POLICY RESEARCH WORKING PAPER 4748

The Market for Retirement Products in Sweden

Edward Palmer

Abstract

Far-reaching changes in the regulation of financial markets and the organization of public pensions in the 1980s and 1990s transformed the landscape for retirement products in Sweden. First, banking and insurance were extensively deregulated in the 1980s, while the securities markets experienced major expansion. Insurance received a large boost from the authorization of unit-linked products in the early 1990s. Second, the public pension system was reformed. Survivor benefits for widows were eliminated from the public pillar in the late 1980s, leading to a large increase in demand for term life insurance. The old defined benefit public pension system was replaced by a notional or nonfinancial defined contribution (NDC) scheme, while a funded defined contribution (FDC) component was also created in the public pillar. The four occupational pension funds that cover the majority of Swedish workers were also converted into FDC schemes. This paper reviews the implications of these changes for the Swedish annuity market. It discusses the regulation of payout options in Sweden, highlighting the compulsory use of life annuities in the public pillar and the preference for term annuities in the occupational funds. It examines the performance of providers of retirement products, including the PPM, and reviews the increasing focus on risk-based regulation and supervision. The paper also emphasizes Sweden's success in moving in the direction of increased funding and privatization of old age insurance, while maintaining its basic character as a highly developed welfare state.

The Market for Retirement Products in Sweden

Edward Palmer[1]

Preface

This paper on the market for retirement products in Sweden is part of a broader project on life annuities and retirement products, coordinated by Roberto Rocha, program manager in the unit for Financial Markets for the Social Safety Net, of the Financial and Private Sector Development Vice-Presidency of the World Bank. The project was initiated in 2004 to fill an apparent gap in the pension literature, especially in the literature addressing the payout phase of defined contribution pension systems. Many countries that have implemented systemic pension reforms and introduced private pension systems are now facing the challenge of organizing the payout phase for retiring workers. Organizing the payout phase entails introducing a well-regulated market for retirement products, covering the effective regulation and supervision of retirement products, marketing activities, providers and intermediaries. However, the literature on the payout phase is generally focused on a few countries and topics, and does not address in sufficient detail the institutional and regulatory issues faced by policy-makers in reforming countries.

The World Bank project fills the gap by reviewing in detail a number of representative country cases, including Australia, Chile, Denmark, Sweden, and Switzerland. These countries have large mandatory or quasi-mandatory private pension systems operating primarily on a defined contribution basis and have already entered the payout phase. Moreover, their institutional and regulatory arrangements for the payout phase are different in many aspects, including decentralized and centralized arrangements for the provision of life and term annuities, different menus of retirement products, different approaches to price regulation and risk-sharing, different marketing rules, and different capital rules for providers. Therefore these countries provide a rich variety of experiences and policy lessons for other reforming countries.

Table of Contents

TABLES

FIGURES

1 INTRODUCTION

Beginning with the passage of initial legislation in 1994, Sweden converted its defined benefit public pay-as-you-go pension scheme - dating from 1960 - into a combination of pay-as-you-go notional or non-financial defined contribution (NDC) and funded or financial defined contribution (FDC) schemes. A third component, a defined benefit (DB) guarantee, constitutes the floor of the overall system. NDC and FDC individual accounts were created in the implementation process and in January 1999 all covered participants received their first account statement. Individuals could make their first fund choices in the FDC scheme in 2000 and the first NDC and FDC benefits were paid out in 2001.

The conversion of the earnings-related public scheme from defined benefit to defined contribution set off a chain reaction among occupational pension schemes. This led to the partial conversion from largely non-financial DB to FDC schemes of the major schemes for public sector workers and the full conversion of schemes for private sector workers. These schemes provide supplementary benefits to around 90 percent of Sweden's labor force. In 2006, the last major occupational scheme made this conversion. As a result, within a little more than a decade after 1994, the entire old-age insurance landscape was completely transformed.

This change in the structure of insurance for old age will have major repercussions on the private insurance market in Sweden in coming decades. First, as the public mandatory FDC scheme matures, the overall demand for annuities will increase dramatically. This can be expected to lead to pressure to privatize the present government monopoly in annuity provision. Second, the conversion of occupational pension schemes to funded FDC will create new demand for retirement products. Furthermore, these landmark events are bound to have repercussions on the development of individual voluntary insurance. First, because women live on average around seven years longer than their spouses, one can expect the demand for individual, voluntary insurance to increase. Second, there should be an increasing awareness in general among persons with short earnings careers, for whatever reason, that they may need to supplement their public and occupational benefits with private voluntary insurance to ensure that they have sufficient coverage in old age. Generally speaking, in the future, increasing longevity, better health and the demand for continued, but perhaps more flexible, working arrangements will also create demand for new types of insurance products. All of these factors together can be expected to influence both the scale and types of insurance products demanded and supplied in the future. Finally, the regulatory environment for dealing with financial risks is presently changing and will have to continue to evolve to meet coming developments in the market. This study presents evidence in support of this thesis.

The study begins by acquainting the reader with the institutional framework of the Swedish pension landscape, briefly discussing the process of evolution that has led to an almost complete transition from DB to DC. Following this, the third chapter examines the development of the present demand for retirement products in Sweden. This analysis provides insights into the relation between the scale and composition of the public sector's commitment and the development of private insurance in the past decades. The experience of Sweden can be especially illuminating in understanding how a country can move in the direction of increased funding and privatization of old age insurance, while maintaining its basic character as a highly developed welfare state. The fourth chapter examines the insurance

products available and the market suppliers of these products. The fifth chapter analyzes the management of risks and discusses the structure of financial market supervision in Sweden. The final chapter focuses on conclusions and possible lessons for other countries.

2   AN OVERVIEW OF PENSION PROVISION IN SWEDEN

This chapter provides an overview of pension provision in Sweden. It begins with a brief history, followed by three separate sections devoted to the new mandatory public pension system. Next Sweden's occupational schemes are presented. These provide supplements to the mandatory public NDC and FDC schemes for earnings below the ceiling covered by the public mandate. In addition, they constitute a major and for many participants the only benefit for earnings above the ceiling in the mandatory system. The chapter concludes with a picture of the overall replacement rate for the mandatory and occupational schemes together, followed by some final remarks.

2.1   Brief History of Pensions in Sweden

Occupational pension benefits in Sweden date back to 1770 when the *Riksdag* granted civil servants the right to retire at age 70 with the salary they had prior to retirement. Regulated private pension insurance dates back about a hundred years when, in 1904, Parliament passed Sweden's first regulatory legislation. At the same time a supervisory authority was created to oversee private insurance companies. The next major step came in 1917, when a group of employers established *Svenska Personalpensionskassan* (SPP) to administer their pension plans. SPP remained a leader in this capacity into the 1990s and, following restructuring in recent times, is still an important player in the private insurance market. Pension plans for local government (county and municipality) employees also emerged and by the mid-1940s almost all counties, larger municipalities and towns had pension plans for their employees.[2]

Public pension insurance began with legislation in 1913 creating a *universal* public benefit from age 67 (*folkpension*), which was converted into a universal flat rate benefit in 1948. In 1960 the universal public earnings-related scheme, ATP (*Allmänna tilläggspension*) was introduced. This meant that from 1960 all residents of Sweden were covered by the flat-rate *folkpension* and, in addition, if they had earnings from work, by the public ATP scheme, with a full benefit retirement age of 67.[3] A full *folkpension* required 30 years of residence. A full ATP benefit required 30 years of coverage (contributions) and was based on the participant's best 15 earnings years. In 1976 the full-benefit retirement age was decreased to 65.[4]

With the implementation of ATP in 1960 – which covered old age, disability and survivors – a publicly administered pension fund, the AP fund,[5] was set up. From the outset and for most of the life of the ATP system, the contribution rate was set at a higher level than was needed to cover current payments with the aim of building up a fund. Two reasons were given for this. The first was to counterbalance an expected decline in private saving following the introduction of the pay-as-you-go ATP scheme. The second was to provide a demographic fund for the large cohort of persons born in the 1940s. By 1990 net assets held by the fund amounted to about 40 percent of GDP, could cover about five years of benefit payments, and

---

[2] Palmer and Wadensjö (2004) provide a more comprehensive overview of supplementary pensions in Sweden.

[3] There was an actuarial deduction for early retirement, possible from age 60, and an actuarial increment for late retirement.

[4] The *folkpension* was financed by a combination of employer contributions and general tax revenues and ATP was financed by an employer contribution. *Folkpension* and ATP benefits were price indexed.

[5] The AP fund was actually several funds. Three funds investing in various bonds were initially set up. In 1974 an equity fund was added, which was later joined by a second equity fund. The AP fund system also presently holds the reserves in the new NDC scheme.

were between one-seventh and one-tenth of what was needed to fully fund commitments at the time (Reformed Pension System 1994). In the end, income from fund investments was needed to help finance current payments and projections showed that the fund would be exhausted by around 2010 without dramatic increases in the contribution rate. This is illustrated by the fact that, in 1994, the ATP contribution rate was 13 percent, but a rate of 17 percent was needed to cover exactly that year's current payments (Reformed Pension System 1994).

At the time of the introduction of the mandatory public earnings-related ATP scheme in 1960 there were already earnings-related private occupational plans covering three major groups of employees: civil servants and other state employees, municipal employees, and most privately employed white collar workers. However, blue collar workers were not covered by occupational plans at the time, which was the main political driving force behind the introduction of the ATP scheme. With the introduction of ATP in 1960, existing occupational benefit plans were all converted into benefit plans *supplementing* the public ATP scheme. This round of reforms was completed when in 1974 the blue collar confederation (*Landsorganisationen* – LO) negotiated an occupational supplementary scheme for its members.

The most recent milestone in public pension provision began with the 1994 legislation and conversion of the *folkpension*/ATP system into mandatory NDC and FDC schemes, with, as a consequence, an accompanying shift in the major occupational schemes to FDC. Sweden's new pension landscape is described here.

2.2   *The New Mandatory Public System*

The mandatory public NDC and FDC schemes are financially self-contained insurance systems. By definition, they maintain a fixed contribution rate over all future generations. Of course, an FDC scheme maintains a fixed contribution rate by definition. What is new in the Swedish context is the creation of a pay-as-you-go NDC scheme that over time also maintains a fixed contribution rate on earnings. This means that there is not only a ceiling on individual earnings covered, a micro constraint, but also a macro constraint, as the fixed contribution rate also fixes the percent of the national product mandated to earnings-related public old-age pension commitments.

The macro constraint is achieved in practice in the NDC scheme through indexation and by introducing life expectancy at retirement in the calculation of benefits in both the NDC and FDC schemes. What different cohorts and individuals within these cohorts receive in the form of benefits will be determined by earnings profiles, the rates of return on accounts during years of participation and the development of life expectancy. The move to a DC world shifts more of the responsibility for determining income in old age to individuals, which can be expected to be reflected in future individual labor supply and saving decisions.

The public NDC and FDC schemes cover earnings up to a ceiling, which is indexed yearly with the rate of growth of the nominal per capita covered wage. This means that the real level of the ceiling is preserved over time with respect to an average wage. In 2008, the ceiling was a little over 60,000 USD (using an exchange rate of 6 kronor per USD). There is also a threshold for *covered* earnings, which in 2008 was about 2,900 USD. Contributions are paid on all earnings from employment and income from self-employment between the floor and

the ceiling, with a contribution rate of 16 percent for the NDC scheme and 2.5 percent for the FDC scheme. There is also a guaranteed pension level which is provided in the form of a top-up to the NDC and FDC benefits combined, which can be claimed first from the age of 65, and which is financed with general revenues from the national budget. The NDC and FDC benefits can be claimed with an actuarial deduction from age 61, but the total amount must be great enough so as not to trigger the guarantee at age 65.

The following three sections describe the components of the public scheme in greater detail.

2.2.1 The NDC Scheme [6]

Although the NDC scheme was complete in all details but the construction of its automatic balancing mechanism with the passage of the 1994 legislation, implementation had to wait until January 1999 when individuals received their first account statements. The initial delay was for political reasons as the new Social Democratic government taking office after the autumn 1994 elections gave the party's members a "time out" to communicate the principles of the new reform.[7] Following this, final legislation was written, not only for the NDC and FDC schemes, but also supporting legislation (for the guarantee, the housing allowance available for low income pensioners and revision of the tax code to eliminate the separate deduction for pensioners); new IT systems were created; and historical data were accumulated and used to create the initial NDC accounts.

Like in a financial account scheme, in NDC individuals – and employers on their behalf - pay contributions on all working career earnings during the accumulation phase. These accounts earn an internal rate of return and the account balance is converted to an annuity at retirement, any time from the minimum retirement age of 61. In the NDC scheme contributions go towards paying the benefits of contemporaneous pensioners, as in any pay-as-you-go scheme. The annuity is based on the retiree's account balance and the life expectancy of the retiree's birth cohort at the age of retirement. The individual can claim his or her NDC and FDC annuities separately, at different times, and either for the full or part of the account balance. At the same time the individual may choose to either exit from the labor force or continue to work full or part-time and, hence, pay additional contributions on earnings, which eventually give an incremental benefit.

In addition to earnings, benefits from other forms of social insurance compensating for income loss give entitlements in the NDC and FDC account schemes. The most important of these are unemployment insurance, sickness and disability insurance and benefits paid during parental leave. The national government's contributions to the individual's old age benefit for these periods of compensation are paid into the individual's account from general tax revenues, i.e., from the central government budget.[8] The amounts of these contributions are also noted in the accounts of the respective insurance budgets and are viewed as part of their overall costs. Also, non-contributory credits are given for military service, higher education

---

[6] There are now many references to the Swedish NDC scheme. A generic NDC scheme is presented in Palmer (2006), while Holzmann and Palmer (2006) provide an anthology of papers dealing with the various aspects of NDC schemes, with numerous cross-references to the Swedish case.
[7] Palmer 2002 and Könberg, Palmer and Sundén 2006 discuss the implementation process in depth.
[8] Contributions have an employee and an employer component. The employee component of sickness, parental leave and unemployment compensation is paid by the individual.

and to parents (one at a time) for up to four years after the birth of a child. These too are financed from the central government budget.

Account balances of persons who die prior to the minimum retirement age of 61 are distributed annually on a birth cohort basis to the survivors in the cohort. The NDC benefit is a yearly payment until death determined by dividing the amount on the individual's NDC account at retirement with a so-called annuity divisor, which is determined not only by life expectancy at the time of retirement but also by an imputed real rate of return of 1.6% during the expected life of the annuity. Benefits are price indexed and adjusted further for deviations (positive and negative) in the real rate of growth of the average covered wage from the 1.6 percent real rate of growth assumed in the calculation of the annuity.

The NDC annuity divisor makes the pension system (almost) robust with regard to changes in longevity. But estimates of life expectancy are based on cross-sectional data available at the time benefits are calculated and do not take into account likely future changes in cohort longevity and, as a result, longevity may be persistently underestimated. In an NDC scheme liabilities cannot exceed assets, just as in FDC schemes. In the Swedish NDC framework an automatic balancing mechanism (ABM) is employed to attain this equivalence.[9] When necessary (when liabilities are greater than assets) the ABM adjusts account values of workers and benefits of pensioners with an index based on the deviation of liabilities from assets. The Swedish ABM also adjusts upwards, but only to a level equivalent to the path of the per capita wage indexation index, that is, the level of indexation that would have occurred without the ABM intervention. The balancing mechanism in the NDC scheme resembles the positive/negative bonus system employed by private insurance in Sweden, to be discussed in a later chapter.

2.2.2   The FDC Scheme

The FDC scheme was partially implemented already in 1995, when the first contributions were paid. Money from 1995 and succeeding years was held at the National Debt Office, with a government bond rate of return, until the new system's administrative apparatus was in place. The first individual portfolio choices were made in the autumn of 2000.

The mandatory individual financial account scheme is managed by a separate government agency, the PPM (*Premiumpensionsmyndigheten* – or Premium Pension Authority), which was set up specifically for this purpose. The PPM is the clearinghouse for fund transactions, maintains individual accounts, collects and makes available (daily) information on participating funds, provides other information services to participants, and is the monopoly annuity provider.

Contributions for the financial account scheme are collected together with all other social insurance contributions, including NDC contributions - and taxes in general - by the National Tax Authority. New contributions are transferred to individual accounts annually, after income-tax reconciliation, on average about 18 months after they have been paid. During the interim they are held on an account at the National Debt Office where they earn a bond rate of return.

---

[9] The ABM is discussed in depth in Settergren 2001.

The PPM acts as a broker between participants and the participating private funds. Fund shares purchased with new payments of contributions, fund choices by new entrants, and requests for fund switches are all grouped together and executed jointly on each transaction day by the staff of the PPM. The transactions are registered on individual accounts kept by the PPM. A fund manager's client is the PPM, not the individual participant.

All fund managers, licensed to operate in Sweden and fulfilling the requirements stipulated in the European Commission's UCITS directive (85/611/EEG, including later modifications), are allowed to participate in the PPM system. Fund managers are required to follow the rules and regulations set out by the Swedish Financial Supervisory Agency (SFSA), which supervises the funds. Fund providers must sign an agreement with the PPM, which includes agreeing to provide information upon request, not to charge withdrawal fees, to compute and report on a daily basis fund share values electronically to the PPM, and to provide a periodic report of administration charges.

The agreement that fund managers conclude with the PPM also involves accepting a system of maximum fee charges. What this means in practice is that a fund can levy its normal administrative fee minus a discount that depends on the balance of its PPM assets. Since there are economies of scale in large holdings of PPM assets, the size of the allowable administration fee decreases with the scale of PPM assets managed by the fund. The exact construction of the allowable fees in the PPM system is described in the Appendix (Tables B1.a and B1.b). In 2007, total costs for the scheme amounted to 45 basis points. By around 2020, when the scheme has come much closer to maturity and the initial loan for establishing the business is paid off, total costs are, according to this author's calculation, likely to be around 23-27 basis points, with a higher concentration of PPM money in a smaller number companies (funds) yielding the lower result.

A company registered to do business in the PPM system can provide one or more funds. At the time of this writing, there are over 86 domestic and foreign companies managing around 785 funds. There is a publicly managed default fund (AP7) for non-choosers, which presently holds the assets of around a third of the system's participants, but a smaller percentage of assets, since choosers tend to have higher account balances. Switching is allowed on a daily basis, although switching transactions take around three business days. In 2007 about 15 percent of participants performed one or more switches, with an average of three per year per switching person and a total of 2.6 million transactions. Over 90 percent of switches were performed using the PPM's internet site.

The PPM is the sole provider of annuity products for the public FDC scheme. These are specified in law. Participants can choose between single and joint *life* annuities, which can take the form of fixed or variable rate products. Around 90 percent of PPM pensioners have chosen a single and about 10 percent a joint life annuity. Lump-sum payments or withdrawals over shorter periods than a life are not permitted. A pre-retirement survivor benefit can also be contracted.

If they choose a fixed-rate life annuity, participants turn over their fund balances at retirement to the PPM, which presently enlists the investment services of a publicly managed fund for its bond portfolio and, beginning in 2007, four private funds for managing its equity portfolio. A variable-rate annuity results from leaving the account balance in the individual's chosen private fund, with an annual recalculation of the annuity based on the remaining account balance and the original life expectancy factor. Accounts can also be transferred to spouses, which to date only a few thousand participants have done. Most (about 85 percent) of PPM

pensioners have chosen variable rate annuities. Annual pension amounts are still very small, however, due to the very short coverage time and the gradual transition rules.

In its first year of operation, in 2000, there were 4.4 million participants in the PPM scheme. By the end of 2007 the number had increased to 5.8 million (Table 1). When the scheme reaches maturity, some 8-9 million participants are projected to be covered by the scheme, given present net immigration patterns. Note that individuals retain their balances even after emigrating from the country. At end 2007 there were about 450,000 pensioners in the PPM plan, about a quarter of all pensioners.

The annual flow of new funds into the system has been about one percent of GDP. The overall portfolio's market value fell considerably below its purchase value with the dot.com equity crash in 2001-2002 and did not fully recover until 2005, as Table 1 shows. At end 2007, total assets equaled 308 billion SEK – equivalent to about 10 percent of GDP. The average nominal rate of return from 1995 through 2007 was 5.8 percent (with a rate of inflation of around 2 percent), according to the PPM's Annual Report for 2007. Recall that, until the autumn of 2000 money was invested in government bonds, awaiting the first portfolio choice. This together with the dot.com crash shortly after fund choices were made has undoubtedly held down the average return.

When the first individual portfolio choices were made in 2000, about two thirds of all participants chose funds actively. They chose about 3.4 funds per person. The number of funds held per person has remained slightly above 3 since then. Persons with previous investment experience, higher income and higher education were more inclined to choose, whereas the youngest participants were the most inclined to passively let their money go to the default option (Engström and Westerberg (2003)). About 90 % of all PPM funds were originally invested in equities. The percentage has fluctuated since then, dropping as low as 70 percent with the dot.com decline in equity prices in the early 2000s.

Table 1. Number of participants and assets in the PPM scheme

Year	New entrants	Number of participants	Total assets on December 31. As percentage of GDP	
			Purchase value	Market value
2000	4 400 000	4 400 000	2.5	2.3
2001	493 000	4 900 000	3.2	2.8
2002	196 000	5 100 000	4.0	2.5
2003	150 000	5 200 000	4.7	3.8
2004	129 000	5 300 000	5.3	4.9
2005	117 000	5 410 000	6.1	7.2
2006	114 000	5 570 000	7.4	9.4
2007	133 000	5 840 000	8.5	10.0

Source. The PPM

The number of active choosers among new entrants has steadily declined since 2000 and in 2007 it reached a new low of only 2 percent, following a change in the information procedures of the PPM. The fact that most new PPM participants do not choose funds actively has drawn considerable attention both in Sweden and internationally. Upon closer reflection, however, this is not so surprising since many new entrants are in their teens and early twenties, often students or others with intermittent earnings. In fact, these days, Swedes reach

normal labor market participation at around age 25. Another large group of new entrants are immigrants entering the Swedish labor market for the first time. Participants are not allowed to switch into the default fund, which also means that once participants exit this fund they cannot return, which may also be a deterrent for switching out. It is noteworthy that, to date, the default fund, which has maintained an equity content of around 80 percent, has outperformed the average of all privately managed PPM funds, which for many must provide an incentive to stay. The real test will be to see to what extent new entrants opt out of the default fund as they become older.

2.2.3   The Minimum Pension Guarantee

Of course, for various reasons not everyone will be able to contribute sufficiently to qualify for an adequate earnings related pension. For this reason the safety net in the Swedish public pension system is a guarantee benefit. The pension guarantee is a defined benefit that can be claimed at age 65. It is means-tested against the individual's combined NDC and FDC benefits. It is price-indexed and is financed with revenues from the central government budget. Its real level can be increased discretionarily by parliament, but to date this has not occurred. Figure 1 provides an overview of how the guarantee is constructed. The amount of the guarantee is approximately 30% of the average wage.

Figure 1.. The guarantee pension and its relation to the combined NDC-FDC pension.
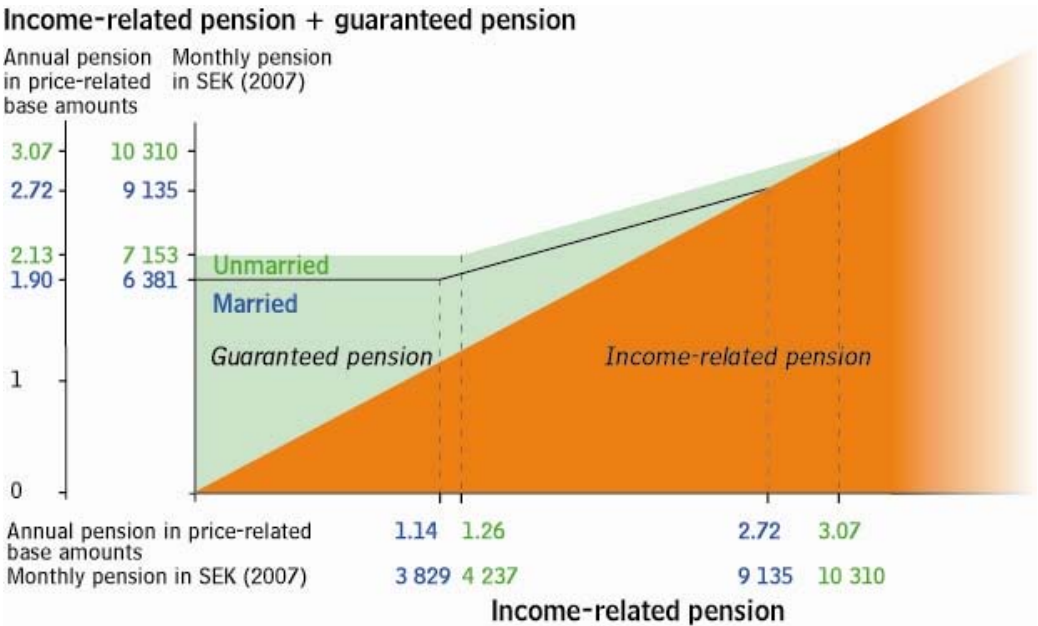
Source: The Annual Report of the Swedish Social Insurance Agency, 2008.

2.2.4   The Public Commitment - Summary Remarks

The conversion of the public pension system from defined benefit to defined contribution put a ceiling on future public sector pension commitments. This is illustrated by the macro-calculations for future pension expenditures performed regularly for the European Commission. According to these, in spite of a continuously ageing of the population,

Sweden's public expenditures on old age pensions will only increase moderately through 2050, from 10.6 to 11.2 per cent of GDP (see Table B2 in the Statistical Appendix to this paper),[10] including an assumption that the level of the guarantee grows at the same real rate as the per capita wage.

Furthermore, the conversion from defined benefit to defined contribution in the main public system sets out clearly where the public commitment to individuals stops. The conversion from a DB to a DC framework means, *ceteris paribus*, that individuals will have to save more on their own or work longer to neutralize the effect of increasing life expectancy on the annuities provided by the public NDC and FDC schemes and the occupational FDC schemes. According to current estimates of life expectancy at age 65, a person born 1970 will live about two years longer than a person born 1940. Assuming the retirement age for the worker born 1940 is 65, then the worker born 1970 will have to work until 66 years and seven months to receive the same annuity in the NDC scheme as the typical wage earner born 1940 – all other things equal. In other words, retirement must be postponed about a year and a half in response to an increase in longevity of two years.

The Swedish public is kept informed about the development of longevity and other developments in an annual report for the pension system published by the Swedish Social Insurance Agency. More importantly for individuals is that they all receive a personal annual pension statement.

2.3   Occupational Pension Schemes

There are four major occupational benefit schemes in Sweden that together cover almost 90 % of all employees. These provide a two-tier supplement to the public system benefits. First, they provide a top-up for covered earnings under the ceiling in the public system, and, second, they provide a "full" benefit for earnings above the ceiling. This section provides a brief summary of changes in occupational benefits. A more detailed exposition is provided in Appendix A.

Table 2 provides an overview of the number of employees covered by each collective agreement. The four major occupational schemes cover the following groups of employees. The SAF-LO agreement encompasses over 40 percent of all employees, working mainly in agriculture, mining, lumbering, industry, trade, transport and communications.[11] The second largest agreement, KAP-KL, covers employees working with health care services, services for the aged and handicapped, other social services and education, police and firemen. All of these are employed by the local governments or county councils. The agreement covering the third largest group, ITP-ITPK, covers most privately employed white-collar workers, excluding persons working in banking, insurance, journalism and architecture. The latter groups have separate supplementary plans. The fourth largest scheme covers civil servants

---

[10] Note that the guarantee is assumed to increase with the real rate of growth from 2010 in these calculations, even though it is indexed to prices according to the legislation. This reflects an assumption that politicians will eventually have to increase its real purchasing power.

[11] The following unions are members of the LO confederation: Construction Workers, Electricians, Painters, Industrial Workers, Workers in the Paper and Pulp Industry, Workers in the Forestry and Lumber Industries, Workers in Retail Sales, Hotel and Restaurant Employees, Workers in Food Processing, Workers in Telecommunications and Public Transport, Goods Transport Workers and Manuel Workers in the Municipal Sector.

and other national government employees. Among the latter are university employees, and persons working in social security, employment and judiciary services.

Table 2. Major Groups Covered by Contractual Benefits in Sweden, 2005

	Number of covered employees	Percent of employed persons
Private white-collar employees, ITP-ITPK	700 000[1]	16.4 %
Employees covered by the SAF-LO agreement	1 831 000	43.0 %
Civil servants and other national government employees, KAP-KL	256 000	6.0 %
Municipal and county council employees	853 000	20.0 %
Insurance and bank employees, architects, journalists	130 000	3.0 %
All covered employees	3 770 000	88.4 %

[1]Figures are for 2004.

Prior to the reform of the public pension system, beginning in 1994, all the occupational schemes provided defined benefits. Only the benefit plans covering the white collar workers, that is, ITP, were financial defined benefit (FDB) plans. The plans for workers covered by the SAF-LO agreement were funded at the time of retirement, while the plans for public sector workers were pay-as-you-go – that is, they were non-financial defined benefit (NDB) plans.

What is important in the present context is that, beginning with the news in early 1994 that the public earnings-related scheme was to be converted to a DC format (originally from 1997), one after the other, all the occupational schemes converted to DC for supplementary benefits under the ceiling for the public commitment. The first to convert were the blue-collar workers, beginning in 1996. The move was completed as the sector scheme for private white-collar employees converted in 2007. There is a period of transition for each major sector scheme, with the longest being for ITP, which only covers (fully) cohorts born 1979 and later.

For private-sector employees, benefits provided over the ceiling have also been converted to DC. However, the schemes for public sector employees still provide pay-as-you-go defined benefits *above* the ceiling, combined in the case of civil servants and other national government employees with a small FDC component. Nevertheless, most employees' earnings are below the ceiling, so as a result of the transition to FDC in occupational benefits, most commitments, including most public-sector employee commitments have become funded.

2.4 *Replacement Rates after the Reforms of the 1990s*

A consequence of the reform of the public pension system and the accompanying reforms of the occupational schemes is that all earnings below the ceiling in the public scheme are covered by defined contribution schemes. The typical employee is covered by three DC schemes, first, the mandatory public NDC scheme with a contribution rate of 16 %, second the PPM managed mandatory public FDC scheme with a contribution rate of 2.5 %, and, third, a quasi-mandatory occupational FDC scheme with a contribution rate of 3.5 – 4.5

percent. The 3.5 % contribution rate is the initial rate for the large LO collective agreement. Note that by the end of 2007 all major collective agreements either had a contribution rate of 4.5 % or had a transition schedule to move to 4.5 % in the future.

Table 3 presents calculations of income replacement rates for a person born 1975, who enters the labor force at age 22 and works all years to retirement at one of the ages specified in the table, with the present unisex life expectancy projection for this birth cohort from the various specified retirement ages. Use of unisex life expectancy is a requirement of a European court ruling for both public and occupational schemes. Note that inheritance gains (account balances of the deceased under the minimum retirement age that are distributed to surviving participants in the insurance pool) are not included in these calculations, which means that benefits are slightly underestimated. Calculations have been performed assuming that the occupational scheme pays a contribution rate of 3.5 %, which is directly applicable to an LO employee.

The results show that the long career worker would have a considerable replacement rate with a 5 % rate of return. The results suggest that coverage is sufficient, even if the worker were to work fewer years than the number (from age 22) assumed in the calculations.

Table 3 Individual Benefits as a Percent of Final Earnings

Age	NDC Contribution rate of 16 %	Public Second Pillar (2.5%) + Group Occupational (3.5%) Return of :			Total. Public PAYG and Second Pillar plus Group Occupational Return of:		
		2%	5%	8%	2%	5%	8%
61	0.32	0.12	0.23	0.47	0.44	0.55	0.79
62	0.33	0.13	0.25	0.52	0.46	0.58	0.85
63	0.35	0.14	0.27	0.57	0.49	0.62	0.92
64	0.37	0.15	0.29	0.63	0.52	0.66	1.00
65	0.39	0.15	0.31	0.69	0.54	0.70	1.11
66	0.42	0.16	0.33	0.76	0.58	0.75	1.18
67	0.44	0.17	0.36	0.83	0.61	0.80	1.27
68	0.47	0.18	0.39	0.92	0.65	0.86	1.39
69	0.50	0.19	0.42	1.01	0.69	0.92	1.51
70	0.53	0.20	0.45	1.12	0.73	0.98	1.65

Calculated for a person entering the labor force at the age of 22 and who works every year until retiring at the age indicated in the table. Earnings grow at a rate of 2 % per year. Indexation in the NDC scheme is also 2 % per year. Unisex life expectancy for a person born 1975 is used to calculate annuity values. The NDC annuity is based on life expectancy and an assumed real rate of annuity growth of 1.6% during the annuity period. The calculations do *not* include a possible increment deriving from the capital of non-survivors.
Source. Palmer 2002.

2.5   *Summary*

In sum, seen in the present context, the reform of the public system had three effects on the development of pension schemes in Sweden. The first was that it set a clear ceiling on the scope of the mandatory public system, establishing the room left for private occupational and individual initiative. Second, the major occupational schemes were converted into DC schemes for the supplements to the public scheme under the ceiling for the public commitment. By 2007, all major occupational pension schemes had been converted from

defined benefit to defined contribution for the supplement they provide for earnings covered under the ceiling in the public system, albeit with transition rules to reach full maturity. The schemes for private (blue and white collar) are also defined contribution for benefits above the ceiling, while the schemes for public sector workers combine a small DC component with a DB component for earnings above the ceiling.

Thirdly, the overall FDC component for the typical employee – whose entire earnings will be under the ceiling for the public system – consists of contribution rate of 6.0 to 7.0 percent (2.5 + 3.5 or 4.5). This will give rise to considerable capital accumulation that will need to be converted into insurance products at retirement. This, in turn, can be expected to stimulate the future development of the annuity market. The next section focuses in depth on the current demand for insurance products and discusses how developments from the mid-1990s are likely to affect future demand.

3 THE DEMAND FOR RETIREMENT PRODUCTS

The point of departure for this discussion of the demand for retirement products in Sweden is a survey of the institutional environment over the past quarter century. The survey identifies and discusses a number of institutional changes that have paved the way for future growth in the magnitude and diversity of privately provided retirement products. The second part of the chapter discusses the factors that affect the demand for private insurance, setting these in a Swedish context, and the third part discusses the role played by various retirement products in the overall income of present pensioners. The chapter concludes with an indication of the outlook for the demand for annuities in the coming decades of the 21st century.

3.1 The Changing Landscape Surrounding Private Insurance

In 2004, 26 percent of the total assets of households were in private individual insurance (Table 4) and about 40 per cent of the population 20-64 years old utilized a tax deduction for payments of private insurance premiums (Figure 2). This has not always been the case. As recently as 1980, private insurance constituted only 9 per cent of the total assets (denoted TA in Table 4) of households, even though for at least the two decades prior to the mid-1980s private insurance provided the best after-tax return among all forms of personal saving (Palmer 1985). Nevertheless, in 1980, only about 4 percent of persons aged 18-64 utilized a tax deduction for premiums paid for private insurance (Jonannisson 2000). Clearly, then, the demand for private insurance has increased substantially in the past couple of decades.

Table 4. The Financial Portfolio of Households, year-end figures

	1980			2005		
	SEK bn	% TA	% GDP	SEK bn	% TA	% GDP
Individual Insurance	34	9	6.0	657	26	24.6
Equities	36	10	6.7	565	22	21.2
Mutual Funds	**	**	**	484	19	18.1
Bank Deposits	182	50	33.5	619	25	23.2
Bonds	43	12	8.0	107	4	4.0
Currency	28	8	5.4	87	3	3.3
Other	44	12	8.0	2	0	0.1
Total	367	100	67.0	2521	100	94.4

Source: Statistics Sweden and Palmer (1985) for 1980 data.

In the 1980s a number of structural changes in the financial market dramatically altered the landscape for individual saving in general and created indirectly a better environment for private insurance. In addition, the 1990s brought structural tax and pension reforms, with direct bearing on the development of contractual saving, as we have already indicated. Here we summarize the most important institutional developments.

Well into the 1980s, the Swedish financial system was constrained by a comprehensive array of quantitative restrictions on bank and insurance company portfolios, such as lending ceilings on banks and portfolio composition requirements for all financial institutions. These restrictions favor investments in bonds at the expense of equities, while interest rates were regulated by the central bank rather than determined by market forces (Gottfries, Persson and Palmer 1989). A general wave of financial liberalization in Europe in the 1980s spread also to

Sweden and after the mid-1980s, most financial market restrictions had been lifted. By 1990, the process of financial deregulation had been concluded.

With financial deregulation, the Swedish stock market began to grow and develop as a major source of risk capital. This was accompanied by strong performance and high rates of return on equities, stimulating public interest in investing in the equity market. These developments had two effects. The first was that the interest of savers was now focused on the stock market with its high returns rather than the insurance market with its more conservative investment policies and illiquid saving. The second was that the development of the stock markets prepared the ground for the introduction of unit-linked insurance, which was to develop into a popular saving vehicle. In addition, deregulation made possible the introduction of financial derivatives, which today constitute an important pillar for the financial market.

The second wave of reforms affected the pension system. A first step in the reform of the public pension system, initiated in the latter half of the 1980s, resulted in a political agreement to abolish from 1990 the publicly provided widow's benefit beginning with the cohort of women born in 1945. Prior to the announcement of this change in the legislation, in 1988, the proportion of persons 20-64 claiming a tax deduction for insurance premiums was increasing, but only slowly. Also, in the early 1980s almost twice as many men as women utilized a deduction. With the announcement and then passage of legislation removing the publicly provided widow's benefit for younger cohorts, the number of persons utilizing a tax deduction to purchase voluntary private insurance increased significantly, beginning with an increase of almost 50 percent in the short period between 1987 and 1990 (Figure 2). Not surprisingly, then, since 1992 more women than men have utilized a tax deduction to purchase private insurance.

The growth in the percentage of the population contracting private insurance continued to be strong through the turn of the century. This occurred despite a reduction in the ceiling on the yearly premium that could be deducted for tax purposes from a little over 11,000 USD to 5,500 USD in 1995 (using an exchange rate of 6 SEK per USD). The ceiling is not absolute, as smaller deductions can be claimed up to a higher absolute ceiling. Using the same exchange metric, the average size of a deduction was 1,560 USD in 1990 (Johannisson 2003). With the decrease in the ceiling and the increase in demand from women with lower earnings the average size of the deduction decreased to 1,000 USD in 2003. (See Appendix Table B3 for more detailed information.)

Table B3 in the statistical appendix provides a detailed picture of the distribution of deductions claimed in 2003 by gender, age and income class. In 2003, in all income classes, more deductions were claimed by women than by men up to the highest income class with income of 1 million kronor (167,300 USD) and over per year. In the income class above 1 million kronor men dominate. In income classes up to 1 million kronor, women deduct about the same amount as men on average - or slightly more. In the highest income class, 1 million kronor and above, the average deduction of men is considerably higher than for women, reflecting the fact that the average income of men in this income class is much higher.

Figure 2. Persons utilizing a tax deduction for pension saving.
Percent of all population 20-64.
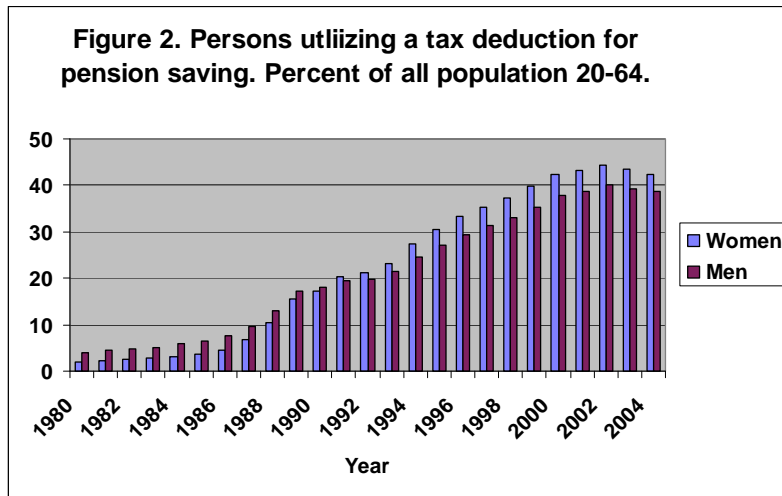
Source: Data from Statistics Sweden.

A third major structural change was a substantial reform of the tax system, which went into effect in 1991. With this reform all forms of saving were given the same income tax status. This improved the relative price of saving in financial instruments compared with borrowing for current consumption or for housing investments. It is noteworthy that individual saving had reached a post-war low at the end of the 1980s, and a major focus of policy in the initial years of the 1990s was on reversing this downward trend.

In 1993, a fourth major change occurred when legislation enabling unit-linked insurance went into effect. Whereas traditional life insurance still followed conservative insurance principles, unit-linked insurance allowed the individual to make his/her own investment choices during the accumulation phase, including choices from among equity funds. Since 1993, an increasing share of growth in the assets of life insurance companies has come through unit-linked contracts.

A fifth legislative change influencing the development of private insurance was the introduction of individual retirement saving (IRS) accounts in 1994. New saving in an IRS account is tax deductible under the same (gross) rule as premiums paid for private insurance. As with private insurance, accounts must be held at least to age 55, and withdrawals must be made over a period of at least five years. Banks and investment funds provide the account services, and the saver can usually choose among a number of alternative funds. Individual retirement accounts are not a perfect substitute for insurance, since they do not cover the risk of longevity, but are more liquid compared to traditional insurance with life annuities. For this reason, they have become an attractive saving form that competes with insurance policies.

A sixth major structural change was the reform of the public pension system, already discussed. The reform of the public pension system, first with the presentation of the proposed framework in 1992 and the ensuing discussion, and then with the presentation of the actual proposal and its passage by Parliament in June 1994, had three important effects on the development of the private insurance market.

First, as has already been discussed, the introduction of defined contribution in the public schemes clearly limited the scope of the public commitment and in doing so focused interest on individual responsibility for retirement. In fact, the public discussion for several years, beginning in 1992, was focused on the reform's "losers", that is, persons with short earnings careers, which may already then have caused additional purchases of private insurance. Secondly, one of the components of the reform was the mandatory financial account scheme itself, which would provide an injection of new money into the market, with the entire working age population as participants. Thirdly, as was discussed in the first section, the reform of the public system led to conversion of a large segment of the quasi-mandatory occupational pension schemes from defined benefit to defined contribution financial account schemes.

Finally new legislation was implemented from May 1, 2008 making it possible to switch providers within the EU for all new contracts and for existing contracts where this is not prohibited by the contract. It is expected that further liberalization will follow enabling freedom of movement even for contracts existing prior to May 2008 that explicitly prohibit switching. The increase in freedom to move between providers can be expected to increase competition for customers through provision of better insurance products with lower administration fees. This should also help spur the development of a more robust domestic annuity market.

In sum, a number of institutional developments, occurring largely from the mid-1980s to the mid-1990s, paved the way for the development of what has become a rapidly expanding market for retirement products in Sweden. The most important institutional change was the pension reform. This encouraged increased voluntary and occupational contractual saving for retirement in general, but also provided a very strong stimulus to saving with investment funds in particular. The latter also benefited from the new mandatory FDC scheme managed by the PPM, the transformed occupational pension schemes and the growth of demand for unit-linked insurance. In conclusion, the reform of the public pension system in Sweden also had far-reaching repercussions for the development of the Swedish financial market.

3.2   *Factors Affecting the Demand for Private Retirement Products*

A point of departure in discussing the demand for annuities is the seminal work of Yaari (1965) which demonstrates that individuals without a bequest motive can best maximize their life consumption in the face of the longevity risk by holding annuity assets. If they also have a bequest motive they will hold a portfolio with both annuity and bequest assets, with the distribution being determined by equating the marginal utility of bequests with that of own consumption. Evidence from a number of countries summarized in Impavido, Thorburn and Wadsworth (2003) indicates that Yaari's prediction from theory is still, however, not borne out in practice. In practice, only a very small proportion of the population purchases private annuities.

The literature contains a number of papers that attempt to shed light on why individuals do not purchase annuities to the extent predicted by theory. The first and most frequently cited reason for the very low level of individual demand for private annuities is that the mandatory system of a country sufficiently fulfills most individuals' needs for longevity insurance. A second reason is that the bequest motive is strong. Annuities can come into conflict with the bequest motive and self-insurance within families. The more general desire to save in liquid assets, which provide flexibility, is a third reason. A fourth, obvious reason is that individuals

may not understand the benefits of annuitization. This is discussed, for example, in Brown (2000). Finally, with both a desire to protect against the longevity risk and to provide bequests, individuals are constrained in trading across states because financial markets are incomplete. This prevents individuals from creating an optimum portfolio. Impavido, Thorburn and Wadsworth emphasize the potential of this shortcoming.

In sum, there are many possible explanations of why demand for private annuities is observed to be low internationally. At the same time, both mandatory pension and financial market institutions are changing rapidly around the world and Sweden, as we have seen, is no exception. As we will argue below, after examining how retirement products are presently utilized in Sweden, the events of the past 10-15 years can be expected to lead to a strong increase in future demand for retirement products provided through the private market.

3.3   Present Level of the Demand for Private Annuities

Ideally, to study the demand for insurance products, we would study data on the prevalence of the different products among recipients, by age, gender and even other variables of interest. Sweden does not collect even rudimentary data on the distribution of insurance products, however. So this is not possible. On the other hand, there is information on the distribution of public, occupational and individual voluntary benefits. We use this data here to examine the role of private voluntary insurance in the retirement income portfolio of individuals needs to be seen in a broader context together with public and occupational pension schemes.

To begin with we can note that the income of Swedes 65 and older is on average 65 percent of that of the average 55-64 years old worker (Table 5). Remarkably, this percentage has remained unchanged for over a decade from 1991 to 2004, apart from a slight improvement in the relative status of persons 75 and older. However, due to the relative weights of the younger and older groups of retirees this change had no effect on the average for all persons 65 and older.

Table 5. Income of persons 65+ as a percent of income of persons 55-64.
Income is measured as equivalent disposable income.

Age	1991	2004
65 – 74	74 %	74 %
75 +	56 %	58 %
65 +	65 %	65 %

Source. See Table B4 in the Statistical Appendix.

It is worth noting that some of the difference between the older and younger pensioners reflects the fact that until 2001 public benefits were only price indexed. With price indexation, as retirees grow older the value of their benefits relative to the earnings of a contemporary worker fall as real earnings of workers increase. [12] As a part of the recent reform of the public

---

[12] If the real rate of growth is 2 % per annum, the relation between the average benefit and the average wage will decline by about 25 %, reducing a ratio of 75 % to 55 %.

pension system, from 2001, there is a positive real growth increment to pensions claimed both under the old and the new rules. When real covered wages grow by more than 1.6 percent, the difference gives rise to real indexation of benefits equal to the difference between 1.6 and the actual rate of growth of the per capita (covered) wage - in addition to normal price indexation.[13] This still falls short of full wage indexation, however.

For all persons 65 and older earnings and entrepreneurial income constitute about 6 percent, capital income 12 percent, pensions 78 percent and housing allowances about 4 percent of total income.[14] Earnings and entrepreneurial income, not surprisingly, are more important for younger pensioners. They constitute about 15 percent of total income for persons 65-69 years old, with a steeply declining profile thereafter. As people age and the importance of earnings decreases, pensions and capital income become the main sources of income.

Table 6 provides data on the distribution of individuals' pension income between public, occupational and voluntary insurance. Table B5 in the Statistical Appendix includes more detailed information, including data broken down by gender. From the data in Table 6, it is possible to calculate that the public pension constitutes 71 percent, the occupational pension 23 percent and the income from private individual insurance 6 percent of the average pension income.

Table 6. Composition of Old Age Pensions 2004

Age	All persons with some form of pension	Average amount 1000 SEK	Of which				Contractual benefit		Private individual pensions	
			Public old age pension							
					With a guarantee benefit[1]					
			Number	Average amount 1000 SEK	Number	Average amount 1000 SEK	Number	Average amount 1000 SEK	Number	Average amount 1000 SEK
All	1 863 855	135.5	1 571 252	113.8	1 563 149	112.1	1 461 832	40.4	370 547	40.1
55-60	143 788	58.6	0	0	0	0.0	110 588	59.4	50 291	36.8
61-64	178 470	105.0	36 207	63.1	28 569	55.0	137 264	100.6	55 825	47.6
65-69	404 411	167.8	397 646	118.0	397 442	111.0	358 079	42.8	150 624	37.3
70-74	345 153	1563	345 128	125.1	345 128	125.1	288 900	28.7	59 959	41.5
75-79	312 167	140.9	312 154	117.5	312 154	117.5	242 082	25.8	25 047	41.6
80-84	264 352	130.0	264 349	108.9	264 349	108.9	189 950	25.9	15 840	42.5
85-89	143 187	122.3	143 183	101.3	143 183	101.3	94 249	27.9	8 764	42.9
90-	72 327	107.6	72 324	88.6	72 324	88.6	40 720	29.8	4 197	37.9

Source. Statistics Sweden.

The data in Table 6 also suggest that the different sources of benefits fulfill different needs. First, six percent of all beneficiaries in 2004 were under the minimum age (61) to claim a public benefit. Their benefits consisted of either an occupational pension, a private individual pension or in some – surprisingly few - cases both. In many cases, employees obtain occupational benefits as a form of severance pay, which does not prohibit them from taking

---

[13] Recall that the NDC benefit is frontloaded with growth of 1.6 % from the time it is issued. The mechanism described here corrects for the difference between 1.6 and the actual oucome.
[14] Statistics Sweden (2004).

new jobs, which many do. Private benefits can be claimed from age 55 and are withdrawn over a period of *at least* five years. They too can be combined with continued employment.

Another observation coming from Table 6 is that the average occupational benefit for the age group 61-64 is relatively large, whereas the average public benefit in this age group is small. There is a straight-forward explanation for this. Occupational benefits will often be the main benefit between ages 61 and 64, as they will be used to cover early retirement from the labor force, a) for those few occupations where early retirement is specified in the employment contract (e.g., firemen) and b) for persons who, either as a result of their own or their employer's initiative, choose voluntarily to leave the labor force in their early sixties deferring withdrawal of their public benefit until later, until just recently usually at the age of 65. With the implementation of the reform more people have begun to work longer, deferring withdrawal of both occupational and public benefits. For those who take out occupational benefits prior to the age of 65, except for the few occupations for which early retirement is still specified by contract, occupational pensions are normally reduced to compensate actuarially for early retirement payments, leaving a smaller amount for a supplement to the public benefit from age 65.

Why is age 65 so important in the Swedish pension landscape? First, age 65 was the age at which one could draw an unreduced benefit in the old DB scheme. Second, given this, labor agreements more or less established this as the mandatory pension age up until 2001, by obliging employees to leave their workplaces at this age. In 2001, this practice was curbed by anti-age discrimination legislation establishing the right to maintain employment until age 67.[15] Hence, prior to 2001, for the majority of employees, occupational benefits were normally claimed at age 65 and provided a supplement to the public benefit. The data in Table 6 suggest that there may also be a tendency to claim occupational benefits for the required minimum five-year period, where this is permitted, as their average value falls substantially after age 70.

The data show that voluntary individual benefits provide a substantial supplement to yearly income primarily for persons younger than 75 years of age. As has already been noted, they are especially important for persons retiring prior to age 65. Nevertheless, 65-69 year olds constitute the largest age group receiving a voluntary pension. This could be due to higher demand for private supplementary insurance among younger cohorts of retirees, in line with the trend increase in purchases of private voluntary insurance noted above. Alternatively, it could result from individuals taking advantage of the possibility to claim benefits according to the 5-year minimum rule to supplement income in the initial stage of retirement. What is most likely is that the outcome has been determined by both of these explanations.[16] Finally, the data indicate that private life annuities have *not* been an important form of longevity insurance for older cohorts of retirees.

The relative insignificance of annuities among present older cohorts reflects saving decisions made well over a quarter of a century ago, when these cohorts were in the workforce. There is evidence from other sources that at least into the mid-1980s Swedes viewed their mandated

---

[15] The politicians involved in the Swedish pension reform tried to convince the unions and employer representatives to abolish this age, which they refused to do, which led to this legislation. Many now believe that Parliament should have set an even higher age. Note that prior to (and after) this legislation persons 65 (and now 67) and older could still be contracted by the same or a new employer, however, at present, new earnings do not give additional rights within the occupational schemes past age 65, nor are contributions paid.
[16] Chapter 4 below presents an in-depth analysis of the various retirement products available on the Swedish market.

public saving as sufficient longevity protection. A series of studies undertaken about two decades after the introduction of the universal mandated earnings-related defined benefit (ATP) scheme in Sweden (Markowski and Palmer 1979, Palmer 1981, Berg 1982 and Ståhlberg 1983) all indicated that individual private saving was lower than it otherwise would have been as a result of the introduction of the mandatory earnings-related pay-as-you-go ATP scheme in 1960. Together, these studies suggested that the decline may have been about 4 per cent of disposable income per year between 1960 and 1980.[17]

In sum, the general picture through 2005 is that private insurance constituted only 6 per cent of the average of benefit from the public, occupational and individual schemes taken together. Less than 20 percent of all persons with a benefit had a benefit from individual voluntary insurance. To date, those with individual insurance tend to use this saving vehicle to help finance early retirement – from 55 through 64 - or to supplement income during the first five to ten years after what until very recently has been regarded as the "normal" retirement age of 65. Finally, people normally defer claiming a public benefit until age 65. Those retiring prior to this normally finance their retirement by drawing on an occupational benefit. Since, 2001, however, age 65 is no longer necessarily the "normal" pension age; people have begun to work longer as this was made easier through the introduction of non-age discrimination legislation. The possibility to work past age 65 will undoubtedly affect the structure of benefits claimed in coming years. It is also likely that the age for non-age discrimination will be raised in the not so distant future.

3.4 The Future Demand for Private Annuities

As we have already established, there is no data available on the distribution of different products among claimants. There is, however, data on the age distribution of total pension payments between public, occupational and voluntarily contracted benefits suggesting that present claimants have chosen to use voluntary insurance as an income supplement in younger years – up to age 75 – rather than as a life annuity. It is reasonable to expect that the demand for retirement products to help finance consumption in the early years of retirement will become even greater after the transition of the public system and occupational supplements to defined contribution, since the actuarial deduction discourages early retirement with a reduced public benefit. Instead, those who can afford it will be more reliant on private saving, including private insurance, to retire early.

The potential scale of future demand can be illustrated with the volume of premiums presently flowing into the market. Table 7 shows that in 2006, contributions into occupational[18] and private voluntary pension insurance were the equivalent of 6.8 percent of GDP and contributions to the mandatory public PPM scheme about 0.9 percent of GDP. Note also that contributions to private voluntary insurance alone were also about 1 percent of GDP.

---

[17] Note that this decline was offset by an increase in public saving - through the partial funding of the ATP scheme (Markowski and Palmer 1979 and Palmer 1981).

[18] Including payments to Alecta, which administers the ITP plan for private sector white collar workers and to SPV, the organization that administers insurance for civil servants and other employees in national service.

Table 7. Assets and premium payments to occupational, individual voluntary and PPM plans, 2006

	Assets	Premiums
All occupational and individual voluntary insurance, billions of kronor	2 270	193[*]
Percent of GDP	80 %	6.8 %[*]
PPM, billions of kronor	267	26
Percent of GDP	9 %	0.9 %

[*]Voluntary individual insurance accounted for about 15 %.
Source. Author's calculations based on data from the PPM and Financial Supervisory Authority

From the information in Table 7 it is possible to calculate that in 2006 Swedes paid 29 billion kronor in premiums for private voluntary life and pension insurance, which is about 5 billion USD (with an exchange rate of 6 kronor per dollar). It is very difficult to make meaningful inter-country comparisons because of the differences between countries in institutional set-ups. If simply taken at face value, however, the data indicate that the market for voluntary insurance in Sweden is strong by international standards. This conclusion can be drawn through comparison with figures cited in Impavido, Thorburn and Wadsworth (2003). More specifically, according to Cardinale et al. (2002), total premiums in the UK for voluntary pension insurance amounted to £ 8 billion (about 15 billion USD) at the turn of the century.

It is not easy to foresee the future based on the present structure of benefit payments. What we know, however, is the following. First, Sweden's pension landscape is dominated by the public mandatory and quasi-mandatory occupational schemes. Together, these command 23 percent of earnings. For the average worker, with a working career of around 40 years, the earnings related benefits from these two schemes together should be sufficient to provide an adequate pension. In addition, individual outcomes can be enhanced either by postponing retirement or through individual saving. Voluntary individual insurance constitutes one of the options available to accomplish this.

Second, we have seen that the restructuring of the mandatory public commitment created two new demand segments. One is persons with earnings careers that are too short to receive a public benefit much over the guarantee level. There are many reasons why this might occur, but the result is the same regardless of the cause, the need to purchase private voluntary insurance. The other is married women, who statistics tell us can expect to outlive their spouses by five to seven years (five due to longevity and two due to the average age difference between spouses). Given that Sweden has abolished the subsidy from unmarried to married couples implicit in a pay-as-you-go survivor (widow's) benefit – the demand from women for longevity insurance can be expected to continue to increase. Finally, private voluntary insurance will remain the major form of coverage supplementing the public system for the self-employed.

The challenge for providers is to create products that cater to the needs of an ageing population with largely healthy younger pensioners and where many will desire to combine work with a retirement benefit into higher ages than previously. More generally, as career life income continues to increase, insurance provides a logical option for allocating personal resources to future (leisure) time in various ways, this also undoubtedly requires rethinking

product supply. In sum, demand for voluntary insurance products will rely on the capacity of the insurance industry to provide products that create to new pension withdrawal profiles.

3.5 Final Remarks

In spite of a need for more private voluntary insurance just discussed, money going into the occupational schemes and the PPM will continue to make up the bulk of the market in the future. Although PPM accounts will all be converted into variable or fixed rate life annuities, given the present law, it is difficult to guess what the distribution of products demanded through the occupational and private voluntary schemes will be in the future. Many individuals will certainly still want to use these saving vehicles to help finance early retirement and higher consumption in the first 5-10 years of retirement, as today, whereas persons with short earnings careers should increasingly demand life annuity products. Even here there seems to be much latitude for product innovation, not the least in order to satisfy the needs of female spouses. What is also clear from the analysis in this section is that the demand for annuities will grow exponentially in the coming decades as the new PPM and occupational DC schemes mature. And, with the maturation of the PPM scheme it is reasonable to ask, why shouldn't contractual savers be allowed to combine PPM, occupational and voluntary DC retirement lump-sum balances and purchase annuity products for the accumulated sum? The next question is to what extent should and can annuity money be allowed to move freely among providers, without giving rise to the sort of adverse selection that would cause annuities to become overpriced?

4   INSURANCE PROVIDERS AND INSURANCE PRODUCTS[19]

4.1   Introduction

There are two categories of providers of annuity products in Sweden: Private insurance companies and mutual benefit societies, which provide annuity products for group occupational and individual accumulation schemes, and the PPM, which is the monopoly provider of annuity products for the financial pillar of the mandatory pension system. This chapter surveys the suppliers of retirement insurance products and presents and discusses the products they provide.

4.2   Overview of Providers of Private Insurance Products

At year's end 2007, there were 42 life insurance companies operating in Sweden with Swedish authorization. In addition, a small number of life insurers and IORPs (institutions for occupational retirement provision) from other EU member countries have operations in Sweden through branch offices. Despite this relatively large number of companies, the bulk of business is concentrated in only seven companies. These seven major companies account for over 90 percent of individual premium payments and hold 97 percent of the total assets of life insurance companies (Table 8). The same seven companies are the major providers of both individual voluntary insurance and occupational group schemes. It is noteworthy that three of the seven companies are owned by three of the largest banks in Sweden - SEB, Handelsbanken and Swedbank.

To complete the picture of insurance provision in Sweden, three more companies should be included. The first is Alecta, the life insurance company that (together with Collectum) administers the ITP contractual plan, but which does not sell individual voluntary insurance. The second is the credit-risk insurer, FPG, which insures pension liabilities of companies retaining the premium payments of employees covered under various plans (book reserves). The third is SPV, which manages contributory schemes for civil servants and other employees of the Swedish state. With these additions, the market value of total assets equaled 80 percent of GDP, while total premium payments amounted to 6.8 percent of GDP in 2006 (Table 8).

Table 9 provides an overview of key financial data for Swedish life insurance companies. Among other things it becomes clear that the sum of premiums, investment returns and the change in the market value of assets was close to twice the amount needed to cover benefit payments and technical reserves/insurance liabilities, that is, to fulfill what are called guaranteed commitments. Sweden's insurance companies offer what is called traditional insurance, which combines a contractual guarantee with a bonus based on the company's investment surplus – above what is required to secure the guarantee. The guarantee is presented and analyzed in detail in Section 5 below. In 2006, the operating surplus for all companies was 131 billion kronor for the year 2006. This constitutes an uncommitted surplus, some of which can be distributed to the insured sometime in the future, as a bonus in traditional insurance, to be elaborated on below.

---

[19] I am grateful to Björn Palmgren, from the Swedish Financial Supervisory Authority, for reading and providing comments on Sections 4 and 5.

Table 8. Distribution of Assets and Premium Payments for Life and Pension Insurance among major Swedish Insurance Companies, 2006

	Company	Percent of assets of all companies	Percent of total premium payments
1	Skandiakoncernen	25 %	19 %
2	SEB Trygg Liv	19 %	17 %
3	AMF Pension	18 %	11 %
4	Handelsbankskoncernen	12 %	12 %
5	Länsförsäkringar	10 %	8 %
6	Folksam	9 %	12 %
7	Swedbank (Robur) Insurance	4 %	10 %
8	Others	3 %	11 %
9	All companies	100 %	100 %
10	All companies (excluding Alecta, FPG, SPV), billions of kronor	1550	124
11	All companies (excluding Alecta, FPG, SPV), % GDP	54.7 %	4.3 %
12	Alecta, billions of kronor	300[a]	19
13	FPG – Reinsured company book assets	125	0.2
14	SPV - Civil servant scheme	295	50
14	All companies, billions of kronor	2 270	193
15	All companies, % GDP	80 %	6.8 %

[a] Author's rough approximation.
Source: Swedish Insurance Federation and author's calculations.

Table 9. Overview of Key Financial Data for Swedish Life Insurance Companies[1], 2006. Millions of kronor

	1 Premium payments[1]	2 Investment Income	3 Unrealized gains on investments	4 Insurance benefit payments	5 Net addition to technical reserves/insurance liabilities	6 Surplus paid out to the insured	7 Operating surplus/deficit
	+	+	+	-	-	-	+
Individual Insurance							
Traditional life insurance	16 228	28 010	15 694	17 977	2 279	1 666	26 316
Unit linked life insurance	26 857	1 809	18 544	20 382	19 892	1 203	1 341
Permanent health insurance	1 107	1 138	501	703	-83	213	1 443
Group life insurance	5 224	1 288	294	3 853	-271	540	1 461
Health and accident insurance	458	628	172	718	-162	-5	413
Occupational Group Insurance							
Defined benefit	16 145	38 291	13 803	10 845	-1 106	0	45 826
Defined contribution, traditional	28 427	38 949	19 744	9 250	12 324	24	48 257
Defined contribution, unit-linked	25 323	1 654	8 586	2 919	31 583	0	698
Health & accident insurance	6 795	1 367	399	1 915	108	87	5 599
Total	126 564[1]	113 134	77 737	68 562	64 564	3 728	131 354

[1] Taking into account deposit share distribution and a couple of other small factors, total premium payments, adjusted for this, were 118 905 in 2006.
Source. Swedish Financial Supervisory Authority and Statistics Sweden.

4.3   The Mandatory FDC Scheme and the Market

Individual choices in the mandatory FDC scheme administered by the PPM have favored Sweden's seven largest private insurance providers. Together these seven companies held 43 percent of total PPM assets in the end of September, 2007 (Table 10). The default fund (the Seventh AP-Fund) held an additional approximately 29 percent. Thus, the seven major companies and the public default fund manage about three quarters of all PPM assets.

Table 10. PPM assets held by the seven largest private insurance companies and the Sevent AP fund (default fund), September 28, 2007

	Percent of total PPM assets	Percent of GDP
Seventh AP-fund	*29%*	*2.7 %*
The Seven Major Private Insurance Companies		
1. Swedbank Robur Försäkring	14%	1.3 %
2. Handelsbanken & SPP	9%	0.9 %
3. AMF	9%	0.8 %
4. Folksam	5%	0.5 %
5. Länsförsäkringar	3%	0.3 %
6. SEB	2%	0.2 %
7. Skandia	1%	.1 %
Total	43 %	4.2 %
Seventh AP-fund and the seven major private companies	72%	6.9 %
Total PPM assets	100%	9.6 %

Sources. The author's calculations using data from the PPM.

The largest company in the market for PPM assets is Swedbank Robur Insurance, owned by Swedbank, with a 14 percent market share. Robur was one of the first companies to provide investment funds on the private market in Sweden, beginning in 1967, and has apparently been able to benefit from its early lead in this market. The second, third and fourth largest companies are SPP (part of which is now a subsidiary of Handelsbanken), AMF and Folksam, all of which have been major players historically in the market for occupational pension schemes. Undoubtedly, this gave them an initial advantage in attracting PPM clients.

Table B6 in the Appendix shows in detail how the total assets of the PPM scheme are distributed among the 50 largest funds. It is noteworthy that the top four private providers manage 29 of the largest 50 funds, ranked in terms of asset values. The next three major providers manage an additional six of the top 50 funds, which means that 35 of the largest 50 funds are managed by Sweden's seven largest private insurance providers. The second and third largest funds in the system, *AMF Pensions Aktiefond – Sverige* and *AMF Pensions*

Aktiefond - Världen, Swedish and world market index funds respectively, held 6 percent of all PPM assets.

At the close of 2006, 53 percent of all PPM assets were invested in funds holding only equities. Only 3 percent were invested in funds holding only interest bearing investments. About 80 percent of the portfolio of the default fund and a large percentage of the portfolios of the generation funds are also invested in equities. As a result, almost 90 percent of all PPM assets were invested in equities at the end of 2006.

At first glance, the percentage of PPM assets held in equities seems high. However, the heavy preference for equities is less surprising when one considers the career-age profile of PPM participants. Although persons born in 1938 and later are covered in the mandatory financial scheme, the accounts of the older cohorts are very small. According to the transition rule for replacing the old system, mandatory contributions to the FDC scheme are 4/20 percent of total contributions for persons born in 1938, rising to 5/20 percent of total contributions for persons born in 1939, etc. ending with 24/24 percent of total contributions for persons born in 1954. With a contribution rate of 2.5 percent for the FDC scheme and with not much of a full career left to contribute before retirement, the relevance of this system for the overall pension of older participants is minimal. Hence, it's not surprising that older cohorts tended to "take a gamble" and invested heavily in equities. On the other hand, the younger cohorts covered by the PPM scheme, born in the 1960s and later, it is in fact wise to have a large percentage of their portfolios invested in equities.

4.4   Retirement Products

The types of products that private insurance companies can provide are not explicitly specified in the law. Instead, they are restricted by tax regulations and court decisions. The Swedish market offers two classes of retirement products. The first falls under the heading of *traditional insurance* and the second is *unit-linked insurance*, called fund insurance in Sweden.[20] We have already introduced both of these. Traditional insurance is an umbrella term for a number of retirement products. Unit-linked products constitute the most recently introduced products, originating in Sweden, as we have already seen, from the mid-1990s. These products are described and discussed in this section. The section begins, however, with a discussion of the minimum age for claiming a private retirement product.

4.4.1   Minimum Age for Claiming a Private Retirement Insurance Product

According to the tax law, all retirement products with taxed benefits – both phased withdrawals over a given number of years and life annuities - can be claimed first from age 55. This minimum age is set in legislation and has been 55 for over half a century, in spite of the increase in unisex longevity of persons 60 and older during the same period of around 5 years. The age 55 rule applies in principle to individual voluntary policy holders as well as to occupational pension schemes. However, occupational plans can set the minimum age to claim a benefit at a higher age.

In principle, possible retirement at 55 is not in harmony with the present goal of policy makers to encourage postponement of retirement in the public system to after the age of 65. There are powerful interests in maintaining this low age, however, represented by both

---

[20] Note that mutual benefit societies cannot provide unit-linked products.

employee and employer confederations who see possible advantages in being able to offer a pension at a younger age than the minimum retirement age of 61 under the mandatory system. By retaining the low minimum age of 55 for claiming retirement products, policy makers enable early exit from the labor market financed through private saving, while maintaining a much higher normal pension age for the mandated public schemes, thereby not subsidizing early retirement of healthy workers. There is an obvious distributional aspect to this sort of rule, favoring the economically better off, since the lifetime poor have to wait until age 65 in Sweden to claim a guarantee benefit.[21]

Finally, in addition to individual voluntary insurance and the quasi-obligatory collective occupational schemes, it is possible for the employer and employee to agree on other than the standard retirement arrangements. Employer payments for insurance in this connection are tax deductible, while benefits when claimed are taxed as normal income. This option provides an alternative for employers to create tailored individual agreements for selected employees as an extra incentive in employment contracts as well as to negotiate compensation for severance not available in the standard collective agreement possibilities. Individual agreements falling under the second category can compensate for a combination of either lost earnings or lost pension rights in the standard schemes resulting from earlier retirement. A study of Swedish data by Eklöf and Halberg (2006) estimates that the probability to exit the labor force early would fall by 14-25 percent, depending on the year examined, if the possibility for employers to give a "golden handshake" of this kind were to be eliminated.

4.4.2   *Insurance Products for Retirement*

Traditional insurance in Sweden offers lump sum payments (called *kapitalförsäkring*), phased withdrawals (temporary annuities using the Swedish terminology) and life annuities. Only phased withdrawals and annuities are eligible for preferential tax treatment. These, together with unit-linked (fund) insurance constitute the retirement products available in the Swedish insurance market. Table 11 summarizes the availability of the three major categories of retirement products within individual, occupational and public (PPM) schemes.

Table 11. Overview of products by category of provision

	PPM	Occupational	Individual
Lump-sums	No	No	Yes
Phased withdrawals	No	Yes	Yes
Annuities	Yes	Yes	Yes

Individual voluntary insurance can be DB or DC. In traditional DB, the insured makes no investment decisions and the benefit is defined from the outset of the contract. In individual DC, the individual determines his/her own portfolio from a list of options during the accumulation phase and chooses between a traditional and a unit-linked product during the decumulation phase. Traditional insurance offers an annuity with a guarantee plus a bonus. The benefit can either be a phased withdrawal or a life annuity. By choosing a unit-linked annuity (phased withdrawal or life annuity) the insured determine the investment portfolio,

---

[21] On the other hand, there is a positive selection of persons with low education, low income and a looser labor market attachment to disability take-up prior to age 65.

with the amount remaining on the account being distributed annually on the basis of the term of the contract or a life expectancy factor.

Recall from the discussion above that all occupational retirement supplements under the ceiling are in the process of conversion to DC, as are all *private sector* occupational benefits above the ceiling. In the public sector, employees have both DC and DB supplements. Hence, although the entire occupational system is moving in the direction of DC commitments, the different sectors will arrive at different times. At the two extremes in terms of transition speed are the occupational schemes for the private blue-collar workers, under the SAF-LO agreement, which have made a complete transition to DC and the private sector white-collar workers, under ITP, where, in principle, DC covers new entrants from 2007.[22] DB and DC products in the occupational schemes are the same as for individual insurance. Table 12 summarizes benefits in the occupational schemes.

Table 12. Overview of DC benefit options within the occupational schemes

	Private blue-collar (DC below and above ceiling)	Private white-collar (DC below and above ceiling)[1]	Civil servants and other state employees DC below and DB above ceiling[2]	Local and regional government employees (DC below and DB above ceiling)
Lump-sums	No	No	No	No
Phased withdrawals	Yes (5 or 10 years)	Yes (5 or 10 years)	Yes (5 or 10 years)	Yes (5 or 10 years)
Life Annuities	Yes	Yes	Yes	Yes

[1] There was a DC scheme even in the previous DB regime, ITPK, based on a 2% contribution rate, which gives a mandatory 5 year payout from retirement.
[2] There was a DC scheme even in the previous DB regime, Kåpan, based on a 2 % contribution rate, which gives a mandatory 5 year payout from retirement.

Table 13 provides a more extensive overview of all retirement products offered in Sweden, indicating in which context they are offered. These products are discussed under product-category headings.

Lump Sums (Kapitalförsäkring)

There are three main versions of *kapitalförsäkring*. The first is a lump sum benefit that becomes available when the policy holder reaches an age specified in the policy. Premium payments are tax deductible up to a ceiling on the deduction and the benefit is taxed together with other income sources. This is a product that is only available for holders of individual voluntary private insurance.

A second version is a lump sum benefit that becomes available to the heirs of the policy holder upon death of the policy holder, when death occurs during an age interval of x to y and where in principle x and y are determined by the terms of the contract. This insurance form has been attractive to persons whose purpose was to avoid creating a gift tax for a cohabitant or for children. From 2005 there is no longer a gift or inheritance tax, which made this saving

---

[22] See Appendix A for details.

Table 13. Overview of insurance products in the Swedish market

	Individual investment choices in accumulation phase	Joint life	Survivor benefit Option	Inheritance gains	Guarantee rate of return	Bonus based on fund performance
Traditional life insurance products						
1. *Kapitalförsäkring* Lump sum paid at a specific age x (Only IVI)	No	Yes	Yes	No	Yes	Yes
2. Temporary annuity K kronor per year is paid from a contracted initial age 55 + A during X – normally 5 or 10 – years. (IVI, SAF-LO, ITP)	No	Yes	No	Yes	Yes	Yes
3. Fixed life annuity K kronor per year is paid for the duration of the policy holder's life. (IVI, SAF-LO, ITP, S, and K)	No	Yes	No	Yes	Yes	Yes
4. *Kapitalförsäkring* **paid upon death of the policy holder** Lump sum paid upon death of the policy holder during the age interval x to y. Paid to the survivor(s). One version allows a payment z years after death. (Only IVI)	No	Yes	Yes	No	Yes	Yes
Unit-linked						
5. Variable rate annuity Assets are held in the fund(s) chosen by the individual. A new annual payment is calculated annually. (IVI, PPM)	Yes	Yes	No	No	No	No
6. Pure unit-linked (IVI and the Kåpan plan for employees of the state)	Yes	Yes	No	No	No	No
7. Unit-linked with conversion to traditional fixed life at retirement ((IVI, PPM, SAF-LO, ITP, S, and K)	Yes, but individual choice is limited x years prior to retirement.	Yes	Yes	No	No	No

Notes. Private individual voluntary insurance is denoted as IVI. The contractual schemes are denoted by SAF-LO, ITP, K (county council & local government.) and S (state employees). PPM denotes the PPM scheme.

form less attractive. Finally, lump sum benefits for survivors are generally provided by most employers, in the form of group insurance.

A third version of *kapitalförsäkring* became available from January 1, 2005, following the abolition of gift and inheritance taxes. This version enables the holder to place an unlimited sum of money into an account, which can be claimed during a period of five years from the age of 55. Normally, the claimants would be the policy holder's spouse, legal cohabitant, or children and the aim of the policy holder would be to avoid paying the wealth tax while in life, while leaving the sum to these legal heirs upon death. As with the first version of this product, the second and third versions are available only through individual voluntary contracts. From February 2007 this product was taken off the market, pending a revision of the tax code.

Phased Withdrawals and Annuities

Annuities can be contracted for a fixed or lifelong payout period. A fixed-period benefit (*temporary annuity*) must be paid out during at least five years – or three years if the agreed period is terminated no later than age 65. Normally payments are made during a period of five or ten years. As we have already ascertained, the typical payout window is between the ages of 55 and 75, with a payout period of 5 or 10 years.

A life annuity is attractive for individuals who for one reason or another believe that they will live longer than average and want to be certain that they will not outlive their savings. Long-living annuitants benefit from the pooling of risks and the transfer of funds from participants with shorter lives. There are versions of this form of insurance where the contract is a joint life annuity with a spouse or legal cohabitant or where the capital of the deceased can be inherited upon the death of the policy holder.

Life insurance can function as both longevity insurance and a survivor product for the policy holder, if it is claimed as a life annuity with a possible survivor benefit upon the death of the policy holder. A life insurance contract can allow for a payment to survivors (spouse, legal cohabitant, children of the policy holder) upon death of the policy holder prior to the age of 55 and an individual longevity benefit for the policy holder from earliest age 55. In the latter case the survivor benefit may be terminated at some age for the policy holder beyond the age of 55, for example age 75. The policy holder of a product with a survivor benefit pays for this product by contracting a lower own life annuity for any given premium payment.

Single and joint life annuities are available through individual contracts, as well as through individual choices in the occupational and PPM schemes. Historically, these products have been a part of a defined benefit package. With the transition to defined contribution, they are retirement products that individual financial accounts can finance.

Traditional fixed-time (temporary) withdrawals or life annuity products offer a guaranteed rate of return and a bonus. The guaranteed rate of return, which varies between companies, has been between 2 and 5 percent per annum (with a rate of inflation of 1-2 percent). For many years it was 3 percent for all companies. The amount of the bonus, which can also be negative, is determined by the performance of the insurance provider's investment portfolio. It is distributed to participants both during the accumulation and the decumulation phase. Hence, a company's clients can benefit from successful investment performance. Both the guarantee and the bonus are used for marketing purposes to attract customers.

Unit-linked Products

With unit-linked insurance the participant invests individual account balances in market funds during the accumulation phase. Upon retirement account balances can be converted into one of the insurance products already described, with the exception of a lump sum, or left in the individual's account, leaving the individual to determine the investment profile of his or her own account. The coming year's benefit is recalculated based on the remaining funds in the participant's account at the end of each year. Here, it is also typical to offer a choice between a monthly payment or a single payment for the whole year. If the insured chooses a monthly payment, the remainder of the annual payment is invested by the insurance provider, which also shares this return with the customer. In practice, the customer chooses a rate of return for payments for the year – *e.g.*, up to 5.5 percent given present alternatives. If the actual rate of return falls short of this amount, the difference is deducted from the account holder's balance before calculating the payment for the next year.

Within the framework of individual voluntary insurance, individuals contract with one insurance company. Once the individual has signed up with a company it is not possible to switch companies – unless switching is explicitly permitted in the contract. It is possible to contract with more than one company and to discontinue payments to one or more companies. Even in this case the minimum decumulation period is 5 years.

There is a definite connection between the construction of the Swedish mandatory FDC scheme and the introduction of unit-linked insurance in Sweden. The design of the PPM system was under active consideration when unit-linked insurance was introduced in Sweden in 1993 and the unit-linked model soon became a model for the Swedish mandatory FDC scheme.

Finally, whereas in the PPM system participants can move money freely between companies and funds during the accumulation phase, persons contracting private individual unit-linked insurance do not have this freedom.[23] Also, recall that in the occupational insurance framework, individuals select one of the companies contracted to provide products for the specific scheme. This reduces individual choice to around ten providers and the funds offered by them.

4.4.3   Longevity Products and Risk

With traditional annuity insurance the longevity risk is borne by the insurance company. Life annuities are the most difficult in this respect since the annuity holder can live four decades from age 60. In principle, individual longevity is unknown to either the insurer or the insured. The only information available is the life expectancy table of the whole cohort, that is, an estimate of the probability to survive one, two years, etc.

Insurers can examine lives of persons who claim life annuities *ex post* in order to determine the correct life expectancy to be used in computing the annuity. The problem here is, of course, that known outcomes based on the lives of the older scheme participants may not present a reliable picture of coming outcomes for younger participants. *Ex ante* information is

---

[23] The possibility of introducing this option was on the political agenda at the time of this writing, however.

uncertain by definition. Trends in population mortality are, however, more reliable and can provide guidance when insurance longevity experience is revised. The most recent revision in the Swedish life tables dates from 2007, replacing tables originating from 1990, which had become outdated especially for older ages.

To the extent people have grounds to believe they will live a shorter or longer life than average, they would choose between 5 and 10 year withdrawals or life annuities on the basis of this information. Information asymmetry can give rise, thus, to adverse selection. If the insurer has information - or perhaps just a belief - that his clients will live longer than the normal population, life annuities will be priced higher to compensate for this profile.

There is no statistical evidence on the distribution of motives for claiming a 5 or 10 year payment period, although this would certainly be interesting to study. Nevertheless, it seems safe to assume that the demand for withdrawals for periods shorter than a whole life is largely driven by the desire to supplement income in the earlier years of retirement rather than adverse selection. Yet, insurers are certainly wise to assume that adverse selection is present to some extent, since this is the result of individuals looking after their own interests. Note that the PPM offers only a *life* annuity to *all* participants. This eliminates the possibility of adverse selection, and all other things equal, makes a higher annuity payment possible for persons with longer lives, albeit at the expense of persons who have good reason to believe that their lives will be shorter than normal.

Finally, we can note that the PPM offers a voluntary survivor benefit during the accumulation phase. The PPM cannot require medical information so it cannot judge individual risks. Since the PPM actuaries believe this product is chosen by persons who have reason to believe they will have shorter than normal lives the price for this product is higher than it would be if the actuaries believed that the subscribers were from the "normal" population. This is a clear illustration of an insurer's caution given the risk of adverse selection. If it becomes known that persons with high risks are disproportionately represented in the insurance collective – or simply if it is rumored – and that the insurer prices thereafter, then informed low risk persons will avoid this insurance product, leading to a potential spiral of price increases that lead to greater avoidance, etc. Obviously, the way to combat this sort of process and still retain the insurance is to either require medical examinations that allow the pricing of risks in accordance with relevant risk information or to create a large randomly chosen population, for example by making the insurance mandatory.

4.5   Final Remarks

In sum, the private insurance market in Sweden is dominated by seven of the over forty insurance providers. Three of these companies are owned by three of the largest banks. These are the major actors in the provision of both individual voluntary and occupational group insurance. In 2006, the market value of the total assets of private individual and contractual insurance for retirement equaled 80 percent of GDP and total premium payments were 6.8 percent of GDP.

The seven largest private insurance providers are also the main managers of the PPM funds. In 2007, they managed 43 percent of all PPM assets and owned 70 percent of the 50 largest funds registered in the PPM scheme. The public default (Seventh AP) fund managed another 29 percent of assets, so, together eight companies managed about 72 percent of total PPM

assets. As has already been noted, the PPM changed its permissible fee schedule in 2007, taking advantage of this fact. Prior to this switch, permissible fees were based on the PPM assets held by individual funds. After the switch the permissible fee is based on the fund managing company's total holdings of PPM assets. This dominance is nevertheless not widely known in either the domestic – or external - discussion of the PPM fund alternatives. Instead, the usual critique is that there are far too many funds, driving up the costs of administration. If PPM participants remain loyal to a selection of funds offered by these major companies, with the growth of assets in the PPM system the dominance of the major managing companies and funds managed by these companies will continue to drive down the administrative costs – given the PPM fee schedule.

This chapter has also surveyed insurance products for retirement in Sweden. The Swedish market for traditional retirement products provides lump sums, withdrawals that can be taken over a period of 5 or 10 years, and life annuities. There are no data on the exact distribution of insurance products among current retirees, as was discussed already in Chapter 3 of this study. Nevertheless, existing data reveal that the most utilized forms are 5 or 10 year withdrawals.

PPM retirement products, which by law are supplied only by the PPM, are restricted to life annuities. The interesting question is whether these annuities will be supplied by the private market sometime in the future. Furthermore, the present slate of private retirement product options has remained relatively unchanged for decades. The major newcomer is unit-linked insurance, which enables the client to determine his or her own portfolio during the payout or decumulation phase. What remains in this context is to offer product types with more degrees of freedom during the decumulation phase, for example the choice of moving from a variable to a fixed annuity with age.

Finally, generally speaking, the large-scale conversion from DB to DC schemes in the recent decade has the effect of decreasing the longevity risk for the insurer. In principle, this should lead to more money's worth in the annuity market as time progresses and the annuity market grows.

5 MANAGEMENT OF RISKS AND SUPERVISION

5.1 Introduction

This section of the study begins with a brief description of the portfolio regulations for Swedish insurance companies. The portfolios of insurance providers are examined against the background of the regulations governing their composition. Then, given this background, risk management and supervision are discussed.

5.2 Portfolio Regulations for Life Insurance Companies

There are regulations for companies providing life and pension insurance regarding the portfolio composition of the reserves that cover guaranteed insurance commitments, *i.e.,* liabilities taking the company's guarantee rate of return into consideration. Prior to 2006, reserves were allowed to consist of up to 25 percent equities, an additional 25 percent in real estate, 10 percent in lending with other securities than real estate, and a maximum of 3 percent in cash. The remainder of the portfolio was to be held in bonds, with a possible maximum portfolio bond content of 100 percent. From 2006, more flexible investment rules are applied to the part of the business providing occupational pension plans. As a result of EU legislation, this part of the business is subject to a prudent person approach. These reserves are called *technical reserves*. Companies are free to invest all reserves in excess of these technical reserves without additional regulation, but following prudent investment policy.

Liquidation of a company presents a special problem, however, and according to EU legislation, the home country is responsible for determining the procedure to be applied in these cases. According to Swedish rules, in the case of liquidation, participants have the right to all technical reserves – corresponding at least to their premium payments, and the right to other reserves after deduction of other debts, for example unpaid wages and salaries of employees. A minimum solvency requirement for life insurance companies has been established by the European Union, which from 2002 is 3 million euro.

Finally, even the legislation regarding investment funds is important in the unit-link context. In unit-link insurance individuals invest in investment funds, either owned by the insurance company where the individual is contracted or by other fund managers, whose funds are open to choice within the contract. For an investment fund to operate in Sweden, it must adhere to EU rules and regulations. There are no additional rules for operation in Sweden. The specific requirements of the PPM for funds to join the system have already been described above.

5.3 Portfolio Composition of Life Insurance Companies

Table 14 shows the composition of the aggregate portfolio of private insurance companies at year-end from 2002 through 2006. First we note that if the assets of companies were only sufficient to cover technical reserves, the share of equities in total assets would be at most 25 percent, the maximum equity portfolio content allowed in the legislation. At the end of the 1990s, prior to the collapse of equity prices, the proportion of assets held in equities for all

companies together was around 50 percent. In 2002, the share of equities fell to 37 percent and it took until 2006 for it to once again reach 50 percent.

Looking at the aggregate portfolio in a different light, the ratio of less risky assets (short-term paper, deposits and bonds) to riskier assets (equities, loans and real estate) was 1.26 in the financial "crisis" of 2002, but decreased to 0.91 by the end of 2006. From 2005, holdings of equities once again dominated holdings of bonds in portfolios.

In traditional insurance, bonuses are distributed to policy holders when assets exceed liabilities. This is in fact one of the features that attract customers, and companies compete on the basis of the guarantee and the bonus. Prudent practice nevertheless dictates that the surplus should be large enough to avoid a fall below unity in the asset-liability ratio, given a normal corridor of variance associated with the equity content in the portfolio.

Table 14. Assets of life insurance companies. Billions of kronor, year-end figures and percent of total assets (within parentheses)

	2002	**2003**	**2004**	**2005**	**2006**
Short-term paper and deposits	175	176	160	188	140
	(11%)	(10%)	(8%)	(8%)	(6%)
Bonds	725	783	844	894	953
	(45%)	(44%)	(44%)	(40%)	(39%)
of which:					
Government	267	287	344	345	404
Mortgage-backed	168	199	196	198	208
Foreign	228	245	250	290	266
Equities	590	697	807	1 051	1 204
	(37%)	(39%)	(42%)	(47%)	(50%)
of which:					
Noted on the Swedish exchange	163	181	202	258	291
Noted on foreign exchanges	183	226	275	352	396
Loans	55	57	59	51	49
	(3%)	(3%)	(3%)	(2%)	(2%)
Real estate investments	68	59	61	70	72
	(4%)	(4%)	(3%)	(3%)	(3%)
Total	1 613	1 771	1 930	2 253	2 418
Short-term paper and bonds/ Equities, loans and real estate	1.26	1.18	1.08	0.92	
Of which life insurance (i.e. excluding non-life business)	1 281	1 443	1 567	1 833	1 979
Assets in life insurance, % GDP	54	59	61	69	70

Source. Based on tables published by the Swedish Financial Supervisory Authority

Tables 15 and 16 show the ratio of assets to liabilities for a selection of private insurance companies. The data begin with 2002, right after the IT crash, through the third quarter of 2007. The ratio in these tables consists of the value of assets related to both the value of guaranteed benefits *and* not yet granted (but known to policyholders) bonus components of liabilities.

Following the dot.com crash in 2002, the ratio was under unity for all major companies, and significantly so for many. As a result, companies were forced in the immediately ensuing period to reduce bonus commitments not yet granted but known to policyholders on a preliminary basis. By the final quarter of 2005, the ratios of many - but not all - companies were comfortably above unity. Ratios leveled out thereafter through 2007, indicating that they had reached what companies considered to be desirable levels.

Table 15. Traditional Premium-based Insurance, with a Guarantee Ratio of Assets to Pension Liabilities. End of year figures.

	2002	2003[*]	2004*	2005**	2006**	2007[***]
AMF Pension	95	105	111	121	120	112
Folksam Liv	91	105	107	111	111	108
Förenad Liv	98	105	108	111	110	-
KPA Pension	91	99	100	100	100	100
Länsförsäkringar Liv	86	92	103	114	114	115
Nordea Liv	89	93	99	102	-	-
Salus Ansvar Liv	88	91	100	101	103	103
SEB Trygg Liv, Old	88	95	106	117	122	122
SEB Trygg Liv, New	94	99	101	102	100	98
Skandia Liv	88	93	101	109	112	114
SPP Liv	97	91	94	98	-	-
Weighted Average	91	96	104	113	115	112

[*]December [**]Fourth quarter [***]Third quarter "-" Indicates the business has been merged with another company.
Source. Swedish Financial Supervisory Authority

Table 16. Occupational Defined Benefit[1] Insirance Ratio of Assets to Pension Liabilities. End of year figures.

	2002	2003[*]	2004*	2005**	2006**	2007[***]
Alecta	113	120	128	128	144	164
AMF Pension	95	124	137	150	144	156
KPA Pension	91	92	101	108	106	102
SEB Trygg Liv, New	94	93	100	-	-	
Skandia Liv	88	105	112	123	156	175
SPP Liv	97	111	110	113	-	-
Weighted Average		119	126	129	143	161

[1]Where the benefit is defined as a percentage of the worker's salary.
[*]December [**]Fourth quarter [***]Third quarter "-" Indicates business has been taken over by other companies.
Source. Swedish Financial Supervisory Authority

The financial picture for occupational insurance (Table 16) resembled that of individual voluntary insurance in 2002. With the exception of one company, Alecta, long-term pension

liabilities, including not-yet granted bonuses, were greater than the current market value of assets at the end of the financial crisis. Recovery began in 2003 and by 2004 margins were again over unity. By the end of 2005 asset-liability ratios were in some cases significantly over unity, but nevertheless continued to climb through 2007.

Summing up, taken together, these tables illustrate how Swedish companies manage their portfolios within the framework of the legislation regulating their business.[24] Although the procedure of distributing surpluses is straightforward for insurance specialists, the fact that a certain proportion of bonuses previously given had to be "cancelled" with the dramatic fall in the equity market right after the turn of the century attracted considerable attention in the mass media and led to a questioning of this procedure. To date, however, there is no indication that it will be abandoned. In fact, instead, the system proved itself to be resilient, returning to normalcy within the short period of 3-4 years.

5.4   Risk Management in Private Individual and Occupational Group Insurance

The change from a predominantly DB to a predominantly DC environment that has taken place from the mid-1990s has implications for the distribution of the longevity and investment risks between plan participants and insurance providers. Within the framework of risk bearing, the major difference between DC and DB is that, whereas the provider bears both the investment and longevity risks from the point of new entrance of a participant until death in the DB framework, in the DC framework the longevity and investment risks do not come into the picture for the provider until it is time to compute the annuity. Instead, the risks during the accumulation phase are borne by the participant, who manages this risk by making primarily decisions concerning how savings are to be invested, given the degrees of freedom offered within the institutional framework. In the following we consider the longevity and investment risks in the DC environment in more detail.

5.4.1   The Investment and Longevity Risks

Here, we consider the longevity and investment risks for private insurers, beginning with the investment risk. The investment risk is a function of the volatility of the investment portfolio's composition. We can begin with an example using Tables 15 and 16, which illustrate the investment risk of Swedish insurance companies in the light of the volatile equity market during 2002-2005. Data for the *occupational* AMF scheme illustrate how dramatically the ratio of assets to pension liabilities can change within a short time span if the insurer's portfolio has a large equity content. In the fourth quarter of 2002, following the extreme drop in equity prices of around 40 percent on the Swedish stock market, AMF's ratio of assets to pension liabilities fell below the threshold of unity to 95 percent. The market recovered in the following two years, and by the fourth quarter of 2005 the asset-liability ratio had rebounded to 150. AMF's asset-liability ratio for private individual insurance also fell to 95 percent, but with a lower rebound to 121 percent, reflecting a different portfolio profile.

More generally, in assessing the investment risk it is important to recall that, in a DB plan, a unit of contributions will be in a pension scheme a long period of time. This time matches the

---

[24] Note that even the new NDC system in Sweden follows this adjustment framework, at least in principle, although to date there is no legislation governing the adjustment of surpluses.

money-weighted average of time during the working career of participants plus the money-weighted average time in retirement before the unit of contributions has to be paid out as a pension benefit. For Sweden, this time is estimated to be around 32 years.[25] Seen in this perspective, it would be wrong for funds not to hold a large share of equities, since the duration of time until a unit of contributions has to be paid out is so long. This way of looking at things justifies a large equity content in insurance company portfolios.

Since a large proportion of the assets in Swedish insurance portfolios is invested in equities, volatility of asset values is higher than it would be with a larger share of interest bearing assets. On the other hand, historically, Swedish government bonds have had a return of around 3 percent compared with a return of 8 percent for equities listed on the Swedish Stock Exchange (Frennberg and Hansson 1995). Hence, the historical data indicate that it is to the advantage of plan participants to have as large an equity component in insurance portfolios as possible.

The Swedish law regulating investments of insurance companies is designed to be cautious for the basic commitments of the plan – the guaranteed benefits – but to leave freedom for investments for the remainder of assets. In principle, providers are obliged to pay the guaranteed benefits they have promised. In addition, companies can provide higher bonus-adjusted benefits when asset portfolios perform well – but if the ratio of assets to pension liabilities threatens to fall below unity - or does so – insurance providers must reduce the bonus in order to bring the asset-liability ratio back to a level greater than unity. In this framework, which is the normal framework for private individual voluntary insurance in Sweden, the insurance provider bears the risk for meeting the guarantee level of benefits. There is no risk involved per se in the bonus, however, other than an image risk if the company must cancel part of a previously announced bonus. Insurers bear the investment and longevity risks of the guaranteed benefits, but these risks are shared among annuitants in the case of bonuses.

In DC schemes of unit-linked type, the individual bears the entire investment risk during the accumulation phase. In addition, if the capital of the deceased during the accumulation period is simply inherited by specified survivors, neither is there a longevity risk for the insurer during this phase. With DC the insurer's period of uncertainty regarding the investment and longevity risks is, then, the much shorter annuity period. From this point, however, the risks for the insurance provider are ostensibly the same for DC and DB. The difference is that in DB a promise will usually have been made to the participant several decades earlier when he/she became a new entrant. Hence, whereas the insurer's hands are not bound in DC at the point of granting the annuity, they are bound by a contractual agreement made early in the worker's career in DB.

The guarantee-bonus system does not alter the risks. What it does do is to provide a flexible framework for managing them. The guarantee is a commitment to be fulfilled, while the outcomes for investments and mortality contribute to determining the bonus. The "bonus" provides the insurer with extra degrees of freedom. It is a convenient mechanism for absorbing miscalculations in longevity and for letting the overall result reflect the development of the market. The more risk-averse insurer will, thus, set a conservative guarantee and hope to compensate with a generous bonus. In a not-for profit setting the distribution between the guarantee and the bonus may be more of theoretical interest if all

---

[25] This is based on estimates performed for the NDC scheme, given current labor market and retirement patterns.

surpluses are distributed to the participants anyway. In a profit setting, however, at least in principle, there is an incentive to maximize both the guarantee-plus-bonus through investment strategy – to attract customers – and enhance *profits* to reward owners.

Within the DC framework it is possible for participants to continue to hold their accounts in funds they choose themselves during the annuity phase. This option is available in all three insurance "categories" in Sweden: private voluntary, private occupational and public PPM insurance. The product is a unit-linked annuity, where funds on the individual's account are distributed yearly using a divisor based on cohort life tables or simply on the remaining number of contractual payments. The participant's investment strategy determines the amount left on account at the end of each period, to which the annuity divisor is applied. This product frees the insurance company from the investment risk. Neither is there a longevity risk for the insurer in the life annuity case, as there will always remain a fraction of an account balance to be paid out in the future, for any given life table. Without a survivor benefit, these remaining positive balances will be transferred to the insurer, with the possibility of distributing them to designated survivors and surviving plan participants or retaining them in the business.

In the case of phased withdrawals for 5 or 10 years, which are presently widely used in Sweden, the insurer is also largely freed from all risk. The individual participant takes on the investment risk, while the longevity period is essentially known. When unused account balances are distributed as a contracted survivor benefit, remaining risks depend on the terms set out in the survivor contract.

In *mutually owned* (not for profit) occupational *schemes* it is the employer who ostensibly bears the risk during the annuity period – in either the DB or DC case (where the annuity is tantamount to a defined benefit). The employer takes on the role of the owner of the insurance company since employers are obliged to transfer capital to a plan in financial difficulty. The employer's financial obligation is only ostensible, however, since a need to provide additional capital at the expense of profits can be passed on to concurrent workers in the form of lower future wage increases. In addition, the bonus mechanism provides considerable opportunity to absorb risk, probably freeing the owners from ever having to provide fresh capital, except in the most extreme of situations. A similar risk is borne by employers who retain capital commitments, taking out credit insurance with the insurer FPG.

According to information from the FSA, all Swedish insurance companies, with the exception of one (Alecta), use essentially the same life tables. This means investment portfolios constitute the main means for competition. Life tables used by Swedish insurers are based on cohort projections computed in 1985 by the Swedish Insurance Federation, revised in 1990 and 2007. Annuity conversion factors may eventually have been systematically overstated through an underestimate of increasing longevity, if companies adhered strictly to the 1990 tables for 17 years. This could have been the case, especially for the older elderly. In the end, all other things equal, this affects the bonus. What determines the actual outcome is nevertheless information that is not revealed to the public.

In sum*, de facto*, the insured bears the longevity risk, either through conservatively chosen life expectancy factors used in computing annuities or through the size of the bonus actually granted – or both. If participants were aware of the exact annuity products they were purchasing or could shop around to purchase annuities, all other things equal, they would choose the company offering the best annuity, which is tantamount to the company willing to take on a larger risk, instead of passing it on to the insured. In a truly competitive annuity

market, this would lead to the highest affordable annuity values for annuity purchasers. The all other things equal caveat includes the investment performance of the provider. A major question is, what latitude should there be or can there be for competition through investment portfolios? This brings us to the issue of the matching asset.

5.4.2   The "Matching Asset"

A way to manage the investment risk would be to match a birth cohort's annuity pool to a financial instrument with at least the same duration as the cohort's life expectancy at retirement – or perhaps longer, for example, until most in the cohort have passed away. If the financing of a retired birth cohort's pooled annuity is matched by an asset with a period of duration (roughly) commensurate to the longevity of the cohort, then the investment risk is minimized or perhaps eventually eliminated. In practice this requires the regular issuance of bonds with a duration of approximately 20 years - or more, depending on what percentage of a birth cohort the insurer wants to cover "risk free". The government is the logical issuer of such bonds.[26] Whether it is in the interests of the country's taxpayers to issue such bonds is an important issue. We can note that an alternative vehicle with a similar purpose, but not yet well-established in Sweden, is mortality bonds.

The expected length of retirement of Swedish cohorts born in the 1950s-1970s is 18-20 years at age 65. The average length of a commitment for insurance companies is slightly longer - 22 years (FSA 2004) - since the average retirement age of a covered participant is under 65. The bonds with the longest duration issued in Sweden since the mid-1990s are two separate issues of 16-17 years, one in 1997 and the other in 2004, for 40 and 64 billion kronor, respectively (Table B7 in the appendix). These are not typical bonds in the Swedish market, however.

Since the mid-1990s, government bond issues in Sweden are typically 10-year issues for amounts of 40 billion kronor. The requirement to hold bonds to back guarantee commitments in Swedish insurance creates a strong link between the insurance business and the government, one that is easily taken for granted. The dimension of this link can be illustrated as follows. In March 2008 the Swedish government's entire debt was 1075 billion kronor (about 35 percent of GDP) of which about 500 billion kronor is financed with Swedish government bonds. Roughly 60 percent of the total stock of government bonds is held by the private insurance companies administering the individual voluntary and occupational schemes.

In 2006-2007, the money weighted coupon rate of the stock of government bonds was around 5 percent, a rate which is sufficient to cover the most ambitious guaranteed rate of return offered by Swedish providers of individual voluntary insurance. In addition, with a rate of inflation of 1.5 percent per annum over the entire period since the Central Bank converted from a fixed to a floating exchange rate in 1992 this indicates a *real* coupon rate of return of around 3.5 percent. This is more than sufficient to maintain balance in the voluntary portion of the insurance business where a *nominal* guarantee rate of 3 percent is typical. In addition, it is sufficient to maintain a bonus rate comparable to a price indexed annuity in the present contractual DB schemes, given that the longevity risk has been properly managed.

---

[26] Whether it is in the interests of the country's taxpayers to issue these matching assets purely for the purpose of insurance providers is an important issue that must be addressed for those who promote this approach.

Note that the 10-year government bond rate, shown in Figure 3, fell to a low approaching 3 percent in mid-2005. Since most insurance providers in Sweden discount liabilities with a rate of 3 percent, examination of Figure 3 shows that for a short period in 2005 there was a possibility that the *market rate* for 10-year bonds had come close to falling below the rate used for discounting liabilities, and, in fact, did so for the few companies using a discount rate of 3.5 percent.

Figure 3. 10-year government bond rate
Monthly values, January 1987-March 2008
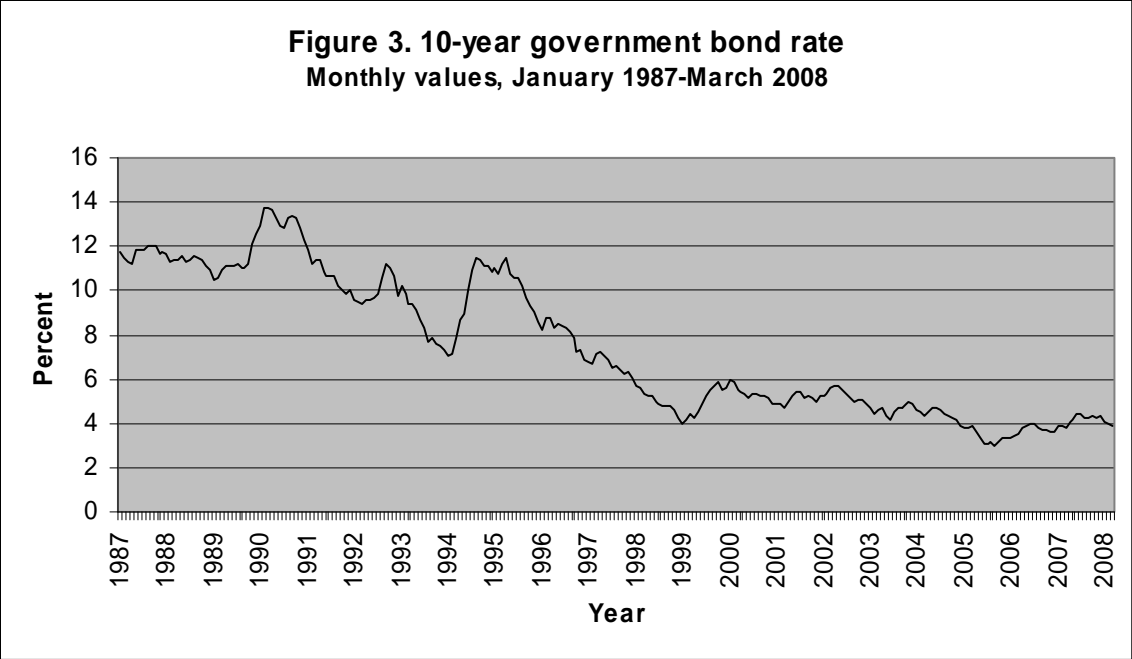
Source. The Swedish National Debt Office

An interesting question in this context is what happens to competition among annuity providers if the whole insurance market has access to and holds long bonds with the same returns. Logically, an investment portfolio that provides a good longevity match between assets and liabilities will inevitably restrict competition among insurance companies. The counterfactual is a situation with portfolios with higher equity content and higher rates of return for customers, but also with more volatility and risk. It can be concluded that present Swedish practice enables companies to assume greater risks – and for annuity recipients to achieve higher returns - than would be the case if annuity liabilities were more or less exactly matched by long bonds with a duration close to the longevity of annuities.

Finally, we note that periods with falling interest rates have two effects on the portfolios of insurance companies. The first is that a lower discount rate increases the present value of a company's commitments. As a consequence, the required technical insurance reserve, that is bond content, also increases. Second, companies' bond portfolios increase in value as coupon rates fall, but this increase will not match the increase in liabilities to the insured. This is a result of the fact that liabilities have a longer duration than assets. The average duration to maturity of government bonds has been around 4 to 5 years[27], whereas the average duration to

---

[27] The duration of the stock of government bonds is 5.5 years, calculated from Table B7 in the appendix. The duration of treasury bills is around a year. The data indicate debt rolls over completely about every four years.

46

maturation of insurance commitments (which for individual voluntary insurance can start at age 55) is much longer.

In closing, it can be noted that, compared for example with the UK where there is a lively public discussion of the need for long-term government debt issuance to create the "matching asset" for private insurance, there is presently little discussion of this issue in the Swedish insurance community. Instead, insurance companies seem to be comfortable dealing with the risk of fluctuating values in asset portfolios through the system of balancing with (positive – and when necessary – negative) bonuses, described above. In addition, as the data above indicate, especially the occupational schemes, which dominate the private market, are presently running with considerable surpluses, suggesting the companies have successfully managed the investment volatility. In retrospect we can see that a major consequence of the dot.com financial crisis of 2001-2002 was development and implementation of a new regime for measuring portfolio stress potential, which will be discussed below under the topic of regulation and supervision.

5.5   PPM Product Provision and Risk Management

We turn now to the PPM. As has already been discussed, the PPM is the sole *provider of annuity products* in the mandatory financial account scheme. The products that the PPM can provide are specified in law. Participants can choose between single and joint life annuities. Life annuities, which can be either fixed or variable rate, are the only products offered. Hence, product choice is limited in the mandatory plan, compared with individual and occupational insurance.

A *fixed rate annuity* is "purchased" from the PPM at retirement and entails closing individual accounts and transferring money to the PPM, which invests the funds. This is the PPM equivalent to the traditional insurance alternative within the private insurance framework, which provides a combination of a guarantee and a bonus rate of return. Alternatively, the participant can leave his/her money in market funds and accept a recalculated annuity on an annual basis. This is the *variable rate annuity,* which is a unit-linked annuity. These annuities are also managed by the PPM.

Until April 2007, the guaranteed rate of return was 2.75 percent. In a series of steps during 2007, the PPM changed its policy both regarding the guarantee and how the funds of pensioners should be invested. In order to enable it to increase its solvency ratio and thereby invest a greater portion of assets in equities, the guarantee was changed to cover only the nominal value of individual balances, i.e. the guaranteed rate of return was lowered to 0 percent. This means that the entire return will be viewed as a "bonus" – or profit-sharing segment of investment returns. It is hoped that this policy will give a better return to policy holders in the long run.

The choice of investment service provider(s) is made by the PPM's Board of Directors. Money turned over to the PPM at retirement is invested by a public investment company. For the past several years, 73 percent of the assets of annuity holders have been invested in interest bearing assets and 27 percent in equities. As has already been discussed, by law insurance companies can have a distribution of 75/25 in their technical reserves, but the PPM

is allowed a 70/30 distribution. The share of equities represents, thus, what is allowable while complying with the rules regarding technical reserves. The PPM is not yet in the position where it has "free assets", that is, reserves much exceeding the amount needed to cover guaranteed commitments, which it can invest more freely.[28] At year's end 2007, following the switch from a guarantee rate of return of 2.75 percent on balances to a guarantee covering only the nominal value of balances, the solvency ratio increased from a little over unity - 1.04 – to about 1.17. Progressively during 2007 the PPM enlisted the services of four private firms to manage an equity portfolio. Its interest bearing portfolio is still being managed by a publicly owned investment agency that invests other government funds.

Benefits are calculated using *unisex* life expectancy tables, which is in line with an EU court (Barber) decision regarding benefit calculations in *public* pension schemes. The life expectancy projections used by the PPM are taken from Statistics Sweden's projections. Statistics Sweden provides two scenarios: a baseline and a low mortality rate scenario. In calculating the traditional fixed-rate annuity, the model with a guarantee and a bonus, the PPM uses Statistics Sweden's low mortality scenario, adjusted even further by assuming mortality will be 10 percent lower. On the other hand, the baseline scenario is used in calculating the variable rate annuity, where the participant retains his or her market funds. The difference between the low mortality scenario and the baseline scenario is substantial, about four years to the year 2050 (Table17). Hence, the PPM fixed rate annuity is based on a very conservative assumption.

Table 17. The PPM Life Expectancy Assumption. Illustrated with LE from birth.

	2004	2050
Baseline scenario		
Men	77.9	83.6
Women	82.3	86.2
Low mortality scenario		
Men	78.0	87.5
Women	82.4	89.9

Source. Statistics Sweden

Whereas in the fixed-rate case the PPM bears the longevity risk for the guaranteed benefits, the PPM bears no longevity risk for the variable rate. From the point of view of the insured individual who has chosen the variable rate option (which around 90 percent of retired participants had in 2007) this allows use of the less conservative mortality assumption and results in less money in the final years of the payout period. For present pensioners, benefits are still so small that this makes little difference in practice. It will become a matter for potential concern when the PPM system has matured and individual balances at retirement are large enough to worry about.

Presently, the PPM expects to retain the mortality schedule, determined at age 65, for the remainder of the participant's life. There is nothing that prohibits changing tables in the future, if longevity changes considerably compared with the table values. Within the traditional insurance framework, as has already been discussed at length, the insurer, the PPM in this case, has the option of covering negative longevity outcomes for the insurer by altering

---

[28] Recall that, as a group, private insurance companies held almost 50 percent of their assets in equities in 2005.

the bonus and then setting a new divisor value for newly granted benefits. This is an option available to both the PPM and private insurers.

There is one issue that is not clear in the Swedish legislation, which is the question of owner liability. Although the PPM's life expectancy assumptions appear to be very conservative, it is still theoretically possible that life expectancy could outperform this conservative value and/or that portfolio investment performance would not be sufficient to cover the guaranteed liability. Swedish law prohibits distributing money between cohorts to cover a deficit for any given cohort. In principle, the Swedish government is the owner of the plan administered by the PPM, which implies that the government would be responsible for covering any deficit that may occur, although this is not stated specifically in the law.

In sum, the set-up for the PPM is similar to that for private individual voluntary insurance, with the exception that the choice of retirement products is considerably more limited.

5.6   Regulation of Providers of Insurance Products

5.6.1   Regulatory Procedures

Regulation of banking, insurance and the securities market are all under one roof in Sweden – the Financial Supervisory Authority (*Finansinspektionen*), referred to as the FSA from here on. The FSA is a public agency. The integration into one supervisory agency is logical, given the development of the financial markets during the past two decades, with integration of insurance into banking and vice versa. The planning and execution of supervision is performed jointly for all financial entities.

The Financial Supervisory Authority grants the right to establish and operate a financial company in Sweden. From 1999 foreign-based companies can operate in Sweden without establishing a registered company, by registering with the FSA. The government sets the framework of principles for operation in Sweden, following EU legislation and regulations.

Quarterly and annual reports, special questionnaires, on-site inspections and market and specific company analysis provide the basis for supervision. Generally, the focus of supervision is on solvency. Traditionally, quarterly information is processed to examine premium receipts, benefit payments, portfolios, etc. in order to determine the vulnerability of assets and liabilities to market risks. Table 10 above is based on a selection of this information. From 2006 the FSA has introduced a new supervisory instrument, called the traffic light system, which is designed to provide an early warning signal of the market risks implicit in the asset portfolios of life insurance companies. This is described in greater detail in a separate section below.

Generally speaking, insurance companies are regarded by the FSA as presenting much less of a systemic stability risk than banks. This is because banks must match liquid liabilities (deposits) with relatively illiquid assets (loans). A rapid fall in deposits is difficult to meet with an immediate adjustment in the stock of loans. The situation is just the opposite for insurance companies, which manage relatively liquid assets that need to match illiquid liabilities.

The FSA summarizes its supervisory role with the following picture.

Table 18. The FSA's Supervisory Role.

	System functionality	Consumer protection
Supervision of system stability	Focus: Supervision of companies' management, financial strength and risk management, etc. to ensure operational stability and adequate risk management.	Focus: Provision of products with transparent product contents and descriptions that ensure that commitments to customers can be understood and met.
Supervision of the market	Focus: Supervision of how financial actors perform independently and together with the aim of ensuring market efficiency and public confidence in the market.	Focus: Correct and relevant information and fair treatment of customers.

Source. FSA 2004.

The FSA intervenes in the operations of a company if two criteria are met. First, there must be an impending situation or risk that the market can not handle satisfactorily on its own. Second, the benefits of an intervention must be considered to outweigh the market efficiency loss implicit in an intervention.

In the supervision of insurance companies, the first question asked is whether the company's survival is in danger and whether there is a risk that payments must be cancelled. If the answer is affirmative then the FSA will interact with the company to achieve a solution to the problem. If there is a systemic risk, which is not an immediate solvency problem, the FSA will initiate procedures for restructuring of the company – if this has not already happened through the initiative of the company itself. This is likely to result in a change of ownership through merger or takeover. An immediate solvency problem will require the intervention of Ministry of Finance and recapitalization through injection of government funds. In principle, this rule should even hold for the PPM, although this is not explicitly stated in the law, as has already been mentioned.

5.6.2   Determination of Solvency

An insurance company is considered solvent if

1)   capital base ≥ 4% of technical reserves for policies where the company bears the financial risk + 1 % of technical reserves for other policies + an amount related to mortality risk exposure; and if

2)   capital base essentially = Value of market assets – Technical insurance reserves, with deduction of intangible assets and addition of subordinated loans.

The technical reserves are the reserves needed to cover the current *guaranteed* liabilities to pensioners.[29]

---

[29] Note that in Tables 16 and 17 above, the liability component in the ratio of assets to liabilities includes both the guaranteed and the committed bonuses, not just the guarantee component as in the solvency calculation. For

The capital base (expression 2) increases in a rising market and falls in a declining market. Likewise, *ceteris paribus*, an increase in technical insurance reserves decreases the capital base. In practice, companies can choose freely any discount rate up to a ceiling established by the FSA. According to an EU regulation the ceiling is 60 percent of the market rate for long government bonds. If the discount rate falls, then solvency falls with it in the case that companies are forced to use a lower rate due to the fall. An increase in the discount rate increases solvency.

Prior to 2007, the market rate used by the FSA to establish the ceiling was the rate on the longest government bond on the market. In 2006 this was a bond issued in 2004, maturing in 2020 and carrying a 5 percent coupon. This gave a ceiling of 3 percent for the discount rate. Preceding this, there was a lower rate based on a bond with a shorter maturity of 11 years. Although market rates began to rise in 2005, the 16-year bond nevertheless remained as the measuring rod for establishing the ceiling. According to its stated policy, the FSA will change this rate only when there is sufficient evidence for doing so.

It is interesting to note that in mid-2003, following the fall in the stock market, the solvency ratio, calculated with reference to guaranteed benefits, for the largest thirteen companies was still relatively high – at 8.7 - and by mid-2004 it had improved by even more, reaching 9.7 (FSA 2004). These are high figures compared with an intervention level of unity. This indicates that, even in the worst years, solvency remained relatively high, even though many companies were compelled to take back previously committed bonuses, as a response to the fall in the equity market, as has been discussed above. However, for one of the largest insurance companies, SPP, the ratio was only 1.18 in late 2004, and it was below 2 for two other relatively large companies. As a result, the FSA required more and more frequent information from these companies during the crisis period.

Companies that come close to the insolvency level lose considerable potential to invest in equities when the market turns up, putting them in a worse situation to compete with other providers. In fact, the companies that were close to the solvency level after the fall in the equity market in the initial years of the new century, and which were forced to reduce bonuses to savers and pensioners, were "punished" by a fall in business in 2004. For example, SPP's sales of new voluntary insurance fell by 65 percent from mid-2003 to mid-2004 (FSA 2004).

An important question recently debated in the insurance community in Sweden is what should be the discount rate applied to determine the value of technical liabilities? Until 2007, the choice was left up to the individual insurance company, albeit with a ceiling, as we have just seen. This meant that companies choosing a higher rate had a smaller liability and more room for free investments. In addition, the FSA has observed that some companies used a higher rate than the reigning rate on government bonds during 2006. The FSA responded by issuing a new regulation at the end of 2006. This regulation requires companies to use a "risk free" discount rate from 2007. The rate used is to be an average of the rate of return on government bonds and the swap rate, the latter is included to extend the portfolio of instruments upon which the discount rate is based.

One of the arguments used in issuing this new regulation was that it is important for all companies to use the same rate, which among other things facilitates comparability, although

dividend-paying life insurers, technical reserves also include the so-called conditional bonus, for which policyholders bear the financial risk.

at the expense of leaving the freedom to choose an even lower rate. If the aim, in addition to specifying a risk free rate, were for all companies to use exactly the same rate, then it would be practical for the FSA to compute this rate and inform all companies of the resultant value. Instead, the FSA has left it up to the individual company to calculate this risk free rate, which in practice opens the door to some variation depending on the method of calculation used. Since this procedure is in conflict with the FSA's specified goal, it seems reasonable to predict that this procedure is likely to be replaced by a standard calculation supplied by the FSA.

In sum, until 2007, insurance companies, including the PPM, were free to choose a discount rate for liabilities with the only restriction that it should not exceed a specified ceiling. From 2007 the rate is, in principle, the same for all companies. In principle, this assures that no company exceeds the risk free rate and creates inter-company comparability. On the other hand, it eliminates the freedom of companies to choose an even more conservative discount rate and in doing so goes beyond the current EU directive, which allows freedom of choice up to the ceiling.

5.6.3 The Traffic Light System

In 2006 the FSA introduced a new supervision instrument called the traffic light system, based on experience of the application of a similar instrument in Denmark. All insurance companies are covered by the traffic light system since January 2006 and the PPM is covered from January 2007. The traffic light system is intended to provide an advance warning of a company's vulnerability before the insolvency level has been reached.

The traffic light system is designed to test the stress tolerance of companies' financial condition by requiring them to compute the change in the values of assets and liabilities resulting from hypothetical declines in interest rates and equity prices. The following tolerance tests are applied (FSA 2005):

1. The equity price risk is separated into a risk for domestic and foreign assets. Insurance companies must be able to tolerate a fall of 40 percent in Swedish and 37 percent in foreign equity prices.
2. Companies must be able to tolerate a fall of 35 percent in property values.
3. The foreign exchange risk that a company must be able to absorb is a 10 percent change in the exchange rate.
4. Companies are required to calculate whether their net interest exposure (the difference between the interest sensitivity of assets and liabilities) is long or short. For a short position, the company is required to calculate the effect of a fall in the rate of interest. For a long position, the company is required to compute the effect of an increase in the rate of interest. The tolerance levels tested are:
    i. nominal SEK interest rate: +/- 30 percent of the 10 year rate
    ii. real SEK interest rate: +/- 30 percent of the longest real interest rate
    iii. nominal Euro interest rate: +/- 25 percent of the 10 year Euro rate
    iv. nominal interest, other currencies: +/- 30 percent of the 10 year rate for the largest portfolio asset denominated in another foreign currency
5. Credit risk (increase in spread): the greater of 100 percent increase or an increase of 50 basis points

The net outcome is calculated as the square root of each risk raised to the power of two, including correlation components. Whether an insurance company receives a red or a green light depends on the net result of this calculation. The traffic light system is seen as a complement to the solvency test and the other data collection and supervisory tools used by the FSA.

In sum, the extreme fluctuations in domestic and foreign stock markets, property values and interest rates during the past couple of decades, together with the increased importance of privately managed and provided insurance in the life portfolios of individuals, has led to the introduction of this much more sophisticated approach to evaluating the tolerance of portfolios to extreme changes in the financial environment.

5.7 Final Remarks

The Swedish insurance framework with a guaranteed rate of return and distribution of performance-based bonuses is a long-standing practice. This form of benefit is the standard insurance benefit within private voluntary, occupational group, and publicly provided PPM insurance. Looking back, this institution has never presented a serious problem for solvency, since the guarantee has always been relatively low compared with the market rate on government bonds. The convention of distributing bonuses to the insured – both during the accumulation and the annuity phases in the DB framework and during the annuity phase in the DC framework – provides an opportunity for companies to compete on the basis of investment performance. In principle, there should even be room for competing through longevity assumptions, but to date companies have tended to use the same life tables. The guarantee-bonus system provides some slack within which the potential problems created by less than certain life expectancy divisors used in computing annuities can be absorbed.

The more general disadvantage of employing the guarantee-bonus model is that there is a risk that distributed bonuses may need to be reclaimed, even if only temporarily. The drawback is that reclaiming bonuses is never popular. This study has illustrated how this mechanism worked following the crash in the Swedish stock market in 2001-2002. Although some companies were forced to cancel portions of previously announced bonuses, no company fell into more than temporary financial difficulty. By 2005 all companies once again had considerable free liquidity. Nevertheless, cancelling bonuses was not popular and, at least temporarily, companies that did not cancel a part of a previously announced bonus gained a competitive edge.

The financial crisis had another repercussion. In 2006, the FSA introduced the traffic light system to analyze the vulnerability of insurance companies to financial stress. There is little experience yet in applying this instrument so it is too soon to pass judgment on the effect it could have on the investment policies of insurance companies and, perhaps, as a consequence, the Swedish "guarantee and bonus" system. On top of this, there is a new regulation from 2007 specifying the risk free rate of return to be used for discounting liabilities as an average of the government bond and swap rate. The aim of this regulation is to create a comparable measuring rod for insurance company liabilities, which is laudable.

Generally, it now appears that both product and supervisory trends are in the direction of decreasing risk and increasing conformity among providers. First, the conversion from DB to DC eliminates the components of longevity and investment risks inherent in the DB

accumulation phase. In DC, the insurance company bears the longevity and investment risks only during the payout phase. In Sweden, all companies use the same life tables. We have noted that if, as is apparently the case, all companies use the same tables to manage the longevity risk, this leaves only investment portfolio returns for competition.

If guaranteed benefits were to be covered by say 20-30 year bonds, still not a reality in Sweden, then even this element of risk would be minimized, but also at the expense of increasing conformity among providers. More generally, in a world where the investment portfolios of providers contained something like birth-cohort bonds issued for more or less the duration of a cohort's life, the investment risk would be minimized, creating almost complete uniformity between providers on this point, too. In the Swedish traditional insurance setting, this would put competition in the hands of investments for creating bonuses.

Finally, supervisory rules are moving in the direction of creating greater conformity and reducing potential volatility of portfolios through the new traffic light stress test. Given that all companies are also restricted in their provision of insurance products to those specified in the legislation regulating insurance, all factors that lead towards similar investment portfolios tend to reduce the remaining degrees of freedom for competition. The major challenge is therefore to retain enough investment freedom to leave room for healthy competition and to encourage product innovation.

6   CONCLUSIONS AND LESSONS FOR OTHER COUNTRIES

Major reforms, including structural reforms of the financial market in the 1980s and the public pension system in the 1990s, were important prerequisites for the development of today's thriving private insurance market in Sweden. The financial market reforms of the 1980s and early 1990s did away with a regime characterized by quantitative portfolio investment regulations. From the point of view of private insurance, the most significant development was the implementation of legislation permitting unit-linked insurance in 1993. This made it possible to couple the emerging private investment fund market with the market for contractual saving.

The first step in the reform of the public pension system was to abolish the pay-as-you-go survivor benefit for widows, beginning with women born in 1945 and later. This led to an immediate increase in the percentage of women purchasing private pension and life insurance products. Women's demand for insurance has increased steadily since this change was introduced in the early 1990s. Most important, however, was the conversion of the earnings-related public mandatory pension system from DB to DC. The transformation of the public commitment to a financial DC framework led to the conversion of all major occupational supplementary benefit schemes from predominantly defined benefit to predominantly defined contribution. Previously unfunded occupational schemes for public sector employees at all levels of government, became (largely) pre-funded. In addition, all occupational arrangements for private sector employees became pre-funded. This transition into increased pre-funding within a DC framework is by far the most important development in the Swedish pension landscape in the past decade.

The conversion to financial DC schemes has led to a considerable injection of money into the Swedish financial market. PPM annual premium payments amount to just about one percent of GDP. Premium payments into the private voluntary and occupational schemes (and various other products of life and health insurance) amount to almost seven percent of GDP. This is significant by international standards. This is on top of a mandatory pay-as-you-go (NDC) scheme with a relatively fixed cost of about 11 percent of GDP. The overall Swedish commitment to pensions is then around 18 percent of GDP, of which about a third is pre-funded.

At 18 percent of GDP, the overall scale of pension commitments in Sweden is high. Some of the total commitment (included within the 11% cost for the public pay-as-you-go commitments) consists of transfers for the low income pension guarantee, non-contributory rights, *e.g.*, for mothers, and covered old-age rights accruing during periods of insured unemployment, sickness and disability. The evidence from Sweden is, thus, that it is possible to maintain a strong welfare commitment even with a more pronounced pre-funding profile. The data on expected future replacement rates for full-career workers support this conclusion. Although the adequacy of coverage of persons with short earnings careers is an issue for concern in the new DC environment, the overall picture is of a country which in aggregate transfers a large percentage of its income to pensioners, in part through transfers and in part through collective and individual saving. What is important to stress is that an increasing percentage will be transferred in coming decades through saving as the new financial DC schemes mature.

Furthermore, Sweden's experience indicates that, even in the more developed economies, the conversion to financial pension schemes can contribute to developing the financial market. The financial defined contribution PPM scheme within the public mandatory system was modeled after unit-linked insurance, providing the opportunity for individuals to make their own portfolio choices during both the accumulation and payout phases. Private individual voluntary and occupational group insurance also offer unit-link products as an alternative to traditional insurance, an alternative that has become a popular product in recent years. The growth of the PPM and the private unit-linked market has in turn pushed the growth in the number of funds available in the market. At the same time the entrance of the PPM helped to put a focus on fund charges and, more generally, administration fees.

In spite of the large number of companies now offering funds in the PPM system, this study reveals that the seven largest Swedish based insurance companies manage the majority of the PPM assets not held in the default fund. The same companies account for almost all the occupational and private insurance business. A conclusion is, then, that despite the large number of insurance companies and fund managers in the Swedish market, the market is dominated by only a few companies. Of course, the mere fact that there are around 40 insurance companies and over 75 fund managers doing business in Sweden is a healthy sign and suggests that despite the dominance of the larger groups many companies still operate successful businesses within this environment.

The analysis in this study of data on the sources of income of pensioners shows that both occupational and private insurance provide an important source of income in the earlier years of retirement for current pensioners. Sweden has no data on the distribution of insurance benefits by types of products. The aggregate data suggest, however, that 5 and 10 year withdrawals of occupational and private voluntary benefits are the preferred options. Also, the data indicate that life annuities are not important income sources for present older pensioners. However, this may reflect the fact that for a long time the public benefit, with an occupational supplement, was viewed as providing sufficient income.

The demand for private insurance did not take off until around 1990, with the beginning of the downsizing of the public commitment – beginning with the abolition of the widow's benefit for younger birth cohorts. The relatively strong increase in the demand for private insurance in the early 1990s may also have reflected a feeling of pessimism among younger birth cohorts that the public commitment would not be honored in full in the future. The reform legislation of the public system, moving from DB to DC, confirmed this, at least in a sense. Although the move to DC was more or less neutral or advantageous for a 40-year plus career worker, it definitely reduced commitments to participants with short earnings careers. In addition, it made retirement at a fixed age, the current "normal" retirement age of 65, more costly in terms of income replaced for successively younger birth cohorts.

Overall, the succession of changes, beginning with the reform of the public system, signals a continued future increase in demand for private longevity insurance products, including life annuities. In fact, life annuities should be expected to be demanded especially by women born after 1945 in part due to the overall age difference between spouses and in part due to the fact that women live 4-5 years longer than their spouses. Within traditional insurance, the portfolio of products offered in the Swedish market has remained practically unchanged for over a half century. The major product innovation during this period was the introduction of unit-linked insurance, giving participants the opportunity to manage their own funds, not only during the accumulation phase, but even during the payout phase, with the latter resulting in a variable

rate annuity. The money weighted duration of the present stock of government bonds is only 5.5 years, based on the figures in Table B7 in the statistical appendix. The turnover time for treasury bills is around a year. A calculation of the weighted duration of both bonds and bills suggests the government rolls over its debt completely about every four years.

Two major issues in insurance provision are the longevity and investment risks. Clearly, a DC scheme shifts the investment risk during the accumulation phase to the individual. Either the individual chooses funds or the company which invests on his/her behalf. If the individual chooses to manage his or her own funds during the payout phase, with payments being recalculated every period (year), both the investment and longevity risks are shifted to the individual, since funds remaining on the account balance at the end of the year are paid out according to a given annuity factor. In this sense, this product form is ideal for the insurer, who then provides only investment fund options and earns money on charges for these management services.

Likewise, 5 and 10 year withdrawal products eliminate the longevity risk from insurance companies, transferring it to workers, at least to the extent that these products are now coupled to a form of a survivor benefit that "reintroduces" risk. However, if the insurance product is a traditional insurance product, which in Sweden means that the insurance provider guarantees a specific rate of return, there remains an investment risk. Since 10-year bonds are a common form of debt finance for the Swedish government, in principle insurance companies have access to a "short" matching asset. Judging by the absence of a debate on this issue of the matching asset, Swedish insurers do not seem to miss the convenience of having a single matching asset. In addition, it is not clear to what extent public debt policy caters directly to the needs of insurance companies.

The Swedish model for traditional insurance provides a guaranteed plus a bonus rate of return during both the accumulation and the payout phase. If the ratio of assets to pension liabilities – including the guarantee - goes below unity, correction entails reducing bonuses granted earlier. This is also the model adopted by the PPM for its traditional life annuity. The bonus is based to a large extent on the returns on the portion of the insurance provider's portfolio that is invested in equities and, given that companies compete through bonus offerings, they are competing on the basis of their investment outcomes. This is a model that could be adopted in many other countries, whereas to date it is apparently Denmark and Sweden that employ it on a large scale.

The guarantee-bonus system facilitates management of both the longevity and investment risks. Insurers bear the investment and longevity risks of the guaranteed benefits, but these risks are shared among annuitants in the case of bonuses, since the effects of an underestimate of life expectancy and volatility of investment returns can be offset by reducing the size of the bonus. The advantage of this system is clear. It enables the insurance company to increase the returns offered to participants by taking on more risk. The disadvantage is that, in the "worst" case, the provider must create a balance between assets and liabilities by reducing the size of previously announced bonuses, which can create an image problem. This feature could be made more transparent through clearer advance information to participants on the nature of the contract. On the other hand, when the market collapses participants will be aware of this fact, and tolerance may be higher when cutbacks can be explained as a logical result of an exogenous event that affects practically all investors. In the case of unit-linked annuities, participants bear the investment risk on an individual basis but share the longevity risk.

In 2006, the Swedish Financial Supervisory Agency introduced a new tool for measuring the degree of stress insurance portfolios can tolerate, called the traffic light system. The traffic light system is designed to illuminate the degree of risk in the insurance provider's investment portfolio in relation to pension liabilities. In addition, whereas prior to 2007 insurance companies were free to choose the discount rate (up to a ceiling) applied in evaluating liabilities, from 2007 they must use a risk free rate determined as an average of the government bond and swap rates. Judging by these recent events the present trend in Sweden is toward creating a stricter regulatory framework, while maintaining the guarantee-bonus system.

Summing up, there are some important lessons that can be learned from a study of developments in Sweden. The first is that it is fundamental that the market be free to develop, albeit under the supervision of a financial supervisory authority. Secondly, the development of financial institutions and instruments feed into each other, generally expanding possibilities for the development of both. Thirdly, even for a country that takes on a considerable welfare commitment, it is possible to build on the market to provide services for this commitment. It is likely that the public FDC plan in Sweden will eventually not only use the market during the investment phase, but also during the annuity phase, once the scale of annuities has become large enough to make this a reasonable step. In 2007, the first step was already taken, with the privatization of equity investments for the traditional insurance portfolio. In the meantime, with small sums of money per beneficiary it is probably to the advantage of pensioners that all risks are aggregated in one collective product. The public PPM-managed scheme follows all the rules that apply to private companies, and is subject to the same regulatory instruments, in principle.

A fourth lesson is that the demand for annuities is related to the coverage of the public scheme and the public perception – or understanding – of the need to supplement the public commitment with private initiative. The Swedish move from DB to DC schemes helped by setting a ceiling on the public commitment. Fifth, the substantial move to DC and pre-funding in the public scheme as well as the occupational schemes for public and private sector employees generated greater long-run intergenerational fairness and long-run financial stability.

One final observation is that, with the major exception of the introduction of unit-linked insurance, little has happened during the past half century in the development of insurance products. To date, the products utilized have been driven in part by a desire to utilize tax rules and in part by an apparent demand for complementary income for the early years of retirement. What remains is to develop retirement products with a focus on how the longevity and investment risks can be managed while offering attractive alternatives to customers.

Appendix A: Changes in Occupational Pension Schemes

This Appendix summarizes the changes that have been effected in the benefit design of the main occupational pension schemes. There are four major occupational benefit schemes in Sweden that together cover almost 90 percent of all employees. These provide a top-up for earnings covered under the ceiling in the public system and a benefit for earnings above the ceiling. The four schemes cover white collar workers (ITP/ITPK), blue collar workers (SAF-LO), local government employees (KAP-KL) and national government employees (PA-03).

Prior to the reform of the public pension system, beginning in 1994, all the occupational schemes provided defined benefits. But only the benefit plans covering white collar workers (ITP) were fully funded financial defined benefit (FDB) plans. The plans for workers covered by the SAF-LO agreement were funded at the time of retirement, while the plans for public sector workers were pay-as-you-go – that is, they were non-financial defined benefit (NDB) plans.

Salaried employees in industry and commerce (ITP and ITPK)

The supplementary pension scheme for salaried employees in industry and commerce (ITP and ITPK) provides a defined benefit scheme for employees born in 1978 and earlier (Table A2) and, according to an agreement reached in April 2006, a defined contribution individual financial account scheme for employees born in 1979 and later (Table A1).

In addition to the standard ITP benefit presented in Table A1, persons born between 1939 and 1978 are covered by an additional plan, called ITPK. This is based on a defined contribution of 2 percent of earnings paid from age 28 to 65. From the very outset in 1990, participants in ITPK have been able to choose from a list of registered insurance providers. This was in fact the first plan of this type in Sweden. When unit-linked insurance entered the Swedish market in 1993 fund choices also became a feature of this plan. There are 14 providers of unit-linked and 10 providers of traditional life insurance products to choose from, with most participating companies providing both.

Upon death prior to the retirement age, the money accumulated by the deceased is paid to survivors in the immediate family, with payments being distributed over at least five years. If the participant dies during the retirement phase, depending on the insurance chosen, payments may be made to the surviving family through a contractual withdrawal period. In addition, a survivor benefit of a specified amount (two times the base amount) paid out during 5 years after the death of the policy holder can be purchased within the specified contribution rate. This choice reduces the old-age component by the amount of contributions transferred into the survivor scheme.

For employees born prior to 1979, *employers* can choose between paying ITP contributions to Alecta (previously a part of SPP) and keeping the debt within the company. Frequently, larger companies choose to keep their funds within the company, with the option of moving part of their debt over to a trust for portfolio management. In 2006 about 1750 companies chose this option.

If companies choose to retain their pension debt, they are required to reinsure it with a company set up to perform this function – *försäkringsbolaget pensionsgaranti* (FPG). When the time comes for a participant to draw on her or his pension, FPG assures that the transfer of

money is made to Alecta, which administers the payment of all benefits under the ITP scheme.

In *the new ITP DC scheme* for persons born in 1979 and later, the employee chooses his or her own insurance company, and, as with ITPK, the participating companies can offer unit-linked insurance. However, at least 50 percent of total contributions must be held in a traditional insurance arrangement. A private clearinghouse, Collectum, has been set up to administer the new ITP plan. It contracts participant insurance companies and administers contribution payments. A pension can be claimed from age 55 either as a life annuity or as a payment over 5 or 10 years. This is a normal product choice within Swedish occupational pension schemes.

Blue-collar employees (SAF-LO)

The *first* supplementary pension plan for employees covered by the SAF-LO[30] agreement was reached in 1973, thirteen years after the other three occupational pension schemes adapted their then existing plans to the introduction of ATP in 1960. From 1974 through 1995 those covered by the SAF-LO agreement received earnings replacement of 10 percent on top of the public benefits for earnings up to the ceiling in the public scheme. In 1996, this DB scheme was replaced with a defined contribution financial account scheme. Also, from 1996, there is no ceiling on covered earnings.

Persons born in 1968 and later are fully covered by the new scheme. Persons born between 1932 and 1967 constitute the transition cohorts and receive an individually calculated sum for years during which contributions were made prior to 1996. Originally, coverage was provided from age 28. In 2002 the age for coverage was reduced to 21. In 2000 the contribution rate was increased from 2 to 3.5 %. Following the new agreement for employees covered under the ITP plan in 2006 (see above) there is now discussion of also raising the contribution rate for the LO collective agreement to the same level, i.e., 4.5 percent.

When the new DC individual account plan was introduced, participants were obliged to keep their accounts in one insurance company, AMF (*Arbetsmarknadsförsäkringar)*. From 1999, however, participants have been allowed to choose from among the same companies participating in the ITPK scheme, which are the major providers of insurance products in Sweden.

Local government employees (KAP-KL)

From 1998, all municipal and county council employees[31] born in 1938 and later – the birth cohorts covered by the new public system – are covered by KAP-KL. This scheme includes a financial defined contribution old-age pension supplement for earnings under the ceiling in the public NDC and FDC schemes and a defined-benefit supplement that replaces 62.5 percent of earnings *over* the ceiling covered in the public system (7.5 base amounts, which was 333 750 SEK in 2006, see Table A1) up to 20 base amounts. There is also an early retirement benefit for police and firemen (which can be claimed from age 61) and a defined benefit for surviving spouses (and registered cohabitants) and/or the children of a deceased

---

[30] *Svenska arbetsgivarföreningen* – SAF denotes the Swedish Employers' Confederation and *Landsorganisatione*n – LO is the Swedish Trade Union Confederation.

[31] Excluding workers in the municipal sector covered by the SAF-LO agreement.

Table A1. Overview of contractual insurance after the conversion to DC

	ITP-ITPK[a]	SAF-LO[a]	Civil servants, national government employees	Local and county council employees
Agreement became effective	2007	1996	2003	1998
First birth cohort covered/ fully covered	Employees born 1979 and later are fully covered	Employees born 1932 are covered (with a transition rule). Persons born 1968 and later are fully covered	Employees born 1943 are covered (with a transition rule). Persons born 1973 and later are fully covered.	Employees born 1938 are covered (with a transition rule). Persons born 1971 and later are fully covered
Age at which coverage begins	Age 25	Age 21	Age 23[d]	Age 21[e]
Form of coverage				
1. Earnings up to the ceiling in the public system (7.5 basic amounts[b])	FDC plan with a contribution rate of 4.5%	FDC plan with a contribution rate of 3.5 %[c]	FDC plan with a contribution rate of 2.3 % + 2.0 % from an FDC plan preceding this agreement (KÅPAN).	FDC plan with a contribution rate of 3.5-4.5 %. (4.5 % for all from 2010 following a stepwise transition.)
2. Earnings equivalent to 7.5-20 basic amounts[b]	Contribution rate of 30%	FDC plan with a contribution rate of 3.5 %[c]	NDB that replaces 60 % of final earnings + Kåpan	FDC as above plus NDB that replaces 55 % of final earnings
3. Earnings equivalent to 20-30 basic amounts[b]	Contribution rate of 30%	FDC plan with a contribution rate of 3.5 %[c]	NDB that replaces 30 % of final earnings + Kåpan	FDC as above plus NDB that replaces 55 % of final earnings
4. Earnings above 30 basic amounts[b]	No coverage	FDC plan with a contribution rate of 3.5 %[c]	No coverage	No coverage

[a] Insurance premiums paid by employers are tax deductible on earnings up to 30 basic amounts. Employees covered by the SAF-LO agreement are unlikely to have earnings above 20 basic amounts.
[b] The basic amount is a unit used in social and private insurance in Sweden. The basic amount applicable in the present case was 45 900 SEK or 6851 USD in 2007, with an exchange rate of 6.7 SEK per USD. The ceiling in the public system was, thus, 51 381 USD in 2006. [c] An increase in the contribution rate to 4.5 % is a likely result of discussions at the time of this writing. [d] KÅPAN provides coverage from age 28 and full coverage requires 30 years of participation. [e] A full NDB supplement requires 30 years of coverage from age 28.

participant. Rights acquired prior to 1998 in the previous DB scheme are calculated upon retirement.

Employees covered by the KAP-KL scheme can choose either traditional or unit-linked insurance and from the same companies providing these services to private white collar workers and the LO affiliated unions. Employees who do not make an active choice are allocated to a default insurance company (*KPA Pensionsförsäkring AB*).

The conversion from defined benefit to defined contribution benefits for municipal and county council employees fulfilled two goals. The first was to bring these schemes into line with the new public NDC and FDC schemes. The second was for the municipal and county councils to stop accumulating unfunded liabilities at the expense of future taxpayers.

Civil servants and other national government employees (PA-03)

The supplementary pension scheme for national government employees is called PA-03. Beginning on January 1 2003, from age 23 all earnings up to 30 base amounts of all employees of the state born in 1943[32] and later are covered by a supplementary agreement called PA 03 (Table A1). Employers pay a contribution rate of 2.3 percent to the individual accounts of their employees. Employees choose either traditional or unit-linked insurance from the same providers as in the other schemes that have already been described. The contributions for those who do not make an active choice are placed in traditional insurance and are reinsured by FSO (*Försäkringsföreningen för det statliga området*), an insurance union for state employees. State employees are also covered by an additional contribution rate of 2 percent from age 28 by another older funded scheme, called KÅPAN, in which employees have no choice of insurance form or provider. KÅPAN benefits are normally paid during a five year period from age 65.

Earnings above the ceiling of 7.5 base amounts are covered by a defined benefit (Table A2). Finally, PA – 03 also includes a transition rule for persons born between 1943 and 1972 to phase out the DB scheme that preceded it. The transition rule phases out completely the 10 percent supplement from the old DB scheme covering earnings up to 7.5 base amounts (replaced by new FDC plan) and provides a transition from 65 to 60 percent and from 32.5 to 30 percent for defined benefit for covered earnings above 7.5 base amounts.

---

[32] The exception is air traffic controllers and officers in the military where the first cohorts covered are those born 1948.

Table A2. Overview of contractual insurance for birth cohorts covered by the DB schemes that pertained *prior* to the conversion to DC

	Salaried employees in industry and commerce, ITP-ITPK[a]	SAF-LO[a]	Civil servants and other national government employees	Local and county council employees
A. Form of coverage				
1. Earnings up to the ceiling in the public system (7.5 basic amounts[b])	DB benefit.[c] 10 % of final earnings.	DB benefit. 10 % of final earnings.	DB benefit. The net amount required to give 65 % of final earnings after deduction of the public benefit.	
2. Earnings equivalent to 7.5-20 basic amounts[b]	DB benefit.[c] 65 % of final earnings.[d]	No coverage	DB benefit. 65 % of final earnings.	DB benefit. 65 % of final earnings.
3. Earnings equivalent to 20-30 basic amounts[b]	DB benefit.[c] 32.5 % of final earnings.	No coverage	DB benefit. 32.5 % of final earnings.	DB benefit. 32.5 % of final earnings.
4. Earnings above 30 basic amounts[b]	No coverage	No coverage	No coverage	No coverage
B. Coverage requirement for full pension	30 years from age 28	30 years from age 28	30 years from age 28	30 years from age 28
C. Basis for calculation	Salary year prior to retirement	Average of 3 of 5 years between the ages of 55 and 59	Average of the 5 years before retirement	Average of the best 5 of 7 years before retirement
D. Financing principle	Funded Payroll fee	Funded upon retirement Payroll fee	Pay-as-you-go Paid from the national government budget	Pay-as-you-go Paid from the local/county council budgets

See Table 3 for notes a and b. c A full DB pension requires 360 months (30 years) of coverage from age 28. Benefits can be claimed at earliest at age 55 and can be postponed until the participant reaches age 70.
    [d] Employees with a salary in excess of 10 base amounts can choose to be in a DC plan instead of the standard DB plan.

Appendix B: Statistical Tables

Table B1.a. Schedule for Fund Manager Charges in the PPM system. For fund fees credited individual accounts 2001-2007

Normal Administrative cost, % of fund holdings of PPM assets	Flat rebate rate, % of fund holdings of PPM assets	Incremental rebate factor	Rebate payable to PPM, % of fund holdings of PPM assets	Administrative cost after rebate, % of fund holdings of PPM assets

1. Managers holding less than 70 million SEK in PPM Funds

1.5	0.4	0.25	0.275	1.225
1.0	0.4	0.25	0.15	0.85
0.5	0.4	0.25	0.025	0.475
0.12	0.4	0.25	0	0.12

2. Managers holding 70 to 300 million SEK in PPM Funds

1.5	0.35	0.65	0.7475	0.7525
1.0	0.35	0.65	0.4225	0.5775
0.5	0.35	0.65	0.0975	0.4025
0.12	0.35	0.65	0	0.12

3. Managers holding 300 million to 500 million SEK in PPM Funds

1.5	0.3	0.85	1.02	0.48
1.0	0.3	0.85	0.595	0.405
0.5	0.3	0.85	0.17	0.33
0.12	0.3	0.85	0	0.12

4. Managers holding 500 million to 3000 million SEK in PPM Funds

1.5	0.25	0.95	1.1875	0.3125
1.0	0.25	0.95	0.7125	0.2875
0.5	0.25	0.95	0.2375	0.2625
0.12	0.25	0.95	0	0.12

5. Managers holding 3000 to 7000 million SEK in PPM Funds

1.5	0.15	0.95	1.2825	0.2175
1.0	0.15	0.95	0.8075	0.1925
0.5	0.15	0.95	0.3325	0.1675
0.12	0.15	0.95	0	0.12

6. Managers holding more than 7000 million SEK in PPM Funds

1.5	0.12	0.96	1.3248	0.1752
1.0	0.12	0.96	0.8448	0.1552
0.5	0.12	0.96	0.3648	0.1352
0.12	0.12	0.96	0	0.12

Source. Constructed by the author using the PPM formula. First published in Palmer (2000).

Table B1.b. Schedule for Fund Manager Charges in the PPM System. For fund fees credited individual accounts from 2008

PPM assets under management, millions of kronor	Free fee, interest bearing instruments	Free fee, equities	Discount, in percent
0 – 1 000	0.10	0.15	65
1 000 – 5 000	0.10	0.15	75
5 000 – 10 000	0.10	0.15	85
over 10 000	0.10	0.15	90

Source. PPM

Table B2. EU Public Pension Expenditure Projections

Year Country	2004	2030	2050
Belgium	10.4	14.7	15.5
Denmark	9.5	12.8	12.8
Germany	11.4	12.3	13.1
Spain	8.6	11.8	15.7
France	12.8	14.3	14.8
Ireland	4.7	7.9	11.1
Italy	14.2	15.0	14.7
Netherlands	7.7	10.7	11.2
Austria	13.4	14.0	12.2
Portugal	11.1	16.0	20.8
Finland	10.7	14.0	13.7
Sweden	10.6	11.1	11.2
UK	6.6	7.9	8.6

Source. The impact of ageing on public expenditure. Report prepared by the Economic Policy Committee and the European Commission (DG ECFIN). Special Report no. 1/2006.

Table B3. Distribution of tax deducted pension saving, 2003.

	Percent of persons utilizing a deduction			Average amount of premium deduction, 1000 kronor		
	Men and Women	Men	Women	Men and Women	Men	Women
Age						
-24 år	7.50	7.60	7.40	1.90	2.00	1.70
25-34	38.50	36.40	40.80	3.20	3.50	2.90
35-44	45.50	41.30	49.80	4.80	5.40	4.30
45-54	45.20	38.90	51.70	7.10	8.10	6.40
55-64	38.60	33.40	43.80	9.60	10.80	8.60
65-	2.40	3.20	1.90	12.60	14.60	9.90
20-64	39.40	35.30	43.50	6.00	6.70	5.50
Income class, 1000 kronor						
1 kr - 99.9	5.90	4.60	6.80	3.60	3.80	3.50
100.0 - 119.9	10.50	7.00	11.90	4.10	4.30	4.00
120.0 - 139.9	14.10	6.80	18.40	4.10	4.40	4.10
140.0 - 159.9	18.50	7.60	26.40	4.20	4.40	4.20
160.0 - 179.9	25.10	11.90	34.90	4.30	4.40	4.20
180.0 - 199.9	31.00	17.90	40.70	4.30	4.30	4.40
200.0 - 219.9	36.20	24.90	46.00	4.40	4.20	4.50
220.0 - 239.9	40.90	32.40	49.90	4.60	4.20	4.80
240.0 - 259.9	43.50	37.10	52.40	4.90	4.40	5.30
260.0 - 279.9	45.90	40.50	54.90	5.30	4.70	5.90
280.0 - 299.9	47.50	42.20	57.00	5.90	5.30	6.70
300.0 - 339.9	50.00	45.30	59.40	6.90	6.30	7.70
340.0 - 399.9	52.20	48.20	61.80	8.00	7.70	8.60
400.0 - 499.9	54.00	50.90	63.60	9.90	9.80	10.40
500.0 - 999.9	56.80	54.70	66.20	15.00	15.00	14.90
1000.0 -	45.90	46.70	40.50	26.40	26.90	22.20

Source. Statistics Sweden.

Table B4. Equivalent Disposable Income.

Median values, thousands of kronor, 2004 prices.

Age	1991	1998	2004
0 -19	124.0	116.6	141.4
20-24	135.5	116.0	138.7
25-34	133.2	127.4	155.8
35-44	138.9	127.9	154.7
45-54	170.1	158.3	180.4
55-64	168.2	166.9	203.8
65-74	125.2	131.3	151.5
75+	94.4	104.7	118.8
65+	109.4	116.3	132.9
All ages	133.9	128.7	153.7

Source. Statistics Sweden

Table B5. Number of Recipients and Average Value of Benefits from Public, Contractual and Individual Old Age Insurance, 2004.

	All persons with some form of pension	Average amount 1000 SEK	Of which				Contractual benefit		Private individual pensions	
			Public old age pension		With a guarantee benefit					
			Number	Average amount 1000 SEK	Number	Average amount 1000 SEK	Number	Average amount 1000 SEK	Number	Average amount 1000 SEK
Age										
All	1 863 855	135,5	1 571 252	113,8	1 563 149	112,1	1 461 832	40,4	370 547	40,1
55-60	143 788	58,6	0	0	0	0,0	110 588	59,4	50 291	36,8
61-64	178 470	105,0	36 207	63,1	28 569	55,0	137 264	100,6	55 825	47,6
65-69	404 411	167,8	397 646	118,0	397 442	111,0	358 079	42,8	150 624	37,3
70-74	345 153	156,3	345 128	125,1	345 128	125,1	288 900	28,7	59 959	41,5
75-79	312 167	140,9	312 154	117,5	312 154	117,5	242 082	25,8	25 047	41,6
80-84	264 352	130,0	264 349	108,9	264 349	108,9	189 950	25,9	15 840	42,5
85-89	143 187	122,3	143 183	101,3	143 183	101,3	94 249	27,9	8 764	42,9
90-	72 327	107,6	72 324	88,6	72 324	88,6	40 720	29,8	4 197	37,9
Women	1 045 573	105,2	889 155	93,4	884 154	92,4	783 549	27,1	182 346	31,7
55-60	80 106	39,2	0	0	0	0,0	63 061	38,4	26 238	27,4
61-64	89 049	68,7	15 551	43,9	10 809	44,1	69 396	64,4	27 311	35,2
65-69	207 541	134,8	204 601	100,6	204 490	95,1	180 422	27,9	78 603	30,0
70-74	185 573	124,6	185 563	103,9	185 563	103,9	150 882	19,6	26 752	33,0
75-79	176 604	110,8	176 598	95,3	176 598	95,3	130 503	18,3	10 276	35,2
80-84	159 370	101,2	159 369	87,0	159 369	87,0	106 121	18,9	6 828	38,9
85-89	94 063	96,7	94 061	82,0	94 061	82,0	56 227	21,9	4 062	39,3
90-	53 267	91,7	53 264	76,9	53 264	76,9	26 937	26,4	2 276	34,0
Men	818 282	174,2	682 097	140,3	678 995	137,8	678 283	55,7	188 201	48,2
55-60	63 682	82,9	0	0	0	0,0	47 527	87,2	24 053	47,1
61-64	89 421	141,2	20 656	77,6	17 760	61,7	67 868	137,5	28 514	59,5
65-69	196 870	202,6	193 045	136,5	192 952	127,8	177 657	57,9	72 021	45,3
70-74	159 580	193,3	159 565	149,7	159 565	149,7	138 018	38,7	33 207	48,3
75-79	135 563	180,0	135 556	146,5	135 556	146,5	111 579	34,6	14 771	46,1
80-84	104 982	173,7	104 980	142,1	104 980	142,1	83 829	34,7	9 012	45,2
85-89	49 124	171,2	49 122	138,4	49 122	138,4	38 022	36,8	4 702	45,9
90-	19 060	152,1	19 060	121,4	19 060	121,4	13 783	36,5	1 921	42,6

Note. [1]In 2001 the *folkpension*, a flat rate benefit pro-rated with years of residence up to 40 and with a reduction for spouses, was converted into a guarantee benefit in the new system Since the entire stock of pensioners at the time had a *folkpension* as the first pillar in the public system, as a result of the conversion, they all received a guarantee benefit after the reform.
Source. Statistics Sweden

Table B6. Top 50 PPM Funds, October 31, 2007. PPM data.

Rank	Fund	Women	Men	All	Bill. SEK	Fund type
1	Premiesparfonden	1158573	1248120	2406693	83,3	Foreign stocks & interest bearing instruments
2	AMF Pensions Aktiefond - Sverige	209747	220147	429894	10,1	Foreign stocks & interest bearing instruments
3	AMF Pensions Aktiefond - Världen	160232	161776	322008	8,1	Foreign stocks & interest bearing instruments
4	Swedbank Robur Aktiefond Pension	148982	122945	271927	7,5	Foreign stocks & interest bearing instruments
5	Didner & Gerge Aktiefond	140085	146440	286525	7,0	Foreign stocks & interest bearing instruments
6	SPP Generation 60-tal	84881	68063	152944	5,5	Foreign stocks & interest bearing instruments
7	Baring Hong Kong China Fund	55996	77481	133477	5,0	Foreign stocks & interest bearing instruments
8	SPP Generation 50-tal	67861	59969	127830	5,0	Foreign stocks & interest bearing instruments
9	Swedbank Robur Contura	193212	192756	385968	3,9	Foreign stocks & interest bearing instruments
10	AMF Pensions Balansfond	81666	72402	154068	3,7	Foreign stocks & interest bearing instruments
11	HQ Rysslandsfond	35028	52816	87844	3,4	Foreign stocks & interest bearing instruments
12	SKAGEN Global	100464	116043	216507	3,3	Foreign stocks & interest bearing instruments
13	Folksam LO Sverige	60569	60944	121513	3,2	Foreign stocks & interest bearing instruments
14	SPP Generation 70-tal	59348	43999	103347	2,9	Foreign stocks & interest bearing instruments
15	SPP Generation 40-tal	59655	54343	113998	2,6	Foreign stocks & interest bearing instruments
16	Premievalsfonden	57165	45454	102619	2,5	Foreign stocks & interest bearing instruments
17	Swedbank Robur Östeuropafond	48612	55229	103841	2,3	Foreign stocks & interest bearing instruments
18	Swedbank Robur Småbolagsfond Europa	65673	60723	126396	2,2	Foreign stocks & interest bearing instruments
19	East Capital Rysslandsfonden	33229	45738	78967	2,2	Foreign stocks & interest bearing instruments
20	Folksam LO Världen	63003	60749	123752	2,1	Foreign stocks & interest bearing instruments
21	Swedbank Robur Medica	114835	105377	220212	2,1	Foreign stocks & interest bearing instruments
22	SPP Aktieindexfond Sverige	41978	47378	89356	1,8	Foreign stocks & interest bearing instruments
23	Swedbank Robur Transfer 60	24433	16483	40916	1,8	Foreign stocks & interest bearing instruments
24	Carnegie Fund - WorldWide Sub-Fund	47148	44457	91605	1,8	Generation fund, 10 yrs. from retirement
25	Swedbank Robur Rysslandsfond	33772	42714	76486	1,8	Russia
26	Folksams Penningmarknadsfond	47556	45075	92631	1,8	Sweden long money market instruments
27	Carnegie Fund - Medical Sub-Fund	78394	73496	151890	1,8	Europe
28	SKAGEN Kon-Tiki	50857	63114	113971	1,8	Pharmaceuticals
29	Carlson Fund Equity - Asian Small Cap	26588	35272	61860	1,7	China
30	Swedbank Robur Sverigefond MEGA	44146	40739	84885	1,7	Generation fund, 20 yrs. from retirement
31	Swedbank Robur Transfer 70	24215	18897	43112	1,7	Sweden, index
32	Swedbank Robur Mixfond Pension	51019	34630	85649	1,6	Sweden
33	Swedbank Robur Europafond MEGA	51086	44165	95251	1,4	Small companies
34	Folksams Aktiefond Sverige	34884	33403	68287	1,4	Sweden
35	Swedbank Robur Transfer 50	20493	12896	33389	1,3	Europe
36	Swedbank Robur Nordenfond	29055	31323	60378	1,3	Nordic short-term money market instruments
37	SEB Europafond	35495	41155	76650	1,3	Small companies, Europe
38	East Capital Balkanfonden	22731	29215	51946	1,2	China
39	JPM - Emerging Markets Equity Fund	39832	41744	81576	1,2	Global
40	Swedbank Robur Småbolagsfond Norden	33613	31531	65144	1,2	Eastern Europe
41	Nordea Europafond	40503	38570	79073	1,2	Asia and the Far East
42	Länsförsäkringar Pension 2015	18868	18121	36989	1,2	Sweden
43	SEB Läkemedelsfond	55546	54362	109908	1,2	Pharmaceuticals
44	Nordea Tillväxtbolagsfond	38888	37042	75930	1,1	Asia and the Far East
45	Swedbank Robur Globalfond MEGA	45781	39246	85027	1,1	Asia and the Far East
46	AMF Pensions Europafond - Euro	27355	33384	60739	1,1	Europe
47	Länsförsäkringar Pension 2020	14301	13241	27542	1,1	North America
48	Gustavia Balkan	17827	22761	40588	1,1	Balkan index
49	Kaupthing Kina	12095	19750	31845	1,1	China
50	SPP Aktieindexfond Europa	31155	30449	61604	1,1	Europe
	Sum, Top 50	4038430	4106127	8144557	208,8	
	Top 50, % of total	62%	62%	62%	71%	

Table B7. Outstanding nominal Swedish government bonds, March 31, 2006

	Date of issuance		Date of redemption		Rate of interest	Amount, billions of SEK
1.	20/4	1999	20/4	2006	3.50	35.3
2.	25/10	1996	25/10	2006	6.50	1.1
3.	15/8	1995	15/8	2007	8.00	79.9
4.	5/5	1997	5/5	2008	6.50	58.2
5.	28/1	1998	28/1	2009	5.00	71.6
6.	20/4	1993	20/4	2009	9.00	1.0
7.	15/3	2004	1/12	2009	4.00	50.0
8.	8/11	2000	15/3	2011	5.25	62.0
9.	13/3	2002	8/10	2012	5.50	44.7
10.	5/5	1997	5/5	2014	6.75	63.8
11.	6/9	2004	12/8	2015	4.50	36.5
12.	19/9	2005	12/7	2016	3.00	32.0
13.	28/1	2004	1/12	2020	5.00	40.2
All bonds	-		-		5.50[1]	576.3
Money weighted duration		5 years			-	-
Total government debt	-		-		-	1267.7

[1]Money weighted average.
Sources: The Swedish National Debt Office and the author's calculations.

REFERENCES

Berg, Lennart, 1983. Konsumtion och sparande – en studie av hushållens beteende. Uppsala: Uppsala University.

Brown, Jeffery, 2000. How Should We Insure Longevity Risk in Pensions and Social Security? *An Issue in Brief,* Boston College Center for Retirement Research, no. 4.

Brown, Jeffery R., Olivia S. Mitchell and James M. Poterba, 2002. Mortality Risk, Inflation Risk and Annuity Products in Olivia S. Mitchell, Zvi Bodie, P. Brett Hammond and Stephen Zeldes (eds.) Innovations in Retirement Financing. Philadelphia: University of Pennsylvania Press.

Cardinale, Mirko, Alec Findlater and Mike Orszag, 2002. The Role of Annuity Markets in Financing Retirement. Cambridge, Mass.:The MIT Press.

Economic Policy Committee and the European Commission (DG ECFIN), 2006. Special Report no. 1/2006. Brussels: European Commission.

Eklöf, Matias and Daniel Hallberg, 2006. "Estimating Retirement Behavior with Special Retirement Offers" mimeograph. Department of Economics, Uppsala University, Uppsala, Sweden.

Frennberg, Per and Björn Hansson, 1995. "An Evaluation of Alternative Models for Predicting Stock Volatility: Evidence from a Small Stock Market," Journal of International Financial Markets, Institutions and Money. Vol 5, No 2/3, pp. 117-134.

FSA, 2004. *Finanssektorns stabilitet 2004* (The financial sector's stability – 2004). Rapport den 15 oktober 2004. Stockholm: The Financial Supervisory Authority.

FSA 2005. *Trafikljuset och en modernare tillsyn – remissförslag*. Rapport den 6 oktober 2005. Stockholm: The Financial Supervisory Authority.

Holzmann, Robert and Edward Palmer, 2006. *Pension Reform through NDCs: Issues and Prospects for Non-Financial Defined Contribution Schemes*. Editor with R. Holzmann. World Bank: Washington DC.

Impavido, Gregorio, Craig Thorburn and Mike Wadsworth, 2003. A Conceptual Framework for Retirement Products: Risk Sharing Arrangements between Providers and Retirees. London: Watson Wyatt.

Johannisson, Inger 2000. "Tax Deferred Pension Saving in Sweden", mimeograph. Department of Economics, University of Gothenburg.

Markowski, Aleksander and Edward Palmer, 1979. Social Insurance and Saving in Sweden in George M. Von Furstenberg (ed.) Social Security versus Private Saving. Cambridge, Mass: Ballinger Publishing Co.

McGill, Dan M., Kyle N. Brown, John J Haley and Sylvester J. Schieber, 2005. Fundamentals of Private Pensions Eighth Edition. Oxford: Oxford University Press.

Mitchell, Olivia and David McCarthy, 2002. Annuities for an Ageing World. Working Paper 9092. Cambridge, Ma.:National Bureau of Economic Research. Cambridge.

Palmer, Edward, 1981. Determination of Personal Consumption – Theoretical Foundations and Empirical Evidence from Sweden. Stockholm: Almqvist & Wicksell International.

Palmer, Edward, 1985. Household Saving in Sweden and Its Composition – An Empirical Analysis. Stockholm: Almqvist & Wiksell International.

Palmer, Edward, 2002. Swedish Pension Reform – How Did It Evolve and What Does It Mean for the Future? in M. Feldstein and H. Siebert (eds.) *Coping with the Pension Crisis: Where Does Europe Stand?* Chicago: University of Chicago Press 2002.

Palmer, Edward and Eskil Wadensjö, 2004. Public Pension Reform and Contractual Agreements in Sweden – Future Directions in M. Rein and W. Schmäll (eds.), *The Political Economy of Pension Reform.* Cheltenham,UK: Edward Elgar.

Palmer, Edward, 2006. What Is NDC? in R. Holzmann and E. Palmer (eds.) *Pension Reform through NDCs: Issues and Prospects for Non-Financial Defined Contribution Schemes.* World Bank: Washington DC.

Reformed Pension System – Costs and Individual Effects (Reformerat pensionssystem – Kostnader och individeffekter), 1994. Sveriges Offentliga Utredningar SOU 1994:21, Betänkande av Pensionsarbetsgruppen, Bilaga A. Stockholm:Sweden's Official Publicatioons.

Statistics Sweden, 2004. De äldres ekonomiska välfärd (The Economic Welfare of the Elderly). Stockholm: Statistics Sweden