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# New Dutch pension contracts and lessons for other countries

Lans Bovenberg and Theo Nijman

# **New Dutch pension contracts and lessons for other countries**

Lans Bovenberg and Theo Nijman<sup>1</sup>

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Preliminary draft; comments welcome

## **Summary**

*This paper summarizes recent developments in Dutch occupational pensions of both the DC and DB type. A reform of DB schemes is discussed that introduces financial assets as individual entitlements. At the same time, the reformed schemes derive (dis)saving, financial risk management and insurance decisions from the explicit objective of adequate and stable lifelong retirement income. In fact, the proposed system involves not only financial assets in individual accounts but also an insurance contract pooling longevity risks and possibly collective buffers that share systematic risks with future pension savers. The paper identifies the strengths and weaknesses of the Dutch contract design and draws lessons for other countries.*

## **1. Introduction**

The main design questions for funded pension contracts are similar across countries. Denmark (Finanstynet (2017)) and Germany (Maurer et al. (2016)) consider the advantages and disadvantages of pension guarantees. The UK mandated the payout of retirement products in terms of deferred annuities until April 2016 but now allows full lump-sum withdrawal. Australia discusses whether to set-up an insurance market for lifelong income provisions on top of the current drawdown options without longevity insurance. Variable annuities, with or without guaranteed lifetime withdrawal benefits (GLWB-rider), are a large market in the US (Kojien and Yogo (2017)).

Proper understanding of the contract designs in different countries is important in order to draw lessons from international experience. This paper summarizes recent developments in occupational pensions in the Netherlands. It identifies the strengths and weaknesses of Dutch contract designs and draws lessons for other countries.

Contract design of occupational pensions is heavily debated in the Netherlands. As regards Defined Contribution (DC) contracts, the requirement to provide guaranteed fixed nominal lifetime income during the payout phase was lifted in 2016. Hence, variable annuities can be offered during the decumulation phase. At the same time, the new legislations maintained the compulsion to offer lifelong payments by pooling idiosyncratic longevity risks.

DB pensions are the dominant contracts in the Netherlands. Also these schemes have been in flux during the past decade. The pension entitlements in these schemes are defined in terms of (deferred) annuities also during the accumulation phase. Employers have progressively withdrawn as risk sponsors of these schemes during this period. Participants thus bear more systematic investment and longevity risks in stand-alone pension schemes. In particular, cost of living

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adjustments depend on the funding status of the schemes and pensions in payments can be cut in case of underfunding.

Currently under discussion is a more far-reaching reform for DB pensions. This reform replaces (deferred) variable annuities by financial assets as individual entitlements. At the same time, the design continues to focus on stable and adequate lifelong income during retirement as the starting point for decisions on (dis)saving, investment and insurance. In fact, the proposed system involves not only financial assets in personal accounts but also insurance contracts pooling longevity risks and possibly collective buffers that share systematic risks with future pension savers. We refer to this proposed contract as Personal Pensions with Risk-sharing and Collective Buffers (PPR-CB). Personal Pensions refer to individual accounts of financial assets, Risk-sharing involves pooling longevity risks in insurance contracts, while the Collective Buffers share systematic risks with future pension savers.

The Dutch PPR design attempts to combine the best of the two worlds of Defined Benefit (DB) and Defined Contribution (DC). Like DB contracts, a PPR aims to provide stable lifelong retirement income by contributing sufficient resources, hedging interest rate risks, smoothing investment returns and pooling idiosyncratic longevity risks. The so-called Defined Ambition (DA) design of a PPR takes the desired retirement income stream as a starting point and endogenously derives the (dis)saving, investment and insurance options from that objective for retirement income. In contrast to traditional DB plans, benefits are not necessarily guaranteed, as lifelong guarantees have become quite costly in the current low-interest environment. Another difference with traditional DB plans is that the PPR design allows (dis)saving, investment and insurance to be tailored to personal characteristics of the participants. Moreover, the valuation of individual entitlements and the relationship between contributions and the accrual of entitlements are less complex than their counterparts found in variable annuities in current DB plans. The combination of a richer menu of instruments with which to tailor risk management and more transparent personal property rights prevents intergenerational conflicts about investment and distribution.

#### **Terminology contract designs**

**PPR:** Personal Pensions with Risk-sharing refers to contract designs combining old-age insurance with personal financial investments. Personal capital changes in a transparent way due to contributions (or drawdowns), investment returns and possibly biometric returns on account of longevity insurance. The various components<sup>1</sup> of the pension contract ((dis)saving, financial investments, insurances) can be adjusted flexibly. See Bovenberg and Nijman (2016).

**PPR-VA:** A PPR design based on variable lifelong annuities in the drawdown phase

**Dutch-DC:** The current (as of 2016) Dutch Defined Contribution contracts, which combine age-dependent contributions during the accumulation phase with PPR-VA during the payout phase

**Dutch-DB:** The current Dutch DB contracts based on (deferred) variable annuities as individual entitlements already in the accumulation phase and adjustments (positive and negative) of these entitlements based on the collective funding rate

**PPR-CB:** A PPR design based on variable lifelong annuities in the drawdown phase as well as collective buffers that share risks over time with future pension savers

**DA:** A Defined Ambition<sup>1</sup> (DA) design derives the required (dis)saving, investment and insurance strategy from the desired properties of the retirement income stream (level, volatility of adjustments, probability of cuts in nominal benefits in payment and so forth)

The paper is structured as follows. Section 2 summarizes Dutch retirement income provisions. Section 3 outlines the strengths and weaknesses of the current DB contracts in occupational pensions. Section 4 outlines new legislation on decumulation of DC contracts. Section 5 explores proposals on personal pensions with risk-sharing and collective buffers. Section 6 identifies lessons for other countries. Section 7 concludes. The paper updates Bovenberg and Nijman (2009) and Bovenberg, Mehlkopf and Nijman (2015). These latter papers offer more detail on older contract designs and earlier policy discussions.

## 2. Dutch occupational pensions<sup>2</sup>

### *Three-pillar system*

The Dutch pension system consists of three pillars. The first is a pay-as-you-go public pension scheme. This Beveridge-type public system provides a uniform, flat pension to all residents at a level that is related to the minimum wage. The Dutch government thus provides only a relatively small part of pension income for workers who earn middle and higher incomes. If these workers want to maintain their standard of living in retirement, they need additional pension income. As the second pillar of pension provision, occupational pensions provide supplementary pension income for these workers. In contrast to the first pillar, the second pillar is earnings-related, and aims at maintaining the standard of living of middle-class workers during retirement. The third pillar consists of voluntary personal pension provisions, which are tax-favored up to a ceiling. This pillar is especially important for self-employed individuals because these workers typically do not participate in occupational pension provisions.

### *Occupational pensions*

This paper focuses on the occupational pensions (second pillar). Occupational pension provisions are typically part of labor contracts, which are negotiated between unions and employers in collective labor agreements. Employees are thus obliged to participate in the negotiated pension scheme. As a result, occupational schemes cover more than 90% of the labor force in the Netherlands. These schemes are funded; the value of assets in the occupational pensions currently amounts to about 1,4 trillion Euro (150% of GDP).<sup>3</sup>

### *Governance*

Second-pillar pension funds are independent non-profit trusts with their own governance and administrative structures. The governing board of a pension fund traditionally consists of an equal number of representatives of employers and unions – although more recently also retirees and independent specialists can be board members. These members of the governing board act as fiduciary trustees. They determine investments, contribution levels and cost-of-living adjustments for benefits. Industry-wide pension funds arrange pensions for workers in a specific sector of the economy. These sectoral funds own more than two-thirds of the assets in the second pillar, and account for more than 80% of the active participants. A company can opt out of an industry fund only if it offers a better pension plan than the plan of the sectoral fund.

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<sup>2</sup> This section updates Section 2 in Bovenberg, Mehlkopf and Nijman (2015)

<sup>3</sup> In terms of active participants, the most important type of pension fund is a company pension fund. To provide pension benefits to its workers, a company does not have to set up its own company pension fund but can also contract out its pension scheme to an insurance company.

### *Deferred annuity plans*

The vast majority of occupational pensions in the Netherlands are structured as (deferred) annuity contracts. These annuities are no longer guaranteed and have become variable annuities. Pension funds do not fully hedge their legal liabilities. In addition, employers have retreated as risk-bearing sponsors of pension plans, which are now typically stand-alone. In addition, due to the maturing and aging of pension plans, higher pension contributions have become less effective instruments to finance funding gaps. Moreover, the pension contributions in many sectors have reached levels as high as around 20% of the wage sum (above a so-called franchise level accounting for the flat public benefit). Hence, raising contribution levels further in order to stabilize benefits has become less attractive. Contribution rates are thus more or less fixed in many sectors. Stable contributions and risk-bearing investments in the absence of outside risk-bearing sponsors imply that annuities have become variable. We will refer to these variable annuity plans as defined-benefit (DB) plans because individual property rights are defined in terms of an income stream rather than a capital claim.<sup>4</sup>

### *Back-loading of accumulation*

The Dutch DB plans aim at a specific lifetime income stream during retirement. Years of service and a reference wage typically determine the annuity entitlement of an individual participant. The reference wage used to be the final wage, but in the beginning of this century most funds moved to career-average schemes. In these latter schemes, entitlements accumulate based on a percentage of the average wage level during the career. Schemes typically aim at an annuity level about 75% of average pay (including the flat public benefit) after 40 years of service. The benefit accrual (in terms of annuity level) is uniform across age groups. Hence, if the aim is to provide 75% of average pay after a working career of 40 years, the annual accrual rate is  $75\% / 40 = 1.875\%$ .

The accrual rate of annuity units is the same for all workers – irrespective of age. This so-called uniform accrual implies that benefits are backloaded, because the time value of money implies that the value of the (deferred) annuity (as a percentage of the wage) rises with age. Despite this back-loading of benefit accrual, industry funds charge the same premium rate for the annuity units irrespective of age. This combination of uniform (i.e. age-independent) accrual and uniform contributions implies that firms with a younger workforce typically<sup>5</sup> subsidize other firms with an older workforce in the same sector. This redistribution implies that the funded system includes an implicit pay-as-you-go element.

### *Variable annuities*

Pension funds aim to index the annuities to wage or price inflation<sup>6</sup>, but these increases in entitlements are conditional on the funding rate (i.e. the ratio between assets and liabilities) of the fund. Moreover, pension rights and thus pension payments can be cut in nominal terms if the assets of a fund are smaller than the value of the nominal liabilities (i.e. the value of the annuities excluding indexation).<sup>7</sup> Government regulation requires that a funding shortage is in expectation resolved within a ten-year period. In calculating the scope for recovery, funds can use expected returns on assets. Hence, risk premia on risky assets contribute to the potential for recovery. Funds, however, are not allowed to increase mismatch risk if they are in a so-called recovery program.<sup>8</sup>

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<sup>4</sup> Others refer to these variable annuity schemes as Collective Defined Contribution (CDC) schemes because the participants bear investment risk. Some company schemes have recently moved to DC schemes in which individual property rights are defined in terms of a claim on financial capital. Hence, each participant has his or her own investment account.

<sup>5</sup> A peculiarity of the DB contracts is that the purchase price of annuities is typically based on an expected, real rate of return, whereas the valuation of liabilities and thus the pay-out rates (which depend on the funding rate defined as the ratio of assets and liabilities) are based on the nominal risk-free interest rate. Due to low interest rates in recent years, a gap has opened up between the discount rate for computing the accruals and the discount rate for computing the funding rate. As a result, rights that have been accumulated in the past subsidize newly accumulated rights. This results in reverse redistribution from older to younger participants.

<sup>6</sup> Most schemes aim to index the deferred annuities to wages during the accumulation phase. During the decumulation phase, they typically target prices.

<sup>7</sup> Several Dutch Pension funds had to cut benefits in April 2013. See Bovenberg, Mehlkopf and Nijman (2015)

<sup>8</sup> When new solvency rules were introduced in 2015, a one-time option to adjust the mismatch risk was offered.

### *Nominal liabilities computed with market interest rates...*

Solvency regulations of DB plans are based on the idea that annuities are guarantees even though they are not guaranteed in practice. In particular, Dutch pension funds must calculate nominal liabilities on the basis of the term structure of nominal risk-free interest rates (based on European swap rates) published by the Dutch Central Bank. This valuation method was introduced in 2007.<sup>9</sup> Before that time, pension funds discounted their liabilities against a fixed discount rate of 4%. The introduction of valuation on the basis of market interest rates did not have a substantial effect on funding rates when the system was introduced, as market interest rates were close to 4% in 2007. This changed after the financial crisis in 2008, when interest rates started to drop substantially.<sup>10</sup>

### *DC plans*

A small but increasing part of Dutch occupational pensions is based on DC plans. During the accumulation phase, individual property rights are defined in terms of a claim on financial capital in personal accounts rather than as deferred annuities. In fact, several company schemes have recently moved to such schemes. Moreover, several DB pension funds also run DC plans for additional voluntary contributions on top of mandatory accruals in the DB fund<sup>11</sup>. Third-pillar arrangements are also based on DC plans. The ceilings for tax-privileged contributions (in percentage of income) rise with age. This back-loading of contribution levels reflects the Dutch DB tradition with uniform accruals of deferred annuities during the working career. A second aspect that distinguishes Dutch second-pillar DC plans from those in other countries is that at retirement the accumulated capital must be converted into a lifelong annuity<sup>12</sup>. Also this reflects the annuity insurance tradition of the Netherlands.

### *DB versus DC plans*

Section 4 provides more detail on the Dutch DC plans, which serve as a benchmark for reform of the DB plans. Indeed, both DB and DC feature strengths. DC plans provide more transparency about the valuation of individual entitlements in general and the relationship between contributions and accrual of entitlements in particular. They thus yield more secure property rights and alleviate conflicts of interest between generations. Moreover, in DC schemes payments can be tailored to individual needs. The income frame of DB schemes aids communication to participants. In addition, it offers a helpful choice architecture for managing macro-economic (interest rate) risk and insuring idiosyncratic longevity risk (particularly for those who become very old).

## 3. Dutch DB contracts: Strengths, drivers of change and desired requirements

Dutch occupational pensions feature a number of strengths (see Bovenberg, Mehlkopf and Nijman (2015)). In fact, Dutch occupational pension schemes are among the best in the world. One may thus wonder why the Dutch are reforming these pensions. After summarizing the main strengths of Dutch occupational schemes, this section identifies the drivers of reform. It also outlines the main criteria that should be met by sustainable occupational pensions.

### *Strength: Income frame*

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<sup>9</sup> This valuation method was amended in 2012 with the Ultimate Forward Methodology (UFR) to determine discount rates beyond the 20-year horizon. This methodology was adjusted in July 2015.

<sup>10</sup> To determine the purchase price of annuities, most funds still employ an expected, real rate of return as discount rate rather than the risk-free interest rate. Due to low interest rates in recent years, a gap has opened up between the discount rate for computing the price of new accruals and the discount rate for computing the funding rate. See also footnote 5.

<sup>11</sup> Collective labor agreements often cap the mandatory pension accrual at a certain income level. The government has imposed an income ceiling of approximately 100,000 Euros per year for certain tax privileges for mandatory occupational schemes.

<sup>12</sup> This requirement does not apply for pension products offered by banks. This is a small market, however, which we ignore here for the sake of simplicity.

First of all, the income frame inherent in the Dutch design focuses on adequate and stable lifelong income streams in retirement. Savings and investment strategies during accumulation are derived from desirable properties of the income stream during decumulation. Hence, hedging of interest-rate risks becomes important. If interest rates drop, more capital is required to be able to withdraw the same income in future years. Longevity risks are pooled, which keeps lifelong retirement income affordable and is quite important towards end of life.

*Strength: Choice architecture and strengthening position of financial consumers*

Collective decision making in pension funds protects individual participants against behavioral biases. In particular, trustees help participants with complex decisions on (dis)saving and the management of systematic financial risks and idiosyncratic risks in insurance. In this connection, the high participation rates and high mandatory contributions negotiated by social partners in collective labor agreements combat the myopia of individual participants. A related strength is that pension schemes bring together consumers who can then operate as a wholesale group in financial markets. This alleviates agency issues due to a weak position of financially illiterate consumers in retail markets.

*Strength: More complete financial and insurance markets*

Dutch pension schemes also complete insurance and financial markets. By forming collective pools to pool longevity risk, pension schemes combat adverse selection in longevity insurance. Indeed, the insurance of idiosyncratic longevity risk allows pension schemes to offer stable benefits for life<sup>13</sup>. Moreover, systematic longevity risk, which is not traded in financial markets, is traded between generations in the pension schemes. This can contribute to more stable retirement benefits. Many would also consider the option to share systematic financial and longevity risks with future generations as one of the strengths of the system.<sup>14</sup>

**Summary of strengths and drivers for change in Dutch contract design**

Strengths:

- High coverage and substantial contributions due to semi-mandatory nature in collective labor agreements
- Focus on stable lifelong retirement yields high saving rates, advanced risk management (e.g. hedging interest-rate risk) and substantial insurance.
- Trustees protecting individual participants against behavioral biases and agency issues
- Increased bargaining strength of consumers in financial markets
- Pooling idiosyncratic longevity risks in collective solidarity pools
- Internal trade of systematic longevity risk, thereby filling gaps in financial markets
- Sharing of systematic risks with future generations

Drivers of change:

- Labor markets become more dynamic
- Investment risks are increasingly borne by participants of the schemes. This raises the demand for transparency regarding pricing and individual property rights in order to avoid conflicts of interest between participants
- Participants become more heterogeneous in their needs for retirement saving

<sup>13</sup> Small lump-sum payments at retirement have been proposed though and might be introduced in the near future.

<sup>14</sup> The advantages and disadvantages of risk-sharing with future generations are heavily debated in the Netherlands. We elaborate on this in Section 6.

While the strengths are to be cherished, many agree that the current system is to be adjusted. We identify three main drivers of reform.

*Driver #1: Transitional labor market*

The Dutch DB system was built many years ago in a world in which almost every worker worked 40 years as a fulltime employee, often with the same employer. The uniform accrual and uniform contribution rates referred to in Section 2 imply that participants pay an implicit tax on their pension contribution at young ages but are subsidized by older employees. However, career interruptions and labor market mobility across sectors and employers are becoming more common. An individual may work fulltime at some ages and part-time later on— or work as an employee in the beginning of their work career and then switch later to self-employment. An actuarially fair system in which contributions correspond to the value of the retirement benefits accumulated in a particular year is more efficient and equitable in transitional labor markets. An actuarially fair system will also make it easier for the self-employed to participate.<sup>15</sup> How to induce these workers to build up pension rights is a major policy issue in the Netherlands. It is related to the broader issue of a dual labor market in which a growing group of self-employed individuals does not participate in social insurance. Indeed, the dual labor market economy endangers the high level of participation in occupational pension schemes (and social insurance in general) because the self-employed do not participate in the second pillar.

Not only efficiency but also equity arguments support a more actuarially fair pension system. Several studies have shown that higher income groups feature steeper income profiles than lower income groups do. The first group is consequently subsidized at much higher income levels than the levels at which they paid in contributions. A more actuarially fair system removes this reverse solidarity from lower to higher income groups. A similar equity argument applies towards people that are employed in the beginning of their career and become self-employed later.

*Driver #2: Valuation and determination of individual risks*

Investment risks are increasingly borne by individual participants. This has made market-consistent valuation of deferred annuities complex. Indeed, the link between the contributions and the value of annuities has become opaque. Moreover, the pricing of the annuities is inconsistent with the rules for computing the funding rate because different discount rates are used<sup>16</sup>. Also the relationship between the funding rate, on the one hand, and cost of living adjustments or nominal benefit cuts, on the other, has been adjusted frequently. These revisions often imply substantial but intransparent value transfers from one group to another. The combination of conflicts of interest among generations and a complex and intransparent system have eroded trust in the DB system, which has become increasingly politicized. Some young participants even question whether there will be a pension for them when they retire. The intergenerational conflicts have also led to more political interference in occupational pensions. These pensions thus have an increasingly public character, with less discretion for the governing boards to tailor their policies to the features of their participants.

*Driver #3: Heterogeneity and big data*

Not only the intransparent valuation but also the one-size-fits-all design of DB funds leads to conflicts of interest about investments and contributions. Participants differ substantially in terms of age, accrued rights, other savings, housing status, preferences and so forth. Despite this

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<sup>15</sup> Actuarial fair choice is important also to avoid choice at the expense of other participants. Many envisage that more options for choice of the contribution rate will emerge—for instance, where one can choose either to repay one's mortgage or to contribute to the occupational pension system. Heterogeneity of participants and choice are discussed in more detail later.

<sup>16</sup> See footnote 5.

heterogeneity, (dis)saving and investment profiles are the same for all. Van Ewijk et al. (2017) show that pension contracts that are better aligned with characteristics and preferences of the individual can substantially enhance welfare. Information technology and big data offer more opportunities to “know your customer” (due e.g. to “big data”) and thus to tailor the pension product to individual needs. This is, however, not easily accomplished in the current “one-size-fits-all” design of DB plans.

#### **Summary of desirable requirements of Dutch occupational pensions**

- Stable and adequate life-long pension income at low costs
- Actuarially fair pricing of participation and other choices
- Adequate information on income streams as well as capital
- Adequate and flexible choice architectures tailored to individual characteristics

#### *Desirable requirements of Dutch occupational pensions*

What are the criteria for sustainable occupational pensions? The goal of the reform of occupational pensions is to provide stable lifelong pension income at low costs. Retirement products should be priced transparently and fairly in order to avoid labor market distortions and conflicts of interest among participants. Trust in the system requires that the fund provides each individual with adequate information on the risk profile of the income streams in retirement. The fund should also show individuals how the value of their pension entitlements has developed as a result of contributions, investment returns in financial markets and biometric returns on account of insurance. The new contracts should provide trustees with more levers with which to tailor the pension contract to the individual. Instead of merely offering more individual choice options to agents with limited financial abilities, schemes should offer adequate and flexible choice architectures with defaults tailored to individual characteristics. If schemes offer individual participants explicit choices, these choices should be priced in an actuarially fair fashion in order not to distort these choices.

#### **4. Dutch DC contracts**

The DC market is currently only a small part (about 10% in asset value) of the total market for Dutch occupational pensions. DC contracts are relevant for DB contracts, however, because they provide a benchmark for the reform of the DB contracts.

#### *Accumulation phase*

In the accumulation phase of Dutch DC contracts, pension contributions are added to personal accounts and invested in financial markets. In third-pillar contracts, the agents can choose the investment strategy themselves. In occupational pensions, however, the board of the pension fund determines investments. Second-pillar contributions (as a percentage of income minus a threshold) are a mandatory part of the labor contract and typically rise with age but are uniform for all employees of a certain age.

#### *Pay-out phase: investment and longevity risk...*

Until recently, Dutch DC capital had to be decumulated as a guaranteed lifelong nominal income stream provided by an insurer. Individuals thus could take neither investment risk nor (micro and

macro) longevity risk during the decumulation phase. As of September 2016, a guaranteed lifelong nominal income stream is still the default option, but agents can choose to take investment risk. As regards longevity risk, the capital of agents that pass away must be allocated to the other participants in an insurance pool as a so-called biometric return. Base risk and macro longevity risk (i.e. unexpected adjustments in mortality tables), however, can now be shared among participants within an insurance pool.

*....and drawdown speed*

The reform of the payout design of DC plans in 2016 liberalized not only investment risk but also withdrawal speeds. The maximum annual income that can be withdrawn is determined in such a way that the expected (nominal) income level does not decline during the rest of life. In particular, the Assumed Interest Rate (AIR) determining the initial payout cannot exceed the expected return on the investment portfolio. This expected return is derived from the actual allocation in risky investments and legislative assumptions on the risk premium. Hence, more income can be drawn if more investment risk is taken. Myopic agents thus face incentives to take more risk. To reduce these incentives, the government requires pension administrators to provide income projections for pessimistic scenarios in which expected investment returns do not materialize. Moreover, the allocation to risky assets that can be used to calculate the AIR is capped at 35% of the portfolio.<sup>17</sup>

*Empirical illustration*

The core properties of the new rules for decumulation of DC capital can be illustrated numerically. A technical explanation that contains the assumptions behind the numerical illustration is provided in Balter and Werker (2017). In this example, the interest rate is 1%, the equity premium 4%, the volatility of equity returns 20% and (for simplicity) the deterministic date of death 20 years after retirement. Figures 1 to 4 show the risk profile of retirement income for two asset allocations to equities, namely either 20% or 35%. In figure 1, the AIR equals the risk free rate; in figures 2 and 3 the AIR coincides with the expected portfolio return; in figure 4 it exceeds the expected portfolio return. The expected income is increasing with age if the AIR is less than the expected portfolio return and vice versa. Initial income depends on the AIR and increases if more investment risk is taken and the maximum AIR is used. Not surprisingly, the outcome in the pessimistic scenario worsens if more risk is taken. Legislation does not allow the case in figure 4 because expected income declines.

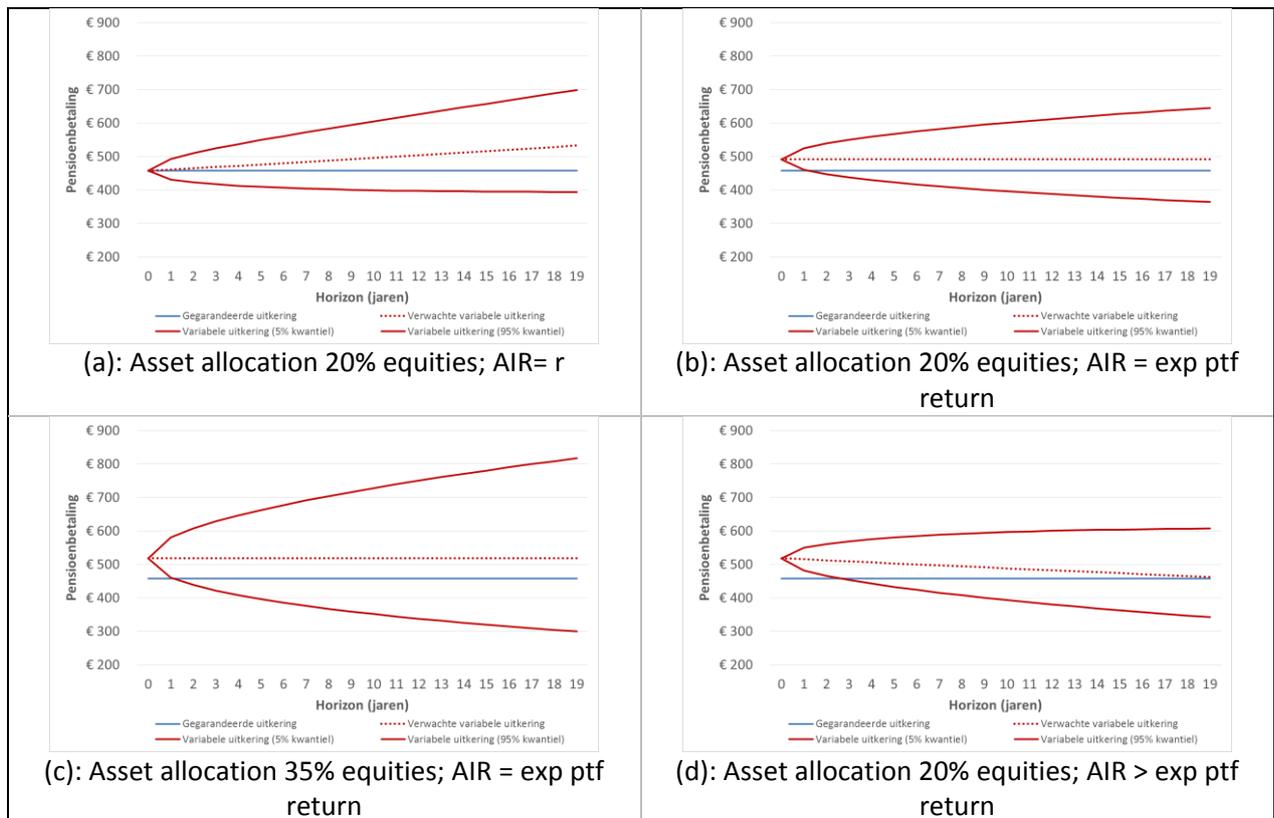
The main results are summarized in table 1.

		asset allocation	AIR	Initial income	Expected income pattern
Fig 1	AIR = risk free rate	20%	1,0%	457	increasing
Fig 2	AIR = exp ptf return	20%	1.8%	492	flat
Fig 3	AIR = exp ptf return	35%	2.4%	518	flat
Fig 4	AIR > exp ptf return	20%	1.8%	518	decreasing

<sup>17</sup> The actual allocation to risk investments can be larger (subject only to “prudent person” requirements).

Table 1. Summary of results in figures 1 to 4

Figure 1: *Income profiles*



### *Personal buffers*

Another novel aspect of the legislation is that unexpected shocks do not have to be transferred immediately to income shocks but instead can be buffered. Smoothing shocks through personal buffers allows risky investing but also rather stable year-on-year pension income. To prevent large shocks at the end of life, investment should have a lifecycle profile in which investment risk is reduced as the individual participants grow older. The maximum so-called recovery period over which shocks can be smoothed is ten years. This is the same smoothing (or recovery) period as in Dutch DB contracts. Smoothing shocks in this way is optimal if participants feature habit formation and need time to adjust their standard of living to unexpected shocks.

### *Income versus capital frame: risk management*

An important aspect of Dutch DC products is that risk management aims at a stable lifelong income stream during retirement. This contrasts with the typical design of DC schemes in Australia and the US, where the investment strategy tends to aim at maximum pension capital at retirement at accepted levels of capital risk. In contrast to this capital frame, the Dutch income frame aims at maximum retirement income at accepted levels of income risk. Accordingly, interest risk management becomes important. Indeed, the income that can be drawn from a fixed amount of capital depends on the interest rate.

### *Transparency*

The accumulated pension capital and the investment returns are to be reported annually in Dutch DC products. It seems natural also both in the accumulation and decumulation phase to distinguish

explicitly between the impact of costs, investment returns, biometric returns and contributions and payouts. In addition, income projections should be included. As participants age, communication in terms of income rather than capital is likely to become more important. In fact, the retirement product becomes more of an insurance than an investment product during the payout phase. The details on participant information during each phase of the life course are still to be set, but both remaining capital, investment returns, biometric returns, expected income and income in optimistic and pessimistic scenarios are likely to be included.

#### *Tailoring to individual features*

The personal nature of a DC plan enables the provider to tailor contribution and payout level, investment strategy and insurance elements (e.g. to have a partner pension) to the characteristics and preferences of the individual participant. All kinds of choices in the accumulation phase, such as additional or lower contributions, and preferences for investment strategies (including sustainable investing) can easily be offered actuarially fairly (i.e. without affecting other participants in the fund). Collective decision making on adequate defaults is likely to remain important. Investment choices can be combined with collective investing through mutual funds. During the payout phase, individual choices on insurance and dissaving must be limited in order to prevent selection. Indeed, the insurance element becomes more important as participants age: a larger part of the overall return consists of a biometric return. Early in the payout phase, selection is not yet likely to be important.

#### *Collective risk allocation*

The regulation distinguishes between individual risk allocation and collective risk allocation during the payout phase of DC schemes. This distinction does not refer to collective investing or to collective governance. These latter collective elements can be present also in case of individual risk allocation. The distinguishing feature of collective risk allocation<sup>18</sup> is that annual adjustments in benefit payments are uniform across all participants. Treating all participants in the same way regarding the development of their income may avoid controversies and may give people more confidence that they are not mistreated. The drawback is that the individual risk and payout profiles cannot be tailored to individual features. As regards the allocation of financial risk, collective risk allocation is a special case of individual risk allocation and thus does not offer more opportunities to share systematic risk. Indeed, the pricing of the variable annuities when the capital is converted into lifelong payments must be on the basis of market value. Hence, risk-sharing with participants that do not yet participate in the pool is excluded.

### 5. The future of Dutch DB contracts

This Section considers the future of the DB contract (described in section 3). As mentioned in the introduction, a reform is currently under discussion for DB pensions. This reform replaces (deferred) variable annuities by financial assets such as individual entitlements. The proposed system involves not only financial assets in personal accounts but also insurance contracts pooling longevity risks.

The main difference between the two new contract types is the presence of collective buffers (i.e. of assets that are not yet allocated to particular individuals). These buffers are added to share

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<sup>18</sup> In case of collective risk allocation, agents gradually buy in to the decumulation vehicle over a period of ten years before retirement. In this way, agents will be less vulnerable to interest-rate risk affecting the prevailing annuity factor at conversion. A purely individual design, however, can replicate this through adequate risk management.

systematic risks with future pension savers. The reformed DB contracts are referred to as personal pensions with risk-sharing and collective buffers (PPR-CB).

#### *The collective buffer mechanism*

The Sociaal Economische Raad (Socio Economic Council; SER)<sup>19</sup> developed a prototype of a PPR-CB contract<sup>20</sup> (SER (2016)). This contract adds a collective buffer to the PPR contract with only personal accounts and personalized buffers described in section 4. On the one hand, returns on the risky investments in the personal accounts in excess of a certain threshold (say 10%) are added to the collective buffer. On the other hand, personal accounts are supplemented from the buffer if the risky investments in these accounts yield seriously negative returns (say less than -5%). To stabilize buffers, these rules apply only if the buffer is positive and less than a certain percentage (say 20%) of the total value in personal accounts. Collective buffers in fact implement intergenerational risk-sharing with generations that do not yet own personal accounts. In particular, the value of the benefits accrued by these generations exceeds the contributions if good investment returns by previous generations have built up a large buffer. If bad historical returns have depleted collective buffers so that these buffers are only small or non-existent, the situation is reversed. In that case, future generations pay implicit taxes on their pension contributions to replenish buffers.

#### *Intergenerational risk-sharing: Completing financial markets ....*

The added value of intergenerational risk-sharing as implemented through pension funds is heavily debated in the Netherlands. Intergenerational risk-sharing is welfare increasing because future generations can benefit from risk premia by taking on financial risks before starting to contribute to the pension system (see e.g. Gollier (2008) and Ball and Mankiw (2007)). Collective buffers can also alleviate borrowing constraints of young participants who want to have a large exposure to investment risk. By allowing future and young generations to participate more in financial markets by borrowing against the collateral of their human capital, intergenerational risk-sharing completes financial markets<sup>21</sup>.

#### *...versus discontinuity risks*

The downside of taking financial risk on the basis of the collateral of human capital is so-called discontinuity risk: future generations might not be willing to participate if they have to pay an implicit tax on their contributions to replenish collective buffers. Indeed, what is risk-sharing ex ante becomes redistribution ex post. Hence, mandatory participation is required to commit future generations to risk-sharing with present generations. Mandatory participation, however, does not allow unlimited intergenerational risk-sharing because workers still have various ways to avoid implicit taxes associated with risk-sharing. In particular, they may reduce labor supply to the formal economy, become self-employed or switch to another sector. Intergenerational risk-sharing may also generate political risks. Indeed, generations that suffer from risk-sharing ex post may want to change the system.

#### *Numerical estimates of trade-off*

Clearly a trade-off exists between the benefits of intergenerational risk-sharing and the drawbacks in terms of discontinuity risk. This trade-off varies across pension funds. In particular, sectors differ in

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<sup>19</sup> The SER is one of the main advisory bodies for the Dutch government. It consists of employer organizations, labor unions and independent members.

<sup>20</sup> In Dutch policy discussions PPR-CB is known as SER IV-C, whereas the PPR contracts described in Section 4 with individual and collective risk allocation are known as respectively SER IV-A and SER IV-B.

<sup>21</sup> Collective buffers can also be used to share changes in life expectancy (macro longevity risk).

the sector-specificity of human capital or the prospects for continuity of the sector (based on e.g. the presence or absence of international competition). Based on models that abstract from discontinuity risk, Boeijen et al. (2015) present estimates of the welfare gains from intergenerational risk-sharing. This analysis assumes a smoothing period of ten years, which is similar to smoothing periods in the current “DB” contracts. These gains amount to about 1% to 2% of supplementary pension income<sup>22</sup>. Alleviation of borrowing constraints of young participants can double the welfare gain from collective buffers. In order to get an idea of discontinuity risk, Boeijen et al. (2015) estimate that the implicit tax for new participants after poor investment outcomes can be as high as 40% of the contributions after poor investment results (5 % quantile).

#### *Collective buffers: benefits...*

Other arguments against and in favor of collective buffers exist. An important argument in favor of collective buffers is that they require mandatory participation of firms in sectoral funds. Without mandatory participation at a sectoral level, individuals and newly established firms face incentives to avoid participation if the buffer is to be restored. Mandatory participation reduces marketing and other transaction costs. Mandatory participation in sectoral funds and risk-sharing with future generations is essential for labor unions. Unions also want to avoid that individual participants must enter financial markets themselves without the aid of trustees who design choice architectures, combat agency issues and enhance the bargaining position vis-à-vis financial institutions. Mandatory participation protects the role of trustees in these governance issues and protects the market share of the Dutch pension funds vis-à-vis commercial insurers.

#### *...and costs*

A drawback of collective buffers is that they add complexity, thereby reducing transparency and giving rise to governance risks. The implicit taxes and subsidies on pension contributions implied by intergenerational risk-sharing makes it more difficult to price individualized elements fairly. Fair pricing is important to protect other participants when personal contributions and investments are tailored to individual needs. These cost considerations support the notion that the collective buffers should remain positive and be small (say up to 20%) compared to the personalized accounts.

#### *PPR-CB versus DB and DC*

Compared to Dutch DB contracts, the reformed PPR-CB contracts increase transparency and reduce conflicts of interests across participants. Moreover, they raise the scope for tailoring (dis)saving, financial risks, and insurance to individual needs. Compared to the Dutch DC, the collective buffers add intergenerational risk-sharing and thus support mandatory participation. At the same time, however, these buffers introduce discontinuity risk. Moreover, they introduce conflicts of interest and reduce transparency— for example, in pricing personalized savings, investment and insurance decisions. Indeed, pricing individual decisions becomes more complicated in the presence of buffers.

#### *Impacts on pensions in payment...*

The Dutch SCP (The Netherlands Institute for Social Research) has repeatedly argued that participants are concerned mainly about the adequacy and risks of pension incomes rather than about the more technical arguments about transparency, governance and tailoring to individual characteristics and preferences. As regards the level of pensions, pension payments have typically not been compensated for inflation since 2008. Many funds even cut pensions in payment in nominal terms in 2013. In the current macroeconomic environment with low nominal interest rates

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<sup>22</sup> Agents that enter the system after older generations have replenished the buffer at the equilibrium level experience a gain in welfare of about 4 % of supplementary pension income.

in the EMU, the Dutch solvency rules for computing funding rates on the basis of risk-free rates imply that many DB funds are probably not able to raise nominal pension rights in line with prices and wages in the years to come. Another reason for this negative outlook for pension payments is that these solvency requirements compel pension funds to accumulate buffers in addition to full nominal funding. These additional reserves are required to buffer investment risks.

An important argument in favor of reform is that the PPR is likely to raise pensions in payment<sup>23</sup> and projected pension incomes for current workers. The reason is that a PPR allows more flexibility than DB contracts in the choice of the speed with which pension capital is paid out. In contrast to the situation in a DB system, adjustment of the AIR in the PPR does not lead to redistribution of resources across generations<sup>24</sup> and thus does not result in intergenerational conflicts; in a PPR, the AIR determines only the speed with which personal accounts are depleted during the payout phase. Whereas DB contracts employ risk-free interest rates to compute solvency, the PPR allows the use of a risk premium in the computation of the AIR<sup>25</sup>. This results in more dissaving and thus larger pension benefits in the short run<sup>26</sup>. Another reason that the PPR and PPR-CB will be more attractive for current participants compared to the DB contract is that no (or at least smaller) buffers must be accrued. Also this results in smaller saving rates in PPR, compared to DB contracts.

#### *...and income risk*

According to the SCP, the second main concern for participants is the level of certainty in pension income. Current DB benefits in the Netherlands are uncertain, as evidenced by the cuts in nominal pension payments in 2013. Introduction of the PPR can be attractive for participants because risk levels can be tailored to individual circumstances. In fact, older participants can opt for guaranteed income. Guaranteed income at higher ages is much less expensive than long-term guarantees. It thus is more attractive than guaranteeing pension payments at younger ages.

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<sup>23</sup> A 1% higher AIR will approximately generate a 5% higher income for a 75 year-old with a remaining life expectancy of 10 and therefore a duration of 5.

<sup>24</sup> The reason is that individual property rights in PPR contracts are defined in capital, while property rights in DB contracts are defined in annuity entitlements. Hence, if the AIR is adjusted, the market values of individual rights do not change in a PPR. This is in contrast to the value of annuity entitlements in a DB system.

<sup>25</sup> If one aims at a stable real pension, however, one should take into account future cost-of-living adjustments. This may result in lower dissaving rates. Unlike the case of DB funds in the US (see Lucas and Zeldes (2009), Rauh and Novy-Marx (2011) and Novy-Marx (2015)), the AIR is likely to be capped using the 35% exposure cap that was implemented for Dutch DC contracts; see Section 4. At current interest rates, this implies a cap on the AIR of about 3% in nominal terms.

<sup>26</sup> If constant expected real pensions are targeted, the risk premium must exceed the expected inflation in order for the short-run benefits to increase in the PPR system compared to the current DB design.

### *Concerns about PPR-CB*

Whereas many political parties and several large pension funds support PPR-CB, others (including the labor unions) still have their doubts. They have five main concerns.

#### ***Summary of main concerns about the new design***

- *Capital frame of entitlement confuses elderly*
- *Capital frame not helpful in completing markets through mandatory intergenerational risk-sharing and intragenerational risk pooling*
- *Behavioral and agency issues in more individualized pension systems*
- *Heterogeneity in pension funds complicates transition*
- *Transition: how not only to remove the PAYG element in uniform contribution and accrual rates but also to convert deferred annuities to capital?*

#### *Concern #1: Income frame in communication*

First of all, one fears that reporting pension capital in the decumulation phase would trigger a feeling of insecurity amongst older participants who would see their capital being depleted. To address this concern, one could focus communication with retired participants on lifelong income rather than on capital – even though individual property rights are defined in terms of capital rather than annuity entitlements. For younger workers, in contrast, one may prefer focusing more on capital.

#### *Concern #2: Risk-sharing and pooling based on mandatory participation*

The second main concern is that the PPR-CB would feature less intergenerational risk-sharing and shift more risks to the individual. Mandatory participation in insurance pools would become more difficult to maintain in a design based on a more individualized capital frame with individual accounts. Completion of financial and insurance markets by sharing risks with future generations and pooling risks would thus be under threat. One could argue, however, that mandatory pooling is still needed and implemented in the new contract to avoid selection in insurance. Indeed, intragenerational risk-sharing (e.g. of micro longevity risk) is very similar to that in the current contract. Moreover, collective buffers enabling intergenerational risk-sharing still provide an argument for mandatory participation. The same holds true for behavioral and agency issues requiring collective governance. The contract design is not yet very explicit on how to deal with systematic longevity risk. This can be addressed by including separate long-term contracts trading systematic longevity risks between generations in their personal accounts. Also these illiquid contracts would require mandatory participation.

#### *Concern #3: Collective governance: behavioral and agency issues*

A third problematic issue involves the concern that individuals would face complicated decisions in PPR-CB and be left to fend for themselves in retail markets, thereby raising transaction and marketing costs. The framing of “personal pensions” has probably led to these fears, even though PPR-CB retains the traditional collective governance with trustees. Indeed, the labor unions have repeatedly stressed that collective governance should be retained.

#### *Concern #4: Heterogeneity in pension funds complicates transition.*

Dutch pension funds differ substantially in age composition, in generosity of the benefits, and in investment strategies. This obscures a clear view of the impact of the new contract for individual funds. The labor unions currently (July 2017) insist on additional computations in order to clarify the implications of the new contract for individual funds to ensure support of their members for the

reform. Many pension funds are currently analyzing the feasibility of the new contracts (Pensioenfederatie (2016)).

*Concern #5: Transition issues: remove the PAYG element in uniform contribution and accrual rates .....*

Last but not least, two transition issues must be addressed. First, the transition for the uniform accrual and contribution system to an actuarially neutral system with an age-independent contribution level implies that the transitional generations must pay off the implicit debt associated with the pay-as-you-go elements in the current DB system. Moreover, the transition from a contribution level that rises with age in the current DC system to an age-independent contribution level implies that pension savings must temporarily be increased. Indeed, older workers still need the back-loading of the old system in order to accumulate adequate pension capital. At the same time, younger generations must save more in the presence of more front-loading.

*...and convert deferred annuities in capital*

Another transition involves the transition from a DB system based on individual entitlements in terms of deferred annuities to a DC system based on individual property rights in terms of capital. A first option is a gradual transition: close the existing DB contract for new accrual but continue to run it alongside the new DC vehicle for new accruals. A second option is a fast transition: transfer existing annuity entitlements to individual property rights in terms of capital in personal accounts. In effect, this amounts to a value transfer from the DB to the DC system, which requires valuing present annuity entitlements in the DB system and allocating funding imbalances to individual participants. This is a complicated issue in view of the many option-like elements<sup>27</sup> in the current DB contracts. The value of these options depends on investment strategies and results in gaps between market and legal book values.

*Dual transition*

The generational distributional effects of the two transitions of moving to age-independent accruals in terms of capital and quickly transforming the existing DB rights into capital in personal accounts seem to largely offset each other (see SER (2016)). This is an argument in favor of a so-called dual transition in which both transitions are combined. The transition to age-independent accruals in terms of capital benefits young workers and future participants who no longer have to pay the implicit tax generated by the PAYG element in the current uniform contribution and accrual system. This transition hurts older workers who lose their implicit subsidies on contributions in the DB system. Converting existing DB rights into capital in personal accounts at least partially compensates the loss of implicit subsidies for older workers, for two reasons. First, no (PPR-VA) or smaller (PPR-CB) buffers are to be built up by these generations. Second, the possibility of using a higher AIR (due to a risk premium) in the PPR system compared to the lower risk-free interest rate as AIR in DB allows for more flexibility in the speed with which pension capital is paid out.

## *6. Potential lessons for other countries*

The main design questions for funded pension contracts are similar across countries. Dutch policy discussions have benefited from designs and experiences in other countries (see e.g. Ponds and Garcia Huitron (2016) and Bovenberg, Cox and Lundbergh (2016)). This section focusses on elements of the Dutch design that might be of interest for other countries.

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<sup>27</sup> One of the examples is the obligation to impose unconditional cuts if the funded rate in 2020 (2019 for some funds) has been below the level of 105% for five years in a row.

## Summary of potential lessons for other countries

1. Income frame
  - The Defined Ambition approach specifies the desirable properties of the income stream (level and stability) and derives the adequate contribution, drawdown, insurance and investment strategies from these goals for retirement income.
  - An income-oriented frame for communication is easier to understand for participants and typically generates higher contribution rates.
  - The focus on pension income supports stable pension income by triggering the required hedging of fluctuations in future expected returns (e.g. interest rates).
2. Personal buffers and biometric returns in the decumulation phase
  - An income frame in communication and design of the draw-down strategy can be combined (see e.g. Brown et al. (2008)) with a capital frame for defining property rights in order to facilitate fair pricing of choices and avoid opaqueness
  - Flexibility in draw-down strategies (AIR) does not give rise to intergenerational conflicts of interest
  - Personal buffers (smoothing) can be used to reconcile stable retirement income with substantive risk taking in the decumulation phase. Life cycle investments can be used to compensate the reduction in absorption capacity if the individual ages during the decumulation phase.
  - Biometric returns can be used to frame insurance elements (e.g. with respect to longevity risks in late life)
3. Unbundling
  - Unbundling and pricing the various functions of pension products allows one to combine innovatively the strengths of both the DB design (income frame, risk management, insurance elements, defaults) and DC design (clear property rights, transparent link between contribution and accrual of entitlements, tailoring to characteristics, preferences and risk factors).
  - The unbundling facilitates also tailoring pension schemes to the specific features of particular countries. The helps Pan European Personal Pensions to respect the institutional setting of each particular European country in accordance with the subsidiarity principle.

### *Potential lesson #1: Income stream during retirement as the starting point*

A first important element of the Dutch designs that might be relevant elsewhere is that the income stream during retirement (in terms of median level and risk properties) is taken as the starting point for determining contributions, payouts, investment and insurance. This so-called Defined Ambition (DA) perspective (see e.g. van Bilsen and Bovenberg (2017) and Bovenberg and Nijman (2016)) typically leads to higher savings and insurance rates. As regards risk management, DA generalizes the liability-driven investment from guaranteed DB plans to personal accounts with stochastic benefits. Indeed, compared to guarantees in DB, DA offers more flexibility in risk-return trade-offs.

A PPR-VA of the Dutch DC type yields transparency about individual property rights and fair pricing. The capital frame on property rights facilitates choice. In particular, fair pricing allows trustees

and/or individual participants to flexibly decide on (dis)saving, investment and insurance choices on the basis of an income frame. Accordingly, the capital frame for entitlements and pricing is thus complementary with an income frame for structuring choices and communication.

#### *Potential lesson #2: Personal buffers and biometric returns*

The transparency of the capital frame can be combined with smoothing of investment risk during the payout phase. The PPR design with smoothing is relevant for countries that are looking for alternatives for guaranteed pension products (which have become rather unattractive in the current low interest environment), but still want to maintain stable, lifelong retirement incomes. The personalized buffers associated with the smoothing mechanism of investment risk contribute to the year-on-year stability of the income stream while participants at the same time benefit from the risk premium on financial investment risk as a result of lifecycle investment. Hedging changes in future returns (e.g. interest rate risk) also contributes to a better risk-return trade-off. If desired, collective buffers can add intergenerational risk-sharing.

Another factor contributing to adequate levels of retirement income with low risk is the pooling of idiosyncratic longevity risk in mandatory pools. Longevity insurance generates an additional biometric return, which is especially important at advanced age. Indeed, countries may want to stimulate various forms of longevity insurance for the eventuality that people become very old. Indeed, in policy discussions in many countries (including Australia, the US and the UK), deferred annuity solutions have been advocated. The PPR design includes pension products that become more of an insurance product at the end of the lifecycle but offers more flexibility<sup>28</sup>. Other insurances, such as health and care insurance, may supplement longevity insurance.

#### *Potential lesson #3: Unbundling*

The PPR design allows unbundling of the various functions of retirement products in order to reconcile transparency, fair pricing and adequate governance with flexibility to tailor (dis)saving, investment and insurance to heterogeneous income needs (see Bovenberg and Nijman (2016)). Each particular country, sector or firm can build an appropriate mix of collective and individual elements. Indeed, the PPR design allows one to combine the strengths of DB and DC. In this context, collective investing, collective governance, and uniform adjustments in pension payments entitlements should be carefully distinguished. Also various risk factors (equity risk, interest risk, inflation risk, micro and macro longevity risk) can be unbundled. One can, for example, choose exposure to equity risk, and at the same time hedge interest rate risk and micro longevity risk. Separate contracts can share macro longevity risk between generations. The PPR concept can also be adapted to settings in which stable income streams are required only for a limited number of periods or in which guaranteed lifetime income streams are to be provided after a particular age.

The flexibility of the PPR concept makes it particularly relevant in the context of Pan European Pension Plans (PEPPs) proposed in the European Union (see European Union (2017)). European countries differ substantially in how they organize the decumulation of pension capital. PPR shows how PEPPs can be designed flexibly to tailor to various traditions, including, for example, integrating accumulation and decumulation phases. The current PEPPs proposals still largely ignore this aspect and focus on the accumulation stage.

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<sup>28</sup> In order to limit selection effects, long-term insurance contracts must be committed to at advanced ages. Early in retirement, however, more flexible insurance contracts are feasible. This provides the possibility to adapt to changes in circumstances and preferences.

## 6. Conclusions

Discussions on reforming Dutch occupational pensions have been going on for some time now. In 2015, the Socio Economic Council (SER) issued an advisory report referring to personal pensions with collective risk-sharing as an interesting option. Over the last two years, SER and others have developed the concept in more detail. A number of political parties and pension funds now support it. Also Dutch DC pensions have been redesigned to allow for risk taking during the pay-out phase.

At the time of writing, the Socio Economic Council has not yet come to a final recommendation— but the direction for the future seems to be clear. The political parties that are negotiating to form a new government advocate some form of personal pension as an alternative for the DB funds. Hence, PPR-CB contracts are likely to be introduced. A PPR design that unbundles various functions of retirement products might also have attractive features for other countries. These features include an income frame, personal buffers, and the biometric-return frame to add longevity insurance for the end of life. Unbundling the various functions of retirement products in the PPR design allows for flexibility of countries, social partners and individuals to select their own combinations of building blocks of a retirement product – depending on their own institutions, preferences and circumstances. It can thus provide unity within the diversity in Europe.

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