

*Lans Bovenberg and Raymond Gradus*  
**Reforming Dutch Occupational Pension  
Schemes**

# Reforming Dutch occupational pension schemes

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## Abstract

Dutch occupational defined-benefit plans suffer from a number of serious weaknesses, including ambiguous ownership of the surplus, back-loading of benefits, and lack of tailor-made risk management. To address these weaknesses, we propose collective individual defined-contribution plans that are actuarially fair. These schemes maintain important strengths of collective schemes, such as mandatory saving, collective procurement and pooling biometric risks. At the same time, they eliminate intergenerational conflicts about risk management and distribution through transparent individual property rights and tailor-made risk profiles. We show how the transitional burden due to the phasing out the back-loading of pension benefits can be addressed without a substantial increase in contributions.

## Introduction

The Dutch pension system consists of three pillars (see also Bovenberg and Gradus (2008)). The first pillar is the AOW, which is the basic minimum public pension provided by the government to all residents. It provides a flat-rate pension benefit, which is related to the net minimum wage. As a direct consequence, poverty under elderly is very low in the Netherlands. The second pillar involves occupational pension schemes, which are part of collective labor agreements. The first and second pillars currently account for similar shares in the average incomes of retirees (see Knoef et al. (2013)). The third pillar comprises individual pension provisions, the premiums of which are deductible for income taxation. The third pillar is relatively small in the Netherlands. It provides only 5% of the retirement income

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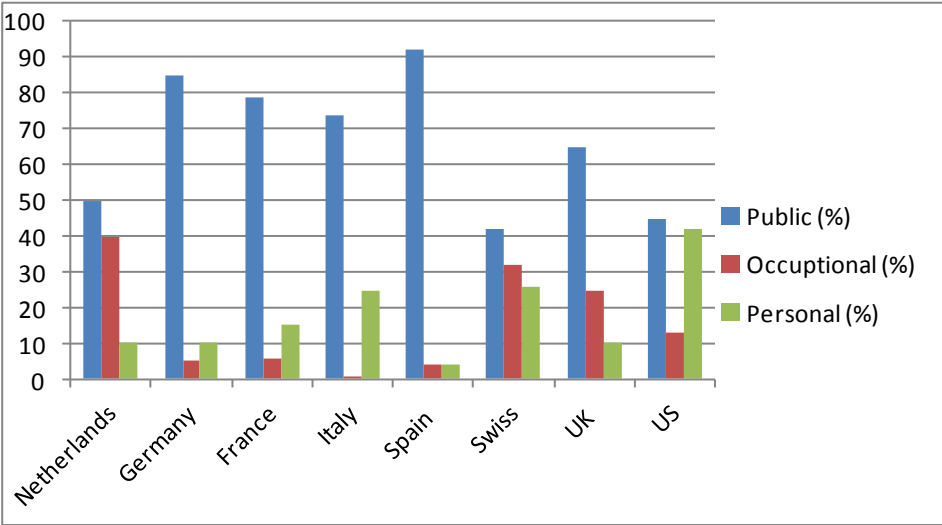
provided by the second pillar. In 2012, parliament passed a law that raises the age at which people becomes eligible for the public pension. Starting in 2013, this age is gradually increased so that the retirement age for state pensions will be 67 in 2021. After that, the retirement age is linked to life expectancy. This reform ensures the financial sustainability of public pensions. However, the Dutch second pillar still suffers from a number of serious weaknesses, including ambiguous ownership of the surplus, back-loading of benefits, and lack of tailor-made risk management. This paper therefore contains a proposal for reforming occupational pensions. Our discussion may be of interest also to other countries who are transforming their DB-plans into DC-plans. Our proposal also eliminates the implicit pay-as-you-go elements in the second pillar and thus creates the familiar transitional problem associated with a move from pay-as-you-go financing to funding (see also Sinn (2000)). Our proposals address this issue head on by grandfathering some of the implicit pension rights in the old system in order to protect the transitional generations.

The paper is structured as follows. The first section describes the pension landscape in Europe and USA. The second section outlines the Dutch occupational pension system. The third section explains why the Dutch occupational pension system is in trouble. The fourth section contains our proposal for collective individual defined-contribution proposal and the fifth section presents the transitional arrangements. Finally, section six concludes.

## **1. The pension landscape in Europe and USA**

Most pension systems around the world consist of three pillars. However, the relative magnitudes of these three pillars differ considerably between countries. In Southern Europe and Germany the first pillar, a pay-as-you-go public pension scheme is large (see also figure 1). These countries face a challenge of fiscal sustainability in an ageing society.

**Figure 1. Sources of retirement income - the size of three pillars**



Source: Börsch-Supan (2004)

The 2009 Sustainability Report of the European Union projects that total age-related public spending for the EU-27 will increase by 4.6 percent points over the period 2010–60 (see European Commission (2009, p. 29)). Public pensions account for an increase of 2.3 percentage points. EU-wide averages hide substantial divergence among countries. Spain will face an increase of 6.2 percentage points of public pensions due to aging, and the Netherlands 4 percentage points.<sup>2</sup> Interestingly, the projection for Italy indicates that the public expenditure share of pensions decreases between 2010 and 2060, but it is doubtful whether this decrease in spending is politically sustainable.

Some countries address the ageing of the population with a mixture of capital-funded and PAY-systems. For example, in the Netherlands, Switzerland and US public pensions account for half or less of the income of retirees. In the Netherlands and in Switzerland occupational pension schemes have a large weight while in the US, individual plans are more important. However, the experience in US shows that individual schemes suffer from weaknesses on account of behavioral biases and the associated agency issues. Many people are myopic and therefore do not save enough for retirement (Benartzi and Thaler, 1995). Moreover, marketing and other transaction costs may be substantial (Bikker and de Dreu, 2009). Therefore, Bovenberg et al. (2014) argue that there is a strong case for exploring defined-ambition plans in the US in which firms act as a distributional platform for pensions,

<sup>2</sup> Current figures should take into account that the pension age in the Netherlands as in other countries has been raised.

thereby addressing behavioral biases as well as imperfections of financial and insurance markets.

Indeed, occupational schemes have their strengths in addressing market imperfections and behavioral biases, but they suffer some weaknesses especially if they are organized as defined-benefit plans provided by pension funds as mutual insurers (see also Bovenberg et al (2014)). In particular, an intergenerational conflict may emerge about not only the ownership of capital in the fund but also the investment profile. These potential intergenerational conflicts are especially serious in the Netherlands due to the large stocks of wealth that have been accumulated. We will therefore focus on Dutch occupational pension plans and the need for reform. Our discussion may be of interest also to other countries who are transforming their DB-plans into DC-plans.

## **2. Dutch occupational pension schemes**

Dutch Occupational pension schemes supplement the flat public benefit for those workers who earn more than the minimum wage. These schemes are earnings-related, and cover about 90% of the labor force. In general, people who are self-employed are typically not participating in occupational schemes and can voluntarily pay for third-pillar arrangements. Participation of employees in occupational schemes is part of the labor contract, which is typically negotiated between unions and employers in collective agreements. The occupational schemes are funded and the value of assets in these schemes amounted to about 160% of GDP in 2012.<sup>3</sup> Industry-wide pension funds apply to workers in a specific sector of the economy. Most of these industry-wide funds started after World War II. At that time, benefits were back loaded in order to benefit older workers so that these workers could still accumulate substantial pension benefits (see also Chen and Beetsma (2013)). In particular, both pension accrual rates (i.e. the income stream in retirement as a share of current wages) and the contribution rates are uniform across age groups even though the contribution rates of younger workers stay in the fund for a long time and this yield more capital returns. Hence, the contributions of younger workers subsidize the pension accrual of older workers.

Sectoral funds own more than two-thirds of the assets in the second pillar and account for more than 80% of the active participants who contribute to occupational schemes. The occupational plans are run like defined-benefits plans, which aim at a certain annuity level

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<sup>3</sup> Compared to GDP, the pension assets for other countries of figure 1 are substantially lower in 2012, namely UK has 112% GDP, Switzerland 108% GDP, US 108% GDP, Germany 15% GDP and France 7% GDP. For Italy and Spain no information is available (see [www.towerswatson.nl](http://www.towerswatson.nl)).

during retirement. Years of service and a reference wage typically determine the benefit entitlement. The reference wage used to be the final wage, but in the beginning of this century most funds moved to the career-average wage as a reference. In these schemes, entitlements to deferred annuities accrue based on a percentage of the average wage level during a career. This accrual rate is fund specific, although they should meet certain tax restrictions. In 2013, these schemes typically aimed at an annuity level of about 80% of average pay (including the flat public benefit) after 40 years of service. This corresponds to an accrual rate of about 2% per year. The current government intends to cut the maximum annual accrual rate from 2.25% towards 1.875% in order to reduce tax expenditures.

The contribution rate is a fraction of the contribution base, which is obtained by deducting the franchise<sup>4</sup> from gross (labor) income. In 2012, the average contribution rate amounted to about 17.5%, of which on average 6.2% point is paid by employees and 11.3% point by employers. In addition, contributions are levied for Early Retirement Schemes (VUT), which is financed on a pay-as-you-go basis. These schemes were introduced in the early 1980s as a means of fighting youth unemployment. In view of the increasing costs of retirement schemes on account of the ageing workforce, some reforms were implemented during the last decade (see also Bovenberg and Gradus (2008)). In particular, tax benefits for early retirement schemes and VUT schemes were eliminated. Moreover, during the phase-out period, which will end in 2016, these schemes continue to be eligible for tax benefits only if workers are rewarded for retiring later by receiving a more actuarially fair higher pension benefit. These reforms by the cabinet Balkenende II have raised the labor participation rate of the elderly substantially. The participation rate for the group between 55 and 64 years age rose from only 27% in 1996 to 57% in 2012.

### **3. The Dutch occupational pension scheme under stress**

Despite the reforms that were implemented during the previous decade, especially, Dutch occupational plans still suffer from a number of shortcomings, which have been documented in Bovenberg and Nijman (2009)<sup>5</sup>:

- Incomplete contracts and ambiguous ownership of surplus
- Back-loading of pension benefits

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<sup>4</sup> The franchise is the level of income over which no pension rights are accrued. In 2012, the (legal) franchise was almost 14,000 Euros. Some pension funds have lower franchises.

<sup>5</sup> Governance problems will not be discussed in this article.

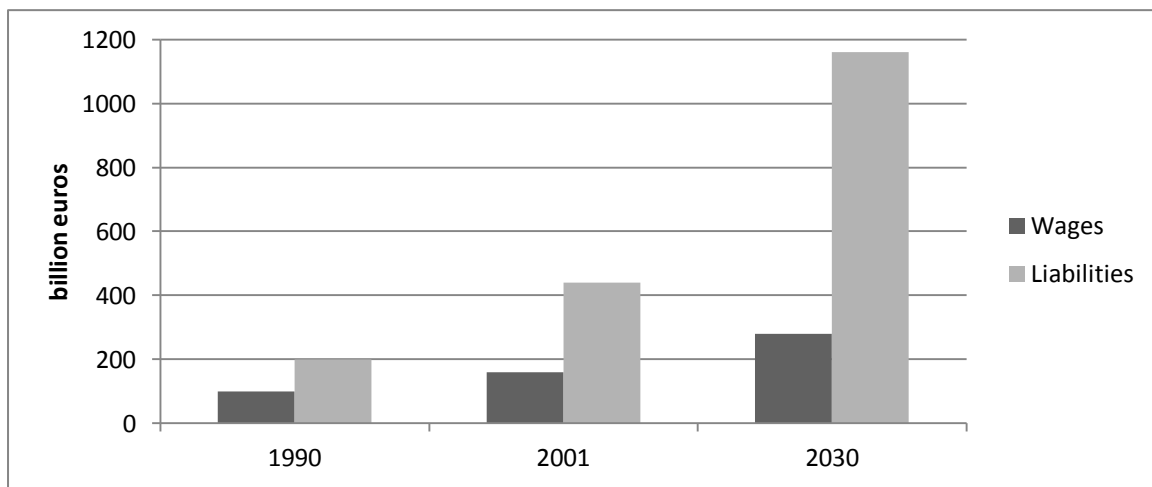
- No tailor-made risk management

Each of these shortcomings will be discussed in turn in view of recent developments and discussions.

*Incomplete contracts and ambiguous ownership of surplus*

Aging of the members of the pension funds has expanded the obligations of the funds compared to the premium base, which can be measured by wages (see Figure 2).

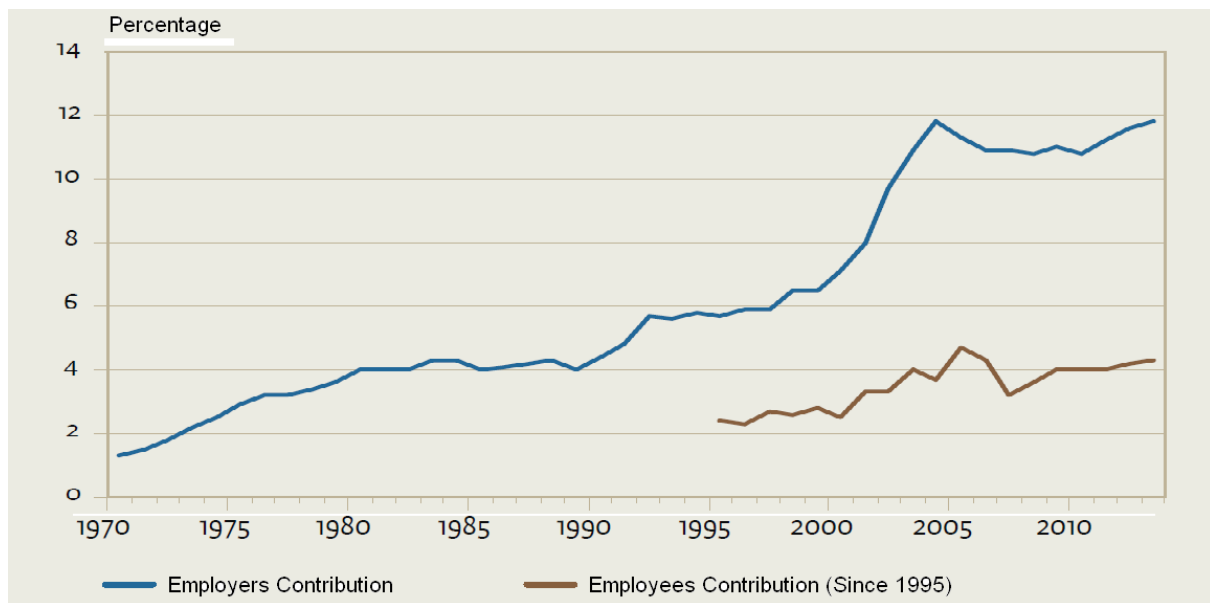
**Figure 2. Liabilities and premium base of Dutch pension funds, 1990-2030.**



**Source: Bovenberg and Gradus (2008, Fig. 4)**

This implies that unanticipated shocks in financial markets and longevity require large changes in pension contributions in order to shield pension rights in DB-plans from these shocks. At the same time, contributions have increased substantially in this century, in part due to low interest rates (see Figure 3). Contributions have reached levels that make further increases quite problematic.

**Figure 3. Contribution rate, 1970-2013**



**Source: Lever (2013)**

Due to ageing and low interest rates, guaranteed pension obligations in defined-benefit plans have become more expensive and cause more volatility in pension contributions. In fact, for many companies the financial and actuarial risks associated with their pension plans start to dominate the risks associated with the core business. Moreover, new accounting rules require to disclose the pension risks on their balance sheets, thereby enhancing transparency. As a direct consequence of these developments, many companies are moving away from defined-benefit schemes to so-called collective defined-contribution (CDC) schemes in which firms provide a fixed contribution rate and is no longer liable for funding shortfalls in the fund. Also sectoral plans are shifting away from DB to CDC as contributions levels are fixed.<sup>6</sup>

With risks being shifted more to pension participants in CDC plans, the rules for allocating funding shortfalls to participants are typically incomplete and often modified as the Dutch experience shows. The identity of the ultimate risk bearer and the associated owner of the surplus in the fund are thus ambiguous. The ambiguity of ownership and risk-sharing arrangements give rise to intergenerational conflict. This leads to political risk and an erosion of trust in the system. In the aftermath of the Euro-crisis in 2012, many funds had to cut pension in payments.<sup>7</sup> This surprised many retirees who thought their pension payments could

<sup>6</sup> Also the rule that all pension schemes should have the same accrual rate for all age is important in this respect. Therefore, DC plans using a more actuarial fair pension scheme should use age-dependent contribution rates, which weaken their labor market position.

<sup>7</sup> In 2013, 68 pension funds (out of total of 415) were required to cut nominal pension rights. More than 5 million members were confronted with these cuts.



not be cut. Incomplete contracts also complicate the valuation of pension rights and therefore lead to conflicts about the contributions that should be paid for new accruals. Moreover, the associated lack of portability of actual pension rights becomes a problem in a flexible labor market.

### *Back-loading of pension benefits*

By law, occupational DB and CDC sectoral pension schemes are back-loaded due to uniform pension accrual rates and uniform contribution rates, which do not depend on age.

Accordingly, workers accumulate most of their pension value at the end of their working career. As younger workers subsidize the pension accrual of older workers, occupational pension schemes incorporate a pay-as-you-go element. Back-loading of pension benefits results in all kinds of distortions and inequities (see also CPB (2013)). In particular, it is unattractive for older workers to become self-employed and thus leave the scheme. More generally, it inhibits the portability of pension rights if people engage in various transitions in the labor market. Also in other countries, the lack of portability has been emphasized as a major drawback of DB schemes (see, e.g., Munnell and Sunden (2006)). Back-loading thus seems increasingly inappropriate in a flexible transitional labor market in which people and firms experience substantial idiosyncratic shocks in part due to a dynamic, competitive world economy.

In addition, back-loading of pension benefits makes the pension system less robust: the pension scheme faces a larger discontinuity risk (see also Bovenberg and Nijman (2009)). Indeed, the implicit pay-as-you-go (PAYG) financing caused by back-loading of the financing of benefits, makes the pension scheme less well funded (and thus more vulnerable to political risks) than appears from the official funding rate.

### *No tailor-made risk management*

Collective DB and CDC plans typically assume that the characteristics and preferences of all participants in the scheme are similar. These schemes implement one-size-fits-all solutions without considering the heterogeneity in the pool of participants. Traditional DB plans thus leave little scope for tailoring the pension product to personal characteristics or preferences. This is especially problematic now that more and more risk is absorbed by the participants. CDC plans pursue the same uniform investment policy for all participants, even though older participants would typically make a more conservative trade-off between risks and return than younger participants. The lack of tailor-made risk management may be especially detrimental

to young workers in pension funds with on average more older members as the pension fund probably pursues a too conservative investment portfolio from the point of view these workers.

#### *Are individual DC plans an alternative?*

All over the world, corporations are withdrawing from their role as risk sponsor of DB plans and thus shift risk to households. As a result, in many countries, individuals have to resort to individual DC plans.<sup>8</sup> In these plans, individuals themselves are responsible for complex financial planning decisions, like how much to save for retirement, how to invest their savings in the capital market and benefit optimally from risk premia without running excessive risks, and how to insure individual longevity risk by converting pension capital into an income stream during retirement. Individual DC plans, however, typically suffer from the following important weaknesses: inadequate individual decision making, agency problems, lack of buying power of households, inadequate risk management, high expenses and selection in annuity markets (see also Bovenberg and Nijman (2009, pp. 450-451)).<sup>9</sup>

#### **4. Towards collective individual defined-contribution plans**

Collective Individual Defined Contribution (CIDC) plans offer an appealing third way between the individual DC plans and the occupational DB plans being transformed in CDC plans. As the second pillar of the Dutch pension system, sectoral occupational pension schemes should be evolving in the direction of collective individual DC (CIDC-) funds. This section describes these CIDC-funds and the next section discusses a transition path towards such a system.

#### *Individual property rights and complete contracts*

Dutch sectoral funds are stand alone in the sense that they lack a risk-absorbing sponsor. Pension funds face a hard budget constraint so that the members of these cooperative schemes become the explicit risk bearers: they have to either share risks among themselves or shift risks to others by trading financial instruments on capital markets or by contracting with insurance companies. An important advantage of CIDC schemes compared to traditional occupational DB plans is that the ownership of the assets lies unambiguously with the

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<sup>8</sup> In a individual DC scheme each participant has his own pension account and does not share any of his individual risks with the other participants

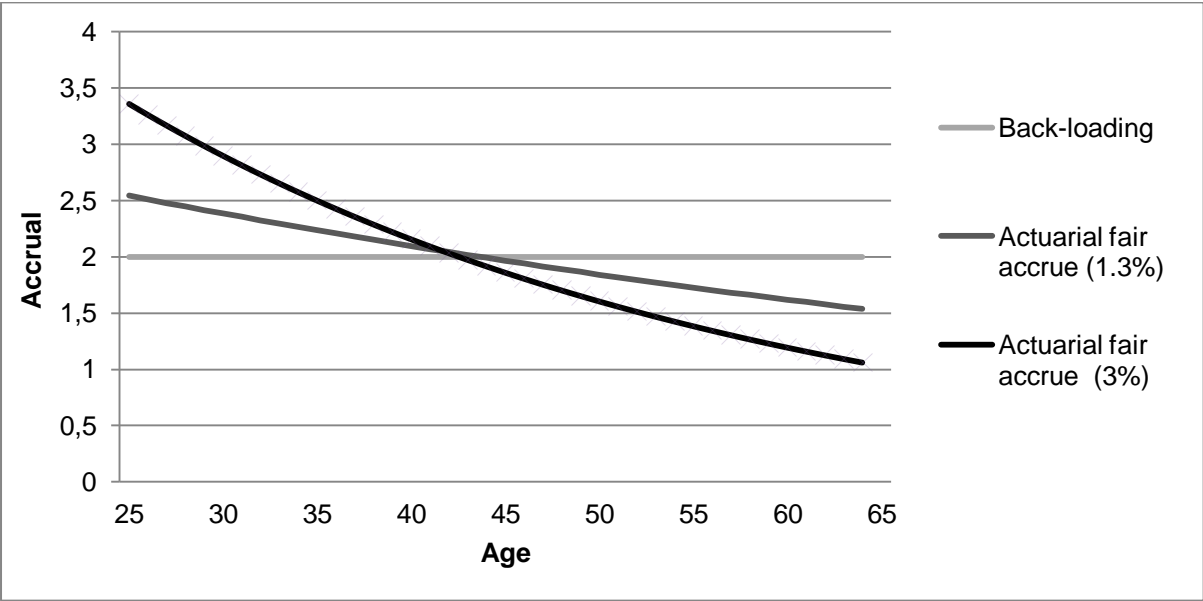
<sup>9</sup> Therefore, in the United States, under the a 401(k) plan, retirement savings contributions are provided and matched by an employer. Importantly, there is no collective sharing of biometric risks.

members of the pension fund through individual accounts. Individual property rights are thus clear. Companies do not have a claim on possible surpluses in a collective fund. They are thus not tempted to increase the risk profile of their pension fund in order to maximize the return on the company's equity at the expense of the members' fiduciary interest.

*Accrual actuarially fair: eliminate back loading of pension benefits*

As part of the CIDC schemes, we propose to continue to levy the same uniform pension contribution for all participants, but to make pension accruals actuarially fair.<sup>10</sup> Figure 4 illustrates this.

**Figure 4. Back-loading and accrual fair pension rights (% of average pay)**



The straight line illustrates back-loading as the accrual rate is age-independent. If accrual rates are actuarially fair in the sense that the additional pension rights correspond to the contribution rate, the accrual rates depend on the discount rate (i.e. the rate of interest minus the growth of pension income and the population of the fund). Figure 3 presents the actuarial fair accrual rates for each age with a discount rate of either 1.3% or 3%. With a discount rate of 3%, the accrual rate of an employee of age 25 is more than three times as large as the accrual rate of an employee of age 64.

<sup>10</sup> Another possibility is that the contribution will be actuarially fair and therefore depends on age. In such a case elderly pay a higher contribution rate than younger do, but their accrual is age-independent. However, such a proposal is not advisable as it weakens the labor market position of elderly (see also footnote 4).

Addressing the back-loading of Dutch DB-plans is complicated by the fact that it creates the familiar transitional burden of moving from PAYG to funding (see Sinn (2000) and Bovenberg and Nijman (2008)). In the next section we give a proposal to deal with this transitional burden.

#### *Advanced risk management*

Currently, the Dutch occupational pension plans aim at achieving the ambition of an appropriate income level during retirement. In particular, the pension fund manages interest-rate and inflation risks so as to realize its ambition to index income streams during retirement to inflation. Hence, the main risks (e.g. investment risk, inflation risk, interest-rate risk and longevity risk) are managed so that risks can be hedged on behalf of households and risk premia on various risk factors can be exploited. This in order to optimize the trade-off between return and risk.

In a CIDC system, life-cycle risk management can be better tailored to the needs of the various generations. In particular, individual accounts of younger workers can pursue more risky investment strategies with less interest-rate hedging compared to older participants. An important technique for managing the various risks optimally is so-called asset-liability management (ALM) (see also Bovenberg and Nijman (2009)). Based on stochastic simulations of the various risk factors, ALM studies simulate the probability distributions of pension income and contribution rates under alternative policy scenarios in terms of asset mix, contribution policy and indexation rules. The contribution and investment strategies are then optimized on the basis of these ALM techniques.

#### *Low expenses, substantial buying power and reduced selection*

Cooperative pension funds with compulsory participation of members and firms keep marketing and other transaction costs low. In particular, competition occurs on a wholesale level rather than a retail level. This tends to reduce transaction costs for individual members, who in general lack sufficient expertise to buy the various services that make up the pension product.<sup>11</sup> Moreover, joining forces in a cooperative pension fund strengthens the buying power of individuals, exploits scale economies in buying complex financial products that are not available to individual investors, and helps to discipline commercial financial service providers to act in the interests of the members of the pension fund. Another advantage of

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<sup>11</sup> In the Netherlands there was also an initiative by the youth organizations of D66, PvdA and VVD where they propose that individual members choose their own pension fund. However, as adverse selection may take place funds with higher pension costs should be compensated comparable to the Dutch health care system (see also Van Asselt et al. (2011)).

forced risk pooling in a sectoral pension fund is that it reduces selection in longevity insurance.

Table 1 compares the four possible pensions systems on the basis of a number of important characteristics.

**Table 1. Different systems and some of their characteristics**

	<i>DB</i>	<i>CDC</i>	<i>IDC</i>	<i>CIDC</i>
Accrual actuarially fair	No	No/Yes	Yes	Yes
Clear individual property rights	No	No	Yes	Yes
Tailor-made intergenerational risk management	No	No	Yes	Yes
Scope for individual choice	No	No	Yes	Yes
Mandatory saving	Yes	Yes	No	Yes
Collective procurement	Yes	Yes	No	Yes
Collective sharing biometric risks	Yes	Yes	No	Yes

Table 1 shows that a CIDC-system combines the best of collective and individual schemes. On the one hand, CIDC maintains important strengths from collective schemes, such as mandatory saving, collective procurement and collective sharing of biometric risks. On the other hand, CIDC also adds important individual elements, such as a clear link between paid premium and value of additional pension rights (i.e. actuarial neutrality), safe and transparent individual property rights, tailor-made risk management and scope for individual choice in terms of risks, contributions and pay outs. The individual property rights make tailor-made risk management possible, prevent intergenerational conflicts about how collective assets should be invested and how the pay-out policy of the fund affects the distribution of economic value across generations.

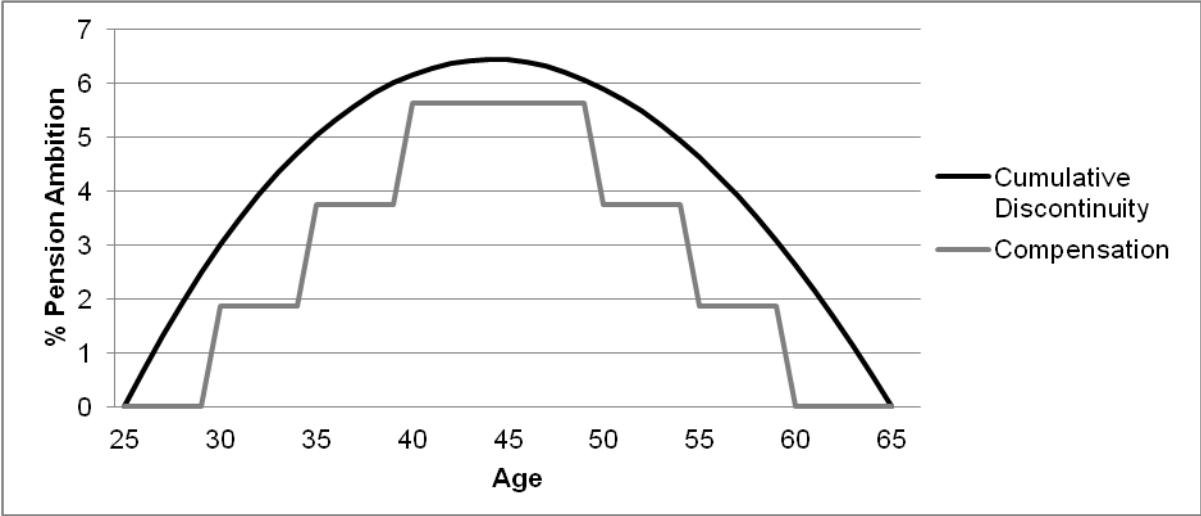
**5. A transition path**

The transition to a system without back-loaded benefits can be problematic. In particular, the workers that are around 45 years old when the transition starts, has not been able to anticipate the elimination of subsidies from young to old. Essentially these workers have paid these subsidies in the past, but will not receive these subsidies when they would be on the receiving end if the system of back-loading pension benefits would have been continued. Accordingly, a strong case can be made for extensive grandfathering of those who are currently around 45 years old. Indeed, grandfathering implies that younger generations have to pay not only for the accumulation of their benefits but also for some newly accrued benefits of older workers.

To enhance confidence and trust the governments should announce as early as possible a credible and fair transition path, which should be carried out by the funds.

Figure 4, which are based on a discount rate of 1.3 %, shows by the bold curve the transition burden in terms of the retirement income of various generations in case of a sudden move to actuarially neutral pension accruals at the same contribution levels. So, an employee at age of 45 years old would face a discontinuity of almost 7% of his pension ambition<sup>12</sup>

**Figure 4. Cumulative discontinuity and compensation as % of pension ambition with a discount rate of 1.3%**



Source: WI CDA (2014)

The compensation policy should focus on the middle-age group as this group carries the largest burden. A possible compensation scheme is given in Table 2.

**Table 2. Possible compensation directive by a discount rate of 1.3%**

Age	Years of compensation	Yearly extra accrual rate	Extra accrual rate as % of average pay
31-35	20	0,075	1,5
36-40	20	0,15	3
41-45	20	0,225	4,5
46-50	15	0,3	4,5
51-55	10	0,3	3
56-60	5	0,3	1,5

<sup>12</sup> In this figure, it is assumed that an employee will build up yearly 2% of average wage earnings, so normally speaking his ambition is 80% of average wage.

This scheme in table 2 is based on a transition period of twenty years. Workers aged between 30 and 34 years old and between 55 and 59 years collect additional pension accruals of 1.5 % of the average wage. This scheme succeeds in compensating two third of the transitional burden (see Figure 4). The additional costs of this compensation scheme amount to 9.5% of aggregate contributions in the first five years, 8% between five and ten years, 6% after ten years and 3.5% after fifteen years.

The introduction of a CIDC system will yield some gains as well. Currently, administrative and investment costs per participants differs widely across pension funds. The investment costs are 5.7 billion euro per year, which equals 0.53% of the Dutch pension assets or 23.6% of annual premium contribution (see LCP (2013)). Investment costs vary substantially between funds. There is little evidence that higher costs cause higher yields or lower risk. If funds would be able to cut investment costs on the average by 0.13% of their assets, 1.3 billion euro would be saved each year. The average annual administrative costs for Dutch pension funds are 155 euro per participant but many smaller funds feature higher administrative costs (see Bikker and den Breu (2009)). The average administrative costs among big and medium-sized pension funds are only 125 euro per participant. Exploiting economies of scale could save an additional estimated 100 million on an annual basis. Moreover the pension regulation for Dutch DB schemes is extensive and therefore expensive for both regulators and pension funds. DC schemes are less complex so that regulation can be simplified. It is expected that 25 euro per participant can be saved annual, due to lower compliance costs (Bikker en de Dreu, 2009). This would save an estimated 400 million annual. Altogether, an estimated 1.8 billion euro (i.e. 6.5% of the annual pension contribution) can be saved yearly by redesigning the pension landscape.

In addition, marking parts all pension contribution to market value yields long-run gains as well. Indeed, the present value of the transition burden associated with the elimination of back loading equals the present value of the long-run gains. With a discount rate of 1.3%, pension contribution can be lowered between 2 and 3%. Hence, even during the first five years of the transition, the cost increase on account of the transitional burden (9.5 % of contribution base) can be approximately compensated by lower investment and administrative costs (6.5 % of the annual contribution base) and the cost cut as a result of eliminating back-loading (2-3 % of the annual contribution base). After five years, the pension contribution starts to fall.

However, as is shown in CPB (2013, p. 15), the gains for future generations strongly depends on the discount rate. If for example a discount rate of 2% is taken, pension

contribution can be lowered between 7 and 8% (see CPB (2013)). Nevertheless, also the cumulative discontinuity of those around 45 years old will be higher and if a compensation directive of 1.5 times of the annual extra accrual rate in Table 2 is taken, the cost increase on account of the transitional burden will be 15 % of contribution base.<sup>13</sup> Also by this discount rate this increase in the first five years can be approximately compensated by lower investment and administrative costs (6.5 % of the annual contribution base) and the cost cut as a result of eliminating back-loading (7-8 % of the annual contribution base).

## **Conclusions**

The Dutch occupational DB pension scheme is in trouble because companies are withdrawing from their roles as risk sponsors, pension contracts are incomplete and unstable and benefits are back loaded. Collective DC schemes are not a good alternative because as in DB-plans individual property rights are not well defined and risks are not tailored to the needs of specific generations. This gives also rise to intergenerational conflicts about risk management and the distribution of economic value. Whereas individual DC schemes are better equipped to deal with a transitional labor market, more heterogeneous tastes and needs and the withdrawal of employers as risk sponsors, these schemes suffer from serious drawbacks as well. In particular, more evidence is accumulating around the world that individual households are not able to implement complex financial planning by themselves and therefore need help from pension funds to address the serious agency issues associated with financial planning, asset management and insurance. In view of the weaknesses of both collective and individual schemes, Dutch occupational schemes should evolve in the direction of CIDC pension schemes as an attractive third way between the occupational DB and CDC schemes on the one hand and individual pension plans on the other. Such a reform will give rise to a large transitional burden because back-loading of pension benefits is transformed into a more actuarially fair system in which individual contributions correspond to the value of additional pension rights. However, we show that this transition burden can be dealt without a substantial temporary increase in contributions, if the transition is accompanied by lower administrative and investment costs.

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<sup>13</sup> This case has been worked out in more details in Gradus and Vijverberg (2014).



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