The Danish pension system: Properties, outcomes and challenges

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Torben M. Andersen
Department of Economics and Business Economics
Aarhus University
CESifo, CEPR and IZA

Abstract:

The Danish pension system is based on public pensions and mandatory occupational pensions covering most employees. Poverty among elderly is very low, and replacement rates are generally high. The occupational pensions are still maturing until retirees have saved for pensions throughout their entire work career at the current contributions rates. Along this transition path the pension burden on public finances declines partly due to the increasing role of private pensions and partly due to reforms increasing retirement ages and eventually tying them to life-expectancy. The financial system is robust since it is partly funded, and since reforms have ensured that public finances are financially sustainable. However, there are some challenges including the incentive structure underlying savings and retirement decisions, unequal taxation of various forms of savings, and ensuring that all save for pensions.

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1. Introduction

Pension reforms are at the top of economic-political agendas in many countries. First, populations are ageing partly due to changes in fertility rates and partly due to increasing longevity\(^1\). Increases in longevity are driven by lower mortality at higher ages, and the increases are substantial and associated with welfare gains, but raise questions on adequacy and financing of pensions. Second, pension systems in many countries do already from the outset suffer from various problems, and in a forward perspective these problems will be magnified by the demographic developments. The challenges on pension systems in terms of adequacy and financing are thus large.

The demographic challenge is illustrated by Figure 1 for European countries. It shows the projected changes in the dependency ratio; that is, the ratio between individuals above the age of 65 in the population relative to the number in the age group 15 to 64. Although there are some country variations, the increase in the dependency ratio is a common trend.

Figure 1: Demographic dependency ratio, EU-countries, 2013-2060

![Graph showing projected changes in dependency ratio](image)

Note: Number of persons aged 65 or above relative to those aged 15-64.

The financial challenge for EU countries is illustrated by Figure 2 showing the projected increases in age-related expenditures including public pensions between 2013 and 2060. For most countries the expenditure path is a mirror image of the development in the dependency ratio, i.e. a gradual

\[^1\] The increases are rather substantial. Life expectancy at age 65 is e.g. by the European Commission (2015) expected to increase by 4.8 years for males and 4.6 years for females between 2013 and 2060, reaching 22.4 years for males and 25.6 years for females.
but steady upward expenditure drift. This questions the financial viability of public finances. It should be noted while the debate tends to focus solely on pensions other age dependent expenditures like health and care expenditures are also crucial for the public finance implications of the changing age structure. Moreover, advances in life-science are likely to create a further upward drift. While health and care are not directly a part of pension systems, these areas are essential for the well-being of elderly citizens, and the public provision of such activities is of crucial importance for the need for private savings.

**Figure 2: Increase in annual age-related public expenditures as a share of GDP, European countries, 2013-2060**

![Graph showing annual age-related public expenditures as a share of GDP for European countries (2013-2060).](image)

Note: The figure shows the increase in annual expenditures on pensions, old-age care and health to the elderly part of the population as a share of GDP.

A few countries stand out by having been front runners in reforms. One such country is Denmark, and the EU commission (2015) actually expects public age-related expenditures in Denmark to fall as a share of GDP, cf. Figure 2. At the same time Denmark is ranked at the very top in the Melbourne Mercer Global Pension Index, cf. Mercer (2015). While the basis of such rankings can be contested, it underlines that Denmark is not facing declining pension expenditures because the pension system is not well-developed and does not deliver acceptable results.

The Danish position is mainly explained by two factors. First, a pension system has developed in which private occupational pensions are maturing and, in combination with public pensions, ensure reasonable pensions for most. Second, reforms have been undertaken to increase pension ages alongside increases in longevity. While the reforms may be somewhat lagged, they are comprehensive and with large effects.
The Danish pension system should be seen against the background of an extended welfare model with a relatively generous social safety net and provision of welfare services (education, health, care etc.) of contemporaneous standards meeting the requirements of most. As a consequence the public sector is large and the tax burden high. Denmark has in international comparison a relatively high income level and low income inequality, see e.g. Andersen (2015).

This paper gives an introduction to the Danish pension system, its properties, outcomes and challenges. As a platform for the subsequent discussion Section 2 starts out by presenting some key principal issues in the design of pension systems. Section 3 lays out the key properties of the Danish pension system, while Section 4 charts the outcomes of the system as well as its robustness in a forward perspective, while Section 5 considers the gradual transition implied by a large role for funded pensions. Section 6 considers some of the challenges faced by the Danish system, and Section 7 provides a few concluding remarks.

2. Principle aspects
Multiple objectives pertain to the pension system. At a general level the overall aims are:

- Distribution: Ensuring that all elderly have a decent living standard (minimum standards).
- Consumption smoothing: Ensuring that living standards after retirement stand in a reasonable relation to living standards while working.
- Insurance: Coverage of various events including long-life (life-annuities) and surviving spouse and children.

Given the multiple objectives, there is not a unique optimal pension system since the design depends on the weighting of the different objectives. This does not imply, however, that the design of the pension system does not matter. Quite the contrary, the design of the pension system is crucial, and it is important to be explicit on the pros and cons of the different design elements and how they relate to the various objectives to be met by the system.

Pension systems are characterized by the membership group, contributions, mode of financing, and benefit structure for the retired, to mention only some general features. Accordingly there are many dimensions of a pension system and therefore modes of designing the pension system, as is also seen from the cross-country variations, see e.g. OECD (2014). Different weighting of the different objectives naturally leads to different designs of the pension system.

It is useful to discuss pension design with outset in two prototypes: (I) a pay-as-you-go system (PAYG) where benefits to current pensioners are financed by taxes levied on the current work active. In this system benefits are typically defined benefits and the basic version offers a flat rate pension to all. More sophisticated versions can have pensions to depend on some measure of lifetime income or number of years in work. The benefit level may also be means-tested against income and wealth, and (II) a defined contribution scheme where individuals during work life
contribute into a pension fund, and the contributions plus the market return on their investments determine the pension the individual is entitled to at retirement.

PAYG pensions are by nature mandatory. Pillar II occupational pension schemes are also often mandatory. Mandatory elements in pension savings are usually justified by the tendency that voluntary savings for many are too low, see e.g. Feldstein (1985) and Laibson (1996). Low pension savings may result from some form of present-biased preferences, where individuals/households do not attach sufficient value to savings and thus future consumption. This provides a rationale for public intervention mandating individuals to save for pensions. Crucial for the net-effect on savings is how voluntary savings respond to the mandatory savings, but empirical evidence shows that crowding out is far from complete.

It is a standard result in the pension literature that PAYG pensions are return dominated by the funded pensions, see Aaron (1966). The return in the funded scheme is clear since it is the market return. The return for PAYG pensions is an implicit return. To see this, consider a stylized pension system where pensions are financed by a proportional tax on wage income. The total revenue is the contribution rate times the total wage income in the economy, and dividing by the number of pensioners one gets the annual pension which can be paid out to pensioners. The pension will grow by the growth rate of wage income in the economy, and this defines the rate of return generated by the scheme. This can also be expressed in the way that the individual contributes based on the individual wage income and gets a pension determined by the future wage income of all employed, and the ratio between the two determines the implicit return. In a dynamically efficient economy the market return is higher than the implicit return in the PAYG system.

An additional advantage of a funded scheme is that the contribution is going into an individualized account, and it is therefore not a tax. The PAYG pension, on the contrary, has the common-pool property that the pension to which the individual is entitled is not in any way depending on the

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2 Agents may discount the future too heavily (myopia) or have hyperbolic preferences. The latter is a time-inconsistent model of discounting where there is a down weighting of all future periods relative to the present, see Laibson (1996). An alternative approach is if agents suffer from self-control problems and therefore are tempted to increase current consumption, see e.g. St-Amant and Garon (2014).

3 Present-biased preferences are not sufficient to make mandatory pension savings efficient in raising net savings. If agents hold voluntary savings or can borrow at the same terms as for pension savings, they can undo the effect of mandatory savings. However, if there are some imperfections in the capital market, mandatory savings may work to increase net savings and improve welfare, see Andersen and Bhattacharya (2011, 2015).

4 Evidence for Denmark points to relatively low crowding out (25-30%) of voluntary savings, see Arnberg and Barslund (2012) and Chetty et al. (2014).

5 If this is not the case, there is over-saving and the accumulated stock of capital is too large, and welfare can be increased by lowering savings and reducing the capital stock, cf. e.g. Blanchard and Fischer (1989).

6 In Denmark the average annual wage sum growth over the period 1990-2013 was 3.6% while the average annual return on a 10 years mortgage was 5.7%.

7 If agents suffer from a present-bias and capital markets are incomplete, the contribution rate may distort labour supply, see e.g. Kaplow (2015).
contributions made, and hence contributions are part of the tax burden levied on labour. Distortions of economic incentives are thus lower under a funded scheme. There are thus two key arguments usually put forward in favour of funded pensions relative to PAYG pensions: they have a higher return and the contributions are less distortionary than corresponding tax rates.

However, PAYG pensions have other advantages. The PAYG system has the advantage that it immediately can provide pensions to the old, while a funded scheme has a long gestation period. Historically, this has been an important reason for the introduction of PAYG pensions. A PAYG pension scheme is also sometimes denoted an implicit social contract since the current work active contribute to the financing of pensions to the current old, in the expectations that the future work active will do the same.

A funded scheme implies pensions depending on income during work-life which serves the consumption smoothing objective. However, this also implies that the distribution of pensions comes to reflect the distribution of (wage) income. The distributional objectives – especially poverty alleviation among the old - are thus to be addressed via the taxation system. PAYG pensions have an advantage in catering more directly for distributional objectives. This is most easily seen in the case of a flat rate pension where all get the same pension. This ensures that all pensioners have some minimum income. Since contributions depend on individual income such a scheme tends to be progressive in a life-time perspective.

Finally, insurance aspects are deeply related to pensions. The first and foremost reason is survival and maintenance of consumption possibilities and thus living standards throughout life. A life-annuity serves this purpose since it diversifies individual mortality/survival risk. Defined benefits in a PAYG scheme are born as life-annuities since entitlement is for rest of life (although the real value of benefits may change). Occupational pensions are usually anchored around life-annuities as being the main benefit form for the retirees. Related to the mortality risk is survivor (and children) pension. The insurance effect goes further. The funded pension depends on the work career of the individual and any interruptions of the work career due to sickness and unemployment as well as wage variations become reflected in the pension, while the public pension is less sensitive to such events (seen clearly in the case of a flat rate pension). Public schemes can also entail risk sharing across generations, which is not possible in funded schemes. Therefore the design of the pension system has implications for risk sharing, which should also be taken into account when comparing the PAYG- and funded pension schemes.

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8 In the strict sense this only holds for a flat rate pension. If the pension is related to e.g. life-time income, there is some relation between contributions and entitlements, but still the return is determined by the growth rate of wage income, and thus lower than the market return.

9 The return difference between the PAYG and a funded system may be considered an implicit tax.

10 The precise extent of redistribution depends both on the taxation scheme and the means-testing of public pensions, cf. below. Moreover, there is also an intergenerational distribution issue. While a PAYG-pension is a clear gain to the inaugural generation receiving a pension, it is a burden on future generations due to the abovementioned return difference.
The two basic pension types thus have various pros and cons, and this is the reason why the World Bank (1994) recommended a multi-pillar pension system consisting of I) public tax financed pensions, II) a mandatory funded pension system, and III) voluntary private savings. The division of labour between the three columns is that the public pensions are addressing the distributional objective, the mandatory and savings based pensions cater to consumption smoothing, while the third column allows for individual desires and needs. Across the columns there are various built-in insurance elements covering various events which may arise at the individual or society level.

While this logic is clear, the actual design is somewhat more complicated since it is not possible to separate the different roles or objectives completely. In particular the distribution objective\(^{11}\) cannot be separated from the consumption smoothing objective.\(^{12}\) The problem is that it is not possible to combine the two without creating incentive problems. To see this, consider the basic question of how to design public pensions such that they are targeted to the economically weakest pensioners. This could be in the form of stipulating a minimum guaranteed pension ensured all old. If the public pension system is designed to ensure this, it will compensate for any pension below this level to ensure that the individual meets the minimum requirement, cf. Figure 3a. However, the flip-side of this is that any increase in private pensions (as long as it is below the minimum level) effectively is taxed at 100% (higher private pensions in this interval do not increase the total pension but only its composition between private and public pensions). As a response to this the public pension may be phased out more gradually (an off-set rate or taper rate below 100%) as is illustrated in Figure 3b. This implies a lower implicit tax rate in the system which may be conducive for savings and later retirement. However, this is achieved at the costs of higher public expenditures on pensions, which in turn have to be financed by (distortionary) taxes. A flat rate pension universal for all is the limiting case of Figure 3b, where all receive the same public pension. Clearly, this leaves a zero implicit tax rate in the pension system but higher public expenditures and thus higher explicit tax rates.

\(^{11}\) The insurance aspect is also involved. Whenever there is ex-post redistribution depending on some events it will ex-ante serve an insurance role.

\(^{12}\) This aspect is not explicitly discussed in the World Bank Report (1994) “...this report recommends separating the saving function from the distributive function and placing them under different financing and managerial arrangements in two different mandatory pillars—one publicly managed and tax-financed, the other privately managed and fully funded-supplemented by a voluntary pillar for those who want more...” World Bank (1994, page 15).
This illustrates a dilemma inherent in the division of labour between PAYG pensions and funded pensions with respect to distribution and incentives. This underlines the point made above that the pension system involves many trade-offs making it impossible to define a unique optimal model.

3. The Danish pension system

The basis of the Danish pension system rests on a combination of public (Pay-as-you-go, defined benefits) and labour market (funded, defined contributions) pensions. The system effectively prevents old age poverty and ensures reasonable replacement rates for most when retired.

The public pension includes a basic amount (flat-rate pension) and means-tested supplements\(^\text{13}\) (residence requirement). Furthermore, there are a number of age-dependent supplements. These pension entitlements are of the defined benefit type, and tax financed\(^\text{14}\). Public pensions are indexed to wages.\(^\text{15}\) Figure 4 illustrates the public pensions and how they depend on private pensions (see also below).

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\(^\text{13}\) Eligibility for the public pension requires residence in 40 years between the age of 15 and 65. If this requirement is not fulfilled, the pension is reduced proportionally to the accumulated period of residence.

\(^\text{14}\) This section gives a summary account, for a more detailed description see, e.g., Money and Pension Panel Expert Group (2012).

\(^\text{15}\) This adjustment is carried out relative to increases in annual wages two years earlier, according to wage statistics from the Confederation of Danish Employers. If the rate of increase exceeds 2\%, 0.3\% is allocated to an adjustment pool used for activities directed at recipients of transfers. According to a recent tax reform the indexation of transfers is changed for the period 2016 to 2023 such that, on average, they are only adjusted by changes to prices.
Figure 4: Structure of public pensions, Denmark 2015

Note: The figure gives a stylized illustration of the public pension system in Denmark 2015. Other supplements to the old (including housing) than the direct pension supplements (Supplement I: Pensionstillæg; Supplement II: Særlig pensionsydelse) are disregarded. Pensions are taxable income. 1 DKK is (July 2015) approx. 0.15 $.

By law all wage earners and recipients of transfer income contribute to the supplementary labour market pension (ATP). It is a defined contribution scheme to which all contribute the same monthly amount (depending on working hours). The contribution rates are relatively small, and therefore this scheme cannot in itself ensure sufficiently high replacement rates.

It falls outset the scope of this paper to provide a detailed account of the process underlying the current system and the development of collective bargained occupational pensions\(^\text{16}\), see Due and Madsen (2003). However, a few remarks are in order to point out that the current setting is an outcome of historic and institutional factors. During the 1980s it was generally perceived that the Danish economy had a savings problem which manifested itself in systematic current account deficits. At the same time there were discussions about the establishment of wage-earner funds for employees to have ownership in firms, an idea to which the employers were opposed. The outcome of this process was an agreement to expand occupational pensions into the private sector\(^\text{17}\). This allowed workers to build up funds, and the employers avoided direct co-ownership of firms. The occupational pensions are thus agreed in negotiations between the labour market parties and in this sense voluntary, but involuntary/mandatory for workers employed in areas

\(^{16}\) In addition labour market pensions include firm-specific pension agreed in a specific employment relation between an employer and employee. In addition there is a special pension arrangement for civil servants in the public sector.

\(^{17}\) Most public employees already had a pension arrangement.
covered by the contracts. The fact that it is a negotiated solution helps ensuring support for the system, but it also creates some challenges, cf. Section 5.

Occupational pension funds are organized on the basis of sectors/type of labour and are non-profit organisations. The boards have members representing both employees and employers. The funds manage contributions, investments and out-payments. The activities by the funds are regulated by law. Funds are typically invested in “standard” assets – domestic and foreign - like bond and shares

The development of labour market pensions took off in 1989-91, and the arrangements have subsequently been extended to a large part of the labour market, and contribution rates have until recently been increasing\(^{18}\), cf. Figure 5. Today contribution rates\(^{19}\) vary between 12% and 18%, with rates tending to be higher for high income groups.

**Figure 5: Contribution rates for bargained occupational pensions, 1993-2011**


Occupational labour market pensions are composed of different elements in relation to investments, payments and insurance cover, and the composition varies across pension funds, see

\(^{18}\) Contribution rates have remained stable in recent years. This may be explained by the replacement rates ensured (see below) and that the current arrangement make it less attractive for some groups to increase their contributions, cf. below on effective tax rates on pension savings.

\(^{19}\) Typically split such that employers pay 2/3 and the employees 1/3. However, this split is only of accounting importance, since employers are concerned about total wage costs, and employees about the total renumeration.
Money and Pension Panel Expert Group (2012) for a detailed account. Pension assets may be used to cover actual pensions or insurance products linked to the pension scheme. The pension is paid either as an annuity, or as a pension payable in instalments or a capital pension (lump-sum). In most cases, the basic pension is a life-annuity (i.e. a certain minimum of pension savings is for an life-annuity product). Insurance elements are often attached to labour market pensions, e.g. disability pensions, spouse/children pensions.

Private pension savings comprise other forms of savings (voluntary savings) as well as savings in pension savings schemes in banks and insurance companies (the return is taxed more leniently, but the funds are tied to retirement).

Statutory ages in the pension system (for public pensions, for early retirement, and age limits for payment of funds from pension schemes) are established by legislation and thus regulated at political level. Recent reforms – the welfare reform from 2006 and the retirement reform from 2011 – will increase these ages considerably to cope with an ageing population. The first element of the reform package is discrete increases in the early retirement age from 60 to 62 years over the period 2014-17, shortening the early retirement period from five to three years over the years 2018-19 and 2022-23, implying an early retirement age of 64 in 2023, and increasing the pension age from 65 to 67 years over the period 2019-22. The second element is an indexation of the early retirement age and pension age to the development in life expectancy at the age of 60 in order to target the expected pension period to 14.5 years (17.5 including early retirement) in the long run (currently about 18.5/23.5 years). Figure 6 shows that the tendency for the expected pension period to grow will be turned by the reforms and in the long run ensure an expected pension period of 14.5 years.

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20 The early retirement scheme is contribution-based (but with public subsidies) and allows the individual to leave the labour market earlier (early retirement as originally available between the age of 60 and 65). The system has been reformed several times to make the system less attractive and to postpone retirement.

21 The system is semi-automatic since a change has to be approved in parliament every fifth year. The changes are smoothed since the change in one year can never be below 6 months and above 12 months. Changes in the pension ages are announced with a lead time of 15 years, implying that the first change will be implemented in 2030 (2027 for early retirement).
The overall taxation principle for pension savings follows an ETT-model; that is, contributions are tax exempt (E), returns are taxed (T), and pension payments are treated as personal income and thus taxable income (T). Due to progressive elements in the tax system, the value of the tax deduction for contributions may be higher than the tax paid on the pension payments. However, this should be seen relative to means testing of public pensions, cf. below. The current tax rate on the returns is 15.3%, which is low compared to most other savings possibilities, see also below.

4. Outcomes
The many different elements of the Danish pension system serve several purposes. The public pension can be seen as the base of the system; i.e., it provides the minimum income that all pensioners are ensured independently of any labour market pension or other private savings. Supplements are dependent on income and wealth to target economically disadvantaged pensioners. This serves the distributional objective. Labour market pensions depend on the extent of work and income during the economically active years as well as the return on the accumulated funds. High employment rates and income result in high contributions and in effect high pension savings, and thus in turn higher consumption opportunities as a pensioner. Labour market pensions therefore play a decisive role in ensuring that the consumption opportunities of pensioners stand in relation to those prevailing prior to retirement (consumption smoothing). Finally, voluntary private pension savings give individuals the opportunity to ensure a higher

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22 A recently introduced scheme called an “old age pensions” for voluntary pension savings is a (T,T,E) scheme, i.e. contributions are not deductible, but out-payments are not taxed. The contributions are tied to retirement upon which the either sum can be withdrawn. The return is taxed at the rate 15.3% which is lower than the general capital tax rate. There is a cap on the annual contribution the individual can make to this scheme.
pension for themselves (or plan for bequests) than that which follows from compulsory public pensions and labour market pensions.

The outcomes of the Danish pension system in terms of distribution and replacement rates are illustrated in Figure 7 and 8, respectively. The level of public pension is such that very few elderly end up in the low-income group having a disposable income below 50% of median income. Those in the low-income groups are often immigrants not meeting the full residence requirement for the public pensions. Using the official poverty line, only 0.3% of those above the age of 64 fall below this threshold in 2013 (compared to 0.7% for the entire population), see Økonomi- og Indenrigsministeriet (2015).

Figure 7: Share of persons above age 65 in the low income group 2012

Note: The low income group is defined by having a disposable income below 50% of the median income for the entire population.

The replacement rates and their composition are shown for different income groups (deciles) in Figure 8. Several points are worth noting:

First, replacement rates are close to 100% for low income groups (1 decile) reflecting that social transfers for non-employed in the working age are close to the full public pension (base pension plus supplements). Most people with income in the 1st decile are out of work before retiring and receive a social transfer. Hence the replacement rate is close to 100%. This is related to the finding above that poverty among elderly is rare.

Second, the replacement rate for high income groups (5th decile or above) is about 65%. This is relatively high in comparison to other OECD countries, see OECD (2014).

Third, considering the composition of the replacement rate, it is seen that the relative role of public pensions is declining and that of private pensions is increasing in the income level. This is an
immediate implication of the means testing of supplements in the public pension system. In a forward perspective this will become even stronger since private pensions are still in a transition phase, cf. below. Hence, replacement rates will increase somewhat, but the composition will change with a larger part coming from private pensions and a smaller part from public pensions, though public pensions will remain of importance to most.

**Figure 8: Average replacement rates at the age of 66 across income deciles, 2012**

![Replacement rates graph](image)

Note: Replacement rates are computed for individual disposable income at age 66 relative to the disposable income at age 55-57 (also the incomes used for the construction of income deciles). The disposable income at age 55-57 is adjusted to 2012-level by use of the index for the general wage development. Among the age group 66, only persons without market income are included. Source: Pensionskommissionen (2015).

5. **Pension system in transition**

The pension system is in transition. Contribution rates have been increasing since the early 1990s, and they have only been steady at the current levels in a few years, cf. Figure 5. Accordingly, there is a time horizon of several decades for the current system to be fully phased in such that pensioners can draw on labour market pensions created by contributing at this level through a full working career.

As a consequence, pension funds are in a building-up phase with relatively steep increases in total pension assets. Figure 9 shows a rather significant development where the assets today constitute about 200% of GDP. Since pensions funds are still in a building-up phase, this share is expected to increase further. Note that the Figure gives a gross amount since pensions are taxable income, but still of significant importance.
The building up of private pension funds relieves public finances due to the means testing (and the effect would be even larger if compared to a situation where the public system should deliver the same replacement rates as the combined system does). It is an implication of the phasing in of private pensions and reforms of retirement ages that private pensions will play an increasing role and public pensions a decreasing but still significant role. This is illustrated in Figure 10 showing both public pensions and annual pensions from funded schemes as a share of GDP.

Extensive welfare arrangements also imply that public finances are sensitive to the age structure of the population. As noted, reform initiatives have been taken to address the implications of an ageing population on public finances, primarily by increasing retirement ages. Danish public finances thus meet the criterion for fiscal sustainability\(^\text{23}\) (see Ministry of Finance (2015), Danish Economic Council (2014)). In that sense, the pension system has a robust funding. The projected profile for public finances taking into account both ageing and the reforms outlined above is shown in Figure 11. The turn in public finances and trend improvement is closely related to the decrease in the expected pension period, cf. Figure 6.

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\(^{23}\) The projected budget profile is problematic since it has a sequence of structural deficits between 2025 and 2055 (peaking at about 1.5% of GDP in 2045, and in most years exceeding the 0.5% of GDP limit) to be followed by surpluses in the far future. This profile is mainly the result of a slow phasing in of the increases in retirement ages and a strong effect of the indexation scheme in the long run (decreasing the share of life spent as pensioner).
6. Challenges

Despite a robust structure the Danish pension system faces some challenges. Some relate to inherent dilemmas in the structuring of pension systems, and others to specific features related to the Danish system.

Figure 10: Public pensions and payments from contribution-based private pensions

Note: Dotted lines are projected values.

Figure 11: Profile for public finances, % of GDP, 2013-2080

Source: Council of Economic Advisors (2015)
(i) Effective tax rates on savings and retirement

Means testing of public pension (supplements) serves the targeting purpose of ensuring that all pensioners have a decent living standard. However, it also implies that increased private savings and thus pensions are not reflected one-to-one in the total pensions since the public pensions are reduced, cf. Figures 3 and 4. Means testing thus effectively implies a tax on private savings or postponed retirement. In considering the incentives to save and retire, one thus has not only to consider formal taxes but also the implicit taxes arising via means testing.

Due to the complexity of the rules this cannot easily be summarized, but Figure 12 illustrates the effects for a single person household living in a rented accommodation. The figure shows the effective tax on the payment from a private pension. For low values of private pensions the effective tax rate can be close to 75%, while for high values of pensions it is about 53%. The reason why the effective tax rates become high for low private pensions (and thus typically low income groups) is the means-testing targeting public pensions to the least well-off pensioners. While serving a distributional purpose, means testing creates an incentive problem which may be detrimental to the overall objectives of strengthening private pension savings and inducing later retirement. In this way, the system becomes regressive, having the largest marginal tax rates for low and medium income groups.

Figure 12: Effective tax rates on pension savings, 2015

Note: Stylized case for a pensioner being single and living in a rented accommodation and thus receiving means-tested rent subsidy.

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24 Note that the Figure shows the effective taxation on the outpayment of pensions. The Figure does not capture the value of the tax deduction of the pension inpayment. The distortion of the savings decision is determined by the relation between and the return taxation. The effective tax on the outpayment is also of importance for retirement decisions.
(ii) Different taxation of various types of pension savings

The current system has very different rates of taxation on the return from different types of savings, cf. Figure 13. This is problematic since it has a distorting effect on the asset allocation. The lower taxation of the return on pension savings is motivated by these savings being tied for release only when retired. The favourable taxation of housing is partly related to a nominal freeze of property taxes since 2002.\(^25\)

A particular question is whether the tax structure provides incentives to so-called balance expansion for households. A person contributing to a pension saving (with a return tax of 15.3%) and at the same time borrowing (with interest rates being deductible at a rate of 25-33%) effectively receives a tax subsidy by expanding the balance. Denmark stands out by having households with a high gross debt ratio, although the average household is a net-creditor, see e.g. Isaksen et al. (2011). Further, a persistent surplus on the current account also indicates that Denmark does not have a general savings problem. However, the liquidity of assets and liabilities are very different, and this may create a systemic risk factor of implications for macroeconomic stability. It may also be questioned why the tax system should give incentives in this direction.

Figure 13: Taxes on the return from different types of savings

![Figure 13: Taxes on the return from different types of savings](image)

Note: For shares and capital income the column illustrates the span between the lowest (min) and highest (max) rates of taxation.

(iii) Return variability and low interest rate scenario

Property taxation has two parts, a property value tax to the state and a land tax (municipal property tax) to the municipalities. The state property value tax is 1% of the assessed housing value (3% of the value above some threshold, in 2015 3.040.000 DKK). A so-called tax freeze implies that the housing value for most house owners remains at the 2002 valuation. The municipal property tax decided by the municipalities within the interval of 0.16% and 0.34% of the assess land value.
The discussion above points to the possible adverse incentive effects of the interplay between public and private pensions via means testing of the latter (and taxation in general). However, this also has an insurance effect. All changes in private pensions beyond individual control, like involuntary unemployment or variations in the return on pension savings, are shared/absorbed via public pensions.

The Money and Pension Panel Expert Group (2012) presents a number of cases showing an implicit insurance effect in the sense that total pensions vary less than private pensions in case of various events. Since means testing applies for relatively low incomes/pensions, there is an asymmetry in the insurance mechanism. Households ending up with low private pensions receive more from the public system. In case of a higher private pension, means testing ceases at some point, implying that further increases in private pensions are to the benefit of the individual (low effective tax). The implicit insurance created via means testing and taxation is thus mainly an insurance against downside risks.

As noted, overall Denmark follows an ETT principle in the taxation of pensions. It is thus one of the few countries taxing the return on pension saving, see Yoo and de Serres (2004). The return taxation was introduced in 1984 since a disinflationary policy implied high real return on nominal fixed bonds (constituting a significant share of pension fund portfolios at the time). The tax has been changed a number of times\(^\text{26}\) and is now a proportional tax of 15.3% on the pension fund return (including accrued capital gains and losses). This contributes a non-trivial amount of tax revenue of about 1.25% of GDP, but also with some variation (between 0 and close to 2.5% of GDP), cf. Figure 14. The revenue from the tax is a mirror of capital market developments (and overall accumulated funds). The variation is rather large, and seen relative to the implications for public finances (and budget norms\(^\text{27}\)), it introduces significant short-run volatility on public budgets.

The ETT-tax system also raises the issue of political credibility. By admitting tax deductions for pensions savings, and taxing pension payments tax revenue is shifted into the future. With the underlying trends this implies that more tax revenue accrues alongside an ageing society and thus an upward expenditure drift. In that sense the tax revenue is implicitly tied to the financing needs. However, large accumulated pension funds also imply large deferred tax payments, which may create a political incentive to front-load some of the revenue\(^\text{28}\).

\(^{26}\) It was originally formulated as a taxation of the real return above 3.5%. The current rate is set on the presumption that inflation remains low,

\(^{27}\) According to the EU Growth and Stability Pact, there is a deficit limit of 3% of GDP in the public budget balance. Even if the public budget is anticipated to be in balance, the variance in the revenue from taxation of the pension fund returns may bring the total balance close to the limit.

\(^{28}\) This is not a theoretical discussion. In Denmark the government has changed two smaller pension arrangements (the so-called Capital Pensions, and the LD-pension arising from mandatory contributions in the 1970s) where individuals were given a tax-refund to swap into a scheme with immediate taxation of the funds (and then no taxation at withdrawal), see e.g. Danish Economic Council (2015)
A low interest rate scenario raises a number of questions for pension savings. One concern is whether pension funds, in a quest for return, will take on more risk. The asymmetric risk sharing implied by the system may reinforce such a tendency. Until now the pensions funds have not moved into so-called “alternative investments” to a large degree, but there is an ongoing discussion on this, and the pros and cons of such a development.

On the return difference between PAYG- and funded pensions it should be noted, that if lower real returns are caused by lower productivity growth, the implication is not only lower return on private pensions but also corresponding lower growth in wages and thus in public pensions (presuming that wage indexation is maintained).

The effect of lower rates of return on fiscal sustainability is complicated. Lower returns on pension savings will imply less tax revenue, more expenditures on public pensions, but also a lower interest rate on public debt (and thus discounting to assess fiscal sustainability). The net effect – given the underlying budget profile for Denmark – is that a lower interest rate marginally deteriorates fiscal sustainability (Ministry of Finance (2015)).

(iv) Funded pensions - Incomplete coverage

On the one hand it is a strength of the current system of occupational pensions that it is bargained across social partners (and for some groups as a part of an employment contract). This implies that the system has broad support. However, it is an implication that the current system of mandatory occupational pensions is that it does not cover all.
Groups left uncovered include employees falling outside the bargaining areas covered by pensions, self-employed and individuals with a more marginalized relation to the labour market. There are very few persons with full-time employment which are not covered by some form of labour market pension. Since the system builds on the combination of public pensions and mandatory occupational pension, this “residual group” is problematic for two reasons. First, some may end-up with an “unexpected” low pension. Secondly, a free-riding problem may be involved, which may undermine the support to the system. Proposals to make some minimum pension savings mandatory for all have been discussed.

7. Concluding remarks
The foundation for the Danish pension system was laid in the late 1980s with a building up of funded labour market pensions as an important supplement to the public pensions. The system is still in transition, and in a forward perspective private pensions will thus play a larger role.

The robustness of the pension system has various dimensions. One crucial dimension is whether the system is financially viable and resilient to changes in, e.g., longevity and changes in financial markets (a financial crisis or a low interest rate scenario). The fact that occupational pensions are funded and that reforms of public pensions have been made to address the ageing challenge (primarily via increased pension ages) ensure that the system is viable and meets its main objectives. This is reflected in satisfying requirements of fiscal sustainability, offering relatively high replacement rates and avoiding poverty among elderly citizens. Having prepared for ageing at a relatively early stage, the pension system has not been challenged by the financial crises, and the financial crisis has not contributed to a worsening of the situation.

Despite this, a number of challenges remain with the structure of the Danish pension system. While the interplay between private and public pensions reflects a division of labour between concerns for distribution and consumption smoothing, it also implies a distorted incentive structure for pension savings and retirement. This may undermine the strategy to make people save for pensions and to postpone retirement.

The Danish experience underlines the very long gestation period for pension systems and hence the importance of long-term planning, as well as the need to avoid frequent changes in rules and regulations pertaining to the pension system.

In an extended welfare state as the Danish, it is interesting how the combination of private and public pensions ensures that overall objectives relating to distribution, consumption smoothing and insurance can be attained. Private pensions play a crucial role in meeting these objectives and in reducing financing burdens on public finances and making pension contribution less distortionary on savings and labour supply (retirement) compared to tax financing. However, the Danish experience also shows that although the interplay between private and public pensions is

29 They may have some contributions to the system, but only very small amounts.
important, it is also difficult. There is an inherent dilemma between on the one hand distribution and insurance and on the other the incentive structure.
References:


Danish Economic Council, 2015, Danish Economy – Autumn 2015, Copenhagen.

Due, J. and J.S. Madsen, 2003, Fra magtkapm til konsensus – Arbejdsmarkedspensionerne og den danske model, DJØFs forlag.


Kaplow, L., 2015, Myopia and the effects of social security and capital taxation on labor supply, National Tax Journal, 68(1), 7-32.


Ministry of Finance, 2015, Convergence Programme Denmark 2015, Copenhagen.


Pensionskommissionen, 2015, The Danish pension system – internationally praised but not without problems (Det danske pensionssystem – international anerkendt, men ikke problemfrit), Copenhagen.


World Bank, 1994, Averting the Old Age Crisis, World Bank Publications, Washington D.C.

Økonomi- og Indenrigsministeriet, 2015, Familiernes økonomi – fordeling, fattigdom og incitamenter, Copenhagen.