Experiences with Occupational Pensions in Denmark*

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Summary: This paper focuses on the development of the funded, occupational pension (OP) system in Denmark. Launched in 1987, as a grand agreement between social partners backed by the government, and as part of the collective wage bargaining process, the Danish OP system differs from the set-up in most other countries, where OP schemes typically have been introduced as part of the legislative process. The OP schemes, being a major component of the overall Danish pension system, have attracted a lot of international attention in recent years and play a key role behind the system's success with respect to achieving satisfactory coverage, providing high replacement rates and not least, for keeping fiscal policy on a sustainable path. Finally, the paper discusses a number of future challenges, mainly related to the interaction between private and public pensions in a welfare state.

Zusammenfassung: Das Papier konzentriert sich auf die Entwicklung des Systems der kapitalgedeckten, betrieblichen Altersversorgung in Dänemark. Das dänische System, das 1987 als große Vereinbarung zwischen den Sozialpartnern, die von der Regierung unterstützt wird, und als Teil des Tarifverhandlungsprozesses eingeführt wurde, unterscheidet sich vom Aufbau in den meisten anderen Ländern, in denen Altersversorgungssysteme in der Regel im Rahmen des Gesetzgebungsprozesses eingeführt wurden. Die Altersversorgungssysteme, die ein wichtiger Bestandteil des gesamten dänischen Rentensystems sind, haben in den letzten Jahren große internationale Aufmerksamkeit erregt und spielen eine Schlüsselrolle für den Erfolg des Systems, wenn es darum geht, eine zufriedenstellende Abdeckung zu erreichen, hohe Ersatzraten zu erzielen und nicht zuletzt die Finanzpolitik auf einem nachhaltigen Weg zu halten. Schließlich wird in dem Papier auf eine Reihe künftiger Herausforderungen eingegangen, die sich vor allem auf die Wechselwirkung zwischen privater und staatlicher Altersvorsorge in einem Wohlfahrtsstaat beziehen.

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1 Introduction

Ideally, pension systems serve a number of purposes: They provide (a) a fair level and distribution of income for the elderly; (b) insurance against adverse economic outcomes across and within generations; and (c) adequate net replacement rates, which allow for consumption smoothing across the life cycle. Also, in light of the fiscal strain posed by ageing populations, the task of achieving long-term fiscal sustainability relies heavily on the pension system's efficient operation.

The Danish pension system has demonstrated its ability to deliver on all these points and as a consequence, has garnered considerable international attention. It is considered to be a role model for achieving good coverage, provision of adequate benefits and for its ability to keep fiscal policy on track. In fact, for six consecutive years, the Mercer pension index, which compares pension systems of 34 countries, ranked Denmark's system as the world's number one or two (e. g., Mercer, 2018).

This high-ranking position is primarily due to an active reform agenda. This has primarily involved postponing retirement age and restructuring the pension system to rely more heavily on retirement savings by households – both individually as well as collectively. For example, occupational pension (OP) schemes have been introduced and retirement age is now linked to changes in longevity (Holzmann, 2013; Andersen, 2015; Pension Commission, 2015).

In this article, we will be focusing on OP schemes in Denmark: We start with a brief description of their basic design characteristics and their role in the overall pension system (Section 2). Next, we illustrate the macroeconomic and fiscal importance of OP schemes for the Danish economy (Section 3). Finally, we discuss the challenges of OP schemes, while sharing lessons for other countries (Section 4).

2 Key Features of the Danish Pension System

2.1 A broad overview

The Danish pension system follows the standard 3-pillar model: First, a tax-financed pillar with defined benefit (DB) pension entitlements, including a basic flat-rate pension benefit and means-tested supplements, operated on a pay-as-you-go (PAYG) basis.[1, 2] Second, a fully-funded pillar, based on two parts: (a) a compulsory, labour market supplementary pension (ATP) to which all wage earners and recipients of transfer payments contribute; and (b) an occupational pension scheme, organized either as an employment relationship or through collective agreements between social partners. Third, a fully private pillar, with individual saving schemes that are flexible and voluntary, arranged through banks and insurance companies.

The financing of public pensions through general taxation combined with supplements being means tested ensures that the first pillar effectively protects against poverty while providing a relatively equal distribution of income among pensioners. It also acts as insurance against adverse economic shocks, both within and across generations.

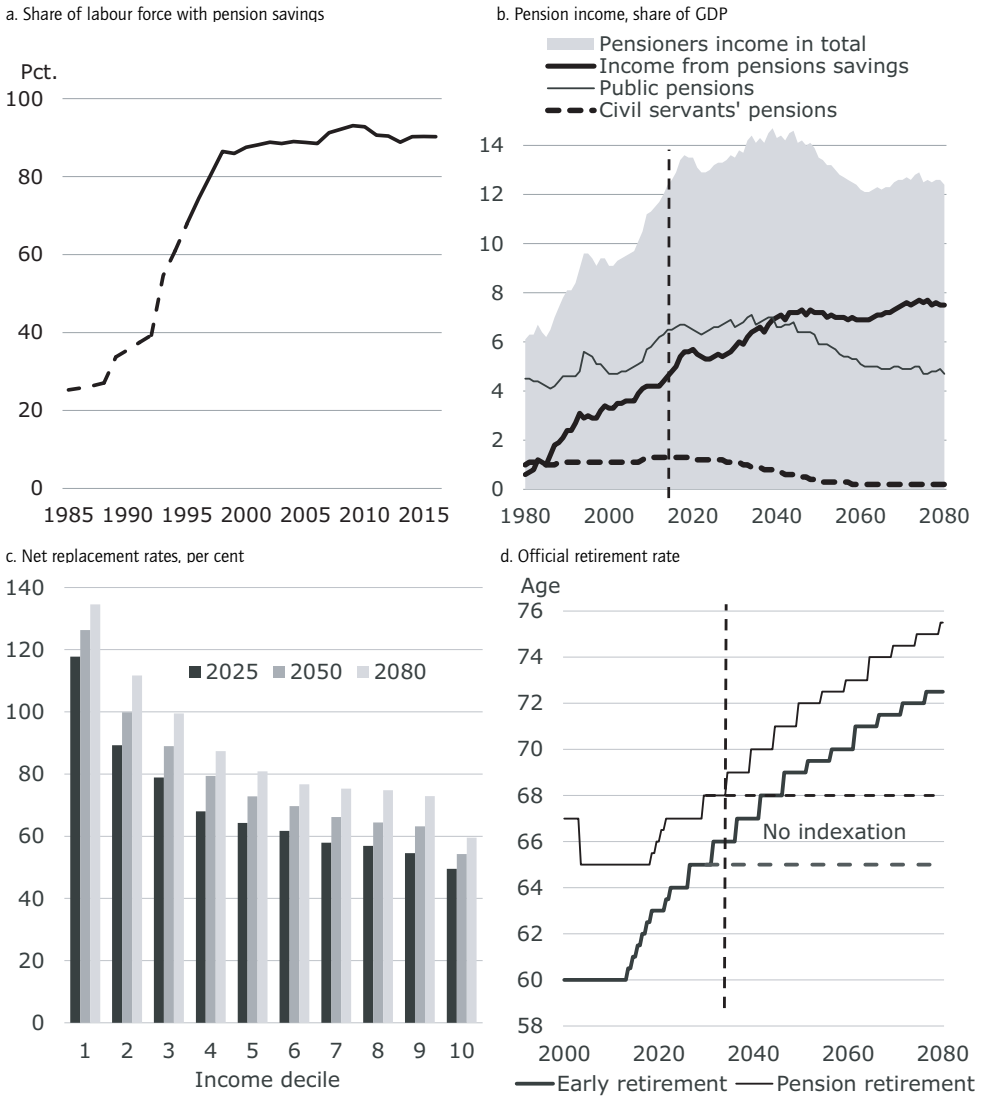
1 Broadly, PAYG systems can be organized in line with either the Beveridgean model or the Bismarckian model, where the former (latter) provides flat-rate (earnings-related) benefits. Traditionally, the Danish model has been of the Beveridgean type.

2 As per 2018, the flat-rate benefit amounts to app. EUR 10,000 annually and the means-tested supplements to EUR 5,400–10,800 annually depending on family status.

The inclusion of the blue-collar segment of the labour market in OP schemes, as agreed in 1987, led to a significant increase in the share of working-age people with pension savings: From 30–40 percent of the labour force in 1990 to 85–90 percent in 2015, see fig. 1.a. The schemes have not yet fully matured, as contributions to the schemes are still much higher than the benefits paid out. When the schemes have matured, which is projected to occur around year 2050, pension income based on OP schemes will constitute 7–8 percent of GDP compared to public pension incomes, which account for 6–7 percent of GDP, see fig. 1.b.

Figure 1

Key Properties of the Danish Pension System



Sources: Danish Ministry of Finance (various issues) and own calculations. Further information about the Danish pension system can be found in OECD (2017b).

With housing supplements etc. public pensions, together with ATP, make for net replacement rates of close to 100 percent or more for low wage earners and persons receiving social transfers prior to retirement, see fig. 1.c. Net replacement rates are substantially lower for high income earners, but regardless of income level, net replacement rates are projected to increase as OP schemes mature.

Finally, an indexation mechanism linking the official retirement age to changes in longevity has been introduced, see fig. 1.d. In the long run, the indexation mechanism is targeted to provide each cohort with an expected remaining lifetime of 14.5 years after retirement. Due to this mechanism, a cornerstone in Danish structural reforms, public finances in Denmark are widely regarded as being on a sustainable path.

2.2 Danish OP schemes: Background and key design characteristics

While white-collar workers and public employees have been covered by OP schemes since the 1950s, OP schemes covering the blue-collar segment of the labour market were launched in 1987, as a major agreement between social partners backed by the government, with the first contributions being made in the early 1990s (Due and Madsen, 2003).

Growing out of negotiations between trade unions and employers' federations as part of the collective wage bargaining process, the Danish OP system differs from the set-up in most other countries, where OP systems typically have been introduced as part of the legislative process. This unique feature of Danish OP design may well have enhanced its legitimacy by improving citizens' confidence in their pensions and by helping citizens to better understand and appreciate the necessity of saving for retirement (Hansen and Jensen, 2012).

With pensions and wages being integrated in the same bargain, workers may find it easier to accept wage moderation, simply because it is a better deal to opt for larger contributions to a pension fund, which are deductible, than taxable wage increases. Similarly, from the employers' viewpoint, an integrated bargain is likely to help securing a company's competitiveness.

The OP system is not yet fully mature, as total contributions are significantly higher than the benefits received by retired scheme members. Table 1 reports the order of magnitude of the accumulated pension funds in Denmark, showing the development of the size and structure of the funds over the period 1998–2015, differentiated by type of investor.

Over the 20-year period, total assets intended for financing future-funded retirement pensions have increased from constituting nearly 100 percent of GDP in 1998 to more than double the size of GDP today – larger than in any other EU country (OECD, 2017a). Of the total assets in 2017, life insurance companies and private labour market pension funds (rows 1–3 in Table 1) constitute about 70 percent, banks (row 4) hold approximately one tenth, while the remaining fifth is held with public labour market pension funds (rows 5a-5c). The share of assets invested through banks has been halved over the period, while the share held by public labour market pension funds (primarily ATP) has been almost constant. Correspondingly, life insurance companies and private labour market pension funds have strengthened their position as investors of pension savings.

The majority of OP schemes incorporate life insurance policies with deferred annuities. This feature simultaneously ensures adequate net replacement rates over the entire remaining lifetime while providing insurance against the adverse effects on living standards of unexpected differences

Table 1

Accumulated Pension Savings in Denmark, 1998–2017, EUR bn.

	1998	2003	2008	2013	2017	1998	2017
	— EUR bn. —					— Percent —	
Life insurance companies	68	98	149	234	316	42.3	52.9
Multi-employer pension funds	28	40	53	78	97	17.7	16.2
Pension funds, firms	5	5	6	7	7	3.2	1.3
Banks	25	29	41	59	51	15.8	8.6
Public pension funds	34	48	104	99	125	21.1	21.0
a. ATP	27	35	90	90	119	16.5	20.0
b. SP	1	6	6	-	-	0.5	-
c. LD	7	7	8	9	6	4.0	1.0
Total	161	220	353	477	597	100	100
Share of GDP	1.02	1.15	1.47	1.86	2.05	-	-

Note: Excluding public pension funds and banks, approximately 80% of total assets in pension companies and funds are currently customer controlled and not for profit.
Source: Insurance & Pension Denmark (various issues) and Statistics Denmark (various issues).

in longevity. OP schemes organised around industries employing persons with similar health and longevity outlooks help to ensure against redistribution from groups with systematic shorter life expectancy to groups with systematic longer life expectancy.

As a case study, Box 1 offers an illustration of the creation and functioning of a Danish OP pension company providing pension and insurance for segments of blue-collar workers since 1990.

Box 1: PensionDanmark

PensionDanmark (PD) offers an interesting case study that illustrates the formation and maturing of OP schemes. PD is a non-profit labour market pension fund and the largest of the so-called "new OP companies" when measured by the number of its 721,000 members – and the second largest when measured by the amount of assets under management. This makes PD one of the 50 largest pension funds in Europe, currently with EUR 32bn. under management.

PD is a merger of five pension companies. PKS (covering municipalities' blue-collar workers) was established in 1990. In 1991, B&A Pension (covering workers under builders' unions' social contracts), HTS Pension (covering workers in trade, transportation and service industries) and finally B&T Pension (textile workers) were founded, and in 1992, an administrative cooperation between these four companies was formed. APK (Union workers' pension) joined in 1997. PD was eventually created in 2005.

Pension contributions were payable from 1993. The parties behind the triparty negotiations envisaged a gradual increase in contribution rates, from very modest levels in the beginning. No target was agreed upon, but 6 percent of gross earnings was probably imagined. At the onset, contributions were 0.9 percent of gross earnings, but in collective agreements over the following 15 years, contributions increased gradually to the current 12 to 15 percent of gross earnings, see fig. a. Over the 15 years approximately one third of total earnings increases were set aside for pension purposes.

Initially, the focus was on saving for pension alone, but as contribution percentages increased, various insurance schemes were included, e.g. supplementary disability pensions as from 2003. At present, approximately 90 percent of after-tax contributions are set aside for retirement pension, while the remaining 10 percent covers insurance premiums and administrative costs.

For a typical member of PD, with a stable labour market record who has contributed since 1993, accumulated pension wealth presently exceeds EUR 150,000, see fig. b. Since 1993, total funds under management have in-

creased to approximately EUR bn. 32 (fig. c), while the number of members has increased to 700,000 (fig. d), of which around 400,000 members currently make monthly contributions.

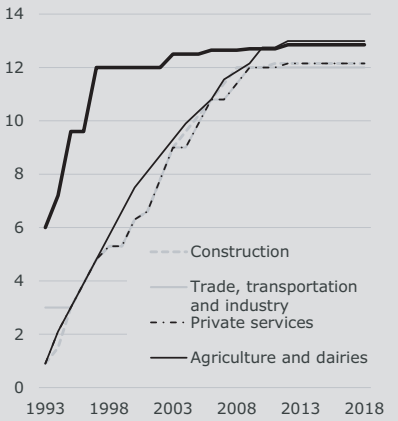
The number of members, as well as the size of funds under management, allow for economies of scale. Administrative costs per member can therefore be kept to a minimum, namely 40 EUR per year.

PD now also provides a Health Care Scheme, which the majority of member unions have chosen to offer to their members as part of the collective agreement. Also, since 2005, PD has been the administrator of funds for supplementary training, as agreed upon and financed by its social partners.

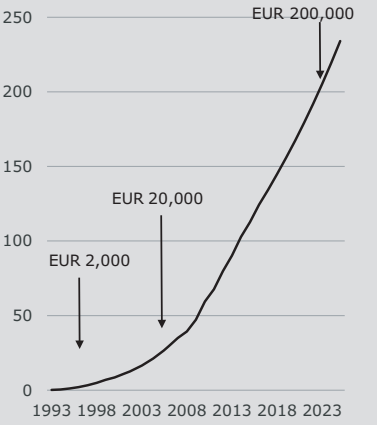
Figure B1

Key Properties of PensionDanmark

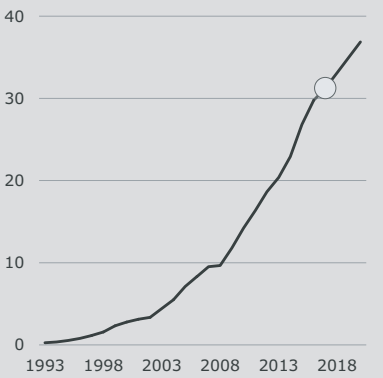
a. Contribution rates across industries



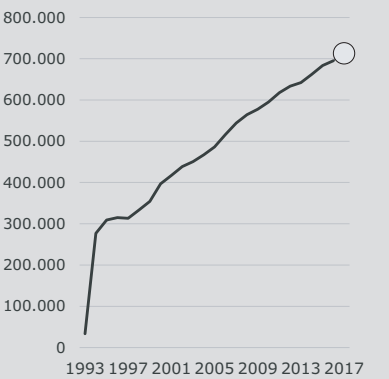
b. Pension wealth, typical PensionDanmark-member



c. Funds under management, billions of euro



d. Members of PensionDanmark



Source: PensionDanmark (2017, 2018). Further information available upon request.

PD is organized as a limited company, but all shares are held by the organizations – the trade unions and employers' federations – behind the respective collective agreements. No dividend is paid, so all profit accrues to members. In this respect, PD resembles a pension fund. Shareholders representing trade unions appoint up to nine board members (typically the trade unions' chairmen), while shareholders representing employers' federations appoint up to six members (typically CEOs of the federations). The board then appoints one independent member who acts as chairman of the risk and audit committee. In order to comply with Fit and Proper regulation, a proportion of board members must possess special competences in areas such as investing, risk management etc. Like other occupational pension funds, PD must comply with Solvency II regulation.

The status of being an incompletely matured funded pension system has major implications for the tax base of personal income tax in the transition period (Andersen, 2018). This is because (the largest share of) contributions to the OP schemes are deductible via personal income tax, whereas pension payments from the pension funds are taxable at the personal income tax rate.

In the process of saving via OP schemes, taxation can appear at different stages, namely when (a) money is contributed to the fund; (b) investment income and capital gains accrue to the fund; and (c) retired scheme members receive their benefits (Whitehouse, 2005).

Traditionally, Danish pension savings, including OP schemes, have been subject to a so-called ETT regime: tax exemption (E) occurs at the time of contribution, fund income is taxable (T) and benefits are taxed when paid out (T). Such a model with deferred taxation may offer a number of advantages. For example, by contributing to a pension fund, a person's ability to pay taxes is, ceteris paribus, reduced. So, by back-loading the tax payments, citizens are encouraged to save for their old age. Also, deferred taxation helps dealing with the demographic time-bomb, as countries will be collecting more tax revenues at a time when more elderly people may put demands on public care and pensions. For economies with incompletely matured pension funds, the tax base is increasing over time. As the OP funds mature, the government's implicit asset in the form of deferred taxes grows, which clearly serves to dampen the fiscal adjustment needed to meet the projected increase in age-related government expenditures.

Indeed, OP schemes' projected development will have a substantial effect on the Danish economy's ability to cope with demographic changes. Provided the existing ETT regime had remained in place, previous studies for Denmark have shown that tax revenues related to pension funds more or less match the increase in expenditures caused by changes in age structure (Bergman et al., 2015). This clearly removes an important part of the increase in the tax burden that would otherwise have been placed on future wage earners, in order to finance the deficit. The risk of generational conflict therefore seems less probable in Denmark than in many other countries.

However, in 2013/2018 a new pension product, so-called "aldersopsparing" ("saving for old-age"), was introduced, which is basically a TTE scheme. In effect, from 2018 the tax regime regarding pension savings will gradually transform from a pure ETT regime to a mixed regime of taxation, where a part of contributions can be set aside for a TTE pension product. When fully matured, it is expected that roughly 25–35 percent of blue-collar workers' gross pension wealth will be subject to TTE (as projected by PensionDanmark, 2018). This raises some fiscal challenges in the medium-to-long term, an issue to be addressed in further detail below.

Overall, Danish OP schemes are widely regarded as being successful. From a macroeconomic perspective, they have contributed substantially to restoring fiscal sustainability and have helped avert chronic imbalances on the current account. They have also given individuals the possibility of smoothing consumption over their lifetime, by increasing the replacement rates of pensions. In a sense, OP schemes have compensated for a widely perceived drawback of the Beveridgean model, namely low replacement rates among people at the medium-to-high end of the pay scale.

Despite the Danish pension system's success in being both financially robust and meeting its key distributional objectives, the system faces two main challenges. First, the continued success of the model strongly depends on a consistent co-ordination between the public PAYG part of the general pension system, the private OP part, and the tax and welfare system more generally. The link

between the PAYG component (first pillar) and the OP component (second pillar) is crucial for not only obtaining a decent standard of living for the poorest retirees, but also to allow consumption smoothing across the life cycle through incentives to save for retirement.

Both objectives are important and cannot be separated. Citizens must feel certain that their (private) benefits from occupational schemes will not be offset by cuts in their public pension benefits. This challenge is closely related to the so-called poverty trap or "toxic combined taxation". We use this term to denote a combination of taxation and means testing, which drives after-tax real returns to pension saving below returns to other forms of investment, and, in some (extreme) cases, below zero. While a means-tested pension scheme allows governments to target poor pensioners and keep the public pension expenditures under control, it may also distort savings by reducing the incentive to save among those eligible to means-tested benefits as the effective return on private retirement savings is reduced relative to those who are not eligible (Fehr and Uhde, 2014; Fehr, 2015). The point is that the existence of "toxic combined taxation" may significantly reduce the incentive to save for retirement.[3]

The Danish government has taken substantial measures over the past two years to reduce the problem of toxic combined taxation. This has been done through a combination of higher tax relief on pension contributions and the introduction of "Aldersopsparing" in a form that can be used in collective agreements' pension plans. The latter transforms parts of OP contributions from ETT to TTE, which allows for a substantial reduction in means-testing of public pension supplements against private pension income. These changes effectively reduce the magnitude of toxic combined taxation, especially for low-to-middle wage income earners. Before the changes in tax regulation, this group were faced with low after-tax returns to pension contributions made up to twenty years before the official retirement age. In combination, the changes ensure that returns on OP pension saving now match returns of other forms of financial saving – disregarding income level and age.

Second, while several studies indicate that fiscal policy in Denmark is on a sustainable path (see, e. g., Ministry of Finance, 2017), a so-called "hammock problem" has been identified. This refers to the shape of the projected time path of the structural balance over the next four decades or so: in the beginning, from 2015 until 2022, the structural balance improves, followed by two decades of deterioration. After 2045, public finances improve again. Over many years, beginning in 2025, the structural deficits will breach the allowed threshold (0.5% of GDP) set by the EU's fiscal compact and the Danish "budget law" (Ministry of Economic Affairs and the Interior, 2014). Right now, it seems like a low-hanging fruit to overcome the "hammock problem" by switching in part from ETT to TTE. However, the financial robustness of the Danish pension system could be undermined if the relevant tax revenues are front-loaded any further. The risk is that revenues may be spent to finance current public expenditures, rather than being saved, so that the required revenues are not available when needed in the future.

A number of suggestions have been put forward to deal with the "hammock problem" (see, e. g., Danish Economic Council, 2014). One possibility is to try to convince the EU that Denmark's fiscal situation is special due to the magnitude of OP funds and the associated large amounts of deferred

3 In order to address this challenge, a Pension Commission was formed in 2014 (Pension Commission, 2015). However, following a general election in Denmark in June 2015, a centre-right government replaced a centre-left government, and one of the new government's first initiatives was to close down the Pension Commission.

taxes. Hence, it would make sense to allow Denmark to deviate from the general fiscal rule and be subject to a milder treatment than countries without similar possession of implicit assets.[4] Another possible step could be to advance the retirement reform, as already agreed across a broad political spectrum. A motivation for accelerating the retirement reform is that longevity has in fact increased faster than assumed back in 2006 when the first welfare reform was agreed. If such attempts fail, it might be difficult to resist the temptation to further convert from the ETT to a TTE principle of taxation, compared to raising taxes or cutting spending.

3 The Importance of OP Schemes for the Danish Economy

While neither scaling back contributions to OP schemes, nor a full conversion from ETT to TTE are likely scenarios in the very short term, they may become serious points on the policy agenda in the medium term. Alternatively, rather than thinking of them as likely events in the short-to-medium term, they may be considered as two counterfactual scenarios capable of illustrating what OP schemes really mean for the Danish economy. Therefore, we briefly consider the effects on the Danish economy in the hypothetical situation where (a) the contributions to (parts of) the OP system are gradually faded out and (b) the OP model with predominantly deferred taxes is given up and replaced by a set-up with the frontloading of tax revenues collected from pension savings.

We do this using the dynamic general equilibrium model for the Danish economy, DREAM ("Danish Rational Economic Agents Model"). This is a model featuring overlapping generations of households that plan their behaviour in a way consistent with rational expectations.[5] A key aspect of such an analysis is the extent to which saving through the OP system is an imperfect substitute for private, voluntary savings.

3.1 A gradual phase-out of the OP schemes

To study the importance of OP schemes for the Danish economy, we consider a scenario where contributions to the OP system are immediately abolished. Specifically, with effect from year 2015, we consider a previously unexpected and immediately implemented "hard stop" of contributions to a certain share of the funds (as listed in rows 1–3 in Table 1), which in a meaningful way can be thought of as OP schemes. Clearly, for schemes where contributions become zero, funds will gradually be phased out. The speed of this process depends on the real interest rate, prevailing tax rules and the time profile of the payment of benefits to members of the respective pension funds.

Figure 2 illustrates, in a stock-flow consistent manner, what happens with the funds over a period of 65 years (from 2015 up to 2080) in two alternative scenarios. First, if contributions are made according to business as usual (baseline, dark blue graph), the accumulation of funds continues and

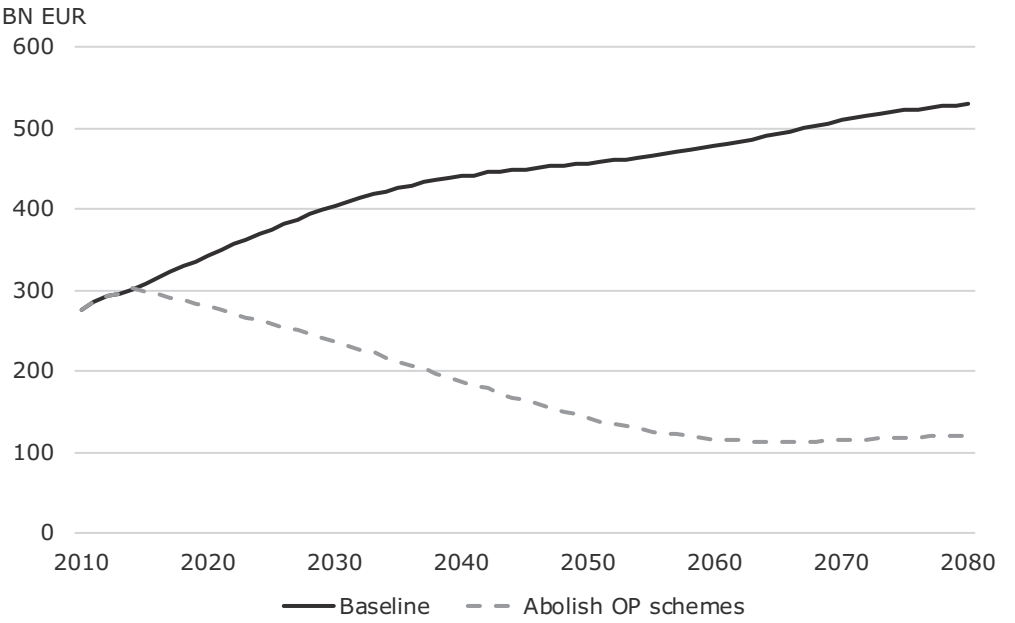
4 The fiscal criteria used in relation to the fiscal compact as well as the Danish budget law are debt and deficits that are conventionally measured and reported. However, a comprehensive balance sheet and permanent income accounting framework for the public sector would allow for implicit assets (and liabilities), such as the present value of deferred taxes (Buiter, 1983).

5 The first version of the model was inspired by the Danish EPRU-model (Jensen et al., 1994) which again was inspired by the inter-temporal simulation framework developed by Auerbach and Kotlikoff (1987). Since then, the model has been enriched by many structural features of the Danish economy, including the OP schemes. Further details on DREAM are available upon request from the authors and from www.dreammodel.dk.

stock by 2080 would be twice as large as in 2015. Second, if OP schemes are abolished (experiment, light blue graph), the funds dry out.[6]

Figure 2

Projected Time Path of Private Pension Funds: Baseline vs. Abolish OP Schemes



Note: Figure 2 illustrates the projected time path of private pension funds in two different scenarios. "Baseline" considers the scenario if contributions are made according to business as usual. The scenario "Abolish OP schemes" reflects the experiment of the abolishment of OP schemes and linked contributions.
Source: DREAM.

By abolishing mandatory contributions to pension funds, working-age people would, other things being equal – such as an unchanged disposable income, have a larger amount available for current consumption or voluntary saving arrangements. So, a key question is how households would react. If voluntary and mandatory savings are perfect substitutes in households' utility functions, then all the unleashed OP savings would be offset by a one-to-one increase in private, individual saving arrangements. In this case, the total private saving profile (voluntary plus mandatory) would coincide with that of the baseline, corresponding to a "zero shock". By implication, the macroeconomic effects would be minor, being limited to the effects of asymmetries in the tax treatment of mandatory and voluntary savings. In fact, if alternative saving schemes are taxed differently, or if there is a low degree of substitutability between mandatory and voluntary savings, the macroeconomic effects of abolishing OP schemes could well be non-negligible. For example, if house-

6 Notice that the funds do not go down to zero, as not all of the schemes reported in rows 1–3 in Table 1 have been identified as relevant to the experiment.

holds replace their released OP savings by more consumption, the macroeconomic outcomes are likely to be considerable.

Unfortunately, empirical literature has not been able to resolve the important issue of how aggregate saving is affected by changes in mandatory saving schemes. However, some hints can be found. For example, Feldstein (1974) found that an additional dollar of social security would offset 30–50 cents of private savings. Later, Gale (1998) found offset effects of about 80%, and Attanasio and Rohwedder (2003) report offset effects somewhere in between the results found by Feldstein and Gale. Estimates of the offset effect on other private savings from IRAs and 401(k)s range from little or no offset – as in Poterba et al. (1995, 1996) – to nearly full offset – as found by Engen et al. (1996) and Attanasio and DeLeire (2002). Again, there are findings reporting effects somewhere in between, such as Hubbard and Skinner (1996) and Benjamin (2003).

The above referenced studies, all based on US data, clearly suggest that the introduction of mandatory OP schemes would increase aggregate saving. A similar insight is obtained from studies conducted on Danish data. For example, Arnberg and Barslund (2012) found that increased contributions to mandatory OP schemes reduce private voluntary savings at the order of 0–30%, indicating little (if any) substitution between mandatory labour market pension savings and private voluntary savings. Similarly, a major study by Chetty et al. (2014) found that only 15% of Danes actively respond to retirement savings policies, thereby providing *prime facie* evidence that one should not expect large compensating effects on voluntary savings if the mandatory OP schemes are abolished.

It is important to stress that the results reported in the above-mentioned studies are *marginal* effects. Therefore, care should be exercised when using these results to predict what would happen if *large* changes are made, such as abolishing OP schemes entirely. Do we really believe that major changes can be implemented to mandatory OP schemes without having a stronger impact on voluntary savings? In fact, such major changes in the mandatory pension system would attract a lot of attention by the media, experts, trade unions etc. Moreover, the banking sector has the capacity to support a positive shift in demand towards private pension savings. Still, it is reasonable to assume that a certain drop in the savings rate would take place following an abolishment of OP schemes.

In the results reported below, we adopt a conservative assumption that voluntary saving increases by approximately 50% of the fall in mandatory saving. This assumption has been used in the calibration of the DREAM model in the baseline scenario. Note also, that DREAM is a model where household behaviour is governed by intertemporal optimization and rational expectations. Within such a setting it is hard to believe that households would not revise their voluntary saving plans following (major) changes to their mandatory saving.

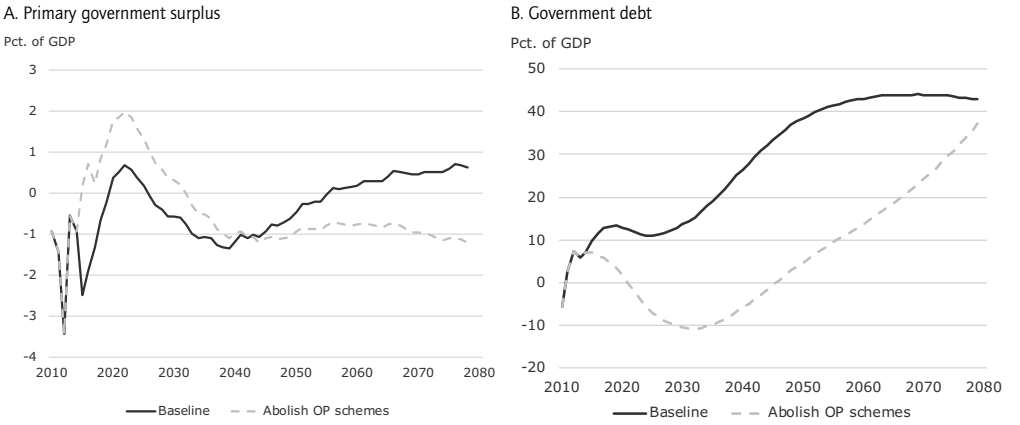
The experiment leads to only minor effects on the level of output and employment, reflecting very small effects on both labour supply and structural unemployment.[7] However, the composition of aggregate demand changes significantly. Indeed, private consumption and investment demand increase, while net exports fall. This occurs because a large share of the increase in private consumption takes the form of imported goods – and exports fall considerably as international competitiveness weakens.

7 The detailed results are available upon request.

If it was assumed that the offset effect was (significantly) less than 50 %, the increase in private consumption would be larger. In the very long run (after 2060), the reduced saving would imply a lower wealth and hence a lower consumption and a fall in GDP. While the general macroeconomic effects are modest, the fiscal effects are considerable. Figure 3 summarizes the effects on the primary government budget (left panel) and government debt (right panel).

Figure 3

Effects on Public Finances: Baseline vs. Abolishment of OP Schemes



Note: Figure 3 illustrates the effects on public finances in two different scenarios. "Baseline" considers the scenario if contributions are made according to business as usual. The scenario "Abolish OP schemes" reflects the experiment of the abolishment of OP schemes and linked contributions.
Source: DREAM.

In order to understand the fiscal effects, it is crucial to understand the ETT regime of taxation: tax exemption (E) occurs at the time of contribution, while fund income and benefits are taxable (T, T). This explains why public finances will improve in the short-to-medium term where households do not exempt as many contributions from taxation as in the baseline scenario. The strengthening of public finances shows up as (a) an increase in the primary surplus and (b) a fall in government debt. Over time, however, tax revenues will fall, simply because the tax base of OP schemes fades out. At the baseline, there will be a long period characterized by deficits in the primary balance, a trajectory largely determined by the demographic dependency ratio. As Figure 2 shows, abolishing OP schemes would lead to stronger public finances compared to the baseline scenario for quite a long period – up to the end of the 2030s. In the long term, however, public finances will be stronger with the OP system (and the ETT regime) in place.

Overall, it is evident that OP schemes play a major role in the behaviour of public finances in Denmark. It is also clear that a major trade-off is involved: by sacrificing OP schemes, improvements to public finances can be made in the short term, but only at the expense of weaker public finances in the longer term. This clearly raises the question as to how abolishing the OP scheme would affect the long-term stance of fiscal policy.

To answer this, we compute the sustainability index, i.e., the permanent improvement of the primary budget (measured as a share of GDP) that is needed to guarantee that the government's intertemporal budget constraint is satisfied. In fact, while the sustainability index in the baseline amounts to -0.07, indicating that fiscal policy is almost sustainable, only a minor tightening of 0.07% of GDP is required, we find that the sustainability index equals -0.93 in the alternative scenario where OP schemes are phased out. To give an indication of the order of magnitude, a permanent fiscal tightening of nearly 1% of GDP to keep public finances on a sustainable path, corresponds to the annual budget allocated to R&D activities at Danish universities. The bottom line is that an abolishment of the OP scheme is associated with a substantial worsening of public finances.[8]

Furthermore, the projected development following an abolishment of OP schemes leads to a marked deterioration of the current account. By dismantling OP schemes, private consumption increases considerably, part of which is fulfilled by imports. Also, the induced wage pressure leads to a deterioration of international competitiveness. With effect from about year 2020, the current account turns into deficit. So, not only does public debt become unsustainable, the experiment also leads to a dramatic fall in aggregate saving and, correspondingly, to a large increase in national indebtedness.

3.2 Converting from an ETT to a TTE principle of taxation

This section seeks to further illuminate the fiscal dimension of OP schemes, by considering the effects of changing the tax treatment of pension savings. As already pointed out, Denmark operates a predominantly ETT regime, it is from here we study in further detail the effects of further shifting to a TTE regime. The motivation for front-loading the taxation of pension savings could be a wish or requirement to satisfy (a) the fiscal compact in the euro area, (b) the Danish budget law, (c) any other fiscal rule calling for short-to-medium term improvements of public finances, or (d) to simply treat pension savings like other forms of savings in the Danish tax system.

We begin with a simple illustration to make the point that a switch from a pure ETT to a mixed ETT and TTE tax regime will make it more difficult to handle the public finance implications of population ageing. As already pointed out, Denmark is in a transition phase towards a mixed ETT and TTE regime. In a continued, pure ETT regime, Denmark would be collecting more tax revenues at a time when more elderly people need public support in the form of care and pensions.

The key numbers are shown in Table 2. Three years, 2018, 2038 and 2058, respectively, have been singled out for special attention. Year 2038 has been chosen because this is when the demographic challenge is expected to peak in the Danish economy. Year 2058 is selected not only as a year when the demographic challenge is expected to be more manageable but one that coincides with the full maturation of OPs. Evidently, public outlays to pensions, health care etc. will increase from 2018 to 2038 as a result of population ageing.

The number of elderly (defined as persons having reached the formal age of retirement) is forecast to increase by about 90,000 people over the next 20 years, corresponding to an increase of about

8 See Andersen et al. (2008) for an earlier study of the importance of the OP schemes for sustainability of fiscal policy in Denmark.

Table 2

Old-Age Expenditures and Taxation of Pension Savings (EUR bn.)

	2018	– 2038 –		– 2058 –	
			Diff. to 2018		*Diff. to 2018*
Old-age pension expenditures (pre means testing)	15.7	16.4		14.2	
Old-age service provision (including health)	14.5	20.6		22.5	
Total	30.1	37.0	6.8	36.7	6.5
OP and private pension benefits (taxable)	9.6	16.2		19.4	
OP and private pension benefits (untaxed)	1.5	2.0		2.1	
Income tax revenue of pension benefits	3.7	5.8		7.0	
Effect on VAT and other indirect taxes	1.2	2.0		2.3	
Phasing-out of pension supplement	0.9	1.3		1.5	
Total	5.8	9.1	3.2	10.8	4.9
Counterfactual experiment without switching to a mixed ETT and TTE:					
Additional phasing-out of pension supplement		0.5		0.7	
Additional tax revenue of pension benefits		1.5		1.7	
Total		10.5	4.7	12.5	6.6

Source: DREAM and own calculations.

8–9 percent (DREAM, 2018).[9] As shown in Table 2 (top panel), this demographic change leads to an increase in public expenditures of EUR 6.8 bn. It is noteworthy that while the projected increase in outlays to public pensions is fairly moderate, at about 5 percent, the projected increase in service production amounts to nearly 42 percent.

In 2058, the number of elderly is expected to correspond to the number in 2018, but, as they will on average be significantly older than in 2018, health care expenditures are expected to be almost 55 percent higher, whereas pension expenditures are expected to be lower (due to means testing, as private pension incomes grow with maturation of OPs).

An important question is how, and to what extent, the funded pension system will contribute to cover the financing of this major shift in public expenditure, and what the effects will be of a partial transition from ETT to a mixed ETT and TTE regime.

The two panels at the bottom of Table 2 show this. First, it is worth noting that if OP schemes are maintained, total benefits will increase from EUR 9.6 bn. to EUR 16.2 bn. in 2038 and 19.4 bn. in 2058. Under the existing mix of ETT and TTE regimes of taxation, and with existing tax rates in place, this would generate an increase in the income tax revenue of the pension benefits and other indirect effects on the revenue side, including phasing out of supplements due to means testing and

9 By international comparison, this may be a modest increase in the number of pensioners. This reflects the effects of the Danish welfare reform of 2006, augmented in 2011, which stipulates an indexation of the retirement age in line with changes in longevity. As a result, the earliest public pension age is projected to increase from 65 in 2018 to 69 years in 2038 and 72.5 years in 2068.

larger VAT revenues. In total, revenues stemming from private pension income can be expected to increase by approximately EUR 3.2 bn. from 2018 to 2038 and by EUR 4.9 bn. to 2058.

The large increase in benefits from OPs and other pension saving thus reduces the gap between increases in expenditure and revenue from EUR 6.5 bn. in both years, to respectively EUR 3.6 bn. in 2038 and 1.6 bn. in 2058.[10] However, despite the large increase in the tax revenue from funded pension benefits, there still is a considerable gap. Had the ETT regime, which Denmark operated up to 2012, remained in place, the gap would have been smaller in 2038 – EUR 2.1 bn. – and non-existent in 2058, as shown in the bottom part of the table. If ETT pension taxation is abolished completely in favour of a TTE system, filling the gap may well become even harder.

In principle, the timing of tax revenues should not have implications for fiscal sustainability if the rate of return on pension savings equals the relevant public discount rate. In practice, however, it will make a difference which of either ETT or TTE taxation regime applies. In particular, it is a critical assumption that the government saves additional tax revenues in preparation of meeting otherwise uncovered liabilities associated with providing for the elderly. Indeed, one could have serious doubts as to whether policy-makers would display such a degree of fiscal discipline and farsightedness. Instead, these revenues might be converted into additional spending programmes or used to cut taxes, such as wage taxes or VAT. In either case, the long-term stance of fiscal policy would be weaker than reported above.

It is well-known that the conduct of fiscal policy is, in practice, mostly associated with a deficit bias. This implies a need for promoting fiscal discipline by "tying the hands" of policy makers in order to constrain decisions about spending and revenue programmes. The main causes of deficit bias cited in the literature are governments' short-sightedness and the common pool problem – although the time inconsistency problem and many other political and economic factors have been suggested. Short-sightedness may be attributable to several reasons, including governments running excessive deficits in anticipation of being replaced by another political party in the future (Persson and Svensson, 1989; Alesina and Tabellini, 1990). Deficit bias may also arise because spending measures tend to be targeted at specific interest groups but financed by general taxation. This creates the potential for free-riding problems emphasized by the common pool explanation for deficit bias (Velasco, 2000; Weingast et al., 1981). Time inconsistency may create a problem for governments to commit to fiscal discipline, leading to excessive deficits, as these commitments may not be credible in the face of the incentive to stimulate short-run aggregate demand (Persson et al., 2006).

4 Further Perspectives and Lessons for Other Countries

According to the *Melbourne Mercer Global Pension Index*, the Danish pension system is "world-class" and was from 2013–2017 ranked number one in the world. The main reasons for this top spot are "Denmark's well-funded pension system with its good coverage, high level of assets and con-

10 In a previous study (Hansen and Jensen, 2012), a more balanced relation between expenditures and revenues was found, indicating that keeping the then existing ETT regime in place would have provided almost simultaneity of (increases in) age-related expenditures allocated to the elderly and tax revenues from the funded pension system.

tributions, the provision of adequate benefits and a private pension system with developed regulations" (Mercer, 2018).[11]

As an illustration of the importance of OP schemes for the Danish economy, we have considered the consequences of a gradual phase-out of OP schemes, assessed from a macroeconomic and fiscal perspective. While it is hard to predict how voluntary saving would respond to an abolishment of the OP schemes, recent evidence based on Danish data suggests that a complete abolishment of the schemes would lead to a large fall in aggregate saving. Public finances would most likely also deteriorate in the longer term. In short, abolishing the OP schemes would most likely seriously threaten the macroeconomic and fiscal sustainability of the Danish economy.

Recent changes in the taxation of pension savings in Denmark have led to a higher degree of front-loading of tax revenues than previously. This was partly motivated by a need to create short-term improvements of the fiscal balance in order to comply with EU's fiscal compact and the Danish budget law. However, it was also done to secure financing of the changes in regulation, which will significantly reduce the problem of toxic combined taxation. Before these changes were made, toxic combined taxation led to quite low or even negative effective rates of return from contributing to OP schemes for low-to-middle wage income earners close to retirement. As the counterfactual experiment reported in table 2 has shown, moving further in the direction of frontloading would further deteriorate the balance between increases in expenditures and revenues associated with population ageing and OP maturation.

The results reported in this article show that such front-loading is certainly a possibility, even without sacrificing the key property of current fiscal policy remaining sustainable. However, doubts could be raised as to whether policy-makers can resist the temptation to spend the additional revenues, at least the leftovers from having satisfied the fiscal compact, rather than saving the funds for the future when they are needed to cover extra outlays caused by changing demographics. Can such a high degree of fiscal discipline and forward-looking behaviour be expected? And would the accumulated savings currently administered by private pension funds be taken care of with a similar proficiency and efficiency if handed over to the public sector?

Another (threatening) possibility would be to pay out the extra front-loaded revenues from taxation of funded pensions in the form of (lump sum) tax reliefs to households. Here the concern is that the implied increase in disposable income would be spent on (domestic and foreign) consumption goods, rather than being saved to underpin the nation's future productive capacity and tax base. Alternatively, the excess revenues could, fully or partly, be used to implement a targeted tax reform aimed at stimulating the supply of labour. This is a complicated experiment which we leave as a topic for future research.

We believe this study brings a number of insights to the table, which are relevant to the debate about further reforming the pension system in Denmark. However, as the Danish pension system may also serve as a role model – given the system's record of being top ranked by the Mercer pension

11 After six consecutive years at the top spot, Denmark has in 2018 been knocked off the #1 position and is now ranked #2 after the Netherlands. While this type of rankings must be taken with more than a grain of salt, we think it is fair to say that these top-ranked pension systems are indeed quite successful.

index, the question is if there are takeaways from this study that could be useful to other countries. We can think of several such policy implications for other EU countries or OECD-type economies:

First, the Danish experience shows that OP schemes have contributed significantly to not only restoring fiscal sustainability but have also helped avert chronic imbalances on the current account. Put differently, our findings suggest that implementing a funded pension system in line with the Danish OP schemes would be a wise way to overcome the problem of twin deficits. This is indeed a situation relevant to several members of the Euro area in Southern Europe, including Greece, Italy, Portugal and Spain (GIPS). Knowing there is no quick "copy-paste" fix, the Danish experience could serve as valuable inspiration.

Second, as part of fiscal austerity programmes implemented in GIPS (and other EU) countries, there has been a series of pension reforms. The impact of these reforms is estimated to lower the replacement rates across all income levels, and especially for higher income individuals in Greece and Portugal (OECD 2013). Again, since the OP model in Denmark has been found to increase net replacement rates while at the same time keeping the expenditure burden of public pensions low, a policy implication suggests itself: with weak public finances, which have led to a reduction in public pension replacement rates, shifting towards a pension system relying more heavily on savings *ad modum* the Danish OP schemes seem like a move in the right direction.

Third, expanding OP schemes among EU countries would also improve free movement of labour within the EU. The reason for this is that social security and public pension provision are ruled by complex regulations, with no general EU measures towards eliminating double taxation problems. The benefit of OP schemes to migrant workers is that the EU Commission is committed to removing tax obstacles on OP schemes within the Single Market framework. If the objective of improving the conditions for portability of social rights is accomplished, it would increase the propensity to work abroad (d'Addio and Cavalleri, 2015). In this sense, OP schemes provide a much better and simpler option for migrant workers compared to public pension systems, in providing fair pension taxation treatment. As for longer-term migrants, the issues are related, not to deductibility rules, but to the portability of pension capital. Given relatively simple accrual and indexation rules, fully funded OP schemes can provide for easier portability (Holzmann and Koettl, 2015).

Fourth, we have shown that shifting, fully or partly, from ETT to TTE pension taxation would potentially allow for front-loading tax revenues without compromising fiscal sustainability. With the benefit of improving the immediate governmental fiscal stance, this is an interesting policy choice for GIPS countries, as population aging expenditure increases may coincide with the development of OP schemes in these countries. As such, changing from an ETT to TTE tax regime may be an interesting policy choice in order to better match aging expenditure with funded pension taxation revenues. However, while front-loading would provide immediate fiscal ease, a myopic government might fail to guarantee long-term fiscal sustainability. Hence, it is of utmost importance that governments ensure fiscal discipline in saving the front-loaded revenues.

Finally, an often-neglected virtue of the Danish OP model relates to the implied voting structure. The point is that voting rights in trade unions negotiating on OP schemes are restricted to current workers. This feature could be critically important in order to get acceptance for policies preparing for future demographic burdens. For example, a policy reform which would shift some of the financial burden associated with population ageing away from working-age people, in the interest of

the overall economy, could be hard to achieve as it would be opposed by the elderly population. The Danish OP model could therefore be of interest to countries with failed attempts to restructure the pension system to rely more heavily on retirement savings by households, as the structural overrepresentation of the elderly in unions is much smaller than in general voting. Even so, we are fully aware that the Danish experience is not directly transferable, as the system has strong historical foundations and therefore copying and pasting it to other countries is not easily done.

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