

A Short Note
on the
ATP Fund of Denmark

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Abstract

The Danish ATP (Arbejdmarkedets TillaegsPension or Labor Market Supplementary Pension) fund is a public pension fund that was created in 1964 to complement the universal pension benefit that is financed from general tax revenues and is paid to all old-age residents. When it was created, participation in ATP was compulsory on most working people. But over the last decade or so compulsory coverage has been expanded to most recipients of transfer income. Contribution amounts are set in absolute terms, but are low relative to earnings (less than 1 percent of average earnings).

ATP has benefited from scale economies and compulsory worker participation and has been able to operate with high efficiency and low costs. Its investment performance has been uneven over the years, reflecting the applied investment policies and rules as well as prevailing financial conditions. In recent years, it has

been a leader among Danish pension institutions in adopting innovative investment policies and has enjoyed an enviable record of high investment returns and low operating costs. In addition, it has long offered deferred group annuities with guaranteed benefits and periodic bonuses (with profits policies). However, ATP also suffers from several weaknesses and shortcomings. It has a cumbersome governance structure, rooted in labor market relations and the role of social partners, while its group annuities have been based on rather 'idiosyncratic' risk-sharing arrangements. Nevertheless, it took the lead in using long-dated interest-rate swaps in euro markets and recently created a department that specializes in hedging its pension liabilities. And it is in the process of adopting a new plan for guaranteed benefits that aims to enhance the management of both investment and longevity risks.

This paper—a product of the Financial Policy Division, Financial Systems Department—is part of a larger effort in the department to study the investment performance of public and private pension funds. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The author may be contacted at dvittas@worldbank.org.

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**Financial Sector Development
World Bank**

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1. Introduction

This short note examines the role and performance of the Danish ATP (Arbejdmarkedets Tillaegspension or Labor Market Supplementary Pension) fund in the context of the Danish pension system. Interest in the performance of ATP is motivated by the growing attention that is paid on a global scale to the challenge of meeting the retirement needs of a fast growing population of pensioners, which is the result of increasing longevity and a growing trend toward early retirement. But it is also motivated by the promise of combining high investment returns with low operating costs that is offered by well-run independent public pension funds. Considerable interest has been shown around the world in the performance of public pension funds that adopt a modern fund governance structure with independence from governments and political influences and a strong emphasis on optimizing investment behavior in the context of full public disclosure and public accountability.

Recent years have witnessed the creation of several public pension funds that follow these principles in a diverse group of countries that includes Australia, Canada, France, Ireland, New Zealand and Norway.¹ At the same time, countries with long-established public pension funds, such as Japan, Korea, and Sweden, have modified their policies to grant greater independence to the boards of trustees of these funds and upgrade their investment policy framework.

The ATP fund of Denmark is a long-established public pension fund that has benefited from scale economies and compulsory worker participation and has been able to operate with high efficiency and low costs. Its investment performance has been uneven over the years, reflecting the applied investment policies and rules as well as prevailing financial conditions. While it has achieved since its inception an average annual nominal rate of return of 11 percent and a real return of close to 6 percent, it was barely able to beat inflation during the first 2 decades of its existence. However, in the more recent decades it has enjoyed an enviable record of high investment returns and low operating costs. ATP has been able to build substantial reserves that also include a sizable bonus equalization fund. This suffered a large fall in the first few years of the new millennium, but has been rebuilt in recent years following the recovery of investment returns and the suspension of some bonus payments.

In recent years ATP has been a leader among Danish pension institutions in adopting innovative investment policies and has been among the first to expand its investments in domestic and foreign equities as well as long-dated foreign bonds and alternative asset classes. When the new stress testing and accounting valuation rules were introduced in Denmark in 2001, it took the lead in using long-dated interest-rate swaps in euro markets and recently created a department that specializes in hedging its pension liabilities. All in

¹ Vitas et al (2007) offer a detailed review of the performance of four, newly created, public pension funds in Norway, Canada, Ireland and New Zealand.

all, ATP has adopted a systematic approach to risk management in order to diversify its risks, attain a better matching of assets and liabilities, and enhance its investment returns.

ATP faces large financial and actuarial risks because it offers minimum guaranteed benefits that are based on a minimum guaranteed interest rate as well as guaranteed conversion rates for deferred annuities. However, it operates a risk-sharing scheme with both active and passive workers. It makes annual transfers to its provisions for guaranteed benefits to reflect the financial impact of increasing longevity before allocating profits to the bonus equalization fund. New legislation will change the modality of guaranteed benefits and will reduce the role of risk-sharing arrangements but without affecting the basic role of ATP as a public institution offering supplementary pensions through a funded scheme to the vast majority of pensioners. The analysis contained in this note is based on the rules that prevailed until the end of 2006. A brief reference to the proposed new rules is made in the concluding section of the note.

The investment policies and performance of ATP have attracted considerable international interest in recent years. It has been named as the 'best pension fund' in Europe on several occasions (Sorensen 2006:20) and its new approach to risk management was specifically mentioned in the concluding chapter of Peter Bernstein's latest book on *Capital Ideas Evolving* (Bernstein 2007:241). The purpose of this note is to offer a brief evaluation of the investment and operating performance of ATP and discuss the relevance and sustainability of its risk-sharing arrangements. The structure of the note is as follows. The next section discusses the objectives of ATP, followed by sections on fund governance, contributions, benefits, asset allocation, implementation of investment strategy, and investment performance. The note ends by offering some concluding remarks.

In writing this note, and especially after receiving extensive comments from ATP officials and some historical data, it became clear that the history of ATP should be divided into three main periods: the years of high inflation, poor investment returns and stagnant contributions before 1980; the decade of the 1980s, which was a period of disinflation, high real returns and rebounding of contributions; and the years since 1990, a period of expanded coverage and contributions, innovative investment policies, and high investment returns. However, access to historical data was limited and thus the analysis of the earlier periods is far less detailed than that of the more recent past.

2. Objectives

The Danish ATP (Arbejdmarkedets TillaegsPension or Labor Market Supplementary Pension) Fund was created in 1964. It is one of several statutory supplementary pension plans that complement the main Danish pension pillars: the universal social pension on the one hand and the occupational and personal pension plans on the other.² As in most other high-income countries, personal savings represent the third pillar of pension

² Two recent papers that review briefly the structure of the pension system in Denmark are Andersen and Skjodt (2007) and van Ram and Brink Andersen (2007). Sorensen (2006) and Rohde (2007) cover the experience of ATP.

provision. (Other supplementary schemes mainly include the LD plan for the compulsory saving of 'cost of living' salary increases in the late 1970s and the Special Pension Savings (SP) scheme that was introduced in the late 1990s - see box for a brief summary.)

Box: Statutory Supplementary Pension Plans

Apart from the ATP fund, other statutory pension plans include the LD, DMP, SP and SUPP schemes.

The LD scheme was created in 1977 for the compulsory saving in individual accounts of 'cost of living' salary increases between 1978 and 1980. The LD scheme has its own board of directors but account administration is carried out by ATP. The accumulated capital of individual accounts is paid out as lump sums on retirement.

The DMP scheme was a temporary pension savings scheme that was established in 1997 and received contributions only for 1998. The contribution rate amounted to 1 percent of earnings and benefits were paid out on retirement as lump sums. DMP was merged into the SP in 2003 and had the same board as ATP.

The SP scheme is a special pension savings scheme that was created in 1998. It is funded with a 1 percent contribution rate, paid by all wage earners, self-employed persons, and some recipients of transfer payments, but contributions have been suspended since 2004. Benefits take the form of 10-year annuities. SP participants were granted free choice of management institution and investment fund in 2005. Following this decision, ATP has become the largest operator of mutual funds in Denmark and has also introduced lifecycle funds and an electronic fund network. At present, nearly all Danish workers have kept their SP balances in ATP and use its investment fund network. SP has the same board as ATP and is managed by it.

Finally, the SUPP scheme is a narrow, voluntary scheme that was introduced in 2003 for recipients of disability pensions, who want to increase their future pension income by saving through tax-favored accounts. Participants have free choice of management institution and contributions are limited to a maximum amount with two-thirds paid by the government. There are no interest rate guarantees during the accumulation phase but accumulated balances are converted into life annuities on reaching normal retirement age. It is run as part of the SP scheme.

The ATP fund is a DC plan with low contributions and correspondingly low benefits relative to earnings. It offers guaranteed minimum benefits based on a minimum rate of interest and deferred annuity conversion factors. But its group annuities are with profits policies that benefit from bonuses that depend on investment performance and longevity experience. Thus, ATP effectively operates a hybrid scheme with elements from both DC and DB plans.

ATP, as its name implies, was created as a labor market institution and was considered part of the second pillar, albeit managed as a public entity. However, its compulsory coverage was expanded in successive reforms in the early 1990s and has now become nearly universal. As a result, it is now better seen as a funded wing of the first pillar (Sorensen 2006:7).

Contribution amounts are stipulated in absolute amounts. Over the years, they have ranged between the equivalent of 1.4 and 0.3 percent of average earnings. The guaranteed interest rate amounted to 4.5 percent before 2002 but was then lowered to 2 percent.

However, annual bonuses are paid when permitted by the financial condition of the fund. These aim to preserve the real value of pensions and pension rights. The bonuses are added to the pensions in payment and to the pension rights that are being accumulated by active workers.

Participation in ATP is mandatory on employees and most categories of recipients of transfer income (unemployment benefits, vocational training, disability pensions, etc.). It is voluntary for the self-employed. Double contributions are made for the unemployed and other people out of employment to compensate for the lack of occupational pension coverage.

3. Fund Governance

Reflecting the corporate traditions of the Danish labor market, where union membership is high, collective labor agreements play a central role, and the so-called social partners shoulder significant responsibilities in formulating and supporting economic and social policies, the ATP Fund has a complex and cumbersome governance structure. This includes a board of representatives (BoR), a supervisory board of directors (BoD), an Executive Committee (EC), and a chief executive officer (CEO).

The BoR consists of 31 members, 15 each from employers and workers, and an independent chairperson selected by the appointed representatives. The details of representation are spelled out in the law. The main members of the BoR come from the Confederation of Danish Employers (8) and the Danish Confederation of Trade Unions (10). However, two of the other worker representatives represent managers and professionals. One of the employer representatives is appointed by the Minister of Finance.

The main function of the BoR is to approve the annual report of ATP and to deal with any matter referred to it by the BoD or no less than four members of the BoD. The BoR plays in general a consultative role.³ However, in one important area, the setting of contribution amounts, a simple majority of each group of representatives is required. This provision may have inhibited the regular raising of contributions that wage growth and inflation would have justified.⁴

The BoD consists of the Chairperson of the BoR, who is also the Chairperson of the BoD, and 12 other members elected from the BoR, 6 from each group of social partners. Board directors are subject to a 'fit and proper' test and are required to have adequate

³ Sorensen (2006:18) argues that involvement of social partners in the governance of a public pension fund may contribute to the dissemination of information about pension issues and may facilitate the search for political trade-offs in the design and administration of pensions schemes.

⁴ In the context of labor market relations in Denmark, decisions about raising contribution levels are taken outside the ATP. The BoR does not have an independent role. It can only endorse decisions agreed by the social partners through collective bargaining. However, the relevant provision in the act serves to reassure labor unions that contribution decisions will not be imposed on them.

experience.⁵ The BoD is responsible for appointing the Executive Committee, which comprises the Chairperson and two Board members selected from the employer and employee representatives. The BoD is also responsible for hiring the CEO and other senior management, setting investment and other operational guidelines, including conflict of interest rules, preparing written procedures for all significant areas of activity, and establishing full internal control systems. The Board is also required to appoint a responsible actuary who must submit an annual report to the Danish FSA (DFSA) on the actuarial status of ATP.

The three-member EC has the authority to make decisions and prepare and implement resolutions of the BoD, especially in the areas of investment policies and employment conditions. The operations of ATP are supervised by the DFSA and are subject to regulations and requirements identical to the traffic light stress tests and the accounting rules covering insurance and pension institutions. These requirements are specified in the ATP Act rather than the Financial Services Act.

In 2006, ATP signed the Principles of Responsible Investing sponsored by the United Nations. This initiative is in line with the policy on Socially Responsible Investments formulated by the ATP in the late 1990s. ATP has also formulated a clear policy on corporate governance in the companies in which it invests. The aim of these policies is to protect its investments. ATP supports resolutions that aim to increase shareholder return, protect shareholder rights, especially voting rights, ensure equal and fair treatment of all shareholders, and increase public disclosure. ATP plays an active role in this area.

4. Contributions

Contribution amounts are stipulated by the BoD but, as already noted, require approval by a simple majority from each group of representatives. Contribution amounts are set in absolute terms and not in relation to earnings. They are lower for part-time employees. Contributions are split between employers (2/3) and employees (1/3). For recipients of transfer income, the employer share is paid by the government.

Contributions have been increased on only 5 occasions since the creation of ATP. In 1964, the contribution amount was equivalent to 1.4 percent of average earnings. This was allowed to fall gradually to 0.3 percent by 1982, but recovered to 1.25 percent by 1992. Total ATP contributions are now slightly less than 1 percent of the salary base. The failure to raise contributions between 1964 and 1982 is attributed to the deadlock that had gripped public pension policy in Denmark at that time. Part of public opinion favored an expansion of tax-financed public pensions, while an opposing camp argued for increased reliance on savings-based private pensions. The deadlock was aggravated by poor macroeconomic performance that suffered from high inflation, high unemployment, and large internal and external imbalances. It is interesting to note that contribution amounts were raised by a whopping 170 percent in 1982.

⁵ The act does not specify what constitutes adequate experience.

In 1987, some groups of public sector employees were allowed to be excluded from the increase in the normal contribution. This prompted the establishment of the 'B' contribution, which has remained frozen at the 1982 contribution level. The normal contribution, now called the 'A' contribution, was further adjusted in 1996. At that time some of the above public sector workers decided to accept contribution increases, giving rise to the creation of the 'C' contribution. A similar process unfolded in relation to a further increase of contributions in 2006, leading to the creation of a new 'D' contribution. A further increase will take effect from 2009 (Table 1). At present, ATP is striving to have as many employees as possible rejoin the original 'A' contribution. Similar initiatives have been effective in the past.

Table 1: Evolution of Individual Contributions

DKK	1982	1988-90	1996	2006	2009
'A' Contribution	1,166	2,333	2,684	2,924	3,240
'B' Contribution		1,166	1,166	1,166	1,166
'C' Contribution			1,517	1,757	2,076
'D' Contribution				1408	1,724
Increase		1,167	351	240	316

Source: ATP

Lack of political agreement on the basic direction of public pension policy probably explains the failure to raise contributions. The contribution rate has remained low and was even allowed to reach insignificant levels in the late 1970s and early 1980s. The lack of political agreement may have been fueled by the preference of unionized workers, especially white-collar workers, to contribute to their own pension schemes, which may have offered better benefits. The exemption of some public sector workers from contribution increases in the 1980s and 1990s lends support to this view.

Various explanations could be put forward for the failure to raise contributions between 1964 and 1982 but evaluating their empirical importance would require access to detailed historical records and would be beyond the scope of this paper. For instance, the intentional redistribution in favor of older cohorts in the early years of operation of the fund created a wedge between investment returns and bonus rates. Although ATP was among the most successful institutional investors, its investment performance was just above inflation during this period (see below). The real value of pension benefits was eroded in line with the erosion in the real value of contributions.

5. Benefits

ATP benefits take the form of single life annuities, unless the accumulated balance is very small in which case it is withdrawn as a lump sum. Pension benefits are modest, reflecting the low level of contributions. They amount to 40 percent of the social pension or 8 percent of average earnings. ATP pensions are received by nearly 80 percent of all present day pensioners. More than 98 percent of all new pensioners have pension rights with the ATP. The coverage of ATP is increasing due to the greater labor market participation of younger cohorts of older women and to the inclusion of recipients of social benefits.

Pension benefits used to depend on contributions made without taking their timing into account. The scheme was described as operating on an 'age-neutral basis', paying 'equal pensions for equal contributions, irrespective of the age of the member' (ATP 1999:11). Because contributions were mandatory and strictly regulated, this did not result in abuse of the system (as could happen if workers were allowed to make larger contributions near the end of their careers). But the system was cumbersome and was changed in 2002 when the guaranteed rate of interest was lowered from 4.5 percent to 2 percent. Benefits are now linked to the age of contributors. Early contributions are entitled to higher benefits.

The ATP law spells out the pension benefits for each type of contributions. For contributions made before 1972, the pension benefit was fixed at 60 DKK for each year of contribution, payable from age 67. It was raised to 100 DKK between 1972 and 1981. The calculation was then changed and set equal to 25.25 percent of total contributions made (without any allowance for investment income) for the period between 1982 and 2001 (a benefit of 100 DKK was paid for each contribution of 396 DKK). These calculations were based on a guaranteed rate of interest of 4.5 percent, during both the accumulation and payout phases.

Table 2: Deferred Annuity Conversion Factors by Age⁶

Age	Rate	Age	Rate	Age	Rate
16	18.30	33	14.06	50	10.55
17	18.02	34	13.84	51	10.35
18	17.75	35	13.63	52	10.15
19	17.48	36	13.41	53	9.95
20	17.21	37	13.20	54	9.75
21	16.95	38	12.99	55	9.54
22	16.69	39	12.78	56	9.34
23	16.43	40	12.58	57	9.13
24	16.18	41	12.37	58	8.93
25	15.93	42	12.17	59	8.72
26	15.69	43	11.96	60	8.51
27	15.44	44	11.76	61	8.29
28	15.21	45	11.56	62	8.07
29	14.97	46	11.35	63	7.84
30	14.74	47	11.15	64	7.61
31	14.51	48	10.95	65	7.38
32	14.29	49	10.75	66	7.14
				67	7.15

Contributions made at the indicated age; pensions start at age 67; after deducting premium for term life insurance for a fixed benefit.

Source: ATP

For contributions made after 2002, the ATP law specifies the pension benefit, depending on the contribution amounts and the age of the contributors and using a 2 percent

⁶ This table will be removed in 2008 and will be replaced with annually calculated ratios (see brief reference in section 9 below).

guaranteed rate for both the accumulation and decumulation phases.⁷ For a 16 year old the annual pension benefit, payable from age 67, amounts to 18.30 DKK per 100 DKK in contributions. This falls to 12.58 DKK for a 40 year old and further to 7.14 DKK for persons aged 66 (Table 2). In the hypothetical case of workers with a complete record of contributions of 100 DKK from age 16 to age 66 and no bonuses, the pension on retirement at age 67 would equal the sum of all these annuity conversion factors or 637.55 DKK. This would correspond to an average conversion factor of 7.14 at age 67. It is, however, stressed that these factors are derived after deducting the insurance premiums for a death benefit that is constant irrespective of age (see below).

Additional bonuses are paid, depending on investment performance and the soundness of reserves. The payment of bonuses aims to maintain the real value of pensions. Historically, bonus policy was used to facilitate the transition of ATP from a redistributive and partially funded scheme to a non-redistributive and fully funded one. Bonus rates differed for different groups of members by status (active or retired) and age cohort. Calculating the impact of bonus rates on different cohorts of workers and retirees would require access to detailed historical records and would again be beyond the scope of this paper.

Large bonuses were probably paid during the 1990s, after the scheme became fully funded and high investment returns were realized, but bonuses were substantially curtailed in recent years. This reflected the decline of interest rates, the new accounting rules that required market valuation of assets and liabilities, the growing longevity of the Danish population, and the need to build adequate reserves.

Although the ATP effectively operates two schemes, it is legally required to maintain one fund. In practice, however, bonus policy differentiates sharply between the two schemes, even though asset allocation is not linked to each scheme. In recent years benefits based on post-2002 contributions received an annual bonus of 2 percent but no bonus was paid on pensions and pension rights based on pre-2002 contributions.

Lump sum benefits are paid to survivors of deceased active or retired workers. Before 2002, survivor benefits were based on the accumulated pension rights of active members or the remaining pension rights of retired members. Spouses of deceased members received the capital value of pension rights, while dependent children received an amount equal to one-year's pension. This system provided higher benefits to dependents of older members and paid lower benefits to dependents of younger members.

The system of survivor benefits was also changed in 2002. The lump sum was set at 40,000 DKK per beneficiary in 2002 and was raised to 45,000 DKK in 2006. A premium

⁷ A fundamental difference between ATP and private sector pension institutions is that all new ATP contributions are subject to the new lower guaranteed rate, whereas in the case of private sector pension institutions new contributions from old members, at least for some schemes depending on the terms of the relevant collective labor agreement, still benefit from the old, higher, rates of guarantee. However, pension institutions have been arguing that the benefits were guaranteed, not the rate of return. This implies that the guarantee was a lifetime undertaking, not a minimum annual rate of return.

is deducted from the annual contribution to cover the cost of survivor benefits, which resemble term life insurance. The premium is determined after taking into account the value of accumulated pension rights. A premium refund is paid to older members whose accumulated pension rights exceed the value of the survivor benefit. The net contribution amount is taken into account in calculating the pension benefit.

The normal retirement age was lowered to 65 from 67 for the universal pension and also for ATP benefits in 2004. However, a new law provides for its gradual increase back to 67 between 2024 and 2027. After 2025 the normal retirement age will be indexed to life expectancy.

Workers are allowed to claim their ATP benefits later, up to age 70, with actuarially increased benefits. Retiring at 65 rather than 67 also results in lower benefits. From 2009, workers will be able to postpone ATP benefits up to the age of 75. This was motivated by the current mismatch between increased life expectancy and the growing use of term annuities (for 5 or 10 years) from occupational schemes (ATP 2006:12).

There is considerable uncertainty about longevity trends. ATP reports that life expectancy experienced a large increase of almost 1 year between 1999 and 2004, which corresponded to the total increase between 1950 and 1999. Life expectancy increased by 4 months for men, 3 months for women during 2005. Statistics Denmark reports that life expectancy in Denmark is one of the lowest in Western Europe. It has stagnated for a long time, although the trend has become positive again in recent years (Statistics Denmark 2007). In the period 1995-1999 there was an excess mortality compared to Sweden that was attributed to differences in lifestyle with regard to smoking, alcohol, diet and physical activity. However, the proportion of smokers fell from about half of Danes in 1980 to about a fourth 25 years later.

Before determining the annual bonus and the amount of surplus that will be transferred to the bonus equalization fund, which is also referred to as bonus potential, ATP makes annual additions to its guaranteed benefit pension reserves to cover the impact of increasing longevity. This reflects the risk-sharing arrangements that ATP operates with both active and passive workers. The annual additions to reserves to cover the future financial impact of increasing longevity have fluctuated widely from year to year. Between 1999 and 2006, they have ranged between 0.5 and 4.2 percent of guaranteed benefits. ATP reports provide little analysis of the justification of these increases and their erratic behavior, other than indicating that longevity is increasing. No specific information is provided on the evolution of life expectancy of its active and passive members and no comparison is made with the life expectancy assumptions used in calculating deferred annuity conversion factors.

The bonus potential fell to just over 7 percent of total pension liabilities in 2002 but recovered more recently and reached 19 percent in 2006 (Table 3). Annual bonuses depend on the relationship between the bonus potential and pension liabilities. Since 2002, an annual bonus of 2 percent has been paid to both active and passive workers on their rights based on post-2001 contributions, but no bonus has been allowed on pensions

and pension rights arising from pre-2002 contributions. In the 1990s, annual bonuses often exceeded 2.5 percent, but in recent years they have represented a tiny fraction of guaranteed benefits. A new rule was adopted in 2005 whereby bonuses will be allowed only if the bonus equalization fund exceeds 20 percent of total pension liabilities after allowing for the bonus. Based on this rule ATP has decided to allow a 2 percent bonus in 2007 for rights accrued before 2002.

Table 3: Annual Bonuses and Longevity Provisions, 2001-2006

DKK billion	2001	2002	2003	2004	2005	2006
Guaranteed Benefits (GB)	206.9	224.2	225.9	264.4	307.1	292.6
Bonus Potential (BP)	38.4	17.3	34.9	40.1	51.9	70.1
Total Pension Liabilities (TPL)	245.3	241.5	260.8	304.5	359.0	362.7
BP/TPL (%)	15.7	7.2	13.4	13.2	14.5	19.3
Annual Longevity Provisions (ALP)	8.7	1.2	1.1	3.5	3.9	4.0
ALP/GB (%)	4.2	0.5	0.5	1.3	1.3	1.4
Annual Bonus (AB)	4.0	0.0	0.3	0.5	0.7	0.7
AB/GB (%)	2.0	0.0	0.1	0.2	0.2	0.2

Source: ATP

In its annual reports and its discussion of the need to lower the guaranteed rate and change the basic structure of the system, ATP makes no reference to the historical ex post performance of individual accounts. In its early years of operation, ATP must have used part of its net investment income to build the bonus equalization fund and another part to finance the high pensions, relative to their contributions, that were paid to the first cohorts of retirees. These two measures must have created a wedge between the investment return of ATP and the return paid to individual accounts. ATP uses its bonus policy to protect its members from the wide fluctuations of financial markets and smooth out the pension benefits to its participants. However, there is no indication of the relationship between the average investment rate of return and the average rate paid to individual accounts over successive decades.

The bonus policy of ATP was complicated in the past by the fact that it has been operated as a mixed scheme that was partly funded and partly unfunded with a significant redistributive objective. This reflected a political decision to offer pensions to early cohorts of retirees that were out of proportion to their contributions to the scheme. ATP estimates that it became a fully funded scheme only in the early 1990s. More recently, the bonus policy has been affected by the non-sustainability of the high guaranteed rate that had been retained unchanged until 2002 and the increasing longevity of Danish pensioners. The changes in the benefit system, first in 2002 and the forthcoming one in 2008, reflect attempts to deal with these issues.

6. Strategic Asset Allocation

Investment policy is decided by the BoD and implemented by the Executive Committee and executive management. Before 1990, the portfolio was placed in domestic securities and was dominated by bonds, both government and mortgage bonds. However, during the 1990s ATP increased its equity portfolio from 22 percent to 43 percent (ATP 1999:25). These were split 60/40 between local and foreign equities. The bond portfolio

was mostly nominal government bonds, followed by mortgage bonds, inflation-linked bonds, and a small allocation in foreign bonds. Real estate assets accounted for just over 3 percent of total assets.

In 1999, a major review of asset allocation strategy was undertaken. This took into account historical data on the level, volatility and covariance of asset returns, the long-term nature of pension liabilities, the size of ATP assets, and the relative size, prospects and supply of securities of different markets. A decision was reached to increase further the allocation to equities and to diversify internationally in both equities and bonds. Investments in real estate were also set to rise to 5 percent.

International diversification in equities was justified by the large size of ATP funds relative to the local market and the possibility of raising average returns and especially lowering risk. Increased international diversification in bonds was predicated on the decision to increase their interest sensitivity to achieve a better alignment with the interest sensitivity of pension liabilities in conjunction with the limited availability of long-dated bonds in the local market, relative to the potential demand from ATP. Increased investments in foreign bonds focused on other European countries, because of the limited exposure to currency risk, given the policy of aligning the Danish crown to the euro.

No currency hedging was undertaken initially but later on, as investments in non-euro bonds started to grow, a very clear policy on currency hedging was stipulated. This required full hedging of foreign bonds denominated in non-euro currencies and a significant but varying degree of hedging of euro-denominated bonds. Clear limits by foreign currency, covering all assets including equities, were also imposed on unhedged positions.

ATP introduced in 2001 an active liability hedging program that has been expanded over the years. This is designed to protect pension liabilities from interest rate changes. The hedging program achieved 100 percent after-tax hedging of liabilities in 2005. A new department that specializes in hedging its pension liabilities was created in 2006.

The investment department now deals with the portfolio of bonds and equities and also engages in hedging activities that aim to manage the risk of investment assets. The investment portfolio was divided into two components in 2005: the Beta portfolio, which focuses on strategic allocation strategies with a longer horizon in assets of varying levels of risk and earning returns commensurate with their risk; and the Alpha portfolio, which focuses on active management that seeks to achieve excess returns.

In recent years, ATP established a group structure that includes 2 companies that invest in real estate, five companies that specialize in private equity, and two companies that offer administrative services to other pension funds on market terms. Investments in private equities and foreign real estate funds are carried out through Danish limited partnerships because this corporate form is better suited for the use of incentive packages

for selected investment employees.⁸ There is also an investment firm offering advice to SP members and an investment company that operates 4 mutual funds with several sub-funds in which SP balances are invested.

7. Implementation of Investment Strategy

Implementation of investment strategy is the responsibility of the Executive Committee and executive management. To strengthen asset management, ATP adopted in 1999 a policy of upgrading the investment skills of its staff, hiring external asset managers, using appropriate benchmarks, establishing effective internal controls, and ensuring a separation of functions between trading on the one hand and record keeping, monitoring and reporting to the Board on the other. Expected tracking error (deviation from benchmark) for different asset classes was clearly specified and closely monitored.

The strategic asset allocation that was articulated in 2000 indicated a growing emphasis on investments in foreign equities and bonds. The asset allocations were set as targets to be reached in 2005. However, in 2004, a decision was taken to adopt active management of total balance sheet risk with a view to ensuring a swift and flexible adjustment of investment policy to changing market conditions and risk capacity.

The share of equities, especially foreign ones, fell in the aftermath of the bursting of the high tech bubble and accounted for 25 percent of all assets in 2006, half the level reached in 2001 (Table 4). Holdings of domestic bonds also fell from 31 percent in 2001 to 17 percent in 2006. Investments in real estate and private equity remained at a low level despite an expressed desire to increase significantly the allocation to alternative asset classes. In contrast, the share of foreign bonds increased rapidly and now represents half the total investment portfolio.

Table 4: Asset Allocation⁹, 2001-2006

	2001	2002	2003	2004	2005	2006
Domestic Equities	16.8	11.8	11.3	9.6	11.2	11.8
Foreign Equities	30.8	13.4	2.2	7.1	11.1	13.4
Domestic Bonds	30.9	32.9	30.3	26.7	20.3	17.4
Foreign Bonds	16.7	31.0	39.5	38.5	39.2	50.4
Real Estate	3.6	4.1	3.9	3.1	2.9	3.5
Private Equity	1.1	1.1	1.2	1.3	1.7	2.5
Hedging Instruments		4.1	2.8	9.2	11.4	
Other		1.6	8.7	4.5	2.2	1.0
Total Assets (DKK bn)	247.5	237.7	259.7	304.4	359.8	396.0
Total Assets (% GDP)	18.5	17.3	18.5	20.9	23.2	24.2

Total assets refer to total investment assets, which are slightly below total group assets.

Source: ATP

⁸ These arrangements entail a loss of transparency and create a risk of malfeasance. However, no indication is provided that these partnerships are subject to intensified supervision from internal and external auditors.

⁹ The annual allocations reported in this table are based on the analyses of investments contained in the annual reports of ATP, supplemented with information contained in the notes to the financial statements. There are some small discrepancies in some of these numbers, but these are unlikely to have a significant effect on the overall assessment and conclusions.

As noted above, the investment portfolio was divided into two components in 2005: the Beta portfolio and the Alpha portfolio. At the same time, the traditional asset allocation decision based on benchmarks was abandoned in favor of a risk budgeting methodology. The strategic asset allocation is expected to be much more diversified in the future in risk terms, meaning that the share of total risk arising from equities will be lowered in favor of other sources of risk, especially alternative asset classes. This is similar to the pattern adopted by public pension funds in Canada and other countries (Vittas et al 2007).

ATP started using interest rate swaps in the fourth quarter of 2001 to attain a more efficient hedging of its pension liabilities (Table 5). Initially, the purchase of interest rate swaps was limited to a potential gain of 10 billion DKK from a 1 percentage point fall in interest rates, but this limit was raised in subsequent annual reviews. Full hedging of pension liabilities has been achieved, assuming that the hedges are enforceable. In fact, the mission of the new department that specializes in hedging pension liabilities is to maintain full hedging after tax. In addition, the maturities of liabilities and swaps are almost completely matched in order to reduce second-order risks.

The bulk of the hedging portfolio consists of receiver swaps in EUR. While the pension liabilities are marked-to-market based on DKK interest rates, ATP also engages in additional hedging activities aiming at covering the interest rate spread risk between EUR and DKK interest rates. The principal amount of interest rate swaps reached 112 percent of total pension liabilities, including the bonus equalization fund, up from 67 percent in 2005.¹⁰

Table 5: Pension Liabilities and Interest Rate Swaps, 2001-2006

DKK billion	2001	2002	2003	2004	2005	2006
Total Pension Liabilities	245.3	241.5	260.8	304.5	359.0	362.7
Interest Rate Swaps	65.1	157.8	191.8	217.7	241.6	407.7
IRS/TPL (%)	26.5	65.3	73.5	71.5	67.3	112.4

Source: ATP

Despite the heavy use of interest rate swaps and the adoption of a policy that resembles a liability-driven investment (LDI) approach, most of the assets continue to be invested in foreign and domestic bonds (68 percent in 2006). Listed equities represent 25 percent and alternative assets 7 percent. However, ATP invests in equity futures and options, which implies a higher exposure to equities than indicated by the balance sheet data.

8. Investment Performance

Investment performance is monitored by reference to benchmark portfolios that are constructed from published indices. The domestic market index is customized to limit exposure to large groups. The 10 largest equity exposures accounted for more than 50 percent of the total equity portfolio in the late 1990s (more than 20 percent of total assets), while exposure to the largest 3 mortgage credit institutions accounted for 30

¹⁰ For a brief discussion of ATP policies in the context of the growing use of derivatives by Danish pension institutions to hedge their embedded options, see Ladekarl et al (2007).

percent of total assets. But large exposures to major domestic groups and large domestic bond issuers have been substantially reduced, following the decision to diversify investments internationally.

ATP reports an average nominal rate of return of 11 percent over its entire life. However, it does not provide an indication of the average rate of inflation during this long period or of the volatility of nominal and real returns. On the basis on data on nominal returns provided by ATP and data on consumer price inflation contained in the IFS database, the following picture emerges regarding the behavior of real returns over time (Table 6).

It is striking how different the selected sub-periods look. While in its first 17 years of operation, which were the years of high inflation in the whole OECD area, ATP achieved a real rate of return of just 0.69 percent, in the 15 years ending in 2005, the years of low inflation, it registered an impressive real return of 7.43 percent. ATP achieved an even higher real rate of return during the 1980s, which was the decade of disinflation.

Large capital gains on bond portfolios were registered during the period of disinflation because of the steady decline of nominal interest rates. However, this episode highlights the shortcomings of focusing on asset returns without looking at the implications of financial developments on the value of liabilities. ATP, like pension funds everywhere, suffered from the rise in the value of liabilities, even though these losses were not reported because liabilities were not required to be marked-to-market.

Table 6: Historical Nominal and Real Investment Returns, 1964-2005

Average Annual Rate %	Nominal Return	Inflation Rate	Real Return
1964-1970	6.18	5.95	0.22
1970-1980	10.96	9.84	1.02
1980-1990	18.67	5.91	12.05
1990-2000	10.48	2.14	8.17
2000-2005	7.97	1.97	5.88
1964-1980	8.97	8.22	0.69
1980-1990	18.67	5.91	12.05
1990-2005	9.86	2.23	7.43
1964-2005	11.44	5.44	5.69

Source: ATP

Focusing on investment performance in recent years, investment returns suffered during the first few years of the new millennium from the decline in interest rates and the collapse of equity prices between 2000 and 2002 (Table 7). Although equity prices recovered substantially between 2003 and 2006, the overall investment performance

lagged behind that of the 1990s, when the average rate of investment return exceeded 10 percent (Table 6).¹¹

Table 7: Investment Returns by Asset Class, 2001-2006

	2001	2002	2003	2004	2005	2006	Average
Bonds	6.5	10.6	4.7	7.0	4.4	2.7	6.0
Listed Equities	-13.5	-28.9	32.5	23.1	39.5	20.4	9.1
Other Assets	6.2	4.9	0.34	0.24	12.4	21.0	7.3
All Assets	-2.7	-7.9	7.6	8.3	11.4	7.9	3.9

Source: ATP

ATP operates with low expenses (Table 8). This reflects the large size of the fund and the compulsory participation of its members. These features produce economies of scale in administration and avoid large marketing costs. It also benefits from offering standardized products. This is in sharp contrast to private pension institutions, especially life insurance companies, which incur high marketing costs and offer a wider range of products. ATP administers several government funds on a cost recovery basis and also offers administrative services to other pension funds. These costs are reported separately. The internal administrative and investment expenses of ATP amounted to 7 basis points of average total assets in 2006. The higher level of administrative expenses in some years is explained by the development of new information systems. External asset management expenses, which are usually deducted from reported investment returns, amounted to an additional 11 basis points in 2006. These expenses have been increasing in recent years.

Table 8: Internal Administrative & Investment Expenses, 2001-2006

basis points	2001	2002	2003	2004	2005	2006
Administrative	4	5	6	5	4	4
Investment	2	3	3	2	2	3
Total	6	8	9	7	6	7

Source: ATP

The high efficiency of ATP operations is also confirmed by the low level of expenses per account. In 2006, administrative expenses per account amounted to 33 DKK (about 5.5 USD)¹² Adding internal investment expenses brought the total to 55 DKK (Table 9). The low average cost per account is also explained, at least in part, by the presence of a large number of pensioners among its account holders. In 2006, the total number of members equaled 4.44 million people. Of these, 0.66 million were above and 3.78 million below pensionable age. Of the latter, 3.09 million paid a contribution in the preceding year. ATP

¹¹ The data exclude the profits or losses generated by the use of interest rate swaps for hedging pension liabilities. There is some discrepancy in the reported data because the overall rate of return on the total portfolio amounted to 3.9 percent for the whole period 2001-2006, while each of the components achieved a higher rate. The data reported by ATP are daily, time weighted rates of return. But this approach should not produce the above discrepancy. Given that bonds and equities represent the vast majority of assets, the overall rate of return should lie between 6 and 9 percent, unless either or both of these rates are overstated in the calculations. The same pattern of discordant rates of return is reported by ATP for the five years ending in 2005 (ATP 2005:32).

¹² The average exchange rate for 2006 equaled 5.95 DKK per USD.

regularly points out that the average cost per account among private sector pension institutions (life insurance companies and multi-employer funds) ranges between 300 and 1,000 DKK per account, but also notes that the latter institutions incur large marketing and selling costs, which ATP is able to avoid.

Table 9: Internal Administrative & Investment Expenses per Account, 2001-2006

DKK per account	2001	2002	2003	2004	2005	2006
Administrative	25	27	32	32	30	33
Investment	11	17	19	16	19	22
Total	36	44	51	48	49	55

Source: ATP

ATP is subject to stress test and accounting rules similar to those applied to other pension institutions in Denmark. It carries out regularly the stress testing computations required by the Danish FSA. For a while in the first few years of the millennium, ATP found itself in the 'yellow light' scenario of the DFSA but its financial position has improved considerably since then and its reserves now exceed by a big margin the losses that could be caused by either the 'yellow light' or 'red light' scenarios.

9. Concluding Remarks

ATP has a long history, having been created in 1964. It has an enviable record of high operating efficiency and investment returns. It has been a leader among Danish pension institutions in adopting innovative investment policies, diversifying internationally, increasing the interest rate sensitivity of its assets and, more recently, expanding the use of long-dated interest-rate swaps to hedge its pension liabilities. It has used an effective system of risk sharing with both active and passive workers, offering minimum guaranteed benefits and annual bonuses that depend on both investment returns and longevity trends.

However, ATP suffers from several weaknesses and shortcomings. It has a cumbersome governance structure that reflects the corporate traditions of the Danish labor market (high union membership, central role of collective labor agreements, and significant influence of social partners) but discourages timely increases in contributions and timely changes in other basic features of its services. In fact, one of the most important weaknesses is the very low level of contributions. The social partners have agreed to a further increase in contribution amounts in 2009 and to maintain their level close to 1 percent of average earnings. Nevertheless, it is ironic that a highly efficient institution is used for providing a meager improvement in pensions. In addition, the 4.5 percent interest rate guarantee was kept in place for a much longer period than in private sector pension institutions (life insurance companies or multi-employer pension funds). The structure of its pension benefits used to be based on an 'idiosyncratic' principle of 'equal pensions for equal contributions, irrespective of age'. This was changed in 2002 but its deferred group annuities continue to involve a risk-sharing arrangement among active and retired workers. This is coming under strain because of the financial pressures of increasing longevity and demands for greater individual choice.

There is also a lack of clarity on the historical performance of ATP as a pension provider. As discussed in section 5 above, ATP does not publish data on the historical ex post performance of individual accounts, which depends not only on the guaranteed benefits but also on the history of bonus payments. There is also a need to clarify the extent of cross-subsidization, which is probably much lower now under the new scheme, compared to the situation in the early years of its operation. The average replacement rate achieved by ATP pensions is currently estimated at 8 percent of average earnings. This would be an impressive result for a contribution rate of 1 percent of average earnings if the real value of pensions was maintained over time. However, this information is not currently available. The record of ATP as a pension provider needs to be better documented and explained.

The performance of ATP as an investment institution experienced a major transformation over time. Initially, it was a poor performer that was shackled by extensive restrictions on its investment policies and was compelled to invest in financially weak and poorly performing markets. In later decades, it has been able to improve its performance, first benefiting from the rebounding of market returns in its traditional investments and then adopting innovative investment policies and diversifying in international markets and new asset classes. ATP is currently a leader not only among Danish institutions but internationally in adopting innovative investment policies and focusing on total asset and liability risks.

The future evolution of ATP will depend on a number of critical decisions. A new benefit plan will become operational in 2008. This will replace the 2002 scheme. The currently legislated fixed annuity conversion rates will be removed. Under the new plan, 80 percent of contributions will be used each year to purchase nominal deferred annuities on the basis of an annually determined maturity-dependent discount rate (drawn from the nominal swap yield curve) and an annual estimate of future cohort longevity. The latter will take into account expected improvements in longevity. The remaining 20 percent will be treated as a bonus contribution and will be added to the bonus fund of the ATP. Depending on investment results, it will be used to index nominal pensions and pension rights to inflation and also accommodate deviations of actual longevity experience from projected longevity. The success of the new scheme will depend on the extent to which the bonus fund will be able to compensate young workers for using a nominal discount rate for the majority of their savings throughout their working and retirement life. The bonuses would need to cover not only future inflation but also some part of the higher returns available on equity markets.

ATP's strong investment performance and high operating efficiency are expected to continue in the future. However, pressure for greater transparency regarding the calculation of benefits is likely to grow. Such pressure is also likely to affect the operations of private pension institutions.

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