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# Hybrid Pensions Schemes with Risk-Sharing: Are They the Future of Occupational Pensions?

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Abstract

Pension institutions are grappling with challenges arising from financial crises and from economic and demographic trends. As a result, many countries want to overhaul their retirement saving systems. The Netherlands has introduced "Defined Ambition" pension plans and more recently proposed a new type of contract: Personal Pension Accounts with Risk-Sharing. In the UK, a national discussion on collective schemes is ongoing but slow to gain traction. Although countries are advancing at different paces, they are united on the common objective to establish new, innovative schemes that can overcome the drawbacks of both defined-benefit and defined-contribution plans. This note highlights the design of various contemporary hybrid pension schemes and discusses the main challenges related to their design.

## Introduction

The sustainability of occupational pension systems is under threat in many countries. Setbacks include a structural increase in liabilities due to longer life expectancy, the harmful effects of financial crises on investment returns, unusually low interest rates that prompt a search for yield from riskier or less liquid investments, and stricter pension regulation.

This inability of funds to cope with the current situation has sparked intense debate about reforming pension systems around the world. One promising line of thought–is to re-define the pension contract. These **hybrid pension schemes** embody elements of the traditional defined-benefit (DB) and defined-contribution (DC) schemes.

DB and DC schemes are at the opposite ends of the risk sharing spectrum between employers and employees. Under a DC arrangement, the members shoulder all the risks. In DB schemes, on the contrary, the employer bears all of the risks, including investments (financial market returns fluctuating around the expectation), macro-longevity (death probability estimates can be inaccurate)[1], interest rates (the cost of annuities is unpredictable due to interest rate changes), and in some cases inflation (the real value of benefit payments may fall more than expected). Hybrid plans are designed as a compromise between DB and DC schemes. They alleviate the employer's high costs of DB provision, yet provide more certainty about the individual's financial security in retirement than a DC scheme does. Numerous hybrid pension plans exist around the world, including collective defined-contribution plans in the Netherlands, Cash Balance plans in the US, and target benefit plans in Canada. These schemes address some of the shortcomings of traditional DB and DC contracts by **allowing risk sharing between employers and employees**. The continuous effort to find hybrid solutions has led to the more recent suggestions of the **Defined Ambition scheme**, and the **Personal Pension Accounts with Risk-Sharing** in the Netherlands. This note highlights innovations in pension contracts in selected countries, and orients the discussion around risk sharing. While the contract names may be country-specific, the fundamental issues tackled and the characteristics of the revised schemes are comparable.

> *Pension funds face important challenges related to recent economic and demographic trends*

## 1 Traditional DB and DC Pension Schemes

Traditional DB schemes aim to provide a certain level of annuity at retirement. This level is typically a function of a member's years of service and a reference wage (e.g., final salary, career average etc.) and is defined in nominal terms (i.e., "hard rights" are promised).

Risk management for traditional DB schemes relies mainly on the employer's contribution rate adjustment. The plan sets a base contribution rate, which is raised (reduced) when the plan is underfunded (overfunded). Tight deadlines set by the pension supervisor to restore solvency, and the requirement for cost-covering contribution rates, have made the promises in DB arrangements less appealing to employers. As a consequence, many DB pension plans

[1] *A related concept is micro-longevity risk, which refers to uncertainty on the actual date of death, if the death probabilities are known with certainty. This risk is also borne by the employer, especially by funds with few members where micro-longevity risk is a concern.*

no longer enroll new members, and now have commonplace features such as pension terminations, where the employer offers to pay retired employees a lump sum instead of an annuity, and buyouts, where the employer transfers the liabilities to an insurer.

At the other end of the risk-sharing spectrum, a DC scheme specifies only the employee and/or the employer's contribution rate. The retiree's benefit is the amount credited to his or her individual account, plus investment gains or losses.

## 2 Hybrid Schemes around the World

The desire to shift some of the pension provision risk to employees has led to the design of hybrid plans that blend characteristics of DB and DC contracts. Globally, there is no uniform definition of a hybrid scheme, other than that it embodies the characteristics of both DB and DC schemes.

*"New "hybrid" pension solutions are developing around the World"*

### i. The Netherlands

The Netherlands is a pioneer in pension contract innovation. Before the stock market downturn of 2000-2001, most pension plans were DB. Since then, more risks have been gradually shifted onto the employees through the introduction of (1) **Collective DC (CDC)** and (2) **Defined Ambition (DA)** plans. More recently, the desire to allow greater personalization of CDC plans spurred a proposal for the (3) **Personal Pension Account with Risk-Sharing (PPR)**.

(1) Collective DC

In CDC plans,[2] nominal benefits are promised, but **inflation indexing of benefits is contingent on the plan's funding situation** and thus depends on investment returns. For example, if the funding ratio is lower than 105%, pensions will not be inflation-indexed[3]. Between a funding level of 105% and 125%, indexation is usually partial, and full indexing is granted when the funding ratio reaches at least 125%.

*"They are designed as a mix of Defined-Benefit and Defined-Contribution and present attractive features (risk sharing between employers and employees, flexibility, ability to smooth financial and longevity shocks, etc.)"*

The excess of assets over nominal liabilities serves as a **collective buffer**. Solvency regulations require that the buffer be large enough so that the nominal funding rate exceeds 105% with 97.5% probability within any given year. The collective buffer can be used to share risk over generations.

The **financial involvement** of **a** CDC plan sponsor **is limited to a fixed contribution rate**. Hence, **nominal rights cuts are possible** in the event of severe financial distress. The employer's contribution rate can be renegotiated every certain number of years to cover higher costs of providing future benefits, caused, for example, by a rise in life expectancy.

One of the drawbacks of such CDC arrangements is the discretion in risk sharing arrangements, particularly vague ownership of the collective buffer within and between the different generations involved in the plan. Furthermore, when funding is insufficient, adjustments may be made at the detriment of certain generations, leading to **unfair**[4] **benefit distribution across generations**. Another source of unfairness across ages stems from the CDC plans' uniform accrual rate. For each unit of contribution, every member accrues the same entitlement (e.g., 2% increase in benefits),[5] regardless of age. As a result, wealth is transferred from young to the old. This is because the older members will retire sooner than the younger ones; hence the economic value of every unit increase in their entitlement is higher than the same increment for the young. The drawbacks of CDC plans led to two alternative proposals, one allowing for more flexibility in benefit adjustment (Defined Ambition), the other improving intergenerational fairness in the definition of individual rights (Personal Pension Accounts with Risk-Sharing).

*"However, there are still some challenges in switching to these new schemes (fair treatment of accrued pension rights, regulation, etc.)"*

[2] *Adoption of CDC plans for major firms (e.g., Akzo Nobel, SNS Reaal, VolkerWessels and Arcadis) occurred around 2004-05 (Schouten and Robinson, 2012).*

[3] *In 2014, 77.4% of career average funds offer conditional indexation (Source: De Nederlandsche Bank).*

[4] *We refer here to the notion of "actuarial fairness", when the present value of expected benefits is exactly equal to the present value of contributions for each member (i.e., there is no ex ante redistribution between age groups).*

[5] *The level of contribution needed to achieve this 2% of benefits accrual depends on the expected-return assumptions, which are subjective, but have to fall within the regulatory guidelines.*

(2) Defined Ambition (DA)

In June 2010, the Dutch social partners signed the *Pensioen Akkoord*, an agreement to shift a greater share of risk to employees through a more transparent pension contract. The major difference with previous contracts is that benefit **cuts** are part of the **regular risk sharing mechanism**, and **no longer a last resort** as in the case of the CDC. The legal structure of a DA is such that the annual benefits of all participants can be reduced in case of bad market performances and higher survival probabilities (Nijman, 2014). The plan has the option to offer a contract that is defined either in "nominal" terms or in "real" terms. A nominal contract is largely similar to the CDC arrangement (e.g., with conditional indexation), except that the centers of interest of employers and employees are necessarily aligned on explicitly targeting a pension linked to price or wage levels. A "real contract" indexation in the pension entitlement is not treated as a target for funds to reach, but is embedded in the definition of pension entitlement. Liabilities under a "real contract" are discounted at the real rate. Any under- or over- funding can either be immediately rectified by adjusting members' benefits, or smoothed over a fixed period, such as three years for a "nominal" contract, and three to ten years for a "real" contract. While the pension contract is not officially renamed, the revamped "real" pension contract is often referred to as the Defined Ambition (DA) contract. With a discrete smoothing period, in addition to the choice of inflation expectation and risk premium when determining the contribution policy,[6] the DA plan faces exactly the same flaw as the CDC: the fairness of generational distribution.

(3) Personal Pension Accounts with Risk-Sharing (PPR)

Although DC plans are stigmatized for allowing individuals to bear all the risks, they offer important and desirable features that DB plans fail to provide. In particular, they offer **actuarially fair contracts**,[7] clear individual property rights, the possibility for individual choices (on asset allocation or decumulation, for example) and tailor-made risk management (e.g., an asset allocation depending on the individual's age and situation). On the other hand, they fall short on a few of the advantages of collectivity, including bulk procurement and sharing of biometric risks[8] that are valuable features of DB plans (Bovenberg and Gradus, 2014). The CDC plan is a first attempt at reconciling the two systems, but it has no clear property right to the surplus. While the flexibility in policy rules fortifies the plan's financial sustainability, the subjective assumptions (on expected returns and expected inflation) concerning the policy rule[9] could **lead to intergenerational conflict by redistributing value across generations**. Another drawback is the lack of an individually tailored investment strategy due to the collective nature of the fund.

In order to address the shortcomings of the current pension system, pension experts in the Netherlands introduced the **Personal Pension with Risk-Sharing** (**PPR**) (Boelaars et al., 2014; Bovenberg and Nijman, 2015). The PPR aims to provide life-long benefits to individuals, but permits greater flexibility in investment decisions and benefit payouts. To overcome the ambiguity of surplus ownership and the potential actuarial unfairness in pension accrual under a CDC, the PPR is set up as a **personal account**. However, unlike an individual DC account, the PPR preserves the risk-sharing advantage of a CDC. This is done through **solidarity agreements** among members in a fund, which permit longevity and investment risk sharing. In contrast to a CDC, the risk-sharing element under a PPR can be made more transparent, and does not rely on a single, aggregated measure that is the plan's funding ratio.

A critical element that makes a PPR account flexible is the **unbundling of the investment and insurance components of pension provision**. The investment component can thus be tailored to individual circumstances, which was previously

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[6] *Dutch pension funds discount their liabilities at the market value (e.g., swap curve) for solvency purposes. However, for contribution policy purposes, the discount rate embeds assumptions on expected return. Assumptions on expected inflation are made when determining conditional indexation..*

[7] *The present value of lifetime benefits is equal to the present value of lifetime contributions.*

[8] *Biometric risks refer to mortality, longevity, disability and morbidity risks.*

[9] *Expected-return assumptions are used to define the level of contributions required to achieve a 2% benefit accrual rate. In "real" DA contracts, liabilities are discounted at market rates, with inflation indexation and risk premium adjustments, which are also subject to assumptions.*

only possible under a pure DC arrangement. As a result, the PPR contains features of a DC account. Despite the accent on individual ownership of the assets, the PPR has embedded insurance functions that distinguish it from a DC setup. Participants are protected against biometric risks through supplementary insurance policies in decumulation. These insurance policies can be offered by the private sector, insurance pools (organized by a group employers, for example), or by the government.

### ii. United States

**Cash Balance Plans (CBP)** and **Pension Equity Plans (PEP)** are hybrid schemes that are legally classified as DB plans, and are insured by the Pension Benefit Guaranty Corporation (PBGC).[10]

A CBP is a DB plan that maintains hypothetical individual accounts. Members' accounts are credited with a notional "pay credit" (e.g., 5% of a member's salary) and an "interest credit" (which can be fixed or variable, e.g., one-year Treasury bill rate) during the accumulation phase. These accrued benefits are similar to the accrual in a DC plan, except that in the case of CBPs they cannot fall. This guarantee element makes a CBP comparable to a DB contract. Benefit at retirement is defined in terms of the account balance, which can be paid as a lump sum or may translate into an annuity.[11] The plan is fully funded by the sponsor, who also bears most of the investment risk. Participants also bear some investment risk through the interest credit rate, which may vary with market conditions. Having the accrued benefit defined in terms of notional credits enhances portability, as members can transfer credits between employers when switching jobs.

PEPs are largely similar to CBPs in that participants accrue pension benefits during their career. Unlike CBPs, however, which define benefits as an account balance, PEPs define pension benefits as a percentage of earnings, for example the wage earned in the four or five years preceding retirement.

Apart from CBPs and PEPs, the **Variable Annuity Pension Plan** (VAPP) is another type of hybrid plan in the US. Benefits are determined based on a fixed interest rate, called the hurdle rate, that is typically set between 3-5%. If returns are higher (lower) than the hurdle rate, then benefits increase (decrease). The plan design stabilizes the financial contribution of the sponsor–the same key feature that underlies CDCs and DAs in the Netherlands–and achieves a stable funding status by adjusting the benefits.

### iii. Canada

Canada has a multitude of hybrid plans, some of which are discussed below.

**Target Benefit** schemes, offered by multiemployer pension plans in Ontario,[12] are pension plans that aim to provide a target benefit with fixed contributions. For plan members, these schemes are very close to regular DB plans, except that, as with Dutch hybrid schemes, accrued benefits may be reduced if the funding level falls below a given threshold.

The Quebec member-funded pension plans (MFPPs) offer the **Target Contribution** contract that provides minimum guaranteed benefits. The MFPP is primarily targeted at private, unionized sectors in which conversion from DB to DC is a pressing issue. Employers' and employees' contributions are fixed and indexed to inflation, though the employees' share is variable if the fund happens to be underfunded. The employer manages the investment formally, but workers have ownership of any surplus.

Various large American companies, such as IBM and Bank of America, provide **CBPs** to their employees in Canada.

**Flexible Pension Plans** allow members to make voluntary tax-sheltered contributions to a flexible component of their traditional plan. The accumulated contributions can then be used to improve benefits at termination (for example, by purchasing automatic

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[10] *The PBGC is a Federal agency that insures the payment of pension plan benefits in the event that participating plans fail or go out of existence.*

[11] *By law, however, the plan must also offer an annuity option when participants reach retirement.*

[12] *They cover about 34% of pension plan members in Ontario in 2008, according to the Ontario Export Commission on Pensions*

inflation indexing or unreduced early retirement benefits[13]), or upon retirement or death. Participants bear investment risk on the flexible component of their plan. Therefore, the fund incorporates both DB and DC features.

**Combination Plans (or Stacked Plans)** allow a DC benefit to be combined with a core DB pension upon retirement to create a single benefit payment. The typical arrangement is to have the DB pension funded solely by the plan sponsor, while the DC portion is funded by optional member contributions.

### iv. Others

The **Danish** labor-market supplementary pension, *Arbejdsmarkedets Tillægspension* ATP, offers an escalating annuity contract. Part of the assets is invested in nominal bonds to meet the nominal guarantees, and the rest (i.e., the collective buffer) is placed in riskier assets. However, when the buffer exceeds a specified amount, such as 25% of the value of the ATP's nominal guarantees, then these guarantees are increased. Thus pension income does not decline in nominal terms under this contract.

By law, DC plans in **Switzerland** offer a guaranteed minimum annual investment return, which may be underwritten by an insurance company and thus allows them to be regarded as DC from the employer's perspective. Similarly, since 2004, DC plans in **Belgium** have to offer a guaranteed minimum annual investment return. In most DB plans, members bear the post-retirement mortality risk, as benefits are defined in lump sum terms.

In the **United Kingdom,** some 8,000 employers, including Sainsbury's, Morrisons and Barclays, offer cash balance plans. These plans are similar in design to those in the US, except that, typically, UK employees also make a contribution. In 2009, the UK Department for Work and Pensions examined the adoption of the shared-risk plans. Although termed **Defined Ambition,** the proposal is closer to the CDC plans in the Netherlands, or the Danish ATP model, than to the DA contracts in the Netherlands. In view of the recent change of Pensions Minister and the hurdles encountered in the UK parliament,[14] efforts to develop a "third way" between DB and DC have been on hold.

The idea underlying each country's re-invention of its occupational pension contracts is the same – to find an intermediate contract between a DB and a DC that better allocates the risks between employers and employees. In practice, hybrid funds differ in terms of benefit adjustment flexibility, the possibility to share risks among plan participants, and the capacity to offer individualized investment strategies. Table 1 summarizes the main features of the existing hybrid pension schemes that we discuss in this note.

**Table 1: Comparison of Hybrid Pension Scheme Features**

| Contract Characteristics | DB | CDC | CBP - PEP | TB - TC | PPR | VAPP | DC |
|---|---|---|---|---|---|---|---|
| Flexibility in benefit adjustments[1] | None | Limited | N/A | Limited | High | Limited | N/A |
| Contractual risk sharing among plan participants;[2] if yes, actuarial fairness | No | Yes; No | No | No | Yes; Yes | No | No |
| Individualized investment strategy | No | No | No | No | Yes | No | Yes |

Notations: DB: Defined Benefit; CDC: Collective DC (Netherlands); CBP: Cash Balance Plans (US, Canada and the UK); PEP: Pension Equity Plans (US); TB: Target Benefits (Canada); TC: Target Contribution (Canada); PPR: Personal Pension with Risk-Sharing (Netherlands); VAPP: Variable Annuity Pension Plans (US); DC: Defined Contribution.

[13] *The retirement benefit payments commence sooner than the normal retirement age but the payment is not reduced due to early commencement.*

[14] *Lokhandwala, T. (2015, June 08). Defined ambition not just an 'academic exercise' – Steve Webb. IPE Europe. Retrieved from http://www.ipe.com*
*Lokhandwala, T. (2015, March 10). MPs call for auto-enrolment review, halt to CDC legislation. IPE Europe. Retrieved from http://www.ipe.com*

## 3 Challenges in Switching to a Different Scheme

Hybrid schemes present notable advantages compared with pure DB or DC offers. Relative to DB schemes, their main interest is the flexibility offered to the employer to reduce benefits depending on the fund's financial situation. Longevity protection, made possible without the participation of a third party such as an insurer in the case of DC contracts, is feasible through a collective risk-sharing mechanism. The ability to smooth financial market shocks, which then allows the fund to take more investment risk and potentially generate more attractive pensions for beneficiaries, also differentiates hybrid schemes from DC contracts. Nevertheless, there are issues that hinder transition from one scheme to another, such as **fair treatment of accrued pension rights**, and the **regulation** of hybrid pension schemes.

**Fair treatment of accrued pension rights**

Transition from a DB scheme to another pension contract leads to difficulties on the treatment of accrued rights. Commonly discussed options include freezing or ring-fencing DB rights, and regulating them under the new rules.

In the Netherlands, discussion on conversion of accrued pension rights has been framed in the context of DB-to-DA conversion. The consequences of such a mandatory transfer would make unconditional benefits conditional, an outcome that some pension lawyers consider to be in conflict with European case law. However, those in favor of conversion argue that the public interest of creating a sustainable occupational pension system may outweigh the breach of ownership rights of pension fund participants.

In the US, the conversion of DB plans to CBPs has given rise to age discrimination lawsuits. Since older employees affected by the transition ended up with lower benefits than if the plans had remained DB, disagreements arose between the sponsor and members on the equivalence of the latters' accrued benefit and the "rate of benefit accrual" set by a CBP. The Pension Protection Act, passed in 2006, is in part intended to resolve these disputes by protecting CBPs against such legal challenges as long as vesting schedules and interest crediting rates satisfy certain conditions. To circumvent the complexity of switching an existing DB plan to a hybrid plan, employers typically either enroll new workers into the hybrid plan while keeping current ones in the DB plan, or freeze all DB accruals and move all workers to the hybrid.

**Regulation**

At present, rigidity within the distinct regulations of DB or DC plans may hinder the adoption of innovative pension arrangements. Hybrid schemes tend to fall under different types of rules depending on the country and the regulator. For example, the UK's Cash Balance Plans are classified as DC under the tax code, but DB under the regulations concerning funding rules, with certain exemptions. Such complexity may be an administrative burden to the plan. In order to foster innovative pension arrangements, existing regulatory regimes have to be modified.[15]

**Commitment of future generations**

In principle, participants in a collective pension scheme can share financial market risk via performance smoothing. By smoothing gains and losses from the plan's investments, market shocks are gradually reflected in benefit adjustments.[16] However, smoothing financial market returns or sharing macro-longevity risk could lead to intergenerational transfers, which necessitate the commitment of future generations.

[15] *There are examples of failed switches from DB to hybrid schemes due to the lack of a clear regulatory treatment of the latter. In the arbitration with Canadian Auto Workers Union, for example, Air Canada emphasized the lack of a clear regulatory path for hybrid plans, which rationalized the firm's decision to set up a simple DC plan instead (Burkett, Bauslaugh and Mackenzie, 2011). Canada's Federal Income Tax Act and many provincial pension and benefit acts have begun to embed elements of DB and DC structures. This should obviate the disincentive to innovate.*

[16] *The advantage of collective risk sharing mechanisms should be tempered by the fact that in practice, the reallocation of risks between age groups can only be small if the fund faces solvency rules with short recovery periods when the plan is unfunded. Moreover, DC plans can provide life cycle investment strategies, which limit the effects of financial market shocks on the elderly. In sum, an individual DC plan using a life cycle investment strategy can largely replicate the welfare gains of collective schemes (Boelaars et al., 2014).*

This makes hybrid pension schemes difficult to implement. For example, the extent of the distribution of financial shocks (i.e., equity, interest rate and inflation) across generations is limited in practice, even in the current Dutch institutional setting (Boelaars et al., 2014).

## 4 Hybrid Funds: The Future of Occupational Pensions?

Due to the unique way in which each country's pension provision and legislative systems have evolved, hybrid schemes are likely to advance in different ways around the world. Relaxing the guarantees offered by DB pension schemes implies either switching to a DC system or sharing risks between the different parties in a hybrid scheme. While most contract innovations are preoccupied with sharing risks between the sponsor and the members through increased flexibility of benefits or contribution adjustments, the advantage of risk sharing among individuals, especially for risks that are not commonly traded on the market (e.g., biometric risks), should not be overlooked as it can be a way to reduce risk for individuals.

Financial and longevity risks could also be shared with a third party, such as an insurer, which charges a premium to meet the costs of annuity provision, which include taxes, regulatory capital, and the need to generate a specified return on the insurer's capital. The attractiveness of the collective risk-sharing solution compared with the solution involving an insurer not only depends on the price of annuity contracts sold on the market, which differs across countries. The premiums associated with annuity contracts are on average 10-15% higher than the present value of the expected future benefits in the US (Mitchell, Poterba and Warshawsky, 1999) and around 10% higher in the UK (Cannon and Tonks, 2004). The corresponding estimates in Australia vary between 14% (Doyle et al., 2004) and 20% (Ganegoda et al, 2007). Despite the differences in money's worth[17] estimates around the world, these estimations suggest that risk sharing among participants in a fund does have a cost advantage.[18]Finally, the success of future pension arrangements will also rely on some additional key features. Actuarial fairness across age groups or generations will be crucial for the stability of the pension arrangement over time. Risk sharing solutions can ex ante improve the welfare of all generations, but some generations may be worse off. Young workers would not enter an underfunded pension scheme when they could be better off with an alternate pension arrangement that they can set up among themselves or on their own. Moreover, with workforce mobility increasing, portability, which necessitates an unambiguous economic valuation of every individual's pension account, in addition to a personalized investment strategy and benefit payout method, is vital to an ideal pension contract.

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[17] *This is the present value of the contract's expected future benefits relative to the contract's premium.*

[18] *Insurers' potential default is another disadvantage of their involvement in risk sharing, but in most countries there are guarantee schemes that protect annuitants. For example, in the US, annuities are protected up to a limit by guaranty associations that are organized by state and belong to the National Organization of Life and Health Guaranty Associations (NOLHGA). In the UK, the Financial Services Compensation Scheme (FSCS) provides 100% protection for personal pensions and annuities, with no upper limit.*

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