OECD Economics Department Working Papers No. 832

Making the Dutch Pension System Less Vulnerable to Financial Crises

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https://dx.doi.org/10.1787/5kgkdgg5fxd3-en

OECD

Unclassified **ECO/WKP(2011)1**

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development **17-Jan-2011**

English - Or. English

ECONOMICS DEPARTMENT

ECO/WKP(2011)1
Unclassified

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JT03295198

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ABSTRACT / RÉSUMÉ

Making the Dutch pension system less vulnerable to financial crises

The Dutch occupational pension system has been successful in securing high asset accumulation to fund generous pension promises. However, for the second time in this decade the pension system has been affected by a financial crisis and many pension funds' assets fell below levels needed to meet regulatory requirements. Insufficient funding raises solvency issues, which could eventually lead to large fiscal costs in case of bail-outs. In response to the crisis, most funds were required by the regulator to draw up recovery plans to restore their funding over five years. This has raised concerns that the adjustment required by the regulator is unnecessarily sharp, with possibly adverse macroeconomic implications. On the other hand, OECD simulations indicate that under current policies, it is unlikely that funding rates will be secured that enable the funds over the long term to fulfil their promises of a replacement rate of up to 80% of average wages. This raises the challenge of implementing parametric changes that secure pension benefits without large detrimental effects on intergenerational equity and growth. Occupational pensions are transferable, which enhances labour market mobility. But it is often very difficult for workers to assess how one pension scheme compares to another, posing practical barriers to mobility that should be eased. This Working Paper relates to the 2010 OECD Economic Survey of the Netherlands (www.oecd.org/eco/surveys/ netherlands).

JEL classification: G23, H55, H75, J32, J62.

Keywords: Pension solvency, recovery plans, financial crisis.

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Rendre le système de retraite néerlandais moins vulnérable aux crises financières

Le système de retraite professionnel néerlandais a permis d'assurer une forte accumulation d'actifs destinés à financer de généreuses promesses de pension. Néanmoins, pour la seconde fois au cours de cette décennie, le système de retraite a subi le contrecoup d'une crise financière, et le niveau des actifs de nombreux organismes de retraite est tombé en deçà du seuil prévu par la réglementation. Cette capitalisation insuffisante soulève des problèmes de solvabilité, qui pourraient déboucher à terme sur d'amples coûts budgétaires en cas de renflouement. À la suite de la crise, l'autorité de régulation a imposé à la plupart des organismes de retraite d'élaborer des plans de redressement afin de ramener leur capitalisation à un niveau satisfaisant dans un délai de cinq ans. Or, certains craignent que l'ajustement exigé par l'autorité de régulation ne soit trop brusque, et qu'il ne puisse avoir des conséquences préjudiciables sur le plan macroéconomique. Cela dit, les simulations de l'OCDE indiquent que les politiques actuelles ne déboucheront pas à long terme sur un coefficient de capitalisation permettant aux organismes de retraite de tenir leurs engagements d'assurer des taux de remplacement pouvant aller jusqu'à 80 % du salaire moyen. Cela soulève la question de l'application de changements de paramètres permettant de garantir les prestations de retraite sans nuire fortement à l'équité intergénérationnelle et à la croissance. Les retraites professionnelles sont transférables, ce qui favorise la mobilité des travailleurs. Néanmoins, il leur est souvent très difficile de comparer les différents régimes de retraite, ce qui représente en pratique un obstacle à la mobilité, qu'il conviendrait de réduire. Ce document de travail se rapporte à l'Étude économique des Pays-Bas de 2010 (www.oecd.org/eco/etudes/Pays-Bas).

Classification JEL : G23, H55, H75, J32, J62.

Mots clés : Solvabilité du système de retraite, plans de redressement, crise financière.

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MAKING THE DUTCH PENSION SYSTEM LESS VULNERABLE TO FINANCIAL CRISES

By Jens Høj[1]

The solvency of the Dutch pension system was put under pressure by financial market developments

The main distinctive feature of the Dutch pension compared to most other OECD economies is its extensive occupational (second) pension pillar. This results from quasi mandatory participation in industry (or company based) pension plans (Table 1), resulting in 94% of employees being covered (see Annex A1 for an overview of the Dutch pension system).[2] Dutch occupational pension funds have the largest accumulated assets relative to GDP in the OECD (Figure 1). This makes the Dutch pension system particularly sensitive to financial market crises despite its success in securing net replacement rates that are among the highest in the OECD (Annex A1). Weakened solvency of pension funds may threaten pension promises and potentially lead to large fiscal costs in case of public bail-outs. Alternatively, pension funds recovery measures may deepen the crisis if they are too pro-cyclical.

Table 1. **Pension funds in the Netherlands, ultimo 2007**

	Number of funds	Assets	Share of active members	Share with defined benefits	Share with defined contributions
Corporate pensions funds	85%	27%	12%	90%	10%
Industry-wide funds	13%	71%	87%	96%	4%
Professional group pension funds	2%	3%	1%	83%	17%
Total	713	EUR 684 billion			

Source: Bikker *et al.*, 2009.

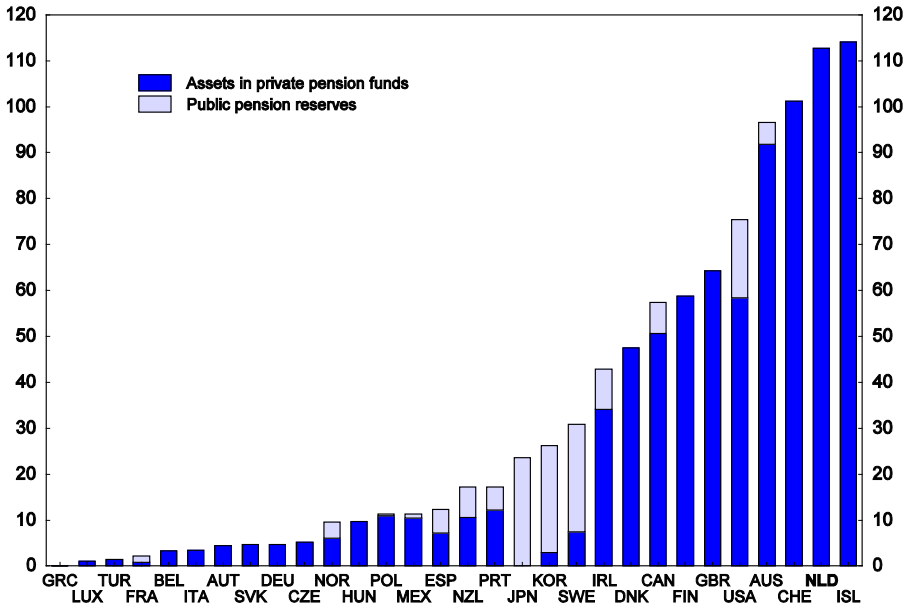
1. Jens Høj is Head of Belgium and the Netherlands desk in the Economics Department of the OECD. This Working Paper is based on Chapter 2 of the OECD's 2010 Economic Survey of the Netherlands which was prepared under the responsibility of the Economic and Development Review Committee. The author is grateful for the valuable comments received from Andrew Dean, Bob Ford, Pierre Beynet Tomasz Kozluk and other colleagues in the Economics Department. He would also like to thank Edward Whitehouse and Fiona Stewart from the directorates Employment, Labour and Social Affairs and from Financial and Enterprises Affairs respectively. Special thanks go to Sylvie Foucher-Hantala and Agnès Cavacuitti for statistical assistance and Sylvie Ricordeau for secretarial assistance.

2. The non-coverage can be explained by the fact that employers are not obliged to offer pension contracts, that some workers (despite being obliged) do not participate in the pension scheme of their firms, that people covered by a pension scheme but pay zero or low contribution are not counted as participants, and that people in third-pillar pension schemes are not counted as participants.

The global crisis has strongly affected the real return of the pension funds in the short term, with a loss of more than 15% in 2008, given Dutch pension funds' weight of equity in their portfolio (40%). While this fall is in line with the average investment performance of pension funds in other OECD countries in 2008 (Figure 2), it nevertheless threatens the solvency of Dutch funds. If unresolved, the solvency issue may have a negative impact on the net replacement rate, which is currently one of the highest in the OECD, as more than half of the retirement income package – a very high share on international comparison – is provided by these funds (OECD, 2009).

Figure 1. **Pension assets relative to GDP in the OECD countries**

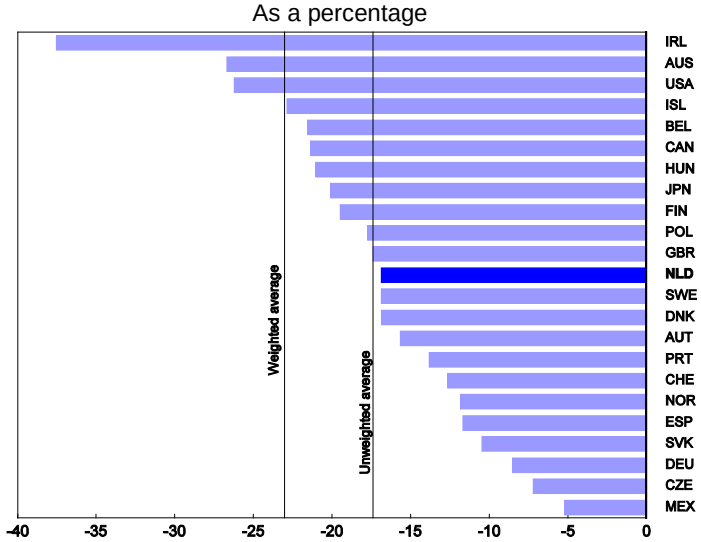
As a percentage of GDP, 2008



Source: OECD (2010), Pensions database and Pension Markets in Focus, No. 6: Statistical table No. 1.

Figure 2. **Pension funds' real investment returns in 2008**[1]

As a percentage



1. Returns are shown only for countries where pension-fund assets exceeded 4% of gross domestic product (GDP) in 2007.

Source: OECD (2009), Pensions at a Glance.

An important measure, in the Dutch context, of the impact of the global crisis on pension funds is the so-called funding ratio: the value of assets divided by the net present value of nominal liabilities. The Dutch regulatory authorities have defined key nominal funding ratios that need to be met to ensure that pension funds are able to finance their nominal (future) pension commitments. If the ratios are not met, a recovery plan has to be implemented (Box 1).

Box 1. **Funding rates for pension funds**

For the individual pension funds, there are three thresholds for their funding ratio:

- A legal minimum level of around 105% – where the exact threshold for each fund follows the EU's directives concerning occupational pensions and life insurances, stipulating a number of technical and other provisions (EU, 2002; 2003). Below this limit funds are not considered to be able to honour their nominal pension promises. If funds fall below that threshold it is mandatory for them to submit a recovery plan with a three year time horizon (presently temporarily extended to five years) to the regulator (De Nederlandsche Bank).
- A higher individual fund threshold of typically 125% (with a portfolio equally divided into equities and bonds and with a standard quality of assets) when the funds are considered to have sufficient capital to fully cover their unconditional nominal commitments within a year with a certainty of 97.5% and which incorporates the riskiness of the individual funds' investment strategy. Funds falling below this threshold have to issue recovery plans with a time horizon of maximum 15 years.
- A threshold of typically 145% for which the pension funds have to be above before they are allowed to make up for past recovery measures, such as lower contribution rates or make up for past suspension of indexation.

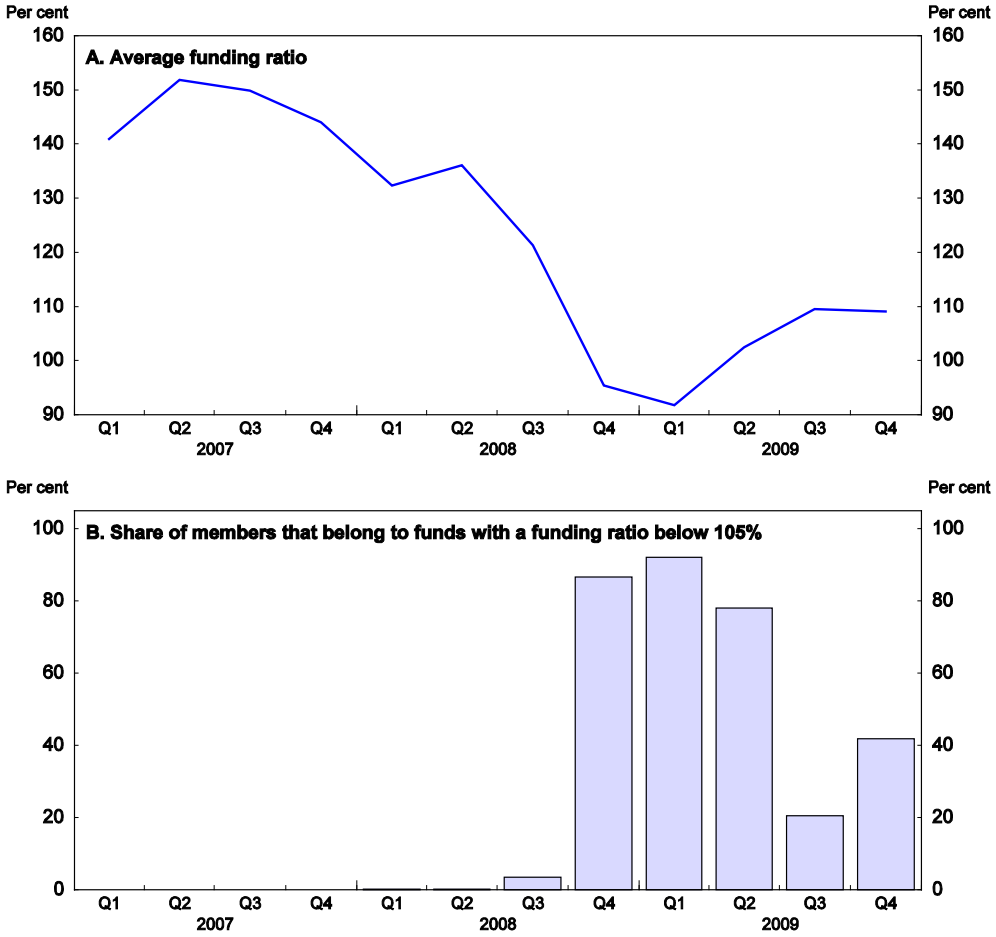
Moreover, each pension fund must make a continuity analysis (including a distribution of possible outcomes) at least once every three years with respect to their financial soundness over the next 15 years (DNB, 2007b) – a measure that forces pension funds to have a relatively long-term perspective with respect to setting contributions, indexation and investment policy as well as contributing to the formulation of well-founded long-term recovery plans. In particular, this measure provides information to members about possible indexation promises.

Following the financial crisis, the average funding ratio fell from 144% in end-2007 to around 92% in early 2009, before recovering to 109% in latter part of 2009 (Figure 3). It should be noted that these figures do not take into account the new life expectancy estimates that are 1.6 years longer in 2050 and which could reduce funding ratios by about 7 percentage points, assuming that life expectancy at the age of 65 increases as much as life expectancy at birth. This is the second time in this decade that the funding ratios for a large number of funds fell below the legal minimum level of 105%.

A contributing factor was a declining discount rate

The two main external determinants of the funding ratio in the short term are the equity and bonds markets, which give the value of assets, and the discount rate for calculating the present value of future liabilities. Reflecting a market based approach to regulation, the latter is the interbank swap yield curve. In the initial phase of the crisis (until mid-2008), the fall in the ratio was mainly driven by weaker equity markets. Thereafter, about 40% of the decline can be attributed to lower interbank swap rates that boosted the discounted value of future liabilities. For example, in the second half of 2008 the 15-year rate declined by about 0.4 percentage point, which increased pension liabilities by some EUR 15 billion (2.6% of GDP) (DNB, 2008). For the full year, the increase in the present value of liabilities was about 25%.

Figure 3. **The average funding ratio and share of funds with a funding ratio below the legal minimum**



Source: Dutch National Bank.

The somewhat unusual choice of discount rate(s) reflects a change in the legislation in the mid-2000s, when the adoption of the fair-value accounting principles led to the replacement of the fixed rate of 4% (in place since 1969) with a market based approach (Ponds and van Riel, 2007; van Rooij *et al.*, 2004) (Box 2). Before that, markets rates were usually higher than the fixed discount rate, which meant that the discounted value of future liabilities was higher than what would have been the case using market rates. In effect, this overestimation implied a hidden reserve for pension funds. Conversely, if the system had remained in place, the current low interest rates would have implied a hidden liability. The new market-based discount rate is the zero coupon interbank swap yield curve, which has the advantage of being a forward looking rate and thus containing, in principle at least, all available market information, according to efficient-market theory, although the recent crisis has called this theory into question.

In the second half of 2009, the average funding rate recovered, mostly on the back of stronger equity markets. The recovery could have been larger, though, if the funds had not scrambled to exit their equity holdings as stock markets collapsed (to lower their risk exposure) with a one percentage point fall in the funding rate typically leading to a ¼ percentage point decline in the equity allocation (Bikker *et al.*, 2009). Developments in individual funds depended mainly on their share of equity in their portfolios and the degree of hedging of interest-rate risks leading to a rather heterogeneous effect on individual funding ratios; the average fall was about 33%, but 27% of funds had larger declines and 42% smaller ones (Annex A2).

Box 2. **Regulatory changes**

A major change in the regulatory approach to pension funds came in 2002, when the regulator – in response to the crisis at the time – issued a letter to the pension funds clarifying the financial supervisory framework and outlining the necessary adjustments for restoring the pension funds' funding ratios. These elements were subsequently adopted and elaborated in the new Financial Assessment Framework (FAF) in place since early 2007, which defines solvency requirements in a stochastic fair-value framework, compelling pension funds to improve their risk management tools to better control their short-term solvency position and to ensure that the (long-term) benefit promises can be met with adequate certainty (Ponds and van Riel, 2007).

The main elements in the letter were:

- Pension funds with funding ratios below 105% were to be back to that level within a year. The 2007 pension law extended the recovery period to three years. The year after, the period was temporarily increased to five years, while the deadline for outlines of recovery plans (1st April 2009) was (earlier) also extended.
- Pension funds with funding ratios below 125% were asked to present a recovery plan to restore their funding ratio to at least 130% within a maximum of 8 years. The new Principles on the Regulation of Financial Regulation of Pension funds that were approved by Parliament in early 2004 extended the recovery period to 15 years.
- Pension funds had to raise contribution rates to cost-covering levels.

The main risk management tool for pension funds is the Asset Liability Management (ALM) analysis to evaluate pension promises, funding and risks, which provides insights into the sustainability of pension policies at different horizons. Typically, an ALM analysis uses an economic model to produce stochastic simulation of returns on asset classes and other relevant economic data, such as inflation, wages, etc. A subsequent scenario analysis produces probability distributions for the key variables. Usually, sensitivity analyses are preformed to explore policy variants in the asset mix, contribution policy and indexation rules. Policy variants are evaluated in terms of expected values and relevant risk measures for the key variables: the funding ration, the contribution rate, the indexation rate, etc.

Most pension funds had to implement recovery plans

During this crisis, funding ratios fell below 105% for about 80% of all funds, which had to submit recovery plans to the regulator, specifying how their underfunding would be eliminated by 2013. Another 10% of the funds, who's funding ratio fell between 105% and 125%, had to submit recovery plans specifying how to eliminate their reserve deficits by 2023. The affected funds have few characteristics in common, reflecting the fact that the shock was external to the pension system. Recognising this, as well as the high degree of uncertainty, it was decided to extend the recovery period to five years. However, the extension is conditional as funds opting for the full five years have to implement supplementary measures if the funding ratio falls below the path agreed on in the recovery plan.

The recovery plans have in almost all cases included suspending indexation of acquired pension rights, directly reducing real benefits to retired members of the fund. Active members and non-contributing members (so-called "sleepers") are affected once they begin to draw pensions. This suspension of indexation is a repeat of similar measures in 2003-06, where accumulated delayed indexation fell 3% behind wage growth and 2% behind price inflation (DNB, 2007a). In addition, in about 90 company-based schemes the sponsoring companies have made one-off contributions to restore the funding ratio (for example, Royal Dutch Shell contributed about EUR 2 billion and ING EUR 1 billion to their company pension funds). Unlike earlier in the decade, only in relatively few cases were the members' contribution rates increased, such as the temporary (and partly suspended) 3 percentage points increase in the ABP fund (for state and educational workers). Lastly, some 20 recovery plans (mostly from small pension funds) include reductions of nominal pensions, although these will be applied only from 2012 onwards and only in case there has been insufficient recovery in the funding ratios.

Recovery plans are better designed than during the last financial crisis

The last financial crisis, when the information-technology bubble burst in the early 2000s, also had a strong impact. Funding ratios in many pension funds fell below the legal minimum of 105%. In response, many funds hiked contribution rates, which on average almost doubled to 12.7% of wages by the mid-2000s, before coming down somewhat before the current financial crisis (Annex A2). Recovery plans had at that time a pro-cyclical impact as the increase in the contribution rate depressed activity, as described in the previous OECD Economic Survey of the Netherlands (OECD, 2009).

This time, however, the Dutch Central Bank estimates that the macroeconomic consequences of the fall in the funding ratio will be limited as the recovery plans are estimated to reduce annual growth by 0.15 percentage points per year on average in the period 2009-13. The muted impact reflects the fact that only pensioners lose disposable income from the suspension of indexation rights, and the assumption that households do not boost other savings to compensate for the reduction in the real value of their accrued pension rights. The latter may be related to the fact that most people only have a vague understanding of the pension system and find it difficult to assemble and process the relevant financial information (Social Economic Council, 2008). Indeed, members' expectations of retirement replacement rates are substantially higher than what available pension records would indicate – a spread that appears to be related to ignorance of pension institutions but which decreases with age (van Duijn *et al.*, 2009). The government, the pension funds, and the social partners have instigated a number of measures to enhance information about pensions (Box 3). Nevertheless, only a bit more than a tenth of pension fund members report that they feel adequately informed about their old-age pension (see below for a more general discussion on how to improve transparency on pension rights).

Box 3. **Pension information**

Pension funds are obliged to inform their members in an annual statement (the Uniform Pension Survey) about the value of their accrued rights. This statement may or may not contain information on the amount of suspended indexation. From 1st January 2009, the annual statement also has to include the so-called indexation label, which is intended to provide the members with information about the quality of the indexation promises of the pension fund. However, the information provided is highly complex as it contains indexation projections based on a number of economic scenarios, which, given the members' limited understanding of pension issues, make it unlikely that members fully appreciate the provided information. The indexation label is based on the continuity analyses that the funds have to deliver to the regulator at least once every three years.

Changes in the pension system have improved inter-generational equity

Raising contribution rates, as in the dot-com crisis, both deepened the crisis and put the main burden of the adjustment on younger generations (Ponds and van Riel, 2007). Subsequently, and to foster pension funds solvency in case of financial market disturbances, most funds switched from final pay to average wage plans, where pension benefits are based on members' average wage over their working life. It should be noted that for people having contributed 40 years, the average wage plans give a replacement rate similar to that in the previous final pay plans.[3]

3. With a 40 years careers and full wage indexation of acquired pension rights, plans currently yield pension benefits that are equal to 80% of average wages over their working life, which is considered to correspond to the typical final wage pension replacement rate of 70%, if accrued pension rights are fully wage indexed.

The move to average wage plans gave the funds an additional recovery measure as indexation became contingent on the funds' financial health. Suspending indexation may prove less pro-cyclical than raising contributions, but also allows funds to spread the adjustment more evenly across generations. More concretely, the suspension of indexation puts most of the adjustment burden on the generation born in 1940-70, assuming that indexation is fully restored after the end of the recovery period (Bonenkamp *et al.*, 2009).

The changes in the Netherlands contrast with developments in a number of other countries (particularly the United Kingdom, the United States and some other Anglo-Saxon countries) where similar solvency problems have accelerated the switch from defined benefit (DB) plans to defined contribution (DC) schemes – a move that places solvency risks on the employee and limits risk sharing between generations (OECD, 2009). Still, a small move in the direction of DC plans has taken place because contingent indexation of pension rights means that to some extent pension payments will depend on the performance of the funds (Ponds and van Riel, 2007).

The recovery plans are unlikely to secure a return to full indexation

During 2009, the average nominal funding ratio returned to a level above 105%, indicating that the financial health is returning to the pension funds. However, the legal minimum level (105%) for the funding ratio only secures the nominal value of accrued pension rights. To see whether accrued pension rights can be expected to keep their real value, a real funding ratio that takes into account likely price developments can be calculated. This shows that, even when the average nominal funding ratio was a seemingly comfortable 144% before the crisis, the real funding ratio was barely high enough (*i.e.* around 100%) to secure accrued pension rights in real terms (see Annex A2 for more details). Moreover, funding ratios exhibit a large variation across funds, and about a third of the funds had ratios that were close to the 125% level that the supervisor considers the lower bound for a sound funding ratio for guaranteeing the nominal pension promises, and which therefore fall short of funding real pension values. Following the crisis and despite the recovery in the nominal funding ratio in 2009, the OECD estimated that the real funding ratio remained around 70%, although the DNB (2009) has a somewhat higher estimate (81%). Either way, both estimates indicate a substantial deterioration of the real value of accrued pension rights.

The current recovery plans are not enough to secure full funding of all indexation promises and additional measures are required. The OECD Secretariat has for this survey created a number of scenarios to evaluate different policy options (see Annex A2) in an environment with relatively conservative financial market assumptions (Box 4). The baseline scenario is that contribution rates and retirement age remain at their pre-crisis level and full indexation is applied, *i.e.* no recovery measures are implemented. Although the baseline scenario does not take into account recovery measures that are currently being implemented by the pension funds, it is realistic in the sense that most funds have not abandoned their long-term ambition of a pension replacement rate of 80% of average wages (about two-thirds of the funds have the ambitions that losses in accrued pension rights arising from suspension of indexation will ultimately be recovered) and thus the scenario can be interpreted as assuming that pension right losses incurred because of the indexation suspension are eventually recovered.[4]

4. A baseline scenario closer to the current recovery plans would not change significantly the picture. As shown in Annex A.2, a scenario that assume that pension funds index pension rights only when the pension fund ratio is above the indexation ladder does not allow funds to return to a ratio of 145% by the end of the recovery period.

Box 4. **Key assumptions behind the baseline scenario**

The calculations assume price inflation of 1.4% in 2010 and 2011, rising to 2.0% thereafter. Nominal wage growth is set to 2.4% in the first two years and 3.7% in 2012 and thereafter. The nominal risk-free interest rate equals 2.9% in the period 2010-2011 and 3.5% in the year 2012 and thereafter. An equity premium of 3%-points over the whole period is assumed; hence, the calculations adopt a 6.5% nominal equity rate of return. The portfolios of pension funds have equal shares of equity and bonds. The largest pension fund in the Netherlands, ABP, has a financial investment portfolio of 45% equity (including hedge funds, private equity and real estate) and 38% bonds and the corresponding figures for the second largest fund (PfZW) are 45% and 39%. Pensions and pension rights are indexed to a basket of wage and price inflation, with weights equal to 70 and 30% respectively.

A long-term real risk-free interest rate of 1.5% a year is below the historical average of 2.1% and is motivated by the prospect of population ageing which is generally expected to decrease interest rates (Campbell and Viceira, 2002). An equity premium of 3.0% is in line with the literature, although it is lower than the world historical average of 3.4%, reflecting the idea that the future equity premium will be below its historical counterpart, because the historical average has been positively affected by a number of non-recurrent events, such as financial liberalisation (Dimson *et al.*, 2009).

The baseline scenario shows that the average nominal funding rate will not recover by 2024 to the nominal funding ratio of 145% that corresponds to a 100% real funding ratio, where the pension promises of a replacement rate of up to 80 % of average wages can be honoured. The baseline scenario allows funds to regain a funding ratio close on average to the legal minimum of 105% by end-2013, but about half of the funds will still not reach that threshold (Table 2). Extending the scenario to 2024 does not improve the funding ratios much. Hence, unless the rate of return on equity is much higher than assumed in the baseline scenario, there is a need for further policy measures to restore the pension fund solvency.[5]

Table 2. **Funding ratios in the baseline scenario**

End of year	Number of pension funds	Pension liabilities (billions of EURs)	2009	2010	2011	2013	2015	2020	2024
Group 1 (<100)	41	46.4	95	97	98	100	101	101	101
Group 2 (100-110)	150	357.5	105	107	109	111	112	112	113
Group 3 (110-120)	115	118.4	115	117	119	122	122	124	125
Group 4 (120-130)	35	37.2	125	127	129	132	133	135	138
Group 5 (>130)	39	31.5	135	138	140	143	144	147	150
Average	380	591.0	109	111	113	115	116	117	118

Notes. Pension funds are divided into a number of groups, depending on their 2009 funding ratio. Group 1 has funding ratios below 100, group 2 between 100 and 110, group 3 between 110-120, group 4 between 120-130, and group 5 above 130%.

Source: Dutch National Bank and OECD calculations.

Restoring pension funds solvency can be achieved through three main options: lowering pension rights, raising contribution rates, or increasing contribution periods. The OECD has simulated different scenarios (see Box 5 and Annex A2 for more details on the results of the simulations). Results show that using each instrument separately will require a substantial adjustment to reach a funding ratio of 145% by 2024. For example, reducing pension rights would imply a one-off cut in the value of accrued pension rights by 17 ½ per cent.[6] Alternatively, lowering pension indexation by half (compared to the baseline

5. The average funding ratio of 145% level is achieved if the real rated of return on equity average 9 ½ per cent per year over the full 15 years period.

6. The implied reduction in replacement rates may not be acceptable to members as surveys indicate that in the Netherlands the minimum acceptable replacement rate is in the range of 60-75% of previous incomes (Binswanger and Schunk, 2009).

scenario) would achieve the same result. Relying exclusively on higher contribution implies increasing contribution rates by one third, which means an additional 4.6 % of wages.[7] Finally, a four year extension of the contribution period could also restore the solvency, implying a retirement age of 69 years.

Box 5. **Different recovery scenarios, 2009-2024**

All scenarios are calibrated to ensure that solvency in real terms is restored, i.e. a nominal ratio of 145%, by 2024 (see Table 3).

Scenarios based on lowering pension rights

A first scenario that shows that a one-off reduction of accrued-pension rights by 17 ½ percent is required.

A second scenario that shows indexation must be reduced by half compared to the baseline scenario.

Scenarios based on raising contribution rates

A third scenario that shows that employees' contribution rates must be increased by a third.

A third "bis" scenario that shows the effects of increasing employers' contribution by a third.

Scenarios based on increasing contribution periods

A fourth scenario that shows that retirement age must be increased by 4 years (implying a lowering of the accrual rate because the funds are subject to an actuarial neutrality conditions)

Mixed scenario

A fifth scenario assumes a 2 year longer contribution period and shows that this must be combined with an immediate pension write off 8.2%.

Table 3. **Different recovery scenarios[1], 2009-2024**

	2009	2010	2013	2024
Immediate pension write off scenario				
Indexation cuts (% pension rights)	-	17.5	0	0
Funding ratio (end of year)	109	135	140	145
Reduced indexation scenario				
Indexation cuts (% pension rights)	-	-0.2	0.9	1.7
Funding ratio (end of year)	109	111	117	145
High employee/employer contributions scenario				
Increase contribution (% wages)	-	4.6	4.6	4.6
Funding ratio (end of year)	109	113	122	145
Increase retirement by 4 years age scenario				
Funding ratio (end of year)	109	112	121	144
Hybrid scenario: increase retirement age by 2 years combined with pension write off				
Indexation cuts (% pension rights)	-	8.2	0	0
Funding ratio (end of year)	109	122	129	145

1. The changes in the policy instruments are relative to the baseline scenario.

Source: OECD calculations.

7. Increasing contribution rates for employers will have similar long-term effects and will only have different short term effects, reflecting the rigidity of wage formation in the Netherlands.

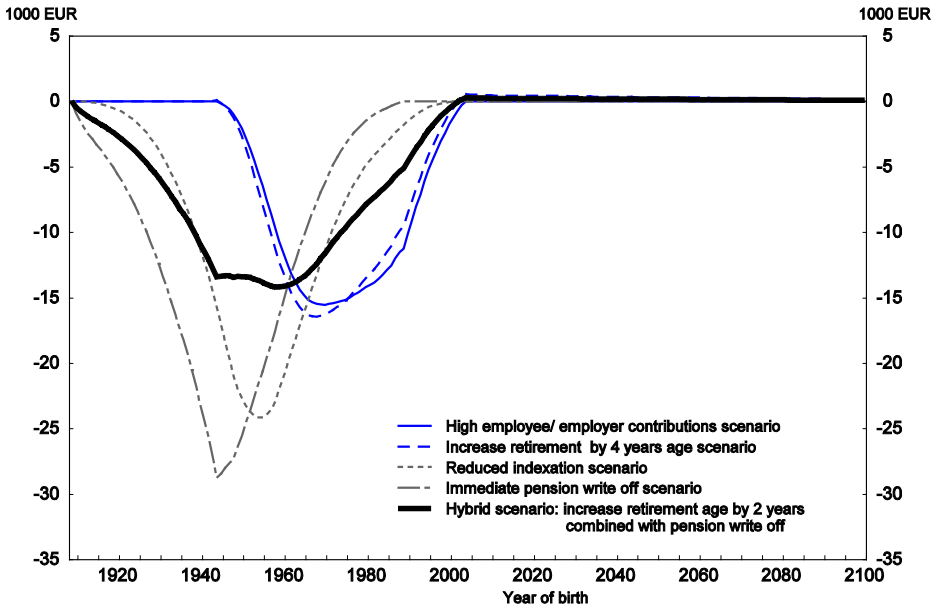
Additional recovery measures will need to take into account impact on equity and growth

When deciding which instruments to use to restore real funding ratios to 100% (*i.e.* about 145% in nominal terms), there are at least two objectives to take into consideration. First, there are intergenerational concerns as the instruments have different impacts on younger and older generation. As illustrate in Figure 4 below, each single instrument has a very distinct impact on generations. Instruments could be group into two categories in this respect. The first group consists of raising contribution rates or increasing retirement age. These two options put the burden of the adjustment exclusively on working generations. The second group consists of the options of suspending indexation or a one–off cut of pension rights ("write-off" scenario). These two scenarios put a bigger part of the adjustment burden on older generations than the two previous ones (Figure 4). Interestingly, the hybrid scenario, combining reduced pension rights and increased retirement age, spread more evenly the burden among generations. From the angle of generational equity, a hybrid scenario could be preferable to the others.

Second, it is also important to consider the growth impact of the different measures. In the short-medium term, the main impact on activity will arise through private consumption, but to a varying degree as, among other reasons, the various measures have different generational impacts. The strongest negative effect on private consumption is found in the *write off scenario* because of its impact on both pension incomes and future pension rights (Table 4). In *the higher employee contribution scenario*, the impact on private consumption is almost as high as in the previous case. On the other hand, if the higher contribution is placed on employers the initial decline will be smaller, reflecting that the initial burden falls on (partly foreign-owned) capital and thus relatively little on wage incomes (in the long-term the effects of higher employee or employer contributions will be similar as the labour market clears). In *the increased retirement age scenario*, the fall in private consumption will be smaller as the slower build up of pension rights are unlikely to affect (myopic) households' consumption decisions in the short-term. The *reduced indexation scenario* has little short-term impact on private consumption as pension incomes are only reduced gradually over time.

Figure 4. **Generational accounts for different instruments**[1]

Net benefits per capita, 1 000 EURs



1. The presented scenarios correspond to the baseline scenario and the scenarios in Table 2.3.

Source: OECD calculations.

In the long term, the main impact on growth will take place through the labour supply effect of each reform. Higher contributions may increase the wedge between pension contributions and benefits durably, reducing labour supply incentives and consequently long-term economic growth. Conversely, the write-off scenario have no long-term effect on the labour supply because there will be no change in the wedge between pension rights and contributions. The impact of the increase in the retirement age on labour supply is more uncertain. On one hand, increasing the retirement age also raises the wedge between pension contributions and benefits, potentially reducing the labour supply. However, this result is likely to be reversed if households are myopic regarding the impact of a later retirement age on the wedge. An expansion of the labour supply is also likely if this measure is accompanied by an equal sized increased in the retirement age in the state pension system.[8]

Table 4. **The macroeconomic effects of the different scenarios**[1]

	2010	2013	2024
Writing off on the value of pension rights			
Private consumption (%)	– 0.9	– 1.5	– 1.2
Labor supply (%)	0.0	– 0.1	0.0
Raising employee contribution rates			
Private consumption (%)	– 0.8	– 1.5	– 1.1
Labor supply (%)	0.0	– 0.4	– 0.3
Raising employer contribution rates			
Private consumption (%)	– 0.2	– 1.2	– 1.1
Labor supply (%)	– 0.1	– 0.3	– 0.3
Reducing the indexation of pension benefits and pension rights			
Private consumption (%)	0.0	– 0.1	– 1.2
Labor supply (%)	0.0	0.0	0.0
Raising the pension entitlement age			
Private consumption (%)	0.0	– 0.1	– 1.2
Labor supply (%)	0.0	0.0	0.0
Raising the pension entitlement age and writing off on the value of accumulated rights			
Private consumption (%)	– 0.5	– 1.8	– 1.2
Labor supply (%)	0.0	– 0.1	0.0

1. The table shows the percentage deviation from a baseline scenario. Moreover, the presented results only reflects policy changes in the occupational pension system.

Source: OECD calculations.

Comparing the macroeconomic and intergenerational effects of the different adjustment options shows that relying on a combination of recovery measures could be a better option than just relying on a single measure.[9] An optimal combination may, however, put more weight on increasing the retirement age

8. In addition, increasing the retirement age may lead to a decline in private wealth, which could boost labour supply incentives.

9. A number of OECD countries (Austria, Denmark, Finland, France, Germany, and Portugal) have gone a step further and introduced measures that link one or more components in their pension system to

than raising contributions rates or reducing the real value of benefits. Macroeconomic benefits of increasing the contribution rates seem to be rather limited. Moreover, the effectiveness of contribution hikes to solve funding crises is declining as the contribution base is shrinking (Box 6). On the other hand, extending working life could be seen as a continuation of earlier efforts, such as the ending of the tax-favoured status of early retirement programmes (VUT) and the proposal to increase the official retirement age to 67 (OECD, 2010). Moreover, the social partners have started talks within the framework of the Labour Foundation (the Stichting van de Arbeid) to examine the sustainability of the occupational pension system, including the issue of extending the retirement age. The presented calculations show that the retirement age in the occupational retirement system should be increased to at least 67 and combined with a mix of other measures, such as a reduction in the real value of pension benefits and higher contribution rates.

Box 6. **Future challenges for the pension funds**

As funds mature, the effectiveness of the contribution rate as a steering instrument declines – for example prior to the crisis it was calculated that an increase in contribution rate of 2 ½ percentage points was required to improve the funding rate by 1%, while in 2030 the necessary increase in the contribution rate would rise to 4 ½ percentage points (Ponds and van Riel, 2007). Moreover, sharp increases in contribution rates have detrimental labour market effects and put too much of the necessary adjustment on the shoulders of younger workers. Thus, there has been a need to have more flexible steering instruments and spread risks more evenly across all members of pension funds.

The maturing of funds is also likely to induce funds to pursue more conservative investment strategies. However, a more conservative portfolio will not be attractive to younger members as the implied lower return on investments means that contribution rates will be higher in order to fund the accrual of their new liabilities. Thus, funds may want to differentiate more in risk exposure between younger and older members, to secure higher returns for the young and more indexation certainty for the old. This can be achieved through the introduction of an age-dependent indexation policy, where active members receive an (wage) indexation that is a function of the part of the realised rate of return on investments that is above the discount rate, while other members get price indexation. With such an indexation rule, the assets could also be divided into a conservative part (to finance the part of the liabilities that is indexed to price growth) and a risky part (to finance the part of the liabilities that is related to the excess return). Alternatively and perhaps a more radical solution is to allow workers to keep their contributions in individual DC accounts, which upon retirement is converted into DB liabilities (Ponds and van Riel, 2007). The latter is similar to converting the pension rights of retirees into annuities, which in other pension systems has been difficult to establish.

A third challenge is that following the crisis, it is likely that – as recommended by the pension committee (see below) – pension regulation will lower the allowed maximum expected rate of return on equity, implying a need for increasing assets, increasing premiums or lower pensions ambitions.

Making the pension funds less vulnerable to financial crises requires reforms

During the recent crisis, almost all funds have suspended indexation, which is partly linked to regulation that prohibits indexation as long as a pension fund is under-funded. Moreover, extending the recovery period to five years explains partly why relatively few funds have raised contribution rates as the extension allowed funds to rely more on indexation suspension – nearly half of the recovery plans have suspended indexation for the next five years. Otherwise, the pension funds have a free course of action when deciding on recovery strategies under the condition that they address the interest of active members, sleepers, pensioners and sponsors in a balanced way. Funds with funding ratios below the legal minimum of 105% are further supported by regulation that prohibits transfers of pension rights away from such funds to prevent a further deterioration of funding ratios. Nonetheless, the government has established a number of committees to evaluate if there is a need for reforming pension regulation to secure the long-term stability of the system (Box 7).

developments in to life expectancy, so that increases in the latter lead to lower pension payments, higher legal retirement, or longer contribution periods.

The market based focus of the Dutch regulatory framework implies that the crisis-related turbulence on the financial markets led to volatile discount rates for the purpose of assessing funding ratios (Figure 5). In all, the 1 ¼ percentage point fall in the discount rate between mid-2008 and mid-2009 decreased the funding ratio by some 20 percentage points – a decrease that was only partly offset by the associated higher market value of the funds' bond portfolios. The discount rates have been gyrating, leading to sudden strong upward as well as downward revisions in the discounted value of future liabilities and hence in the funding ratios.

Box 7. **Possible pension reform areas**

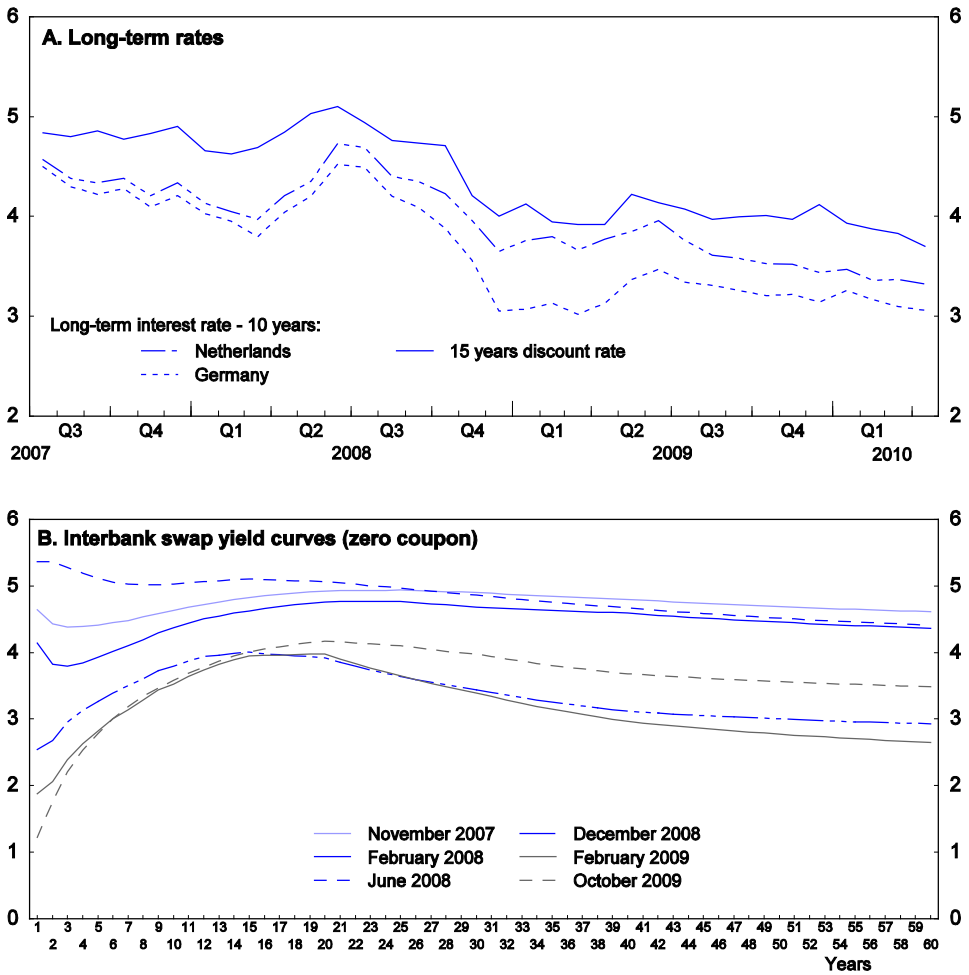
The government has established a number of committees to investigate pension funds' actions and lessons to be learned from the current crisis. These committees reported and made policy recommendations in the beginning 2010, including the following:

- An investment policy and risk management committee (also referred to as the Frijns committee).
  - The committee concluded that the vulnerability of the (heterogeneous and increasingly complex) pension funds will increase as a result of population ageing and longer life expectancy, affecting their recovery ability and shortening their investment horizons. Nonetheless, the funds have structurally undervalued the importance of risk management and the associated implementation of investment policies. In addition, specific fund characteristics, such as the age of members, are not adequately translated to into investment policy. Particularly, outsourcing risks arising from principal agent problems are underestimated. A particular issue is that funds have increased the riskiness of their portfolio to keep contributions down and protect the real value of pension entitlements. Part of the problem is that there is too much emphasis on nominal funding ratios, whereas in the future a real framework must serve as a guide. Moreover, the governance model must adapt to deal with increasingly complex governance duties, pointing to the need for securing adequate and professional support – which tends to lack in smaller pension funds.
- A committee on the sustainability of the supplementary pension schemes to evaluate if pension funds are future and shock proof with regard to financial and economic crises and to longevity (ageing) with the aim of providing policy recommendations that maintain the current collectively and solidarity elements.
  - The committee found that the current system lacks sufficient durability in view of population ageing, rising longevity and the increasing vulnerability to financial risks. The sustainability of the system can be improved by lowering the ambition level with respect to pension benefits for given contribution period (*i.e.* accrual rates should be lowered). Changes in life expectancy should be linked to either pension benefit levels or contribution periods. Alternatively, risks should be borne more explicitly by participants. Strategies for addressing future windfalls or setbacks should be made explicit and communication to members should be improved. The flat contribution rate should be preserved, but it should be considered to have an age based decline of accrual rights to facilitate labour market mobility (particularly of self-employed) and reduce the implicit transfer from younger to older participants.
- A parameter committee evaluated whether the currently used parameters should be adjusted, such as the maximum allowed yields on different categories of stocks, wage and inflation assumptions, etc.
  - The committee argued that the minimum expected values for wage and price inflation, 3% and 2% respectively, should be kept. Likewise for the expected nominal bond rate of 4.5%. The committee was divided on which value to use for the expected rate of return on equity, with one group arguing that future rates of return should be 1.5% lower than in historical average as windfalls effects from integration of financial markets, technology developments and an unprecedented rise in productivity cannot be expected to be repeated. The other group argued for a slight downwards revision of the expected rate of return to 7.25%, but also that pension funds should be more prudent in accounting for the possibility of deviation from this historical average. If adapted, contributions have to be EUR 1.9 billion and EUR 0.6 billion higher in the view of the two groups.

Moreover, there will be an evaluation of the Financial Assessment Framework (part of the Pension Law) by the regulator (DNB) and the Ministry of Social Affairs, which is to be discussed with the social partners.

One way of diminishing the influence of short-term volatility could be to use a weighted average of swap rates. However, using an average of historical values reduces the forward looking value of using market rates and it would not entirely remove non-fundamental information, such as the drying up of liquidity and other crisis effects.

Figure 5. **Interest rate developments**



Source: Dutch National Bank and OECD (2010), Analytical database.

The problem in this area may be that the regulatory approach is still putting too much weight on short-term developments for the assessment of the long-term commitments of the pension funds. Thus, the market based approach to establishing the discount rate should be preserved, but should rely on less volatile interest rates, pointing to using long-term bond rates. These can be obtained from investment high grade bonds, such as AA- rated corporate bonds. The regulator could also consider using the rate on long-term government bonds, either from the Netherlands or the risk free bonds in the euro area. Such a choice would imply a lower discount rate than when using AA- rated corporate bonds, thus boosting liabilities. If this is unwarranted, then one way of preserving a more stable discount rate that reflects a safe market based return could be to add the historical difference between the corporate and government bond

rates.[10] However, these other market rates also exhibited significant, though less, volatility in the recent past, and so would not have solved the discounting issue fully.

Alternatives exist to further resolve this problems, but at the considerable cost of divorcing the process from its current market basis. Fixed discount rates are used in the United Kingdom and United States and some countries (Denmark and Finland) have allowed pension funds to calculate solvency on the basis of a return to "normal conditions" – an approach that is also being discussed elsewhere (OECD, 2009).

Despite the extension of the maximum allowed recovery period, five years is still short compared with the 10-15 year recovery periods that are used in countries like the United Kingdom and the United States, with the length of the business cycle and with the maturity structure of pension funds' liabilities.[11] As argued in OECD (2010), the depth and the severity of the crisis are such that the projected recovery is likely to be relatively weak and slow in gathering speed. Thus, longer recovery periods would give funds more flexibility in restoring their funding rates, implying at least that the exceptional extension of the recovery period should be made permanent.[12]

The governance of pension funds should improve to reduce risks

Pension funds have full freedom to compose their portfolios under the regulatory risk management constraints, and the variation in equity holdings is rather large, ranging from an average of 17.6% in the relatively risk free funds to 46.9% in the funds with the largest equity exposure (Bikker *et al.*, 2009). However, there is evidence that some smaller company-based funds have relatively risky investments portfolios (*i.e.* a relatively high equity share) (Davis *et al.*, 2007). Dutch funds are obliged by law to follow an investment strategy based on the prudent-person principle. This means that investments in sponsoring firms is limited to 5-10% of total investment, and that funds have to inform members about their investment strategy and its implementation. The riskiness of investment strategies is also limited by regulation that the funds within a year have to be able to meet their obligation with 97.5% certainty. Moreover, there are maximum values for what rates of return funds can expect when calculating their funding ratios and what indexation members can expect (the so-called continuity analyses, see below).

In general, the funds have invested in assets that reflect the age composition of their active members (Bikker *et al.*, 2009). However, the committees looking into the occupational pension system highlighted that the pension funds have been increasingly pursuing more risky investment strategies in order to contain contribution rates and still meet their indexation promises, without paying sufficiently attention to fund specific characteristics, such as the age composition of all members (including sleepers and pensioners). The riskiness of the pension funds' portfolio should reflect the age structure of its members to reduce the volatility of the solvency rate as the fund matures (OECD, 2009).

Nevertheless, the regulator has found that several (smaller) pension funds have severely underestimated the inherent risk in their investment policies (DNB, 2009). This underestimation may reflect the fact that the funds' boards are dominated by representatives from the social partners, who tend

10. A more individualised approach could be to let the discount rate for individual pension funds reflect the members' risk willingness in terms of future indexation, *i.e.* their conditional pension rights.

11. Determining optimal recovery periods is probably unrealistic as this would require the formulation of an optimal response taking into account the specific circumstances of the individual fund as well as expected macroeconomic developments.

12. Other measures are necessary to increase the effective retirement age. Currently, the severance payment rules allow firms to fire employees on their 65 years birthday without paying severance pay. Moreover, hiring older workers carries a potential high health cost, reducing demand for +65 years (OECD, 2007).

to focus on the interest of active members or the average age of their members, rather than basing their portfolio choice on a cohort-specific investment policy (Teulings and De Vries, 2006).[13,14] The latter could be addressed by increasing the representation of retirees and sleepers on the board of the funds or the professionalism of the boards. More professional boards would also address the problem that some (smaller) funds have not properly monitored that when outsourcing investment function, whether the investment firm actually implemented an investment portfolio that reflects the risk level decided in the investment strategy – a problem particularly when more advance financial instruments were used. The regulator also concluded that the risk management function could be improved as, at times, it did not adequately recognise that investment decisions were biased towards the attractiveness of the product in terms of potential returns rather than being balanced against associated risks.

The system of corporate governance for pension funds has not prevented a large dispersion of annual administration costs across pension funds, ranging from 0.1% and 1.2% of pension fund assets, although on average Dutch funds compare well with those of other countries. Such costs can be an important factor behind the final outcome of pension savings. For example a 1 percentage point higher annual administrative cost can induce a cumulative reduction of 27% in pension benefits (Bikker and de Dreu, 2006). Larger industry-wide funds are significantly more efficient than the smaller (company) funds, reflecting economies of scale and relatively straightforward pension schemes (absence of information costs, no adverse selection, etc) under the collective labour market agreement and relatively fewer transfers of pension rights, contributing to the ongoing consolidation of pension funds (Bikker and de Dreu, 2006). However, pension regulation limits the incentives to reduce administrative costs, *e.g.* by preventing members from switching pension funds. Other than allowing members greater possibility for switching funds, regulation could be adapted to promote transparency of pension plans' operating costs, which would increase merger incentives as well as reduce the cost of supervision (Bikker and de Dreu, 2006).

Changes in transfer rules could favour labour mobility and improve corporate governance

As discussed in the previous *Survey*, a recurrent issue in the Netherlands is how to mobilise underutilised labour resources (OECD, 2007). In the context of pensions, the changes implemented over the past years have potentially created a barrier to changing jobs and thus reducing labour mobility between sectors. Previously in the final pay plans, the decision to transfer pension rights was relatively straightforward, as it was generally advantageous to transfer accrual pension rights because of the embodied automatic wage indexation for active members. Presently, under the average wage plans the decision of whether to transfer accrued pension rights in connection with potential employment changes (involving another pension fund) has become highly complex because of the contingent indexation of accrual pension rights - a contingency that rules out transfers of indexation promises – creating a risk that job changing members lose pension rights. From a legal point of view there is a right to transfer accrued pension rights in connection with job shifts and transfer periods are very short (Box 8). Moreover, if workers decide to become sleepers, pension funds are legally required to apply same indexation rules as for pensioners in the funds. However, the complication comes from the fact that indexation of accrual nominal pension rights is conditional on the financial position of the pension fund, requiring the member to make the non-trivial comparison of indexation promises and of investment strategies (Bikker and Vlaar, 2006).

13. Applying generational accounting would also increase the incentives to extend members' working life as a measure to restore funding ratios.

14. The median equity exposure increased from about 11% in 1995 to around 30% five years later, where it has roughly remained during the 2000s. In the latter period, also funds with traditionally very low holdings of equity have increase their share to about 10, while the most risk exposed funds have lowered their equity holdings from nearly 60% in 1999 to around 50% since the mid-2000s. In terms of assets, then the equity exposure is nearly 40%, reflecting the higher exposure among the larger funds.

Box 8. **The pension fund transfer processes**

The value transfer process requires considerable effort on the part of all the parties involved: the employee must make a request; the pension administrator must provide information; experts must provide advice; the employee must make a choice; the transferable value must be determined and transferred to the new pension administrator; the value must be translated into entitlements; the outcomes must be entered in the accounts and relevant information again passed to the employee. To ensure that the process is completed within half a year, strict time limits are imposed on each stage, and in practise the process is completed within a couple of months. The associated costs (potentially up to several hundred EUR per case) are borne by the pension funds (recovered through contributions).

To secure equal treatment, a standard method has been adopted for assessing the transferable value of accrued pension rights (but not of indexation promises) and its translation into entitlements under the new pension scheme, although in practice the transferable value will seldom be precisely equal to the value available to the pension administrator releasing it, because there is a difference between the principles for allocations to reserves and the principles applying to transferable value assessment (Stiching van de Arbeid, 2004).

The comparison of different indexation mechanisms is not only restricted to considering the type of promised indexation (to industry wages, general wage, or consumer prices) but is also often complicated by an inverse link between the quality indexation and the accrual rate in the pension plan. Thus, the first hurdle for a worker who is considering transferring his accrued pension rights is a non-trivial comparison of indexation mechanisms (including type of indexation ladders and other mechanisms) and the associated accrual rates (Table 5). The second major hurdle is an evaluation of the quality of the indexation promises that is linked to the financial health of the pension funds (DNB, 2006). Funds provide information in this respect through a continuity analysis (once every three years) to gauge expected indexation and, more recently, the so-called indexation label (the "toeslaglabel" in the annual pension briefs), which provide information about the possibilities for pensions to keep pace with price increases over the next fifteen years (DNB, 2008). Processing such highly complex financial information and drawing the relevant conclusion is difficult even for workers with well-developed numerical skill, suggesting that such a label perhaps has a limited value for most workers who are contemplating switching pension funds. Thus, it is difficult to establish what action would be most favourable for a worker considering changing pension fund (Stichting van de Arbeid, 2004) and this lack of transparency may lead to potential welfare loss for individuals (Ponds and van Riel, 2009). The quality of indexation is from a theoretical point of view highly important, but from a more practical point of view the high complexity probably means that this issue has little impact on labour mobility across sectors and firms, particularly in view of the members' poor understanding of pension issues.[15]

The government has already taken measures, such as the indexation label, to enhance transparency in this area. It should continue efforts in this direction, so pension fund members eventually gain a broader and deeper understanding of their own pension plans. However, that will not solve the indexation problem in connection with transfers. The regulator has proposed three practical approaches (DNB, 2006):

- To base pension transfer on the expected value arising from the mandatory continuity analysis. This approach has the benefit of using an existing framework that encompass the indexation that members can reasonably expect.

15. Nearly half of members do not know the type of pension scheme that they are a member of and almost two-third of members do not know their pension rights nor their future pension benefits (van Rooij *et al.*, 2007).

- To base pension transfers on indexation reserves – many funds have reserves specifically for future indexation, which could provide payments for indexation promises. However, to be fully operational such a system would require all funds to have indexation reserves and boils down to increasing the funding ratio.
- To base pension transfers on solvency ratios. The value of indexation is linked directly to funds' solvency ratios and thus provides a strong indication of the expected indexation.

Table 5. **Indexation of active and non-active members**

	Basis for indexation of active members		Basis for indexation of passive members	
	Share of funds	Share of members	Share of funds	Share of members
Price	16.3%	8.1%	49.8%	21.6%
Wages	54.1%	78.5%	12.9%	60.5%
Mix prices and wages	7.8%	1.3%	5.3%	0.9%
Other	21.9%	12.1%	32.0%	17.0%

Source: Dutch National Bank.

Of the three proposals, the last two have the advantage of being easy to apply, but are rather crude. Using the continuity analysis would be an attractive alternative, but the results are parameter dependent and thus cannot be determined with a high degree of objectivity. For example, in the case of a fund with solvency problems, a relatively high indexation value may emerge because of allowances made for future contribution policies or expected returns. This is naturally not a problem for the receiving fund, but may aggravate the situation for a financial weak donor fund. Thus, this approach calls at least for some parameter standardisation.

Facilitating transfers could create a strong incentive for improving corporate governance. Such increased transfer possibilities should focus on underfunded funds, where present rules lock in members - potentially leaving them with limited real pension benefits despite lifelong contributions. Thus, persistently underfunded funds should be faced with the prospects of members leaving. This principle could be widened more generally to include persistently underperforming funds, but who nevertheless manage to maintain funding ratios above the legal minimum. Such changes, however, need to be accompanied by adjustments in transfer rules so that the value of transferred pension rights reflects the financial health of the fund from which the member is departing.

An implication of the pension transfer rules is that some firms with company based funds may be hesitant to hire older workers with large accrued pension rights. The issue arises when the company based fund has high quality indexation that has to be applied to the large accumulated accrued pension rights. This may lead to a potential decline in the funding ratio, raising the risk that the sponsoring company has to inject additional capital (DNB, 2006). Another labour mobility problem is that older workers may refrain from becoming self-employed as there is no pension fund for self-employed (except for certain type of professions like doctors) and most of the accrued pension rights are accumulated relatively late in peoples' careers. Workers who become self-employed have the right to continue in their previous pension fund on a voluntary basis for three years and must thereafter cater for themselves and their accrued pension

rights get the status of sleepers (Choi, 2009).[16] However, the indexation of sleepers' accrued pension rights are typically indexed to prices as compared with wages for active members. This means reduced incentives for becoming self-employed, potentially implying a less dynamic business sector and lower employment growth. A relatively simple solution is to allow the self-employed to stay (longer) with their pension fund and pay the full (employer and employee) contributions. The latter could, for example, be based on the wage scale that was in place when they were employed.

The issue of contingent indexation could be removed by moving the regulatory focus to real funding rates and ensuring they are high enough to support indexation for all funds. This would require increases in contributions or reductions in pension promises. Raising funding requirement would force pension funds to boost their assets, on average, by about one third to bring the average nominal funding ratio to 145%, but the assets needed would be considerably higher create sufficiently large financial buffers against unforeseen events (analogous to the current nominal funding requirement of well over 100%). In the absence of an unusually strong recovery in stock markets, this would require measures (*i.e.* much higher contribution rates, prolonged suspension of indexation, etc) that could have strong adverse effects on economic growth.

Box 9. **Policy recommendations to strengthen the pension system**

Further reduce the impact of short-term economic developments on the funding ratio

- Stabilise the discount ratio by replacing the current interbank swap yield curve as the discount rate(s) with a more stable long-term interest rate from an investment high grade bond. This could be the corporate AA-bond rate, but if that market is considered insufficiently liquid, another choice is a long-term government bond rate. If this rate is considered to low, the historical difference between the corporate and government bond rate could be added.
- The normal recovery period should be extended to five years, at a minimum, making the exceptional extension permanent to avoid abrupt changes in recovery parameters.
- Longer contribution periods (equivalent to lowering the accrual rate) should be introduced to structurally improve the funding ratios. If the aim is to increase the retirement age in the pension funds to 67, this has to be supplemented by a mix of higher contribution rates and lower real value of accrued pension rights.

Securing better transfer of pension rights

- Transfer decisions should be supported by greater information provision to ensure that members take informed decisions in this area.
- To encourage self-employment, workers shifting to become self-employed should be allowed to remain active members in their pension fund, paying the full contributions (*i.e.* that of employees and employers).
- Members should be allowed to leave persistently underfunded or underperforming funds, although in such cases transfer rules should be adjusted so that the value of transferred pension rights reflects the financial health of the fund from which the member is departing.

Corporate governance needs strengthening to align risks and investments.

- The boards of the pension funds need to be strengthened to reflect all interests. This could be achieved by increasing the representation of pensioners and sleepers in the board. There is also a need for more professional boards to ensure that the risk levels decided in investment strategies are reflected in the riskiness of the portfolio choice.

16. If the self-employed return to paid employment with another pension fund, then s/he will be entitled to transfer past accrued pension rights as an employee to the pension scheme associated with the new employer (Dutch government, 2005).

- The members should be able to evaluate the performance of boards, which requires that regulation should be put in place to promote transparency, both with respect to the link between investment strategies and portfolio choices and to operating costs of funds.

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Annex A1

The Dutch pension system

The Dutch pension system has two main tiers, consisting of a flat-rate public scheme and earning-related occupational plans. The basic old age pension is payable from age 65. All residents are eligible for this benefit. The gross pension benefit reached EUR 12 017 in 2006 or about 30% of average earnings. The basic benefit accrues at 2% of the value of each year a person of age 15 to 65 lives in the country. There is also a social-assistance scheme for older people with less than 100% public pension entitlements. This schemes provides supplements to the full net basic pension.

The occupational pension system has three types of pension funds. The industry-wide funds that are organised for individual industries (*e.g.* construction, health care, transport, etc.) and which is mandatory for all firms and where the Minister of Social Affairs and Employment can declare that the collective pension agreement is binding for all in the industry. The second type is company based pension funds, where a sponsor runs its own pension plan for its employees. Companies can opt out of industry schemes by establishing a company scheme with better conditions than offered in the industry fund. In both cases, worker participation is mandatory and governed by collective labour agreements. The third type is the professional group pension funds, which organise pension schemes for specific groups of professionals (physicians, notaries, etc.) (Bikker *et al.*, 2009). Self-employed need to organise their own retirement plans, typically through savings in their companies or in the third–pillar pension system. The occupational pension system has 5.8 million active members, 2.6 million pensioners and 9.3 million inactive participants ("sleepers") - *i.e.* former active members that have accrued pension rights in the fund.

In all, the funds cover 94% of the active labour force. More than 85% of all workers are covered through the nearly 100 industry funds (which administrate more than 70% of all pension assets). The nearly 600 company based pension funds administrate more than a quarter of all assets and serve about 12% of all members (Table 2.1). Moreover, most of the funds are mature, being established in the 1950s and 1960s, with a relatively high share of pensioners and consequently a high ratio of pension-fund liabilities over contributions – currently around 2 ½ and expected to increase to 4 ½ by 2030 (Ponds and van Riel, 2007).

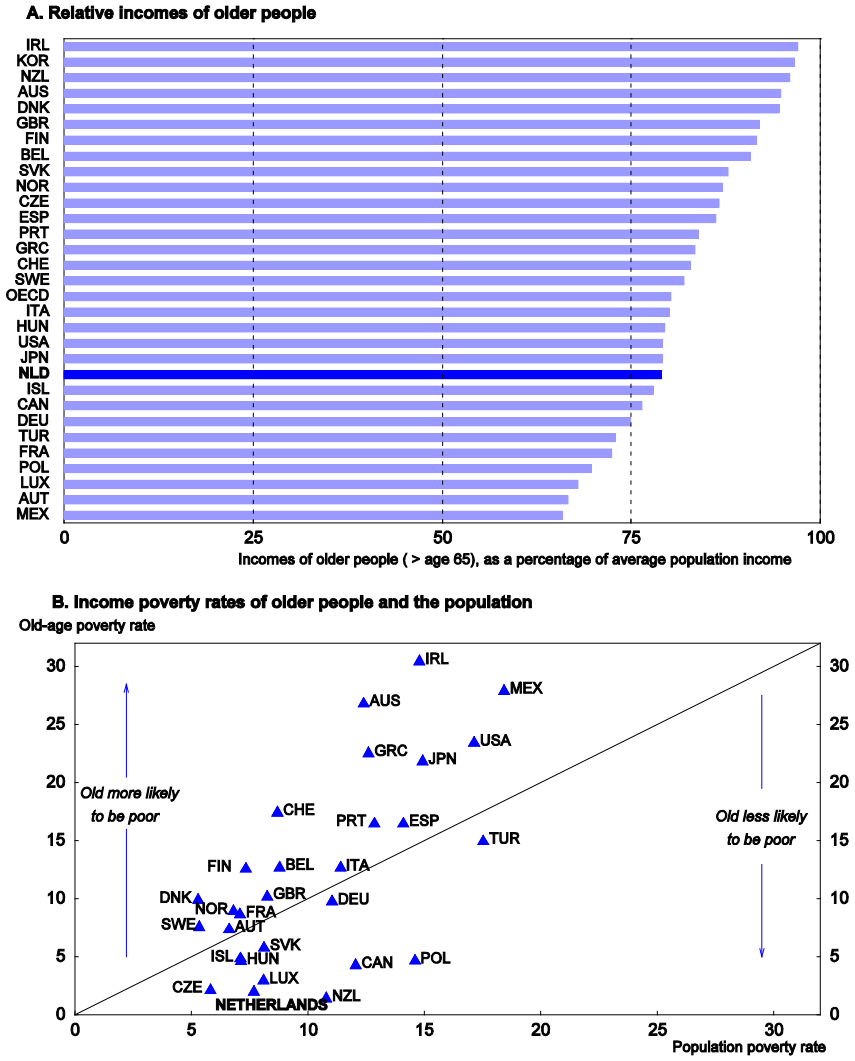
About 94% of the employees in the pension plans are covered by defined-benefit (DB) types of schemes and the remaining by defined contribution (DC) schemes. Nearly 85% of participants in DB schemes have pensions based on average wages. In these plans, each worker accrues nominal pension rights at a fixed rate (between 1 ¾ and 2 ¼ per cent but typically around 2%) of the salary earned each year throughout the worker's career (with both the employer and the worker contributing to the fund). Only about 3% of participants are still in final pay plans – down from more than half in 2002. The rest of the participants either have a combination of average and final pay plans or a fixed amount (DNB, 2008). A few, mainly smaller, employers offer schemes operated by insurance companies. The accrual of pension rights is strictly related to employment with some few exceptions. There are no credits for childcare periods, although many schemes allow voluntary contributions to cover periods of absence. Neither are there credits for unemployment except for older workers, where the social partners administer a fund (FVP) to allow older workers to accrue pension rights for a certain period during unemployment. Pension taxation follows the EET (Exempt, Exempt, Taxed) system, where contributions are not taxed, nor are any taxes levied on capital or capital gains, and where pension payments are taxed (Dutch government, 2005).

The standard retirement age in the funds is 65 and used to be linked to the official retirement age in the state pension scheme. Following the government plans to increase the official retirement age to 67 years (OECD, 2010) a gap in the retirement age between the two systems will open up. The funds typically pay pension benefits for a period of about twenty years, but this period is increasing as life expectancies are revised up, like the recent revision from 81.5 years to 83.2 years and 84.2 years to 85.5 years for males and females, respectively. After a full working 40 years working life, pensioners may receive pension benefits (including state pension that equals about 30% of average earnings) that corresponds to 70-90% of average career income. However, the exact pension benefits are difficult to determine ex-ante as they depend on the pension scheme, the accrual rate, years as a contributing member, wage developments, and the conditional indexation. As the funds are operating on the basis of actuarial neutrality, workers who retire before the age of 65 receive a correspondingly lower pension benefit.

The broad scope of the pension system has been successful in securing net replacement rates for pensioners that are among the highest in the OECD (Figure A1.1, Panel A). Particularly, retirees with low-income working lives have relative pension benefits that are higher than in most other countries. Moreover, provision for widows is stronger than in most other OECD countries (due to a mix of relatively generous survivors' benefits, other protection for non-working spouses and indexation policies). In addition, pensioners' real disposable income, when taking into account the value of their in-kind benefits, their lack of work-related expenses and the fact that they often have considerable real savings, are often higher than that of working generations. These strong pension provisions are instrumental behind the much lower poverty rate among retired people than in the population at large and compared with other OECD countries (Figure A1.1, Panel B).

Figure A1.1. **Pensioners' relative incomes**

Mid-2000s



Source: OECD (2009), Pensions at a Glance.

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Annex A2

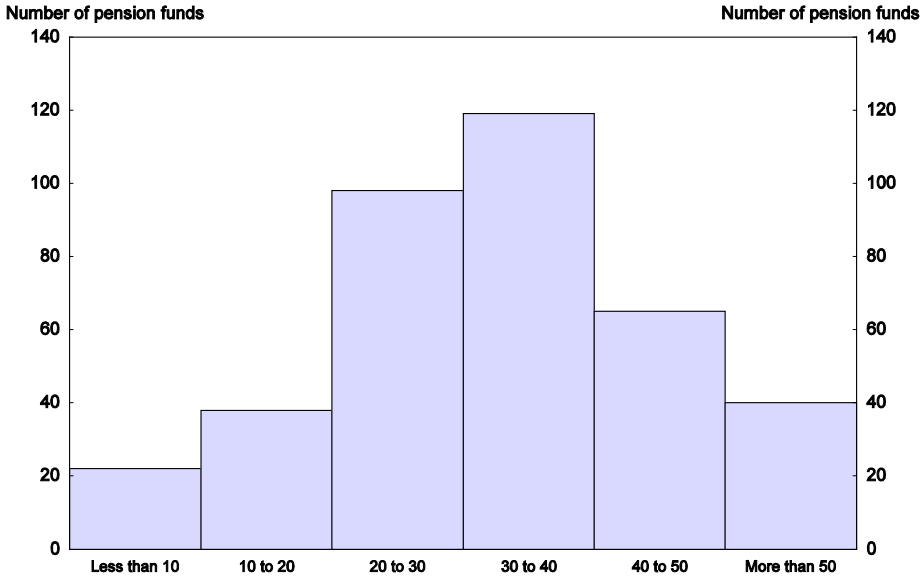
The effect of the financial crisis on the solvency of Dutch pension funds and its economic consequences – a simulation

The dual impact of crisis on pension funding

The crisis caused the pension funds' average funding ratio to fall from 144% before the crisis to a trough of 92% in the first quarter of 2009[17]. The next two quarters saw a recovery in the average funding ratio to 109%, although this figure does not take into account an estimated 7 percentage point reduction in the ratio due to the recent upward adjustment of life expectancy.[18] The collapse of share prices reduced the value of pension funds' assets, lowering the average funding ratio by an estimated 23 percentage points (2007Q4 to 2009Q3). The decline of nominal interest rates increased the present value of nominal pension liabilities, lowering the funding ratio by some 15 percentage points. The associated higher bond prices raised the funding ratio by some 3 percentage points. The varying impact of the crisis on individual pension funds reflected differences in exposure to the equity market and in the use of derivates to hedge nominal interest-rate risks. In all, the average decline was about 33%, and nearly 60% of funds experienced a decline of more than 30% (Figure A2.1).

Figure A2.1. **Decline of funding ratio**

In terms of percentage in 2007Q4-2009Q2 period



Source: Dutch National Bank.

17. Jan Bonenkamp (CPB), Lans Bovenberg (Netspar), Casper van Ewijk (CPB, Netspar) and Ed Westerhout (CPB, Netspar) carried out the simulations and contributed to the drafting.

18. In 2009 life expectancy estimates increased by 1.6 years in 2050 – for males from 81.5 years to 83.2 years and for females from 84.2 years to 85.5 years). The calculation assumes that life expectancy at the age of 65 increases as much as life expectancy at birth.

Simulation of the impact of various recovery measures

Below, a number of simulations are presented to explore pension funds' different alternatives – such as higher contribution rates, longer working lives, and reduced real values of pensions – for restoring a real funding rate of 100% (corresponding to a nominal funding ratio of 145%, or about the same as before the crisis, based on the assumptions stipulated in Box A2.1), under a set of conservative assumptions about future economic and financial market developments (Box A2.1). Each of the policy alternatives is expressed relative to a baseline scenario in which pension funds do nothing: *i.e.* contribution rates and retirement age are kept at their initial, pre-crisis levels; and pension rights are fully indexed to wage and price inflation. The baseline thus neglects the indexation ladder that many pension funds employ to relate the rate of indexation to the funding ratio and that pensions with funding rations below 105% are not legally allowed to index.

Box A2.1. **Model and parameter assumptions**

The model adopted for the analysis is non-stochastic. It is based around an accumulation equation for the financial wealth of a pension fund. This relates policy measures (the level and duration of contributions and the indexation of pension rights) to the time path of the funding ratio. The analysis distinguishes between five funds that differ (only) in their initial funding ratio, each having a different accumulation equation.

The portfolios of pension funds have equal shares of equity and bonds. Pensions and pension rights are indexed to a basket of wage and price inflation, with weights equal to 70 and 30% respectively. Other key parameters are presented in Table A2.1. The assumed long-term real risk-free interest rate of 1.5% a year is below the historical average of 2.1%. This can be motivated by the prospect of population ageing which is expected to decrease interest rates. An equity premium of 3.0%, somewhat lower than the world historical average of 4.2%, matches the idea that the future equity premium will be below its historical counterpart. Dimson *et al.* (2009) put forward several arguments for this assumption, among which is the difference between the concepts of excess return (an *ex post* measure) and equity premium (an *ex ante* measure) and the increased diversification of equity risks. Our calculations show that an additional annual 1.4 percentage-point rate in returns would be needed over a period of 15 years. Under the assumption that pension funds invest half of their financial wealth in equity and that risk-free bonds earn a nominal interest rate of 3.5% a year, the equity rate of return would have to amount to 9.3% a year for a period of fifteen years.

Table A2.1. **Key parameter assumptions**

Per year

	2010-11	2012-2024
Price inflation	1.4%	2.0%
Wage inflation	2.4%	3.7%
Nominal interest rate (risk-free)	2.9%	3.5%
Nominal return on equity	5.9%	6.5%

The heterogeneity of pension funds is taken care of in the model by constructing baselines for five different pension funds. These differ only in the funding ratio and are representative of the five classes defined in Table A2.2. The table also shows the expected development of the funding ratio for these five typical pension funds under the baseline scenario. Four out of the five fund-types are expected to meet the minimum reserve requirement (a nominal funding ratio of at least 105%) by the end of 2011. However, after 15 years, under the baseline scenario, only one of them (covering only about 5% of all members) is expected to achieve a real funding ratio of 100% (nominal funding ratio of 145%). Thus, about 95% of members can expect that additional measures are needed if their funds are to achieve full funding of their real pension obligations in 15 years.

Table A2.2. **Funding ratios, full indexation scenario**

End of year	Number of funds	Pension liabilities (EUR billions)	2010	2011	2013	2015	2020	2024
Group 1 (<100)	41	46.4	97	98	100	101	101	101
Group 2 (100-110)	150	357.5	107	109	111	112	112	113
Group 3 (110-120)	115	118.4	117	119	122	122	124	125
Group 4 (120-130)	35	37.2	127	129	132	133	135	138
Group 5 (>130)	39	31.5	138	140	143	144	147	150
Average	380	591.0	111	113	115	116	117	118

Source: The Nederlandsche Bank and own calculations.

Policies to restore solvency ratios

The simulations below evaluate different instruments that the pension funds could use to restore a 100% real funding ratio within 15 years (for a similar analysis see Van Ewijk, 2009).

Scenario 1: Applying conditional indexation

This scenario assumes that pension funds implement no recovery measures, but apply an indexation ladder. Many funds apply a rule where there is no indexation of pension rights if the funding ratio is below 105%, full indexation if the funding ratio is above 130% and partial indexation in between. On average, the indexation ladder alone does not achieve full funding of pension liabilities in 15 years, despite the loss in accrued pension rights via the accumulated 5% indexation cut. Full funding in this scenario can only be achieved if the pension contribution rate is also increased by 3.1 percentage points (Table A2.3).

Table A2.3. **Conditional indexation scenario**

	2009	2010	2011	2013	2015	2020	2024
Increase contribution (% wages)	-	3.1	3.1	3.1	3.1	3.1	3.1
Indexation cuts (% pension rights)	-	1.1	1.1	0.9	0.4	0.0	0.0
Funding ratio (end of year)	109	114	118	125	130	138	145

Scenario 2: Writing off on the value of pension rights

In this scenario, the nominal value of pension rights is reduced through an immediate write-off. Economically, this instrument differs from the indexation instrument in the balance between new rights and old rights. An immediate write off of the value of pension rights implies no effect on new rights. An immediate write-off of 17.5% of pension rights is sufficient to bring back the funding ratio back to the 145% level in 15 years (Table A2.4).

Table A2.4. **Immediate write off scenario**

	2009	2010	2011	2013	2015	2020	2024
Increase contribution (% wages)	-	0.0	0.0	0.0	0.0	0.0	0.0
Indexation cuts (% pension rights)	-	17.5	0.0	0.0	0.0	0.0	0.0
Funding ratio (end of year)	109	135	137	140	141	143	145

Scenario 3: Raising employee contribution rates

Contributions to supplementary pension schemes are paid in the Netherlands by employees and employers in the proportion 1:2. To secure full funding, the employees' contribution rate has to be increased by 4.6 percentage points, to 17.0%, for 15 years (Table A2.5). This increase is larger than the hike in the early 2000s, reflecting (partly) a smaller contribution base (Figure A2.2).

Table A2.5. **Employee contribution scenario**

	2009	2010	2011	2013	2015	2020	2024
Increase contribution (% wages)	-	4.6	4.6	4.6	4.6	4.6	4.6
Indexation cuts (% pension rights)	-	0.0	0.0	0.0	0.0	0.0	0.0
Funding ratio (end of year)	109	113	116	122	126	136	145

Scenario 4: Raising employer contribution rates

An alternative is to raise the contributions paid by employers. From the point of view of the pension fund there is practically no difference with respect increasing the employees' contribution rates as discussed above.

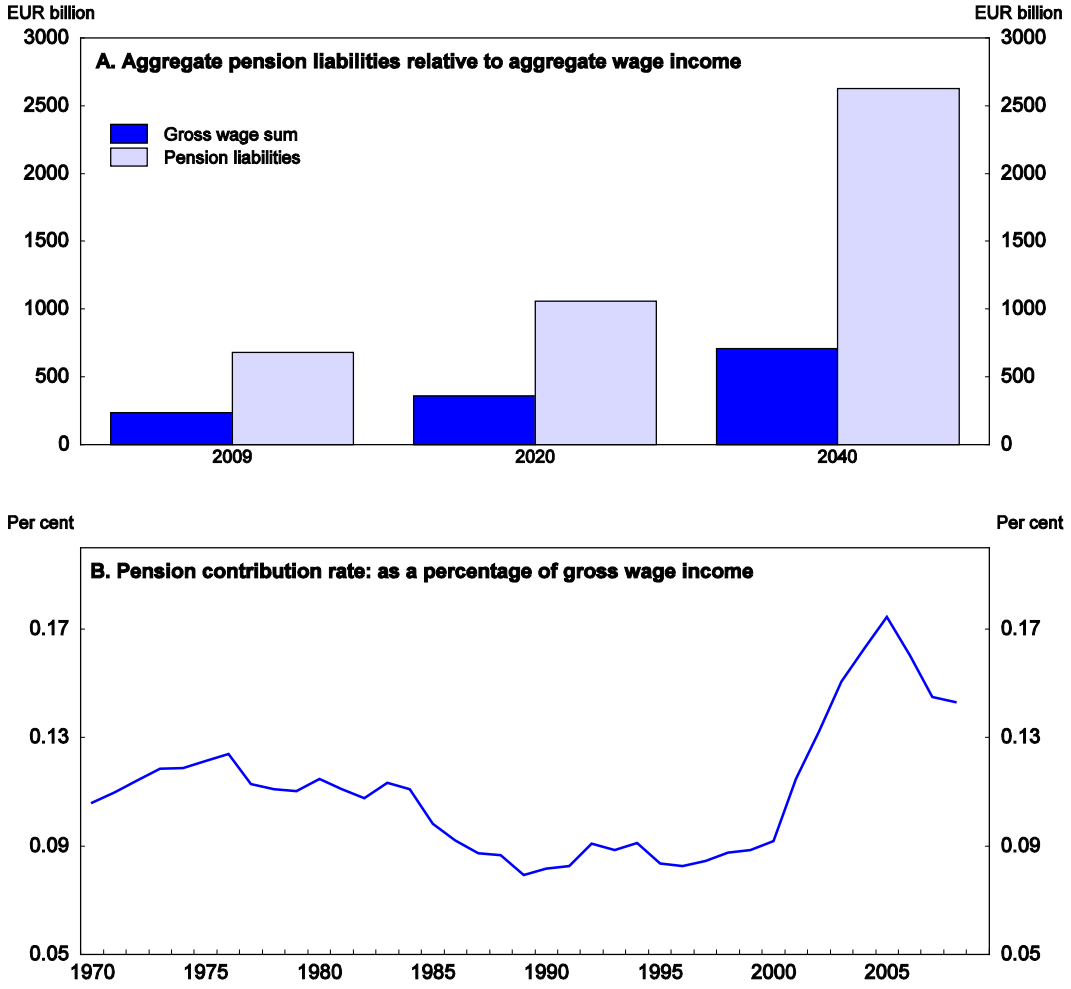
Scenario 5: Reducing the indexation of pension benefits and pension rights

This scenario shows that the indexation of pension benefits and accrued pension rights has to be reduced by 1.53 percentage points a year for 15 years for all active and non-active members of the pension fund. Since lower inflation is assumed for 2010, the indexation is negative that year. From 2012 onwards, full indexation amounts to an increase of pensions of 3.2% a year, so indexation amounts to 1.7 percentage points per year (Table A2.6). Over 15 years, these indexation cuts sum up to the same 17.5% as in the immediate write off scenario.

Table A2.6. **Reduced indexation scenario**

	2009	2010	2011	2013	2015	2020	2024
Increase contribution (% wages)	-	0.0	0.0	0.0	0.0	0.0	0.0
Indexation cuts (% pension rights)	-	-0.2	0.2	0.9	1.7	1.7	1.7
Funding ratio (end of year)	109	111	113	117	121	133	145

Figure A2.2. **Pension and wage incomes**



Source: Bank of Netherlands.

Scenario 6: Raising the pension entitlement age

This scenario implies a lower accrual rate for building up pension rights from 2010 onwards, but with an unchanged contribution rate. This leaves pensioners with the same pension rights as in the other scenarios, but they have to work 4 years longer to achieve the 100% real funding ratio in 15 years (Table A2.7).

Table A2.7. **Retirement age scenario**

	2009	2010	2011	2013	2015	2020	2024
Increase contribution (% wages)	-	0.0	0.0	0.0	0.0	0.0	0.0
Indexation cuts (% pension rights)	-	0.0	0.0	0.0	0.0	0.0	0.0
Funding ratio (end of year)	109	112	115	121	124	134	144

Scenario 7: Raising the pension entitlement age and writing off on the value of accumulated rights

The last scenario combines an increase of 2 years in the pension entitlement age with an immediate write-off on already accumulated pension rights. The simulations show that to achieve full funding in 15 years, the immediate write-off of pension rights must be 8.2% (Table A2.8).

Table A2.8. **Hybrid: retirement age/write off scenario**

	2009	2010	2011	2013	2015	2020	2024
Increase contribution (% wages)	-	0.0	0.0	0.0	0.0	0.0	0.0
Indexation cuts (% pension rights)	-	8.2	0.0	0.0	0.0	0.0	0.0
Funding ratio (end of year)	109	122	125	129	132	138	145

Macroeconomic impact

The main short-term macroeconomic impact of the different measures is to depress private consumption and thus economic activity. Other effects include changes in the relative prices between capital and labour, affecting investment and external competitiveness. However, these are likely to be relatively small and tend to be reversed over the longer-term as the labour market clears. The private consumption response differs importantly between different scenarios (Table A2.9):

- In the immediate write off scenario, consumption declines relatively strongly because of an immediate cut in pension incomes and in future pension rights.
- In the higher employees' contributions scenario, the consumption response is slightly weaker than in the immediate write-off scenario, mostly reflecting that the higher contributions only affect the income of working cohorts. This group has a lower consumption propensity than pensioners because of more possibilities to spread out the associated wealth losses over their life cycle. The fall in private consumption can be larger if the higher contributions reduce labour supply incentives.
- In the higher employers' contribution scenario, the decline of consumption will be weaker than for higher employees' contribution, as the higher contributions fall on capital income, which is partly owned by non-residents, implying that part of the decline of consumption is exported abroad. However, increasing employer contributions increases labour costs for employers and reduces labour demand, leading to, at least temporarily, an increase in unemployment and an additional depressing effect on consumption.
- The reduced indexation scenario integrates the immediate write-off scenario (through its reduction of the value of accumulated pension rights) and the employee contribution scenario (through a similar increase in the wedge between pension rights and contributions). However, the short-term effects are modest as pension incomes are only reduced gradually over time.
- The increased retirement age scenario is similar to the higher employees' contribution scenario, as both have a similar increase in the wedge between pension rights and contributions for 15 years. However, in the short-term it is unlikely that myopic households take into account the lower build up of pension rights in their consumption decisions. In the longer run, myopic will play no role.

In the longer term, the growth effects are related to changes in the incentives to participate in the labour market. This does not exclude short-term effects, such as reduced labour demand that leads to (temporary) increases in unemployment, but implies only that the labour market are assumed to clear over the longer term. These effects fall into two distinct groups:

- The scenarios that raise contribution rates or reduce the accumulation rate of future pension rights weaken the incentives for labour supply, as the increased wedge between pension rights and contributions induces workers to spend less time on the labour market. However, if the longer contribution period is accompanied by an increase in the retirement age in the state pension system, then the labour supply effects are mitigated and likely to be reversed.
- The immediate write off scenario does not change the wedge between future pension rights and pension contributions and therefore does not change labour-supply incentives.

A note of caution is that higher contribution scenarios could lead to higher structural unemployment through the increased wedge between net wages and gross labour costs – as observed in many OECD countries. The reduced indexation of future pension right scenarios also creates a wedge between net wages and gross labour costs by reducing the value of delayed wage income, possibly leading to higher unemployment. Only scenarios that rely on reduced indexation of already accumulated pension rights escape such permanent unemployment effects.

The above discussion has assumed that changes in private wealth have no impact on labour supply decisions, which is in line with empirical studies. However, all the scenarios assume a loss of private wealth of about EUR 175 billion. Thus, it cannot be ruled out that this wealth loss is sufficiently large to induce an increase in the labour supply, mitigating or reversing the negative long-term effects on the labour supply. On the other hand, recent literature on behavioural economics suggests that people tend to discount information that relates to the (distant) future. To the extent that this is true, the calculations presented here overestimate the decline of consumption on account of a decline of future pensions or an increase of future pension contributions. In particular, if households are myopic then an increase of the pension entitlement age would have more favourable labour market consequences than the simulations suggest. Along similar lines, the immediate write-off pension rights may boost household savings more than warranted on the basis of wealth and income factors.

Table A2.9. **The macroeconomic effects of the different scenarios**

	2010	2011	2013	2024
Scenario 1: Applying conditional indexation				
Private consumption (%)	– 0.5	– 0.9	– 1.1	– 1.1
GDP (%)	– 0.1	– 0.3	– 0.5	– 0.1
Labor supply (%)	0.0	– 0.1	– 0.2	– 0.2
Unemployment (% level)	0.0	0.1	0.2	0.0
Scenario 2: Writing off on the value of pension rights				
Private consumption (%)	– 0.9	– 1.3	– 1.5	– 1.2
GDP (%)	– 0.3	– 0.4	– 0.5	0.0
Labor supply (%)	0.0	0.0	– 0.1	0.0
Unemployment (% level)	0.1	0.2	0.2	0.0
Scenario 3: Raising employee contribution rates				
Private consumption (%)	– 0.8	– 1.4	– 1.5	– 1.1
GDP (%)	– 0.2	– 0.5	– 0.8	– 0.3
Labor supply (%)	0.0	– 0.1	– 0.4	– 0.3
Unemployment (% level)	0.1	0.2	0.3	0.0
Scenario 4: Raising employer contribution rates				
Private consumption (%)	– 0.2	– 0.2	– 1.2	– 1.1
GDP (%)	– 0.3	– 0.6	– 1.4	– 0.3
Labor supply (%)	– 0.1	– 0.2	– 0.3	– 0.3
Unemployment (% level)	0.5	0.7	1.0	0.0
Scenario 5: Reducing the indexation of pension benefits and pension rights				
Private consumption (%)	0.0	0.0	– 0.1	– 1.2
GDP (%)	0.0	0.0	0.0	0.0
Labor supply (%)	0.0	0.0	0.0	0.0
Unemployment (% level)	0.0	0.0	0.0	0.0
Scenario 6: Raising the pension entitlement age				
Private consumption (%)	0.0	0.0	– 0.1	– 1.2
GDP (%)	0.0	0.0	0.0	0.0
Labor supply (%)	0.0	0.0	0.0	0.0
Unemployment (% level)	0.0	0.0	0.0	0.0
Scenario 7: Raising the pension entitlement age and writing off on the value of accumulated rights				
Private consumption (%)	– 0.5	– 0.7	– 1.8	– 1.2
GDP (%)	– 0.2	– 0.2	– 0.3	0.0
Labor supply (%)	0.0	0.0	– 0.1	0.0
Unemployment (% level)	0.1	0.1	0.1	0.0

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