the Netherlands, Denmark), or adjacent target-benefit / shared-risk designs (Canada and, in a weaker sense, Germany). Collective risk-sharing tends to arrive either nationwide and quasi-mandatory where it grew from strong social-partner traditions (the Netherlands, Denmark, Iceland), or sectorally and by employer where it is retrofitted onto a DB-to-DC transition under legislation (the UK, New Brunswick, the German model). The mandatory, mature systems score best on adequacy, while the retrofitted ones face challenges around fairness, transition and trust.

3.1 History of Collective Defined Contribution implementation globally

3.1.1 *The Netherlands – the deepest collective tradition, now mid-transition*

3.1.1.1 The Netherlands originally framed its reform around the idea of 'defined

ambition' (targeting a benefit for a known, defined contribution) before settling closer to collective DC.

3.1.1.2 The Netherlands has long run the world's largest collective second-pillar system: quasi-mandatory sector and company funds covering roughly 90% of employees and holding well over €1.5 trillion. Historically these were career-average DB schemes with conditional indexation, but because employer contributions were effectively capped they became, in substance, collective DC. The Future Pensions Act (Wet toekomst pensioenen), in force from 1 July 2023, is the largest reform in Dutch history: it abolishes the DB promise, requiring all occupational accrual to be DC by 1 January 2028, and converts most existing accrued rights into the new system (the contested 'invaren' process). Two contract types are permitted: a solidarity contribution scheme with a collective buffer (closest to classic CDC) and a more individual flexible scheme. The Dutch system ranked first in the 2025 Mercer CFA Institute Global Pension Index (85.4, grade A) (Mercer & CFA Institute, 2025).

3.1.2 *Denmark – collective DC with smoothing, plus Arbejdsmarkedets Tillægspension*

Denmark pairs a flat-rate state pension with large, quasi-mandatory labour-market schemes covering around 90% of the workforce (contribution rates roughly 10–18%). These are DC in law but invest collectively and pay smoothed lifelong annuities. The clearest CDC-like institution is Arbejdsmarkedets Tillægspension (ATP), founded in 1964, now holding DKK 710 bn (ATP, 2026): contributions are a fixed cash amount split two-thirds employer / one-third employee, and the benefit combines a guaranteed deferred-annuity element with discretionary bonuses paid when the fund is sound. Denmark ranked third in the 2025 Mercer index (82.3, grade A) (Mercer & CFA Institute, 2025).

3.1.3 *United Kingdom – CDC by name, expanding from a single scheme*

The UK created CDC as a distinct legal category ('collective money purchase') in the Pension Schemes Act 2021, with detailed 2022 regulations and a Pensions Regulator code (Government of the UK, 2021). The Royal Mail Collective Pension Plan, authorised in April 2023 and opened on 7 October 2024, is the UK's first and, as of mid-2026, still only authorised CDC scheme: a single-employer, whole-of-life plan for 100,000+ staff, with members contributing 6% and Royal Mail 13.6%, using flat accrual and shared indexation. Its first valuation (31 March 2025) produced a 6.4% total benefit increase (2.6 percentage points above the consumer price index (CPI), a strong first year but a single data point in a favourable market. Policy is now broadening CDC where final unconnected multiple employer scheme (UMES) regulations were outlined in October 2025 (schemes possible from 31 July 2026). A decumulation-only CDC consultation estimates up to 16 million DC savers could benefit from such an arrangement. To protect fairness, multiple employer schemes are expected to use age-related accrual and an actuarial-equivalence test, with no exit debt between employers.

3.1.4 Canada – shared-risk / target-benefit plans

Canada has no ‘CDC’ label but operates target-benefit and shared-risk plans with the same DNA: fixed contributions, a targeted-not-guaranteed benefit, collective pooling, and the ability to cut benefits. The flagship is New Brunswick’s Shared-Risk Plan model (from 2012), loosely modelled on the Dutch system, governed by a formal risk-management goal (typically not having to cut base benefits in at least 97.5% of stochastically-modelled scenarios) (Benefits Canada, 2024). Conversions around 2013 reportedly enabled roughly 23% in additional cost-of-living allowances. The model is politically charged: critics argue some conversions were unnecessary and shifted risk to members, and a 2023 law mandating further conversions drew a 2024 legal challenge.

3.1.5 Germany and others

Germany’s Sozialpartnermodell (‘Nahles-Rente’), enabled by the 2018 BRSG, allowed ‘pure DC’ with no guarantee for the first time, but accrual remains account-based rather than a pooled target, so it is better treated as a related risk-sharing model than full CDC; uptake has been slow because German employers and savers prize guarantees (a useful counterpoint for South Africa). Iceland (second in the 2025 Mercer index, 84.0 (Mercer & CFA Institute, 2025)) is another strong collective system.

3.2 Comparative analysis of international models

Distilling these cases, the consolidated matrix below compares the systems across legal form, scope, contributions, benefit mechanics, the ability to cut pensions in payment, adequacy, maturity of the evidence, and the headline controversy each faces. ‘CDC-like’ denotes function, not legal label.

TABLE 3. Consolidated comparison of international CDC and CDC-like systems

Dimension	Netherlands	Denmark / ATP	UK (Royal Mail)	Canada (NB SRP)
Legal form	DC (solidarity / flexible) post-2023	DC + mandatory ATP	Collective money purchase (CDC)	Shared-risk / target benefit
Scope	Nationwide, quasi-mandatory	Nationwide (ATP) + sectoral	Single-employer (→ multi 2026)	Sectoral / public-sector
Contributions	Flat-rate, capped ~30%	Fixed cash (ATP); 10–18% occ.	6% member / 13.6% employer	Capped by funding policy
Accrual / benefit	Capital + solidarity reserve	Deferred annuity + bonuses	Flat accrual, shared indexation	Base + conditional benefits
Can cut in payment?	Yes	Bonuses flex; guarantee on part	Yes	Yes (active + retired)
Adequacy	1st, 85.4 (A)	3rd, 82.3 (A)	n/a (scheme-level)	n/a
Maturity of evidence	Decades (now transitioning)	Decades	1 year (since Oct 2024)	~Decade+
Headline controversy	‘Invaren’ / transition fairness	Regressive longevity subsidy	Cross-subsidy to early cohorts	Forced conversions / lawsuit
Sources: Lockton; OECD, 2025; Hyman Robertson, 2026; Norton Rose / Pensions Age; CRR / Benefits Canada; Mercer & CFA Inst., 2025				

4. THE SOUTH AFRICAN RETIREMENT LANDSCAPE AND THE RATIONALE TO CONSIDER NEW/DIFFERENT OPTIONS

4.1 Overview of South Africa's pension system

4.1.1 South Africa's retirement system rests on a means-tested state old-age grant, a predominantly DC occupational second pillar (with a smaller, mostly public-sector DB legacy), and voluntary savings. The occupational layer is characterised by employer-sponsored funding that has consolidated to a large degree into umbrella arrangements. These umbrella funds pool smaller funds into larger multiple-employer funds that benefit from shared costs (administration and investment) and governance.

4.1.2 The two-pot reform (of September 2024) has refocused on preservation and compelling saving to provide retirement income but has also introduced short-term access to a savings component within formal retirement funding.

4.1.3 While we welcome the positive impact that we expect preservation to have on retirement outcomes, the member engagement with benefits is often still focused on:

- individual savings balances as opposed to a potential income outcome,
- flexibility: contribution rates, investment choice and access to savings component, and
- investment returns: time-weighted return comparisons over relatively short 1-, 3-, 5- and 10-year periods.

4.1.4 We note limited changes in the way benefits are communicated or managed for the purpose of generating certainty about the income a member may secure in retirement.

4.1.5 In addition, at retirement, IDC members are often required to secure an annuity with a provider outside of the fund, typically a life insurer – for a guaranteed life annuity – or a linked investment service provider (LISP) for variable draw-down living annuity benefits.

4.1.6 The majority of South Africans still opt for a living annuity, where all investment and longevity risk is borne by the individual.

4.2 Key challenges and objectives

4.2.1 If we establish retirement income provision as a primary objective of employer-sponsored funding arrangements in the second pillar, we consider reasons to explore alternative mechanisms to provide for retirement benefits.

- **Individual risk exposure:** prior to retirement, each member currently bears all investment risk. This results in volatile and uncertain benefit outcomes.
- **Low annuitisation and weak longevity protection:** many DC members never secure a guaranteed lifetime income. It is appropriate to consider methods to manage longevity risk that may include pooled arrangements or even insurance.
- **Uneven and frequently insufficient adequacy:** many members fall short of income targets. This may be treated, to some extent, by the two-pot reform, with forced pre-

servation. We propose that more may be done to focus member engagement on an income target that they can manage.

- **Risk sharing** can stabilise and potentially optimise risk management to the extent that it can enable investment strategies that can raise average outcomes, as the international evidence suggests.

4.2.2 Currently there is a perception that the system is not sufficiently providing the necessary income security for most retirement fund members in South Africa. This stems from a combination of:

- retirement fund members not engaging with the income benefit sufficiently and rather considering IDC benefits in terms of an accumulated savings account;
- complexity of the many variables that impact a potential retirement benefit outcome, and.
- difficulty of understanding and addressing all the risks associated with meeting a retirement income objective due to complexity.

We explore whether there is scope for collective risk sharing to potentially improve retirement outcomes within the South African context.

4.3 Regulatory and market considerations in South Africa

4.3.1 DC retirement provision has become firmly entrenched in South Africa. While we argue that members do not (necessarily) engage with the income objective sufficiently, they do engage with the IDC fund build-up. Certainly, recent retirement reform regulatory initiatives such as defaults and two-pot have significantly improved member engagements and are expected to improve outcomes. We do not propose a wholesale change to retirement benefit provision methods that stray too far from some of these entrenched concepts.

4.3.2 However, it may be appropriate to review the impact of some of the entrenched practices of the South African retirement industry if only to raise awareness that it may require further investigation and/or to develop potential enhancements. In particular:

- the cost (versus the benefit) of optionality,
- individuality as a philosophy in terms of retirement savings,
- living annuity sustainability (and complexity), and
- the benefit of life annuities and potential redesign of certain benefits.

4.3.3 *Income versus other in-retirement benefits*

4.3.3.1 In a DB fund the income benefit is payable by the fund under its rules. In a DC fund a member typically chooses between an insured life annuity (a lifelong income guaranteed by an insurer, with any escalation, guarantee period and spouse's pension that is structured) and a living annuity. A living annuity is an individual investment product

offering choice of investment, a selected drawdown of between 2.5% and 17.5% of capital each year, and a death benefit equal to the residual capital.

4.3.3.2 A living annuity therefore abandons the pooling of longevity risk in exchange for an easily understood death benefit, while requiring the member to fund a sustainable income for an unknown lifespan within the drawdown limits. Where a member has more than sufficient capital, that flexibility and death benefit is attractive.

4.3.3.3 It follows that a living annuity cannot mathematically maximise the income a member receives, because some capital is always directed to an expected death benefit. Members who wish to maximise income may be therefore better served by solutions that pool mortality and investment risk (the case that motivates a collective in-retirement design).

4.4 The opportunity for risk pooling in South Africa

Taken together, these factors make risk pooling a compelling option to provide optimal income benefits for many members. It can improve retirement-income security without reintroducing full DB guarantees by instituting structured longevity and investment risk-sharing among members. International modelling (for example the Royal Mail scheme's expectation of a materially higher pension than a comparable DC-plus-annuity outcome) suggests a meaningful uplift is plausible for the typical DC member. Our working hypothesis, to be tested in Sections 5 and 6, is that pooling may increase expected retirement incomes and reduce risk relative to existing DC arrangements.

5. RESEARCH APPROACH AND METHODOLOGY

5.1 Analytical framework

5.1.1 Our quantitative approach interprets a South African version of the research presented in Aon's 2013 paper, 'The Case for Collective DC – A new opportunity for UK pensions', updated in 2020.

5.1.2 The paper argues that a CDC plan can benefit from pooling risk between members to achieve more stable/predictable and better outcomes than a conventional DC plan. Similar arguments are discussed elsewhere in our paper.

5.1.3 The Aon paper provided a set of modelled outcome results for a CDC plan relative to a conventional DC plan with different investment strategies.

5.1.4 Their results are summarised in Figure 1.

- DC Gilt assumes the member invests 100% in a bond-based strategy over the period in the fund.
- DC Equity assumes the member invests 100% in an equity-based strategy.
- DC Lifestyle assumes the member invests 100% in equities until ten years prior to retirement at which point it transitions 10% from equities to bonds every year – to be 100% invested in bonds in the year prior to retirement.

5.1.5 The results are for a male member in the UK who contributes at a net rate of 10% of salary towards retirement in a DC scheme until age 65, after which he purchases an inflation-linked annuity.

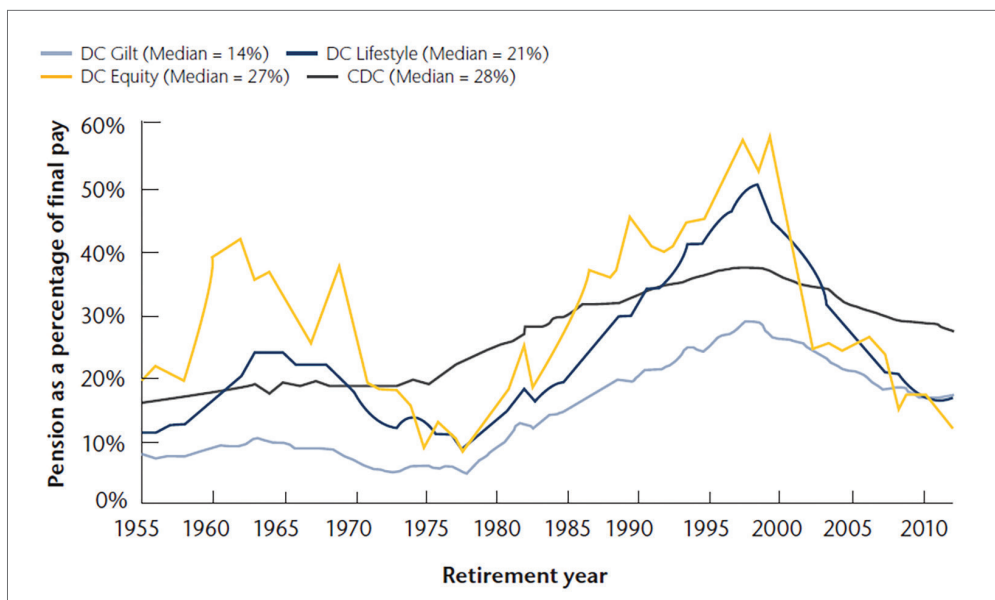


FIGURE 1. Projected income outcomes expressed as a percentage of final salary from the Aon paper ‘The Case for Collective DC’ (Aon, 2020)

5.1.6 The annuity allows for a contingent spouse’s pension of 50% (of the pension at the date of the principal annuitant passing away – and it assumes that 80% of members are married at retirement with a female spouse who is three years younger than the principal annuitant.

5.1.7 The results show:

- While the DC Gilts strategy provides relatively stable outcomes, the outcomes are significantly below the outcomes from the other investment strategies. This is due to the lower return earned by the bond investments relative to the other strategies over the 25 years prior to retirement.
- The DC Equity strategy generates the most volatile outcomes, but they are higher (on average) than the Bonds and Lifestyle strategies. 50% of the outcomes for the measurement period are above an income replacement ratio of 27% (of final salary).
- The DC Lifestyle strategy is more stable than the DC Equity strategy, but the outcomes are lower due to the switch into the lower performing bonds over the ten years prior to retirement. 50% of the income outcomes for this strategy are above an income replacement ratio of 21%.
- The CDC outcomes appear more stable than the bond-only strategy, but at a higher level

to rival the average from the DC Equity strategy. 50% of outcomes for the measurement period are above a replacement ratio of 28% – the highest median for the Aon results.

We attempt to compare similar historical outcomes for South African data. We will discuss some of the challenges of this exercise in the sections that follow and how we attempted to adjust our calculations in a pragmatic way to present outcomes.

5.2 Data sources

5.2.1 We used published historical monthly returns for South African equities and bonds. We also used published South African CPI statistics and bond yields as inputs for our various projections. The majority of this history was provided by the Old Mutual Investments Group and Symmetry investment research teams. We cross-checked this data with data we received from external asset managers to check for reasonability – notably Momentum Investments and Colourfield Liability Solutions.

5.2.2 We experienced a number of challenges with obtaining data over a long enough history to generate a credible number of long-term results. Some of the input data at earlier dates – specifically nominal and real bond yields were difficult to source. We used these yields to calculate annuity factors to convert the accumulated retirement savings account into a pension at retirement. We then express this pension as a percentage of salary just prior to retirement.

5.2.3 For annuity rates, we received annuity quotes for a male member aged 65, for a single life annuity with no guarantee period – as at the end of July 2026. The rates used to calculate our outcomes include:

- CPI guaranteed, life, not-profit annuity.
- A with-profit annuity: Old Mutual Platinum Pension 3.5% post-retirement interest (PRI) as a proxy for a guaranteed life annuity that targets inflationary increases over time.
- A 5% pa fixed escalating annuity: as an annuity that we may bring into our discussion.
- Versions of the above that incorporate a spouse's pension of 50% of the main pension at the date of death – should the spouse be alive. We requested with and without a five-year guarantee periods as alternatives, and use these later in our discussion to consider the impact of selecting a death benefit on the income payable.

5.2.4 We require an annuity factor history to determine the income that could have been purchased at different retirement dates in the past. This is where we experienced some challenges, either with determining the appropriate with-profit annuity to use, or with historical real yield data to value the inflation-linked annuity.

5.2.5 For the CPI-guaranteed annuity, we overcame this in the following way:

- For the real yield at 31 July 2026, we estimated the price of a term-certain annuity that would equate to the CPI-guaranteed annuity price.

- We then used this term and derived estimated historical CPI-guaranteed annuity prices, a similar term-certain annuity at the prevailing real interest rate.
- Our monthly real yield data only extended back to January 2013. Prior to January 2013 we estimated the real yield by simply adjusting the prevailing ten-year nominal yield by the inflation experienced in the previous 12 months.

5.2.6 The constraints for the historical annuity calculations are noted (and disclosed). Even though we use an historical one-year CPI figure and apply it to a forward-looking nominal yield, it at least provides a version of an annuity factor that we may consider.

5.2.7 Our main objective with determining historical annuity rates (and income levels) is to consider the variability in the cost of securing an inflation guaranteed annuity. We feel our methodology provides a reasonable way to estimate this.

5.2.8 For our with-profit annuity history, we feel it is sensible that the amount needed to secure an annuity that targets CPI increases would move in a similar fashion to the cost of a CPI-guaranteed annuity. We used the proxy CPI-guaranteed annuity we estimated to also estimate the value required to target a CPI increasing with-profit annuity. We determined the implied enhancement to the real yield as at 31 July 2026 that would equate to the price of the with-profit annuity. This enhancement to the real yield was 1.06% per annum, which we applied to our historical real yields to estimate the price of a with-profit annuity.

5.2.9 The method to estimate the with-profit annuity price will basically retain the relative pricing of the with-profit annuity to the CPI-linked annuity for the historical annuity rates.

5.2.10 For the calculations we have used the monthly return and CPI from February 1971. We have used nominal bond yield data from 1996 and published real yield data for inflation-linked bonds from 2013. We used a combination of nominal bond yields and actual inflation to proxy real yields for the period from July 1996 to 2013.

5.3 Modelling methodology and outcomes

5.3.1 We assumed a single male member contributes 10% of his annual salary to a retirement fund, where contributions are invested monthly in arrears.

5.3.2 At age 65, the member retires to purchase a single life annuity that is guaranteed to increase with inflation every year. We use a savings period of 25 years prior to purchasing the annuity at age 65.

5.3.3 We have only considered portfolios that can invest in equities and bonds, subject to the limits of Regulation 28 for retirement funds.

5.3.4 We have considered two examples of what we term ‘growth strategies’: the first one allocates 60% to SA equity and 40% to SA bonds (Multi Asset (MA) 60/40), while the second one allocates at a Regulation 28 maximum of 75% to equities and 25% to bonds (MA 75/25).

5.3.5 We have considered cases where a member is invested in the growth strategy for the full savings period (e.g., MA 60/40) along with a lifestyle ‘de-risking’ strategy that transitions a uniform amount from equities into the bond strategy over the five years prior to retirement (e.g., Multi Asset de-risking (MADR) 60/40).

5.3.6 The 60/40 strategy references a widely used standard formulation for an equity/bond strategy and is included to demonstrate the impact of a higher exposure to equities over time.

5.3.7 The lifestyle strategy emulates a DC strategy that transitions from more risky growth-type assets to more secure income-generating assets over the five years preceding retirement. This is often referred to as a de-risking approach.

5.3.8 We assumed that salaries increase at a rate of 2% above inflation per annum (over the fullness of the employment period) and that all funds are available to secure the CPI-guaranteed life annuity at age 65.

5.3.9 Figure 2 and Table 4 summarise the outcomes for 367 rolling 25-year periods. We determine the income that the member would be able to secure at the end of each month – after 25 years – with the final 25-year period ending on 31 July 2026. This income is expressed as a percentage of the final salary for that member in the year prior to retirement – the replacement rate.

5.3.10 We assume that the full accumulated savings amount will be used to secure a guaranteed income for life that increases with inflation each year. Table 4 summarises some statistics that apply to the different strategy outcomes reflected in Table 5.

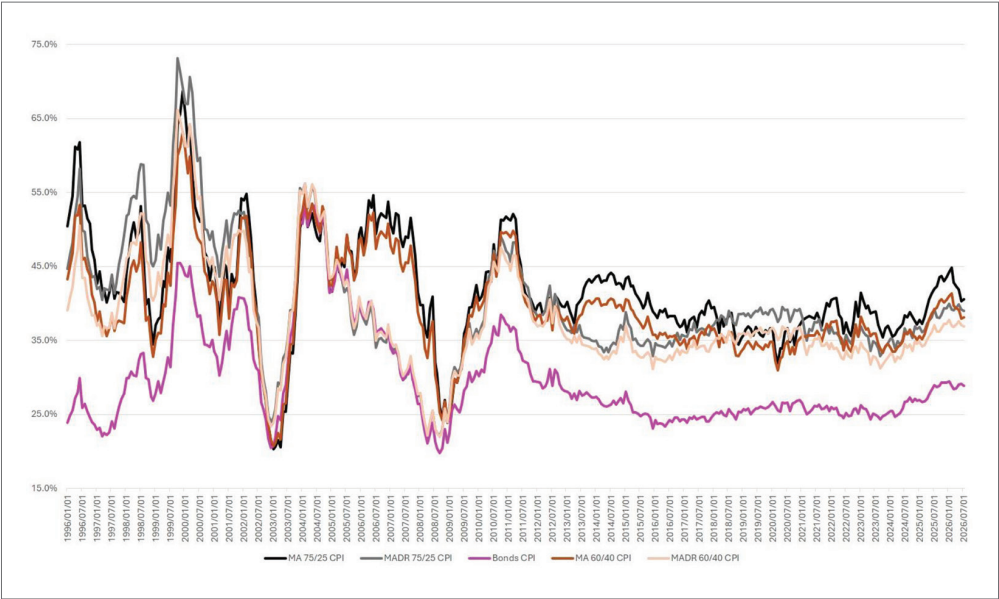


FIGURE 2. Rolling 25-year outcome of retirement fund income expressed as a percentage of salary in the final year of service

TABLE 4. Summary statistics for the rolling 25-year outcomes graphed in Figure 2

	Mean	Min	Max	Standard deviation of replacement rate	Implied average accrual rate
MA 75/25 CPI	41.8%	20.3%	68.7%	7.5%	1.67%
MA 60/40 CPI	39.5%	20.7%	63.2%	6.9%	1.58%
MADR 75/25 CPI	40.1%	21.9%	73.1%	8.6%	1.60%
MADR 60/40 CPI	38.0%	22.0%	66.1%	7.6%	1.52%
Bonds CPI	29.9%	19.7%	53.3%	6.9%	1.19%

- 5.3.11 We can note the following from the calculated outcomes.
- Similar to the Aon results, the bond-only portfolio gives the most stable income outcomes, but also secures an inflation-guaranteed annuity at a structurally lower level (Bonds CPI).
 - The MA 60/40 equity/bonds portfolio with a MADR strategy generates the next lowest set of results for outcomes and variability of those outcomes (MADR 60/40 CPI).
 - The MA 75/25 CPI outcomes are on average 2.3% higher than the MA 60/40 CPI outcomes. This indicates that the 15% higher exposure to growth assets over the period results in an average uplift of around 6% to the outcome over the 25-year savings period.
 - The MADR 75/25 CPI outcomes are on average 1.7% lower than the MA 75/25 CPI outcomes. This indicates that a de-risking strategy over the last five years prior to retirement may cost a member around 4% of their retirement income.

5.3.12 We consider how we may adapt the Aon research for the South African context. We believe it will be challenging to introduce a version of CDC envisaged in the Aon paper for South Africa. We therefore did not consider a model that smoothed around a target accrual rate for the IDC retirement savings.

5.3.13 Instead, we consider it reasonable to test some of the CDC concepts with solutions that are already familiar to the South African retirement fund market. This may also make the engagement with (and adoption of) these concepts more practical.

5.3.14 Specifically, we consider the well-established practice of smoothing investment returns for retirement fund investment – as a version of collectively pooling investment experience.

5.3.15 In addition, we build off the well-understood framework of with-profit annuity solutions that insurers offer, to emulate what we may expect as an in-retirement collective annuity. The CDC literature may refer to this as retirement-only CDC (or RCDC).

5.3.16 *Smoothing investment returns*

5.3.16.1 Smoothing investment returns is a familiar concept for South African retirement funds. Historically funds may have offered smooth returns in-fund, whereas many insurance companies offer versions of smooth bonus funds, where returns are

smoothed in a policy. We do not attempt to discuss a specific insurer product but rather test the efficacy of generic smoothing principles on the retirement outcomes we model.

5.3.16.2 We note that over time, smoothing solutions have evolved to reduce and even remove the guarantees (and associated) charges for smoothing returns. Where there are no guarantees, the smooth bonus fund in effect pools investment risk and benefits may be adjusted downwards to manage the residual risk, like CDC.

5.3.16.3 We generate outcomes for two theoretical smoothing methodologies applied to the underlying monthly return of our market portfolio that invests in equities and bonds. One of the arguments for a CDC-type solution is to maximise exposure to growth asset classes to generate better (shared) outcomes. This is supported by the outcomes we observed in the previous section. We have therefore focused on smoothing returns for the multiple asset class portfolio that invests 75% in equities and 25% in bonds (MA 75/25).

— **Smooth Bonus 1 (SB1)**

- Targets a 100% funding level – asset value relative to the smooth liability value.
- Smooths returns for funding levels between 90% and 110% over 12 months ((funding level – 100%)/12).
- Applies an immediate bonus return to increase the funding level to 90% or reduce it to 110% if the funding level breaches either of those limits.
- Uses a target monthly bonus equal to CPI over the past year + 7.5% per annum. This was the observed average CPI outperformance for our MA 75/25 portfolio over the 367 25-year periods.

— **Smooth Bonus 2 (SB2)**

- Targets a 100% funding level – asset value relative to the smooth liability value.
- Smooths returns for funding levels between 80% and 115% over 12 months ((funding level – 100%)/12).
- Applies an immediate bonus return to increase the funding level to 80% or reduce it to 115% if the funding level breaches either of those limits.
- Uses a target monthly bonus equal to CPI over the past year + 7.5% per annum. This was the observed average CPI outperformance for our MA 75/25 portfolio over the 367 25-year periods.

SB1 is a slightly more aggressive version of SB2 in that SB1 aims to manage the level of cross-subsidy between different periods in a tighter band of 90% to 110% relative to SB2's 80% to 115% band.

5.3.16.4 For the first round of outcomes, we only compare the SB1 and SB2 outcomes relative to the MA 75/25 CPI outcomes. These results for SB1 CPI and SB2 CPI are shown (and summarised) in Figure 3 and Table 5.

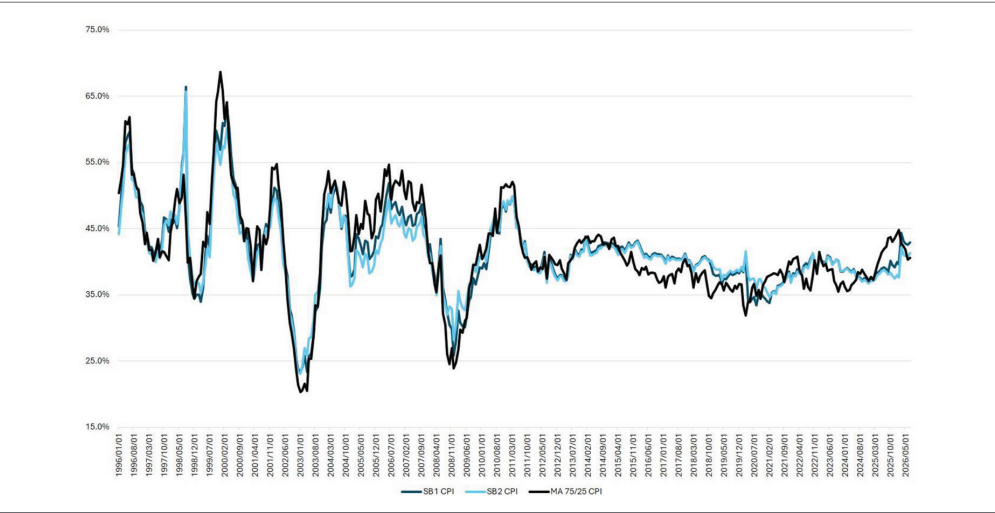


FIGURE 3. Rolling 25-year outcome of retirement fund income expressed as a percentage of salary in the final year of service

TABLE 5. Summary statistics for the rolling 25-year outcomes graphed in Figure 3

	Mean	Min	Max	Standard deviation of replacement rate	Implied average accrual rate
SB1 CPI	41.5%	23.4%	66.4%	6.4%	1.66%
SB2 CPI	41.2%	23.1%	65.7%	5.7%	1.65%
MA 75/25 CPI	41.8%	20.3%	68.7%	7.5%	1.67%

5.3.16.5 Visually we see that the outcomes are largely similar for SB1 CPI, SB2 CPI and MA 75/25 CPI. This is because in practice SB1 and SB2 target the same end return as MA75/25 – with a target funding level of 100%.

5.3.16.6 Therefore, over the 25-year period, one may expect that the outcomes for the 367 observation are likely to be similar for these 3 investment options.

5.3.16.7 Overall, we see a slight reduction in the average outcome for SB1 CPI and SB2 CPI relative to MA 75/25 CPI. This indicates that – on average – at the end of the 25-year period, SB1 and SB2 are slightly positively funded (on average) relative to the smooth return liability. We do note a slight improvement in the variability of the income outcomes for SB1 and SB2 – for a CPI guaranteed life annuity. There is more of an impact for SB2 where the cross-subsidy of the underlying returns is greater than for SB1.

5.3.17 *With-profit annuity to test an in-retirement CDC option*

5.3.17.1 Another well-established solution offered in the South African retirement fund market is a with-profit annuity. These guaranteed life annuities pool mortality and investment experience to distribute ‘profits’ as part of a pension increase strategy.

5.3.17.2 As for pre-retirement smoothing, an expected benefit of a CDC plan is that one does not pay for any insurance guarantees Typically with-profit annuities levy a capital charge for the guarantees and governance provided to manage the annuity.

5.3.17.3 One may then be able to consider a potential RCDC option as a with-profit annuity that does not guarantee a non-negative increase. In theory, as for CDC plans, the retirement income benefit may be reduced in future if experience requires it.

5.3.17.4 We used our calculated history of with-profit annuity rates for a guaranteed with-profit annuity that targets inflationary increases over time.

5.3.17.5 Figure 4 and Table 6 outline a comparison of historical outcomes for a strategy that invested fully in SB1 and SB2 prior to retirement and then secured a with-profit annuity with an expected increasing target of inflation (SB1 with-profit annuity CPI and SB2 with-profit annuity CPI) and MA 75/25 CPI.

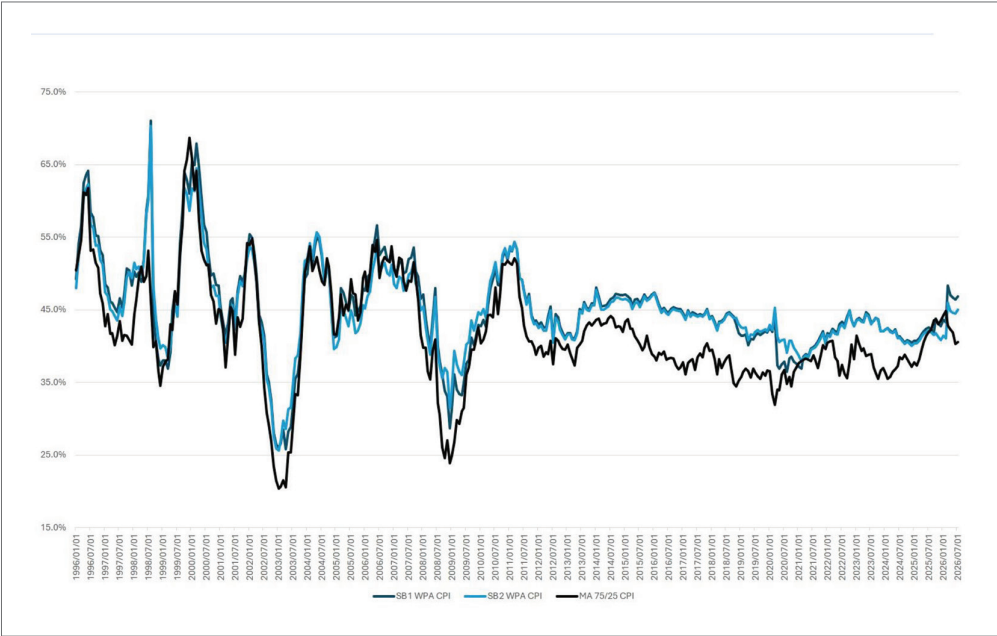


FIGURE 4. Rolling 25-year outcome of retirement fund income expressed as a percentage of salary in the final year of service

TABLE 6. Summary statistics for the rolling 25-year outcomes graphed in Figure 4

	Mean	Min	Max	Standard deviation of replacement rate	Implied average accrual rate
SB1 with-profit annuity CPI	45.3%	25.8%	71.1%	6.7%	1.81%
SB2 with-profit annuity CPI	45.0%	25.6%	70.3%	6.0%	1.80%
MA 75/25 CPI	41.8%	20.3%	68.7%	7.5%	1.67%

5.3.17.6 The main reason for the improvement in SB1 and SB2 outcomes is because the annuity pricing is more cost effective for the with-profit annuity that targets CPI and its relationship is assumed to remain over time. This also correlates the with-profit annuity pricing and CPI annuity pricing.

5.3.17.7 The SB1 CPI and SB2 CPI outcomes are higher than MA75/25 CPI for over 80% of the observed outcomes. The average income is around 8% higher than MA 75/25 CPI.

5.3.17.8 If we wish to further explore the concept of a CDC-type solution, we can test for a hypothetical version of a with-profit annuity that does not guarantee a floor that the income doesn't decrease. In this with-profit annuity, increases can be negative – benefits can reduce – in response to funding pressures.

5.3.17.9 In this hypothetical with-profit annuity, we assume a reduction in the charge for capital and governance of 0.5% pa. This has the impact of increasing the income that can be provided by the annuity.

5.3.17.10 The hypothetical example of an annuity that shares investment and mortality experience to pay an income benefit – but without a guarantee – is similar to what has been discussed for an RCDC mentioned in an earlier section.

5.3.17.11 We can test the potential impact of this annuity type on the income outcomes for members who opt for our hypothetical CDC annuity in Figure 5.

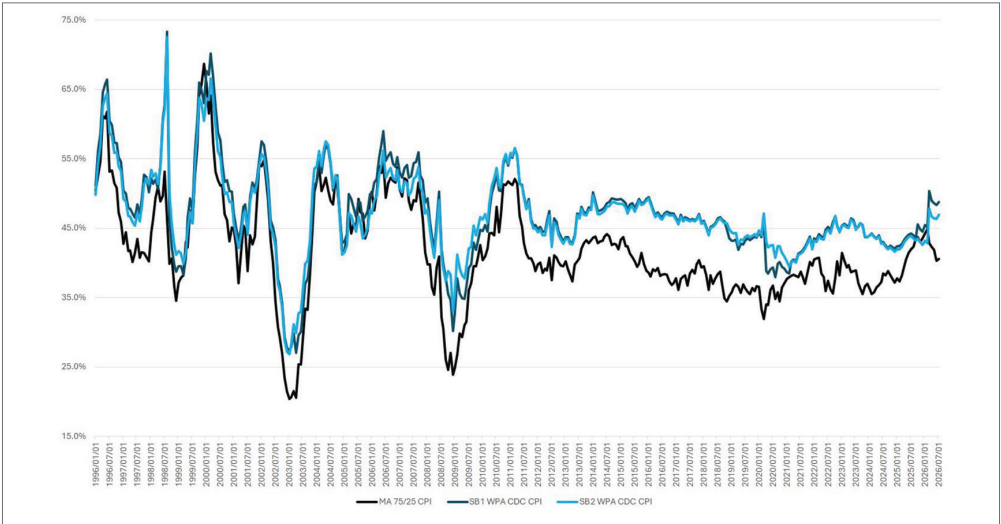


FIGURE 5. Rolling 25-year outcome of retirement fund income expressed as a percentage of salary in the final year of service

5.3.17.12 This amplifies the results from the standard with-profit annuity CPI target outcome, where the CDC observed outcomes now beat the MA 75/25 CPI over 90% of the time, with an average enhancement of 13% to the final income benefit.

5.3.17.13 We believe that statistically this is significant enough to warrant further investigation and consideration of these concepts.

TABLE 7. Summary statistics for the rolling 25-year outcomes graphed in Figure 5

	Mean	Min	Max	Standard deviation of replacement rate	Implied average accrual rate
SB1 with-profit annuity CDC CPI	47.1%	27.0%	73.3%	6.9%	1.89%
SB2 with-profit annuity CDC CPI	46.8%	26.9%	72.5%	6.1%	1.87%
MA 75/25 CPI	41.8%	20.3%	68.7%	7.5%	1.67%

6. QUALITATIVE BENEFIT DESIGN CONSIDERATIONS

The previous section provides quantitative context for why one should consider collective risk sharing to manage and enhance retirement benefit outcomes for members. This section introduces a few qualitative themes to consider.

6.1 Why collectivism and risk sharing

The main arguments for collectivism and pooling – to share risks for individuals relative to IDC – include:

- More stable outcomes and more certainty for benefit provision.
- Pooling investments pre-retirement, to help manage short-term volatility, enables the investment strategy to invest in generating assets that otherwise may be avoided due to their short-term volatility.
- Pooling longevity in-retirement to benefit from a more stable income stream than from a drawdown annuity.
- Specifically for CDC, the focus changes from a current retirement savings balance for an individual asset to an income target for a future income in retirement. This allows members to consider the implications for a longer-term retirement income benefit rather than a current savings balance.
- In a one-fund solution that transitions from pre-retirement to in-retirement, it is possible to smooth the experience at the transition stage. This can further improve certainty and the time horizon for the investment strategy.
- Collective scale can help reduce the impact of the cost of administration, investment and advice relative to individual benefit provision.

6.2 Cross subsidy and cost/benefits

6.2.1 Cross subsidy results from different individual experiences in a collective pool. Members will experience gains and losses as a result of the collective experience relative to their individual contribution/experience. This introduces elements of potential ‘cost’ versus ‘benefit’ that may be difficult to quantify – as well as ‘fairness’ – to share those costs and benefits.

6.2.2 Individuals prefer to know about individual costs and benefits, without necessarily understanding the potential benefit of income certainty that pooled experience/collectivism may allow.

- 6.2.3 The design implications for a scheme that pools risks in some way are:
- To have a clear, well-communicated and understandable framework to manage the outcomes from the pooling scheme. What benefits are paid under what conditions, why a certain strategy is followed – to enhance benefits – and why certain benefits may change as a result of experience being different to what is expected.
 - To have strong governance, including technical capability and advice – to manage the pooling scheme. A robust process should be implemented with the help of technical experts in a transparent manner to instil confidence.

6.2.4 Areas of cross subsidy with implications for a benefit pooling framework in a CDC, where the intention is to have a uniform accrual rate for all members, include.

- **Age:** In terms of accrual, older members (nearer retirement) accrue benefits as a percentage of salary more slowly than younger members (with more time to retirement).
- **Gender:** In-retirement income benefits are more costly for females relative to males, because they are expected to live longer than males.
- **Marriage status:** If there is a spouse's pension, in-retirement benefits are more costly for married members than for single members.
- **Longevity:** People pass away at different points in time in-retirement. Typically a portion of the assets for a member (annuitant) who passes away earlier are used to subsidise the benefits for those who live longer.
- **Time:** The relative economic value of assets and the benefit liability will change over time. This has implications for the allocation of individual benefits relative to the pool over different time periods.

6.2.5 In our testing of different collective pooling options in South Africa, we have not considered the specific CDC framework where:

- Target benefits accrue uniformly (as a percentage of salary) over time for different members of different age, gender and marital status.
- Accrued target benefits transition seamlessly from pre-retirement to in-retirement.

6.2.6 We believe that this is an area that warrants further investigation.

6.3 Retirement benefits: annuities

6.3.1 We started a discussion about retirement income that considers annuity income increasing every year with inflation (as measured by the change in CPI). This has historically been used as the 'gold standard' for providing retirement income benefits for funds.

6.3.2 A CPI-linked annuity protects the purchasing power of income from the impact of inflation over time, when future inflation is uncertain. The primary risk is that inflation is higher than expected in future – specifically higher than the increases that are granted by the annuity.

6.3.3 As central banks, including the South African Reserve Bank (SARB), have moved to explicitly target inflation within certain bands, one may argue that inflation has become a more stable measure (SARB, 2026). In South Africa we can see this in Figure 6.

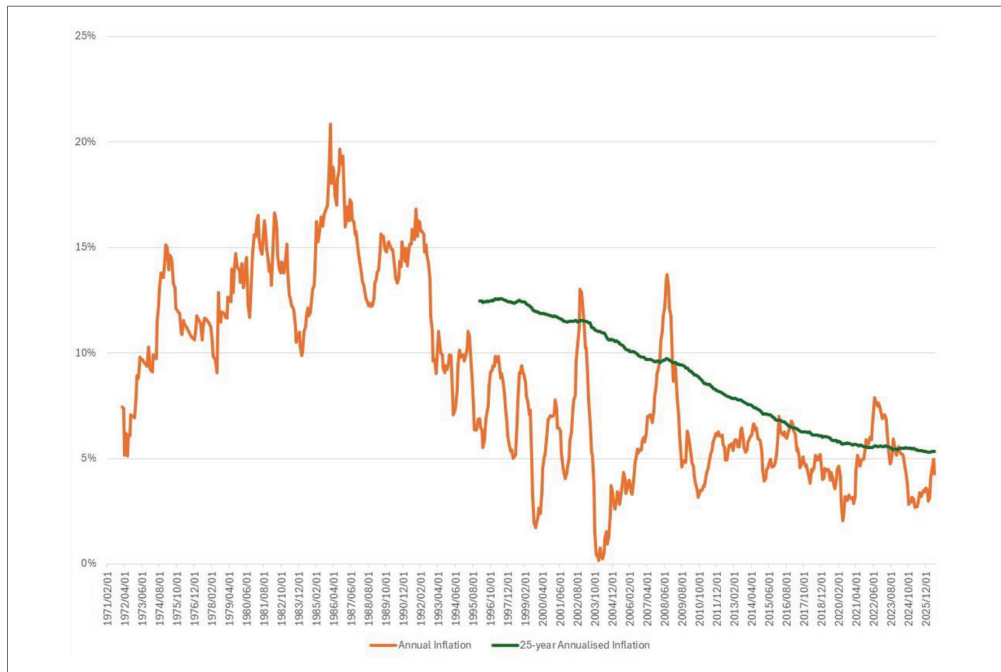


FIGURE 6. The graph shows the annual inflation rate for the period from February 1971 along with the rolling 25-year average inflation rate for the 367 25-year measurement periods we investigated.

6.3.4 There appears a structural downward trend such that the 25-year number has come down from a high of around 12.6% pa to a current average of 5.3%. This illustrates a successful impact of the monetary policy regime that has targeted inflation.

6.3.5 Looking to the future, the SARB has changed its inflation-targeting policy to one that contains inflation in a 2–4% pa band, with a targeted inflation rate of 3% pa.

6.3.6 Against this background, a guaranteed life annuity with a fixed escalation of 5% per annum appears generous. The annuity pricing for a male aged 65 with a premium of R1 m is revealing. Based on the annuity rates from Old Mutual Corporate this would secure the following income for life, based on conditions at the end of July 2026.

TABLE 8. Annual starting pension for a guaranteed life annuity for a premium of R1 m

	Income (R per annum) for R1 m premium
CPI guaranteed annuity	80 706
5% pa fixed escalating annuity (5% FE)	82 412
With-profit annuity that targets inflationary increases*	88 050
*The with-profit annuity in this instance is the Platinum Pension 2003 3.5% ARI/PRI annuity	

6.3.7 We may deduce:

- The 5% fixed escalating (FE) annuity gives about a 2% uplift to the CPI-guaranteed annuity.
- The expected inflation in the CPI annuity is higher than the 5% pa fixed increase promise for the 5% FE annuity.
- The with-profit annuity gives about a 7% uplift to the 5% FE annuity.
- The with-profit annuity gives about a 9% uplift to the CPI-guaranteed annuity.

6.3.8 Instead of opting for a with-profit annuity that targets CPI increases, a member may be willing to pay R70,000 for a guarantee of 5% per annum. If they opt for the CPI annuity they pay an additional R20,000 to guarantee inflation protection if the long-term average CPI is above 5% pa – when the government has a stated policy to target 3% pa.

6.4 Death in-retirement and living annuity solutions

6.4.1 We now further consider:

- The impact of a death benefit on the retirement income benefit. We will lump this under the term ‘legacy benefit’ to capture a second component of the benefits that an individual may expect to fund. This will include any insurance lump-sum death benefit, guarantee period, spouse’s pension and the remaining lump sum in an investment account for a living annuitant.
- The market norm for individuals to select an IDC-type pension in the form of a living annuity that does not pool mortality and investment risk so that the individual retains both. The legacy benefit in the first bullet is an often-mentioned reason for why individuals opt for a living annuity.

6.4.2 For the legacy (death) benefit we discuss the impact of those where the reduction in income may be more easily understood, i.e., guaranteed life annuities. Any legacy benefit that an individual may select at purchase date will reduce the income payable. We then separately discuss the legacy benefit for a living annuity.

6.4.3 For this paper we obtained various annuity quotes from Old Mutual Corporate to help outline this point. We requested annuity rates at different retirement ages, for both males and females, with and without a spouse (where the male is assumed to be five years older than the female) and a guarantee period.

6.4.4 We can extend our analysis of the annuity rates that we have been quoted for a male aged 65 who purchases a CPI-guaranteed annuity. If the male opts for a guarantee period of five years the income he would receive will fall by R1,745 pa (or 2.2%). If (in addition to the five-year guarantee period) he elects a spouse's pension of 50% of the pension at date of death, to be paid to his female spouse who is five years younger than him, this will reduce the total original benefit by R14,675 pa (or 18.2%).

6.4.5 This implies that the cost of the death benefit is around R182,000 – or 18.2% of the original R1 m premium. Of the original R1 m, the member has made an informed decision to allocate R182,000 to a death benefit. This death benefit will be paid out as a combination of the remainder of full pension payments in the first five years – if death occurs in this period, and a spouse's pension equal to 50% of the principal pension at the date of death. The spouse's pension is payable for the life of the surviving spouse and will increase in line with inflation. We have a clear (and known) benefit structure, and we can estimate the cost of this insurance to be R182,000.

6.4.6 In a paper presented at the 2018 Convention of the Actuarial Society of South Africa, 'What do you want? Managing risks for better outcomes when you retire', Warren Matthysen determined an expected value that is implicitly allocated to a death benefit when a member secures a living annuity in retirement. This value is more challenging to conceptualise, because – as in IDC – there is uncertainty about the value and timing of the benefit.

6.4.7 Using a set of demographic and economic assumptions, the paper outlines how an initial premium investment of R1 m may be allocated to provide an expected income and death benefit.

TABLE 9. Summary statistics for different initial drawdown rates for a living annuity with a starting premium of R1m

Initial drawdown rate	Present value of expected income benefit	Present value of expected death benefit	Age when 17.5% drawdown cap is breached	Probability of reaching cap age
5.2%	R570,559	R429,441	N/A	N/A
6.0%	R655,881	R344,119	93	15%
7.5%	R761,693	R238,307	80	61%
17.5%	R875,500	R124,500	65	100%

6.4.8 The interesting thing to note from this work is that for the sustainable drawdown rate of 5.2% – in this example – around 43% of the initial investment is being allocated to an expected death benefit.

6.4.9 One may also compare the 6.0% initial drawdown option with the guaranteed CPI annuity with a 50% spouse's pension and a five-year guarantee period.

TABLE 10. Summary comparison of expected benefit values using a premium of R1 m to purchase a living annuity with a starting drawdown of 6% pa and an inflation guaranteed life annuity with a 50% spouse's pension and a five-year guarantee period

	Living annuity	CPI guaranteed annuity
Starting income (pa)	R60,000	R67,936
Increases	6% pa (assumed)*	Inflation*
Age limit imposed on income	93 (expected)	N/A
Probability of income restriction	15%	0%
Spouse's pension	Unknown. Whatever may be purchased by the remaining lump sum at the date of death.	50% of pension at date of death
Lump sum	Unknown. The remaining lump sum at the date of death.	Equivalent of 50% of remaining pension payments in the first five years – if death occurs in the first five years
Other	Residual asset is available to be paid to other beneficiaries in the instance that there is no spouse at the date of death.	Apart from the benefit if death occurs in the guarantee period, there is no residual benefit if there is no surviving spouse at the date of death.
Expected value of income benefit	R655,881	R818,167
Expected value of death benefit	R344,119	R181,833
*Note that for the living annuity projection in 2018, inflation was assumed to be 6% pa.		

6.4.10 With the current benefit design options, it remains complex to try formulating an assessment of value between the two annuities. Specifically, how much do you want to allocate to the legacy benefit – since this is often used as a reason to opt for a living annuity. An alternative design that pays out a guaranteed death benefit to a nominated dependant from the guaranteed annuity may make an assessment of value simpler.

6.4.11 Note that the above comparison is for the modelled IDC expected outcome when securing a CPI-guaranteed income stream. The relative value of the benefits in a RCDC equivalent annuity is more compelling. In this instance the member can secure an income of R76,965 along with all the contingent death benefits. This is 28% higher than the initial income from a 6.0% initial drawdown living annuity.

6.5 Complexity, optionality, advice and cost

6.5.1 This document provides some evidence about the complexity of providing for retirement benefits as an individual member in a DC plan, specifically when a living annuity providing in-retirement income benefits is selected.

6.5.2 One of the authors, Warren Matthysen, once heard retired professor of economics, Dr Zvi Bodie, suggest that an individual managing their retirement outcomes in a money purchase (defined contribution) scheme is 'like asking a one-legged blind man to climb Mount Everest'.

6.5.3 While the exaggeration may be for effect, the level of complexity we expect individuals to navigate may seem unreasonable.

6.5.4 One way to mitigate some of this complexity is for individuals to get advice, though this will add a layer of cost that, in turn, impacts the net benefit received. The default regulations for South African retirement funds have done little to simplify this complexity.

6.5.5 The optionality that is provided is often viewed as a benefit, but it also seems to add to the complexity, the need for advice and the cost. The cost is both explicit – higher charges for a complex option and advice – or implicit – lower expected investment returns because the optionality shortens the investment time horizon.

7. AREAS FOR FURTHER RESEARCH

Several questions sit beyond this paper's scope: detailed actuarial modelling of extreme scenarios; member behavioural responses to a benefit cut in payment; the fairness of transfer-out values and outcomes for atypical members; performance through a genuine demographic decline; and whether whole-of-life CDC outperforms a simpler 'DC accumulation plus collective decumulation' split once complexity and governance costs are netted off.

8. CONCLUSION

8.1 South Africa has a DC retirement challenge — volatile, often inadequate outcomes under individual DC, with too little secured lifetime income. Collectivism can provide a credible risk-sharing function for DC funds – aligned to pooling benefit outcomes for DB and new CDC arrangements.

8.2 The international evidence and trends support the case for collectivism, which provides more certainty around benefits and enhances expected member outcomes. Unlike DB funds, this risk sharing does not require open-ended employer guarantees.

8.3 Benefit design and operation should focus on the nature of the income outcome rather than the retirement savings balance and aim to reduce the complexity associated with optionality and choice. This can assist members to engage with an income benefit rather than product features like flexibility and choice. It will also reduce the cost of providing benefits if less bespoke advice and administration is required.

8.4 We encourage industry stakeholders (and policymakers) to consider the use of pooling to manage risk and improve the certainty of benefits for DC retirement fund members. We hope for further research to interrogate risk-sharing mechanisms and innovation to develop suitable solutions that can improve retirement outcomes – and make them available to a wider member audience.

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