



Evaluating the UK and Dutch defined-benefit pension policies using the holistic balance sheet framework[☆]



Zhiqiang Chen^{a,c}, Antoon Pelsser^{a,d,e}, Eduard Ponds^{b,c,d,*}

^a Maastricht University, Netherlands

^b Tilburg University, Netherlands

^c APG, Netherlands

^d Netspar, Netherlands

^e Kleynen Consultants, Netherlands

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ABSTRACT

This paper compares the UK and Dutch occupational defined-benefit pension policies using the holistic balance sheet (HBS) framework. The UK DB pension system differs from the Dutch one in terms of the steering tools and adjustment mechanisms. In addition to the sponsor guarantee, the UK system has the protection from the Pension Protection Fund (PPF) that guarantees DB pension schemes' funding shortfalls if the sponsors of the schemes are insolvent. The paper first introduces a multi-period model called value-based ALM to value the embedded options implied by both UK and Dutch pension policies and build the HBS. The HBS framework allows us to have a holistic view on the real and contingent assets and liabilities of a pension scheme and evaluate the impact of introducing a new policy for the stakeholders of the pension scheme. Then, we compare the results of a typical UK policy with a typical Dutch one. The comparison suggests the UK policy is better for participants but worse for the sponsor compared to the Dutch policy. The UK policy is more generous in indexation and participants do not have the burden to contribute to the funding recovery of the pension scheme. The PPF provides protection of the benefits up to a certain level if the sponsor is insolvent, thus, participants in a scheme with a UK pension policy are exposed to limited downside risk. On the other hand, the sponsor of the pension scheme with the UK policy shoulders a heavier burden to contribute to the recovery of the pension funding shortfalls than that of the pension scheme with the Dutch policy.

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1. Introduction

1.1. Research background

The second pillar pension plans in Europe vary considerably in size, pension promises, finance method, etc. The regulation and supervision of the pension funds also differ greatly. This diversity makes it difficult to compare plan designs and regulation burdens across countries fairly. To harmonise the framework of quantitative requirement for European pension funds, the European

Insurance and Occupational Pension Authority (EIOPA), the European pension regulator, introduced a “holistic balance sheet” approach.

Unlike the traditional balance sheet (TBS) that states only the real assets and liabilities, holistic balance sheet (HBS) also takes into account contingent assets and liabilities implied by pension policies. These contingent assets and liabilities are called embedded options, as their values depend on the market conditions, like derivatives. Therefore, the derivative asset pricing approach can be employed to value the embedded options. The HBS presents the values of both real and contingent assets and liabilities, providing a “holistic” view of the pension fund status.

The development of the quantitative framework using the HBS approach is still in its early phase. EIOPA (2013) recently published the preliminary results of the Quantitative Impact Study (QIS), which conducted the HBS studies for the defined-benefit (DB) pension funds across eight European countries. The results shed some

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* Corresponding author at: Tilburg University, Netherlands. Tel.: +31 0653787272.

E-mail address: eduard.ponds@apg.nl (E. Ponds).

light on the impact of different pension policies across the countries.

This paper builds the HBS for UK and Dutch pension policies, respectively. By presenting the contingent assets and liabilities alongside real assets and liabilities, we compare the impact of each policy on the stakeholders of the pension fund. The results demonstrate that the HBS framework does provide an appropriate quantitative method to compare pension policies with different features.

1.2. Features of UK pension policies

According to [EIOPA \(2013\)](#), UK has the largest private sector DB occupational pension scheme market in Europe with around £2 trillion of pension scheme assets. There are around 11.7 million members in total, including 2.1 million active members, in the DB pension schemes.

Pension Protection Fund

One special feature of the DB pension schemes in UK is that almost all schemes in this group are eligible for the UK Pension Protection Fund (PPF) protection. The PPF was established in 2005 to protect members of private sector DB pension schemes in the event of pension scheme underfunding when the sponsor of the pension scheme becomes insolvent. The PPF guarantees full amount of the pensions in payment and 90% of the deferred pensions.¹ The total amount is also subjected to a cap set by the PPF annually. Once the sponsor declares insolvency, the trustees of the pension scheme start to apply for the PPF protection and trigger an assessment period. During the assessment period, the PPF acts as a creditor to the insolvent sponsor of the pension scheme, and tries to retrieve some assets to mitigate the pension deficit. Meanwhile, the pension scheme in concern tries to quote life insurance contracts that pay each member at least their accrued PPF guaranteed benefits. If the remaining assets from the pension scheme can afford such contracts, the life insurance will be bought for each participant and the PPF stops to be involved. Otherwise, both the assets and the liabilities of the pension scheme and its participants will be transferred to the PPF. From then on, the PPF will pay the guaranteed amount of accrued benefits to participants when they retire.

The PPF charges each eligible pension scheme an annual premium (called the levy). The size of this premium depends on the size of the scheme and the level of risk in the scheme, including the pension funding shortfall, the credit risk of the sponsor, and the investment strategy of the pension scheme.

The assets of the PPF consist of the premiums the PPF charges eligible schemes, the assets from the taken-over schemes, the assets retrieved from the insolvent sponsors, and investment returns of the PPF. The liabilities of the PPF are the present value of the guaranteed benefits of the participants of the schemes that are taken over by the PPF. The liabilities will potentially increase in the future if the PPF takes over more pension schemes.

Since 2008, the turbulent financial markets and economic slowdown lead to funding shortfalls in many UK pension schemes and increased number of company insolvencies. As a result, the liabilities of the PPF surged. The PPF had to increase the premiums it charges eligible schemes to achieve its long term self-sufficient funding target ([PPF, 2012a](#)). This paper addresses the issue of how the PPF policy affects an individual pension fund, thus, we leave out the discussion of the viability of this pension guarantee mechanism.

Indexation

Another particular feature of the UK pension system is that benefits must receive statutory pension increases in payment. The indexation to increase benefits each year used to link to the retail price index (RPI) and switched to the consumer price index (CPI) in recent years. The indexation is capped at 5% for the pensions in payment and 2.5% for the deferred pensions. A number of pension schemes also provide guaranteed pension increases in addition to the statutory requirements. It should be noted that indexation for the benefits paid out from the PPF is capped at 2.5%.

Recovery plan

UK DB schemes are subject to the Pension Act 2004, stating that “every scheme is subject to the statutory funding objective” to “have sufficient and appropriate assets to cover its ‘technical provisions’”. The technical provision is the assets that are required to make provision for the pensions in payment and deferred pensions. If there is any funding shortfall at the effective date of each actuarial valuation, a so-called recovery plan must be prepared and agreed upon between the trustees and the sponsor(s) of the pension scheme. The recovery plan aims for any shortfall to be eliminated as quickly as the sponsor can reasonably afford. It consists of streams of annual cash flows that can span many years. A typical recovery plan in UK lasts between 5 and 10 years with a median of 8 years. Some pension schemes have a recovery plan length of more than 17 years and some have a recovery plan length of shorter than one year.

As one can see, the only steering instrument available to the pension trustees in UK is the recovery contribution from the sponsor(s). The PPF does provide securities to participants of the pension scheme, but only after the scheme is liquidated. These policies have very different characteristics from the instruments available to the pension funds in the Netherlands.

1.3. Features of Dutch pension policies

The private sector DB occupational pension system in the Netherlands, with assets under management of around 1000 billion Euro, is ranked highly in the world. The system consists of around 80 industry pension funds, 300 pension schemes of individual companies, and 12 pension funds for certain professionals like medical doctors. Instead of having “sufficient and appropriate assets to cover” the “technical provisions”, Dutch pension regulator requires pension schemes to have an asset buffer so that the probability of underfunding in the next period is smaller than 2.5%. Several steering tools and adjustment mechanisms are available to the trustees of the pension scheme so that they can maintain the funding ratio at a healthy level. The typical Dutch policy analysed in this paper includes the following features.

Conditional indexation

Dutch pension schemes give indexations that are linked to the wage growth. Instead of full indexation, the actual indexation given depends on the funding position of the pension scheme. The trustees of the scheme set up a floor and a ceiling for the funding ratio, such that full indexation is given if the funding ratio is above the ceiling and no indexation is given if the funding ratio is below the floor. If the funding ratio is between the floor and the ceiling, the indexation is a proportion of the full indexation. The proportion equals the ratio of the difference of the actual funding ratio and the floor to the difference of the ceiling and the floor.

Sponsor support

Like its counterpart in UK, the Dutch policy also requires sponsors of the pension scheme to contribute to the recovery of funding shortfalls. How much the sponsor contributes depends on

¹ The pensions in payment mean benefits paid to the pensioners and the deferred pensions refer to the accrued benefits that will start to be paid to participants when they retire.

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