

**Denmark: Financial Sector Assessment Program—  
Technical Note—Pensions with Profit Contracts**

This Technical Note on Pensions with Profit Contracts for Denmark was prepared by a staff team of the International Monetary Fund as background documentation to the Financial Sector Assessment Program with the member country. It is based on the information available at the time it was completed in September 2006. The views expressed in this document are those of the staff team and do not necessarily reflect the views of the government of Denmark or the Executive Board of the IMF.

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Price: \$18.00 a copy

**International Monetary Fund  
Washington, D.C.**



FINANCIAL SECTOR ASSESSMENT PROGRAM

DENMARK

TECHNICAL NOTE

PENSIONS WITH PROFIT

CONTRACTS

SEPTEMBER 2006

INTERNATIONAL MONETARY FUND  
MONETARY AND CAPITAL MARKETS DEPARTMENT

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## EXECUTIVE SUMMARY

**The Danish life insurance and general pension fund industry is well-developed.** It is an important and integral part of Danish social policy, which is promoted by taxation rules. The industry is quite concentrated. The business model of offering guaranteed rates is only gradually changing with the introduction of unit link products whereby the policy holder carries the risk. Most companies are still offering guaranteed returns, although at levels that reflect current market conditions.

**The Danish life insurance and pension sector is sensitive to a range of risks on both the asset and liability side of the balance sheet.** One of the principal vulnerabilities for the sector arises out of the requirement to achieve a high guaranteed return for the duration of “in-force” policies, which may span several decades, in an environment where higher returns are more difficult to achieve and there is mortality risk.

- The main consideration is that the sector remains susceptible to low interest rates, and also to other market risks, including low equity and property prices.
- The mortality risk arising from the liability side of the balance sheet is also an issue, as Denmark, similar to other countries, experiences increased longevity.

**Although several measures have been implemented to increase provisions and capital, and for hedging interest rate risk through derivatives, the overall risk in the pension sector still needs to be closely monitored.** In a scenario with an overall negative development in the financial markets and associated low returns on investments, along with changes in longevity, the level of provisions and buffer capital in the life insurance and pension sector will be vital. The range of risk factors places an important premium on sound risk management by life insurance institutions and effective oversight by supervisors.

## I. INTRODUCTION

1. **This technical note focuses on the implications of the commitment of life insurance companies and pension funds to pay returns exceeding the current yields on government securities.** It briefly describes the life insurance and pension industry in Denmark; reviews the measures the Danish Financial Supervisory Authority (DFSA) has used to address guaranteed high yields in a low yield environment; and encourages the authorities to continued diligence.
2. **Internationally, many life insurance companies are facing challenges similar to those in Denmark.** The DFSA has addressed these proactively, as described in this note, by applying measures also used in other countries (Box 1). Nevertheless, continued diligence is warranted, particularly since the same business model—guaranteed returns, although at a lower level—is still being used without explicitly pricing the implied options.
3. **The Danish life insurance sector is dominated by a relatively small number of groups and the major insurance products are with-profit pension schemes.** These products have similar characteristics to those sold in a number of other countries with minimum guaranteed rates of return. In all such cases the pension suppliers suffered financial stress during the equity price downturn of recent years and in the low interest rate environment. The Danish life insurance industry has historically produced adequate profits, but the dominance of the guaranteed life products and the associated asset-liability matching concerns have rendered results contingent on asset-side performance.
4. **The note is structured as follows.** Following the Executive Summary and this introduction, section II briefly describes the life insurance products, the guaranteed returns, and the distribution of profits. Section III reviews the investment policies. Section IV discusses the asset/liability sensitivity. Section V reviews the solvency level in the life insurance industry and its buffer capital. A brief description of the structure of the life insurance industry, including pension funds, is provided in Appendix I.

## II. PENSION PRODUCTS

5. **The life insurance companies and general pension funds are mainly providing a supplementary pension—a mandatory pension scheme for employees, where the major products are traditional life annuities with a guaranteed interest rate.** The contribution (premium) from each of the employees is used to buy a fully paid up pension benefit each year. The size of the benefit is dependant on age, sex, retirement age, the level of guaranteed interest rate, and the contribution. For the mandatory pension schemes that are part of the labor market agreements, the typical contributions rates are 12 to 17 percent of the wage, split between the employer and employee.

## Box 1. Selected Options to Address Contracts with a Guaranteed Yield

Measure	Impact of Measure	Comments
<i>Old contracts with high yield commitments—existing business</i>		
Adjust methodology, require additional technical reserves, or ultimately more capital to increase the cushions.	Will increase costs for companies if additional requirements are excessive. Can be imposed by the regulator if companies do not react in a timely manner.	The DFSA has introduced stress test—the traffic light system—and fair value accounting on all assets from 2002 and on liabilities from 2003 to assess the capital adequacy.
Hedge exposures.	A market based approach, but it can become very expensive if done at a late stage.	Encouraged by the DFSA and widely used by the industry.
Allow riskier investments with higher expected returns not fully compensated by higher solvency requirement.	While higher expected returns on average might allow companies to “grow out of their problems”, but the risk of a failure is also increased.	In 2000, the DFSA eased the limit for investing in equities. Larger risks are allowed if more capital is available.
Changing the bonus allocation between policy holders and the owners of the company.	While policy holders any time take priority, there may be unclear legal implications before various cushions are fully utilized.	May be a breach of the contract.
Reducing the yield to below the guaranteed yield due to force majeure.	While saving the company, although in the policy holders’ interest, it also breaches the contract if there are no pertinent force majeure provisions in the contract. The actuary would also have to be satisfied that “policyholders’ reasonable expectation” has been met. If the guaranteed yields were not realistic at the time of sale, this could also be a potential mis-selling issue.	Not allowed in Denmark—would be challenged in court. Japan has allowed individual companies to apply for lowering guaranteed yields, but none have so far applied.
Separate policy statutory funds for new and old contracts within same company.	This would explicitly limit the risk to the old contracts. The statutory fund concept must be entrenched in the legislation or risk being challenged by liquidators in the event of insolvency.	Used in Denmark. Some companies prefer separate companies because legal framework is clearer. Statutory fund concept is also accepted in, e.g., Australia and Singapore.
Separate company for new and old contracts	Same as above, but clearer legal framework.	Used by some Danish companies.
Breaching the contracts, which would require amending the legislation.	While saving the company, which is in the policy holders’ interest, it also breaches the contract. Different groups of policyholders/fund members joining at different time have different interests. There is a need to balance the conflicting interests of various stakeholders. While legislation might be introduced to over-ride contractual rights, the reputational risks for the insurance/pension industries are not to be under-estimated.	This has complicated legal implications and legal counsel should be sought to clarify the implications and viability of this approach. The amendment itself may raise constitutional issues.

**Box 1. Selected Options to Address Contracts with a Guaranteed Yield (concluded)**

Voluntary portfolio transfer as a going concern.	This is as costly as buying a hedge and the company loses franchise value. Policy holders will be affected and will usually have to give their permission, since the new company only is required to observe the letter of the contract.	In Australia and Japan, for instance, policyholders' consent is required for transfer of business.
Run-off a portfolio, while technical reserves are adequate to cover losses.	Company stops this line of business affecting its reputation. Policy holders will be affected, since new company only required to observe the letter of the contract. In the absence of a transfer of business, the run-off could be administered in the same company.	
Winding up: transfer to the insurance protection fund when technical reserves are inadequate.	The insurance protection fund will cover deficiency. Policy holders will be affected, since the protection fund is only required to observe the letter of the contract. There may be limits on the payouts, e.g., 90 percent of the policy benefits (defined in the rules of the policyholders' protection funds).	As in most countries, there is only a nonlife insurance protection fund in Denmark.
Bankruptcy: technical reserves are inadequate.	Owners of company will lose all or part of their share capital. Policy holders may be covered by insurance protection fund or without such a fund, lose their coverage and long term savings and retirement funds.	
<b><i>New contracts—new business</i></b>		
No guaranteed yield.	Unit linked products, where policy holder carries investment risks.	In Denmark, this business is still modest, but increasing.
Yield commitment contingent on market developments—basically indexing the guaranteed yield.	This would split the risk, depending on the split of bonuses between the owners and the policy holders.	
Yield commitments at a lower guaranteed rate.	The former problems may still apply if yields decline further. Consideration should be given to price the embedded options.	Used in Denmark—it is a business decision. The products, however, may not be fairly priced if the embedded options are not explicitly valued.

6. **The market for individual life insurance contracts and unit link products from the insurance sector is limited (Table 1).**<sup>1</sup> Unit link products were introduced in the late 1980s, and just recently the market share of unit linked contracts has begun to increase. Some

<sup>1</sup> A unit link product means the policy holder carries the investment risk.



life insurance companies have introduced unit linked products with an embedded zero interest rate option.<sup>2</sup>

**Table 1. Distribution of Different Products of Life Insurance Companies and General Pension Funds, 2000–05**

	Gross Premiums (Percent)			
	2000	2003	2004	2005
With profit contracts—nonlinked	88.1	83.4	82.3	75.7
Term risk	...	1.4	1.7	4.6
Unit linked insurance	...	5.1	6.6	8.8
Unit linked life insurance—with zero percent return option	2.6	1.7	0.9	1.6
Group pension insurance	9.2	8.4	8.5	9.3

Source: Danish Financial Supervisory Authority.

7. **Until mid-1994, life insurance companies and general pension funds mostly applied a maximum technical interest rate of 4.5 percent on the traditional with profit contracts.** In 1994, the rate was lowered by the DFSA to 2.5 percent. In addition, many companies also used this opportunity to change the guarantee from an American option (which can be exercised at any time before or at maturity) to a European style option (which only can be exercised at maturity). In 1999, the maximum technical interest rate was reduced further to 1.5 percent. The agreed guaranteed interest rate applies throughout the life of an in force pension scheme, so that the agreements established up to mid-1994 still yield a guaranteed rate of interest of 4.5 percent. Wage raises are not covered in old contracts with high guaranteed return, but will be covered by new contracts with lower guaranteed returns. This fact eases the problem of fulfilling the high return on “in-force” policies. The technical interest rates are maximum guaranteed rates of interest and the life insurance institutions have been at liberty to create pension schemes based on lower guaranteed rates of interest, or without any guarantee at all.

8. **The guaranteed returns have created challenges, particularly in years with low returns on investments.** This has thus also affected the return on equity of the life insurance and general pension funds (Table 2).

9. **In general, the life insurance companies and general pension funds have only limited opportunities to amend the terms of existing pension schemes, but for new pension schemes, however, there is greater scope for development.** Several companies have already introduced new pension products such as pension schemes based on zero interest guarantees or unit linked schemes. Over time, these new schemes and the run-off of older schemes will lower the overall risk related to the contracts with a high guaranteed return.

<sup>2</sup> The Danish Pension Council has issued a report on unit link in Danish pension funds. It is available only in Danish and is entitled *Pensionmarkedsrådets Rapport om Unit Link I Danske Pensionsordninger*, March 2006. It is available on: <http://www.finanstilsynet.dk/sw20031.asp>.

**Table 2. Return on Equity for Life Insurance Companies and General Pension Funds, 2000–05**

	2000	2001	2002	2003	2004	2005
Return on equity before tax	4.11	-15.96	-12.68	19.66	17.59	17.82
Return on equity after tax	3.94	-14.31	-10.59	18.15	15.91	15.65

Source: Danish Financial Supervisory Authority.

Note: The ratio of profit before/after tax to average equity capital.

10. **In Denmark, profit distribution is based on the so-called contribution principle, on a fair basis, unless the contract states otherwise.** The contribution principle guides the distribution of the realized result between owners and policyholders, and mutually among policyholders. The distribution is based on to what degree the owners and policyholders have contributed to achieving the result. The contribution principle is applied in the same way to the distribution of losses between owners and policyholders. As a consequence, the return on the equity capital is not solely dependent on the result for the year, but is calculated on a residual basis.

11. **The actual bonus to the policyholder is usually also based on the average-return principle.** This means that all policyholders in a life insurance institution receive the same return, irrespective of whether they have individual schemes or labor-market pension schemes. Furthermore, the return is determined on the basis of the company's bonus policy and the development in the investment yield over several years. The actual bonus is thus, in principle, independent of the investment return in the individual year. The average-return principle means that the yield is leveled over time, thereby supporting stable and predictable development in pension and insurance benefits. At the same time, the leveling of the yield means that redistribution takes place between groups of policyholders. This approach could justify dissatisfaction among policyholders with a low guaranteed return.

12. **The owners and policyholders may have diverging interests regarding the distribution of profits in life insurance companies.** On one hand, the owners may be interested in carrying the profit-to-equity capital, while on the other hand, the policyholders may prefer distribution to policyholders. The life insurance companies and pension funds must set up rules for the return on equity. These rules generally comprise two elements, a return that is in line with the yield paid to policyholders and a risk premium that must be reasonable in relation to the risk associated with providing equity capital. The actual profit to policyholders has been equal for all policyholders independent of the level of guaranteed returns.

13. **Presently, there are court cases in progress concerning the distribution of bonus and profits.** These court cases may have an impact on how profits are distributed in the life insurance companies and general pension funds.<sup>3</sup>

14. **Policyholders are allowed to transfer their contracts from one company to another, but are not entitled to undistributed profits (collective bonus reserves).** Accordingly, the level of transfers between companies has been limited, but also because of the high administrative costs charged in the event of transfers. As a result of a report from the Bremer Committee, the life insurance industry has initiated measures to simplify and lower the cost on transfers. Ideally, this would encourage competition.

### III. INVESTMENTS

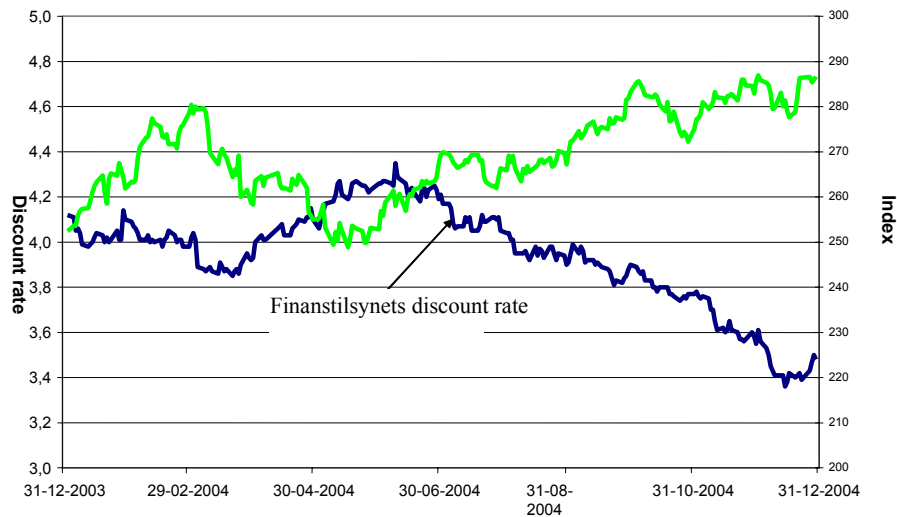
15. **The Danish capital market is well developed and quite efficient.**<sup>4</sup> The bond market is among the largest in Europe, comprising primarily mortgage and government bonds. The Danish equity market is relatively small, but the market capitalization has increased mainly due to booming equity prices. The life insurance companies and general pension funds also invest in foreign financial markets, with 72 percent of the equity portfolios in foreign equities and 28 percent of bond portfolios in foreign bonds.

16. **Danish interest rates have trended downward in recent years, while equity prices have trended upward.** This is illustrated in Figure 1 showing the developments of the DFSA's fixed discount rate (comprising three government bonds) and the Copenhagen Stock Exchange OMXC20 index. The yield on 10-year government bonds, which illustrates the risk-free interest rate, has not been sufficient to cover the guaranteed returns of 4.5 percent in recent years.

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<sup>3</sup> In August 2006, Nordea won a case where two customers argued that the interest guarantee of 4.5 percent was for each year, while Nordea argued that the guarantee covered 4.5 percent on average during the insured period.

<sup>4</sup> See the technical note *Review of the Danish Capital Market*, a part of the Danish FSAP.

**Figure 1. Development in Finanstilsynet's Discount Rate and the OMX Index, 2004**

Source: Danish Financial Supervisory Authority.

17. **The proportion of equities in the investment portfolios showed a growing trend until 1999, whereupon the trend changed toward increasing the bond portfolios (Table 3).** This development was particularly evident in 2001. In 2005 (2004), bonds and equities accounted for 56.2 (61.7) and 15 (13.8) percent, respectively, of total investment assets. The change in the asset mix was mainly due to the need for adjustments to match the investments risk with the interest-rate risk on liabilities, arising from the mismatch between the guaranteed benefits on contracts and the decreasing market interest rate.

**Table 3. Distribution of Investments of Life Insurance Companies and General Pension Funds, 2000–05**

	2000		2002		2004		2005	
	Value	Percent of Total	Value	Percent of Total	Value	Percent of Total	Value	Percent of Total
Land and buildings	3,514	3.0	4,620	3.8	3,825	2.6	4,224	2.5
Investments in subsidiary and associated companies	10,785	9.1	6,179	5.1	8,440	5.8	19,644	11.8
Participating interests	36,630	30.9	14,700	12.2	19,974	13.8	25,113	15.0
Bonds	61,002	51.5	84,769	70.3	89,227	61.7	94,026	56.2
Interests in investment associations	5,692	4.8	7,962	6.6	18,981	13.1	14,773	8.8
Other investments	867	0.7	2,349	1.9	4,195	2.9	9,509	5.7
<b>Total investments</b>	<b>118,490</b>	<b>100.0</b>	<b>120,579</b>	<b>100.0</b>	<b>144,643</b>	<b>100.0</b>	<b>167,289</b>	<b>100.0</b>

Source: Danish Financial Supervisory Authority.

18. **The return on investments fell substantially in the years 2001 and 2002.** However, investment returns increased during 2003–05 as a result of a rise in equity prices (Table 4). Because of the reduced proportion of equities in the investment portfolios, the life

insurance institutions have not taken the full advantage of the favorable development in the equity market. In 2003, the return on investments was above the high guaranteed rate of 4.5 percent. In 2004 and again in 2005, the investment returns were the best during the preceding five year period. Administration costs have been reduced from 6.49 percent in 2001 to 5.33 percent in 2005.

**Table 4. Return on Investments for Life Insurance Companies and General Pension Funds, 2000–05**

	2000	2001	2002	2003	2004	2005
Return on investments before tax	5.65	-1.63	1.77	6.86	10.40	14.25
Return on investments after tax	4.95	-1.20	1.71	6.05	9.11	12.46

Source: Danish Financial Supervisory Authority.

19. **As the life insurance companies and pension funds are large institutional investors in the capital markets, situations could arise where the market would not be liquid enough if there was a sudden need for quick changes in the investment mix.** This is most dominant for the equity market, since the bond market in Denmark is large and relatively liquid. This would especially be a problem for individual securities in the event of solvency problems in one of the larger pension providers.

#### IV. ASSET LIABILITY MANAGEMENT

20. **Since 2000, the DFSA has introduced several measures to make the insurance companies and general pension funds aware of the risks related to the mismatch between assets and liabilities.** The maximum technical interest rate has been lowered several times. In June 2001, reporting according to the “traffic light system” and accompanying additional capital requirements were introduced. Another measure was to introduce fair value accounting on all assets from 2002 and on liabilities from 2003. These measures have resulted in increased provisioning and buffer capital in the insurance sector, as well as a change in the asset allocation. The companies have also increased the level of hedging of interest risk through derivatives simultaneously with the fall in interest rate levels.

21. **The reduction of the maximum technical interest rate has necessitated that the life insurance companies and general pension funds now have schemes with different guaranteed rates of return.** This may lead to conflicts of interest between the different groups of policyholders, as contracts with low guaranteed returns may engage in investments at a higher risk and higher expected returns than contracts with high guaranteed returns. In a situation where market yields are relatively low, the high guarantees will stimulate investment in bonds rather than equities in order to ensure that the guaranteed obligations are met. This conflict is presently of limited concern, as the results in the life insurance companies and general pension funds over the last two years have proved sufficient to provide a return above the 4.5 percent guaranteed return to all policyholders. This matter could possibly change, if returns on investments decrease significantly.

22. **Some life insurance companies and general pension funds have divided their insurance portfolios into policy blocks or transferred portfolios to separate companies**

**based on the size of the guarantees provided.** This makes it possible to draw up an investment policy for each policy block that matches the guarantees given. While not necessary in principle, separate companies help clarify the legal framework and hence reduce the risk for disputes.

23. **It is estimated that over half of the life insurance companies and general pension funds liabilities are still based on the high maximum technical interest rate of 4.5 percent (Table 5).** The volume in pension schemes based on guarantees of 4.5 percent is still increasing as a result of the accrual of interest and current payments, although wage increases will be covered by new contracts with lower guaranteed returns. The level of interest rates was considerably higher in the early 1980s than today. The guaranteed return was thus far below the level of interest rates in the market and probably functioned more as a basis for calculation to illustrate the development in policyholders' savings. However, the development in the level of interest rates has made fulfilling the guarantees a challenge to the life insurance companies and general pension funds.

**Table 5. Pension Liabilities Distributed on Interest Rate Guarantee Levels**

	0 Percent	0 - 2 Percent	2 - 4 Percent	over 4 Percent
Life insurance companies	3	25	20	52
General pension funds	2	12	31	55

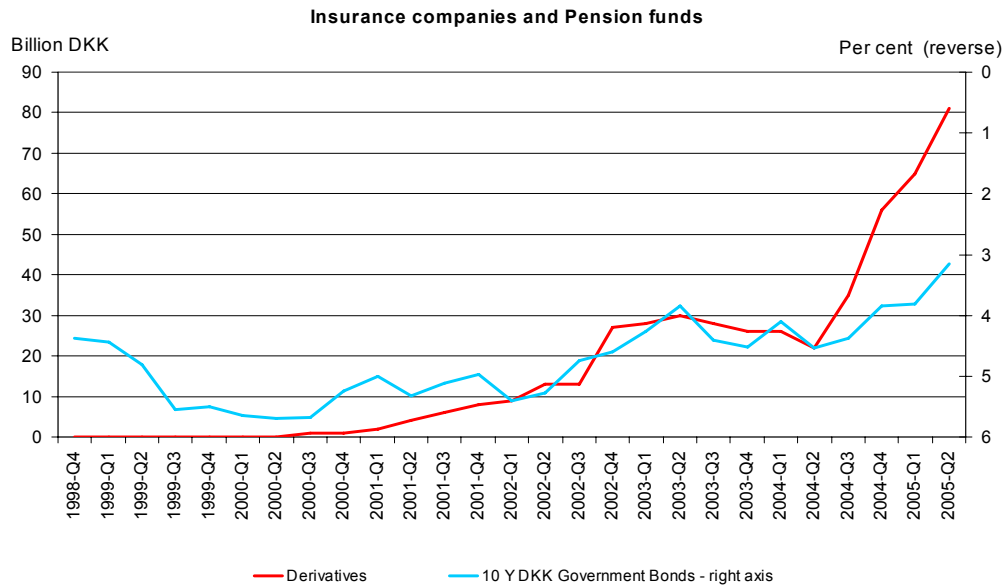
Source: Danish Financial Supervisory Authority.

24. **In recent years life insurance companies and general pension funds have hedged all or part of the interest-rate risk via financial derivatives (Figure 2).** Several companies also use financial derivatives to hedge other types of risks. Figure 2 shows the development in the level of derivative contracts in the life insurance sector compared to the changes in interest rate. Hedging by Danish life insurance and pension funds began relatively early, while buying similar hedges at today's prices would be much more expensive.

25. **The use of derivatives to cover interest rate exposure is significant.**<sup>5</sup> The liabilities are sensitive to the guaranteed returns, while the assets are also affected by the typically large share of Danish callable mortgage bonds. Figure 3 illustrates the extent to which the use of derivatives has changed the interest sensitivity of the Danish life insurance and pension industry. However, note that the lines are extrapolations between four calculated points; hence, in practice, the lines may not be as smooth as shown in Figure 3.

<sup>5</sup> See, *Use of Derivatives to Hedge Embedded Options: The Case of Pension Institutions in Denmark* by Jeppe Ladekarl, Regitze Ladekarl, Erik Andersen, and Dimitri Vitas, World Bank Working Paper, forthcoming.

**Figure 2. Development in Interest Rates and Volume of Derivative Contracts, 1998–2005**

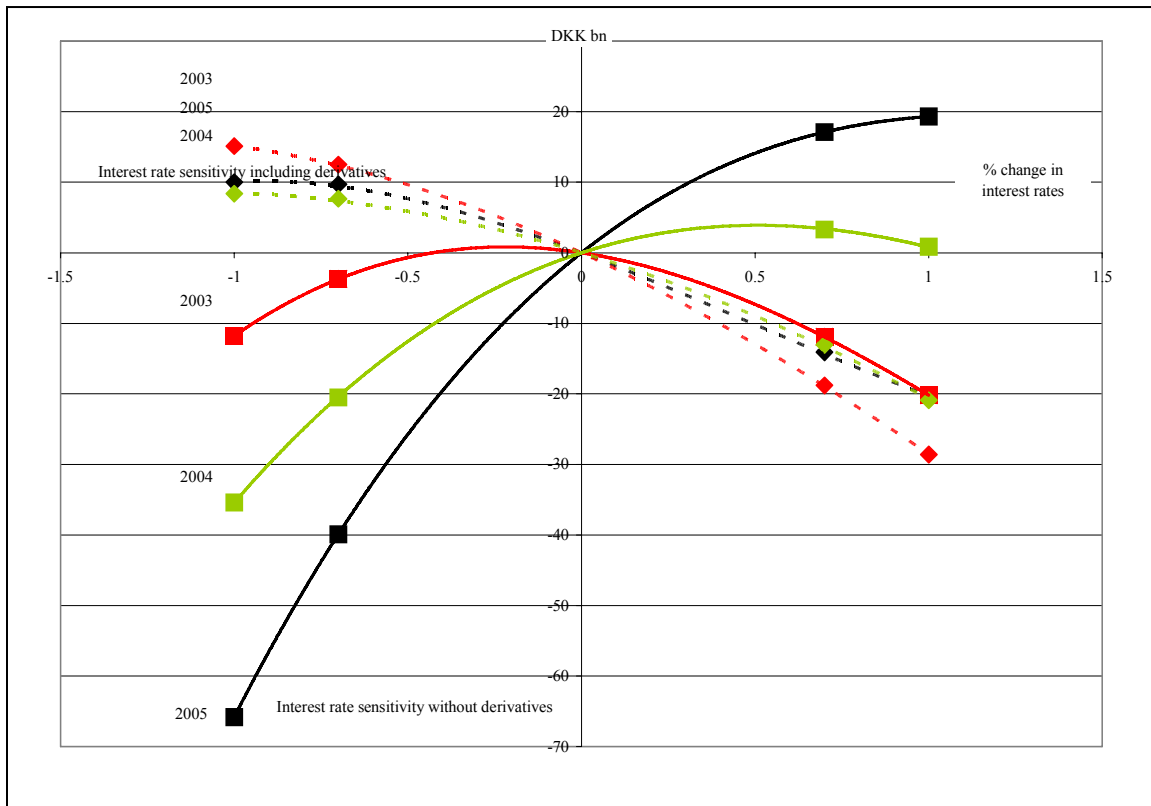


Source: Danish Financial Supervisory Authority.

### Sensitivity test

26. **In 2000, the regulatory limit for investments in equities was raised to 70 percent of the technical provisions, on the condition that the match between the assets and the liabilities of the industry should be improved.** In Spring 2001, Finanstilsynet calculated the effect of a negative market development for each life insurer and pension fund, and the companies not being able to cope with the stress test, were asked to comment on their financial position. Approximately 35 undertakings were unable to cope with the simulated adverse market development. In June 2001, after negotiations with the industry and as one of the first Nordic supervisors, Finanstilsynet introduced the red and yellow light stress test scenarios for life insurers and pension funds.

**Figure 3. Net Interest Rate Sensitivity With and Without Derivatives, 2003–05**



Source: *Use of Derivatives to Hedge Embedded Options: The Case of Pension Institutions in Denmark* by Jeppe Ladekarl, Regitze Ladekarl, Erik Andersen, and Dimitri Vittas, World Bank Working Paper, forthcoming.

27. **The red light scenario is a decrease of 12 percent in the price of stocks, a decrease of 8 percent in the price of real estate, and a change of the interest rate level of 0.7 percentage points.** The technical provisions are discounted based on a risk-free interest rate curve (i.e., a EURO-swap curve). A change in the interest level of 0.7 percentage points will also change the value of the technical provisions. Credit and foreign exchange risks are stressed as well. Companies and funds report the result of the stress tests biannually. If a company cannot meet the red scenario, the DFSA will require monthly reporting and the company in question is not allowed to increase the overall risk.

28. **The yellow scenario is an early warning indicator.** The yellow light scenario is a decrease of 30 percent in the price of stocks, a decrease of 12 percent in the price of real estate, and a change of the interest rate level of 1.0 percentage point. In case a company cannot meet the yellow scenario, the DFSA requires quarterly reporting. The traffic light system supplements the solvency margin requirements. As of end-2005, the system flagged only one company (nonlife company) as being under the red light and thus warranted closer monitoring by the DFSA. Six companies were signaled as being under yellow light, suggesting that they could better withstand the combination of shocks.



### Stress test of biometric risks

29. **The DFSA has also introduced a stress test on biometric risks.** All life insurers and pension funds have to estimate the consequences of the changes in the assumed levels of mortality and disability used in the annual report. The test assumes both a decrease and an increase in the mortality intensity of 10 percent. It corresponds roughly to changes in longevity of one year. Furthermore, the test assumes an increase in the disability intensity of 10 percent. The result of these stress tests is required to be disclosed in the annual report.<sup>6</sup>

### V. SOLVENCY

30. **The life insurance companies and pensions funds have three sources of capital that can absorb losses without affecting the guaranteed benefits to policyholders.** They comprise (i) the collective bonus potential; (ii) the bonus potential for fully paid pension benefits; and (iii) the capital/own funds. The two first buffers belong to the policyholders, while the capital/own funds, also comprising equity capital, belongs to the owners. In principle, the bonus potential for fully paid pension benefits cannot be regarded as an aggregate buffer for the entire company, as this bonus potential is related to the individual policy and can only be used to cover negative results for policies within the same portfolio.

31. **The collective bonus potential is the policyholders' collective undistributed reserves against fluctuations in the value of the assets and negative developments in insurance risks and costs.** If the collective bonus potential exceeds what is deemed necessary as a provision against unfavorable developments, distribution must take place to policyholders on an individual basis.

32. **Solvency capital has been quite volatile in recent years, but has since 2003 it has been at 2.6 percent or above (Table 6).** In 2005, 10 percent of the companies with the least capital had a solvency ratio below 1.5—none less than 1.2—and 10 percent of the best capitalized companies had a solvency ratio exceeding 6.4.

**Table 6. Buffer Capital and Weighted Average, 2000–05**

	2000	2001	2002	2003	2004	2005
Solvency ratio in percent	4.2	2.4	2.2	2.6	2.7	2.6

Source: Danish Financial Supervisory Authority.

33. **Four life insurers and general pension funds have not been able to meet the solvency requirements during the last five years.** The capital of these four institutions was successfully restored by restoration plans accepted by the DFSA. Their failures were due to

<sup>6</sup> Note that in a study on mortality assumptions in selected industrialized countries, the difference between the observed future life expectancy of a 65 year old male and the assumed life expectancy was in balance in Denmark, while insurance companies in most other countries assumed a higher than observed life expectancy. See, *Mortality Assumptions used in the Calculation of Company Pension Liabilities in the EU*, Cass Business School.

losses on investments (decrease of equity prices and low interest rates) and were related to a mismatch between interest rate sensitivity on assets and liabilities. All companies have continued their businesses and no direct losses to policyholders or owners were observed.

## Appendix 1. The Structure of the Danish Pension System

34. The Danish pension system consists of a three pillar system. The first pillar is the entitlement of all citizens in Denmark to an old-age pension from the age of 65,<sup>7</sup> and the Danish Labor Market Supplementary Pension Fund ATP scheme. The second pillar is the mandatory labor market pension schemes, the Special Pension Savings Scheme (SP), and the LD Pension Fund. The third pillar is the private and individual pension savings. The old-age pension in the first pillar is funded by taxation and is a “pay as you go” scheme. The other pension schemes are funded.

35. The funded pension schemes are paid by employers and employees without any contributions from the government. However, contributions are tax deductible. There are three main schemes: (i) schemes established by law; (ii) schemes established by agreements between the parties in the labor market; (iii) and individual schemes.

36. The general retirement age is 65 for pillar I pension. However, a number of schemes will include options to early retirement (e.g., from the age of 60). Most pension schemes include a death benefit (lump sum), disability, and old-age/survivor pensions. Furthermore, spouse and child pensions are usual. The options vary among the pension schemes.

37. The funded mandatory schemes ATP, SP, and LD are managed in specific funds. The mandatory labor market schemes are provided by life insurance companies, general pension funds, company pension funds, and credit institutions. The individual pension schemes are concluded in life insurance companies and credit institutions.<sup>8</sup> Table 7 shows total pension savings split on different types of pension providers in Denmark. At end-2004, total assets of these providers amounted to 126¼ percent of GDP.

38. In 2005, total pension assets have grown by almost 17 percent. This is the largest growth in the last five year period. Credit institutions and the ATP have experienced the largest increase, followed by the life insurance companies. The schemes based on law accounts for 22 percent, and the life insurance companies and general pension funds accounts for 62 percent of the total pension assets.<sup>9,10</sup>

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<sup>7</sup> In 2006, a broad political agreement was reached on gradually increasing the retirement and early retirement ages to 67 and 62 years respectively, while linking retirement ages to life expectancy over the longer term.

<sup>8</sup> In 2003, life insurance penetration (direct gross premiums in percent of GDP) was 5.17 percent in Denmark , 2.00 in Finland, 3.90 in Germany, 5.40 in the Netherlands, 2.81 in Norway, 4.58 in Sweden, and 9.76 in the United Kingdom. According to the *OECD: Insurance Statistics Yearbook 1994–2003*, (Paris: OECD).

<sup>9</sup> More detailed information is available on the DFSA’s website: <http://finansstilsynet.inforce.dk/sw1341.asp> and selected key figures are available on: <http://www.finanstilsynet.dk/sw1245.asp>.

<sup>10</sup> Most of the largest Danish insurance companies are listed in ISIS, see: <http://www.bvdep.com/ISIS.html>.

## Appendix 1. The Structure of the Danish Pension System (*continued*)

**Table 7. Pension Assets by Types of Entities, End-2004 and End-2005**

	2004		2005	
	Value of Assets in Billions DKr	Percent of Total Value	Value of Assets in Billions DKr	Percent of Total Value
Life insurance companies	810	43.9	953	44.2
General pension funds	339	18.4	381	17.7
Company pension funds	39	2.1	42	1.9
Credit institutions	244	13.2	298	13.8
ATP	307	16.7	365	16.9
SP	46	2.5	51	2.5
LD	58	3.2	64	3.0
<b>Total</b>	<b>1,844</b>	<b>100.0</b>	<b>2,154</b>	<b>100.0</b>

Source: Danish Financial Supervisory Authority.

### Market Structure—Life Insurance and General Pension Funds

39. At end-2005, there were 36 life insurance companies and 29 general pension funds. Some of these entities are organized as groups, so that there were effectively 18 life insurance companies/pension funds (groups) in 2005. The life insurance companies and pension funds are covered by the same legislative framework. In addition there were 44 company pension funds (Table 8).

**Table 8. Number of Life Insurance Companies and Pension Funds, 2000–05**

	2000	2001	2002	2003	2004	2005
Life insurance companies	63	58	43	41	37	36
General pension funds	31	31	31	30	30	29
Company pension funds	54	50	47	47	44	44

Source: Danish Financial Supervisory Authority.

40. During the last 10 years, there have been a number of new entrants and exits at the level of legal entities. However, most of these entrants and exits have taken place within the various insurance groups due to changes in tax rules. At the level of life insurance groups, the number of companies is largely unchanged. No exits were caused by winding-up or other insolvency procedures. New entrants and exits form part of normal adjustment to market conditions, including mergers. Recently, a couple of general pension funds merged, but the scope for further consolidation of general pension funds depend on the parties in the labor market.

41. The life insurance market is dominated by a few large groups. In 2005, the top 5 companies had a market share of 59.9 percent and the top 10 companies had a market share of 79 percent (Table 9). In the commercial market, the top 5 companies have a market share of 89.2 percent and the top 10 companies had a market share of 99.9 percent.

### Appendix 1. The Structure of the Danish Pension System (*continued*)

**Table 9. Market Concentration Measured by: Life Insurance Companies and General Pension Funds (Gross Premiums in Percent of Total), 2003–05**

	2003	2004	2005
Danica Pension	19.0	17.4	17.6
PFA Pension	17.4	17.2	17.4
PensionDanmark	...	...	9.0
Nordea Pension	8.3	7.9	8.8
Kommunernes Pensionsforsikring	7.6	7.6	7.3
Industriens Pensionsforsikring	5.1	5.2	...
<b>Top 5 total</b>	<b>57.4</b>	<b>55.3</b>	<b>59.9</b>
Industriens Pensionsforsikring	...	...	5.2
SEB Pension (Codan)	4.8	5.0	4.7
Pen-Sam Liv	3.8	3.9	3.8
B&A Pension	3.1	3.5	...
Topdanmark Liv	2.8	3.1	3.1
HTS Pension	2.4	2.6	...
MP Pension	...	...	2.2
<b>Top 10 total</b>	<b>74.4</b>	<b>73.4</b>	<b>79.0</b>

Source: Danish Financial Supervisory Authority.

42. In life insurance and general pension funds cross-border activities are limited, both for foreign insurers operating in Denmark and Danish insurers operating abroad. The major reason for this is the tax legislation, as premiums paid to foreign undertakings according to the tax law are not tax deductible for the insured. However, some life insurance companies are controlled by foreign banks and insurance groups.

43. The major distribution channels are direct sales from the insurer, sales through banks, and sales through intermediaries. For life insurance and pensions, the parties of the Danish labor market as part of the labor market agreements to a large extent, decide the supplier as well as the level of premiums and coverage.

#### Company pension funds

44. There are several private pension funds covering mandatory pension schemes. Company pension funds administer pension schemes for all the employees or a group of employees in a single company, or for all of the employees or a group of employees in companies that belong to the same group. Three company pension funds for the telephone operator TDC account for more than half of the total assets of the company pension funds. The total assets of company pension funds are approximately Dkr 39 billion (about 2 percent of the total pension assets).

#### ATP/LD/SP

45. There are additional funded pension plans established by law, which can be regarded as private pension plans. The largest funded pension plan is the ATP, which is a mandatory scheme for all employees. Contributions are deducted from the salary and paid to the ATP by the employers. The funds are invested and together with the profits, used for annuities for

**Appendix 1. The Structure of the Danish Pension System (*concluded*)**

members from the age of 65. The assets in the ATP amount to approximately DKr 365 billion (almost 17 percent of total pension assets).

46. There are also two smaller supplementary pension plans. The SP is funded with contributions amounting to 1 percent of personal income, but contributions were suspended in 2004 and 2005. The assets of the SP amount to approximately DKr 51 billion (or 2.4 percent of the total pension asset). The LD Pension Fund was established by law at the end of the 1970s and contributions were collected during 1977–79. The government has decided to use the LD as a supplementary lump sum pension upon retirement. The assets of the LD amount to approximately Dkr 64 billion (or almost 3 percent of total pension assets).