



MINISTRY OF FINANCE

Pension Projection Exercise 2021 Country Fiche Denmark

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1. Overview of the pension system

1.1 Description

The Danish pension system can be divided into three pillars:

1. The first pillar consists primarily of the public old-age pension and is financed on a PAYG basis. This is a universal defined benefit scheme financed by general taxes aiming at guaranteeing a minimum pension for the pensioners. Disability pensions are also included in the first pillar. The ATP and LD-schemes are also included here.
2. The second pillar consists primarily of (privately organized) labour market pension schemes, which are contribution-defined. This pillar also contains tax-financed earnings-related civil servant pensions. However, these are in general in the process of being phased out.
3. The third pillar consists of individual, voluntary pension schemes similar to the schemes in pillar 2. The public voluntary early retirement pension (VERP) is also placed in this pillar.

The three pillars are explained in greater detail in the supplementary annex.

Public old-age pension and Voluntary early retirement (VERP)

Public old-age pension is paid upon application from the age of 66 (currently), that is the generation born in 1954. It is possible to postpone retirement with up to 10 years which will result in a higher pension. The additional benefit is calculated as the period postponed relative to the expected lifetime at the postponed retirement age multiplied by the regular old age pension. The additional benefit is added until death.

In order to be eligible for public old-age pension, the rules are as follows: The minimum requirement is 3 years residence in Denmark between the age of 15 and the retirement age. For people who are neither Danish citizens nor EU citizens, this requirement is increased to 10 years, where at least 5 years have to be just before the retirement age. Furthermore, the pension is reduced proportionally if the pensioner has lived less than 40 years in Denmark before reaching the retirement age.

Voluntary early retirement pension (VERP) is for all employees and self-employed persons who are members of an unemployment insurance fund and the VERP scheme and who have reached the age of 63 years, but who are not yet 66 years old, the youngest generation being born in 1957.

To be eligible for VERP, one must be a member of an unemployment insurance fund and paid contributions to the voluntary early retirement scheme for 30 years. Furthermore, it is a precondition that the membership and the contributions start no later than the age of 30.

With the two major reforms of the Danish pension-system *Welfare Agreement – 2006* and the *Retirement Reform – 2011*, an indexation mechanism was introduced such that retirement age for both VERP and old-age pension was based on life-expectancy for a 60-year old, which means that the retirement age increases with life expectancy. The *Retirement Reform – 2011* also cut the VERP-period from 5 to 3 years. The current indexation mechanism of the retirement age is described in *box 1.1* and the two reforms are described in detail in the supplementary annex. The indexation of the retirement age to life expectancy is vital for the Danish economy in ensuring fiscal sustainability.

Box 1.1

Description of the indexation mechanism of retirement age

The period on old-age pension is intended to be 14.5 years (17.5 including VERP) based on life-expectancy for a 60-year old (unweighted average for men and women).

The last decision concerning the indexation mechanism was taken by Parliament in 2015, which will be renewed every 5 years. Changes in old-age pension age are decided 15 years before they occur (12 years for VERP), so the first increase due to decision in 2015-indexation is in 2030 (2027 for VERP). The next decision concerning the indexation mechanism is before the end of 2020 to increase the pension age to 69 years in 2035. The maximum increase in the retirement age is restricted to 1 year every 5 years.

Example: Increase in old-age retirement age in 2030 (decision in 2015):

- **Assumed life expectancy** = life expectancy for 60 year old in 2013/14 (latest known data in 2015) + assumed increase of 0.6 years = $(60 + 23.1) + 0.6 = 83.7$
- **Calculated retirement age in 2030** = assumed life expectancy – 14.5 years = $83.7 - 14.5 = 69.2$ years
- **Calculated retirement age in 2030 (rounded)** = Calculated retirement age in 2030 rounded to nearest half year = 69 years
- **Actual retirement age in 2030** = 68 (due to restriction of max increase with 1 year – old-age retirement age is 67 years in 2029)
- **VERP age** is then increased with 1 year 3 years earlier (in 2027) to maintain a 3 year VERP-period

Source: Danish Ministry of Finance.

In the projection included in this ageing report for Denmark, the calculated age limits for both old-age and early retirement is based on the life expectancy in the EUROPOP2018, *cf. figure 1 and 2*. The statutory retirement age will increase by 9½ years from 65½ years in 2019 to 75 years in 2070. Correspondingly, early retirement age increases by 9 years from 63 years in 2019 to 72 years in 2070, *cf. table 1*.

The increase in the statutory retirement age should also be seen in the light of ensuring that every generation can expect approximately the same number of years in retirement given the projected increase in life expectancy, *cf. figure 1 and 2*.¹

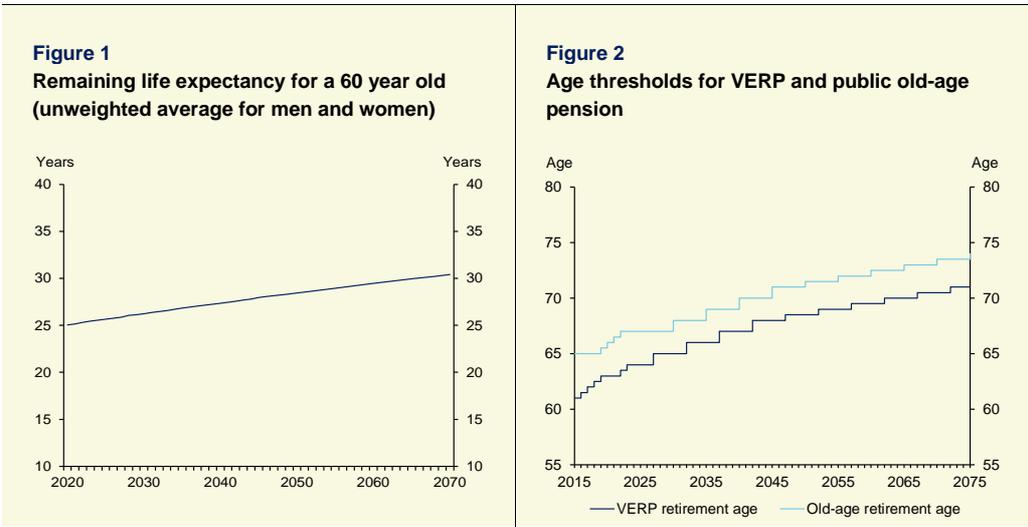
¹ In the coming years, the average number of years in retirement with old age pension are expected to be larger than the target in the indexation rule, because life expectancy has increased more than expected.

Table 1
Qualifying condition for retiring

	2019	2020	2030	2035	2040	2050	2060	2070
Qualifying condition for retiring with a full pension								
Minimum requirements	-	-	-	-	-	-	-	-
- Contributory period - men	-	-	-	-	-	-	-	-
- Retirement age - men	-	-	-	-	-	-	-	-
- Contributory period - women	-	-	-	-	-	-	-	-
- Retirement age - women	-	-	-	-	-	-	-	-
Statutory retirement age - men	65½	66	68	69	70	71½	72½	73½
Statutory retirement age - women	65½	66	68	69	70	71½	72½	73½
Qualifying condition for retirement without a full pension								
Early retirement age - men	63	63	65	66	67	68½	69½	70½
Early retirement age - women	63	63	65	66	67	68½	69½	70½
Penalty in case of earliest retirement age	-	-	-	-	-	-	-	-
<i>Bonus in case of late retirement (varies)</i>								
Minimum contributory period - men	-	-	-	-	-	-	-	-
Minimum contributory period - women	-	-	-	-	-	-	-	-
Minimum residence period - men	-	-	-	-	-	-	-	-
Minimum residence period - women	-	-	-	-	-	-	-	-

Note: Earliest retirement age is set to statutory retirement age for the VERP scheme, which requires 30 years of contributions. See the description below. The age limits are calculated based on the life expectancy in the EUROPOP2018 projection, which may differ from the official projections used in the Danish Ministry of Finance. Changes in the statutory retirement age for old-age pension due to increases in life expectancy have to be confirmed by Parliament 15 years before they take effect (12 years for changes in the VERP age). The increases in the VERP and old-age retirement ages until 2030 are already confirmed. Increases beyond 2030 are projected using the expected life expectancy and under the assumption that Parliament confirms these increases in the retirement age.

Source: Own calculations based on EUROPOP2018.



Note: Changes in the VERP and old-age retirement age due to increases in life expectancy have to be confirmed by Parliament 12 (VERP) and 15 (old-age) years before they take effect. The increases in the VERP and old-age retirement ages until 2030 are already confirmed. Increases beyond 2030 are projected using the expected life expectancy and under the assumption that Parliament confirms these increases in the retirement age.

Source: Own calculations based on EUROPOP2018.

Disability pension

Eligibility rules for disability pension are the same as for old-age pension. However, for disability pension, the reduction in the pension benefit if the pensioner has lived abroad is based on the number of years between the age of 15 and the age when disability pension is granted. If the pensioner has lived at least 4/5 of this period in Denmark, full disability pension is granted. Otherwise, the pension is reduced proportionally. In addition, to receive disability pension, the conditions mentioned above must be met.

As a result of a reform of disability pension in 2012, disability pension is only awarded to people above the age of 40, except for cases where it is obvious that a person’s work ability cannot be improved. People below 40 years are instead assigned to a “resource program” in order to improve their work ability. This is not considered disability pension and is therefore not included in *table 2* or the pension projection.

Table 2
Number of new pensioners by age group – administrative data (year 2018)

	All	Old age	Disability	Survivor	Early retirement
Age group					
15-49	4,761	-	4,761	-	-
50-54	2,175	-	2,175	-	-
55-59	2,352	-	2,352	-	-
60-64	17,142	-	2,454	-	11,379
65-69	20,127	19,584	18	-	150
70-74	4,077	3,978	-	-	-

Note: The table only include new pensioners, persons who have received either disability pensions or early retirement benefits does not count as new pensioner when they are transferred to old-age pensions at the age of 65.

Source: Own calculations on administrative register data.

1.2 Indexation of public pensions

The benefits for different types of transfer payments are automatically adjusted once a year on the basis of wage developments in the private sector (the area covered by the Danish Employers' Confederation). Transfer payments are adjusted at the rate adjustment percentage, *cf. the Rate Adjustment Percentage Act*.

The rate adjustment percentage for a given fiscal year is fixed on the basis of wage developments two years before the fiscal year. The rate adjustment percentage for 2019 was, thus, fixed on the basis of wage developments from 2016 to 2017.

As a part of the 2012 Tax Reform, the indexation of all income transfers were lowered in the period 2016-2023, *cf. table 3*. However, old-age pensions were, overall, exempted from this. In the projection, VERP and disability pensions are therefore affected by the 2012 Tax Reform.

Table 3
Lower indexation of income transfers according to 2012 Tax Reform

	2019-23
Percentage points	
Change	-0.75

Source: Danish Ministry of Finance.

1.3 Recent reforms of the pension system included in the projections

In November 2018, a pension reform was adopted by Parliament together with the finance act for the budget year 2019. The purpose of the reform was twofold: i) To ensure a fair income and to reduce the dependency of public pensions for

old age pensioners, and ii) To increase the incentives to postpone retirement for older workers. The main elements of the reform are:

- 1) *An increase in the indexation of old age pension payments* by 0.3 percentage points.
- 2) *Compulsory pension contribution scheme on top of transfer payments.* In 2020, 0.3 per cent of all public transfers (e.g. unemployment benefits) are paid into an individual pension savings scheme (DC). The contribution rate is increased yearly by 0.3 percentage points until it reaches 3.3 per cent in 2030.
- 3) *Frontloading of postponed old age pension payments:* The option to postpone old age pension payments for workers in the age groups above the old age pension age has existed since 2004. In the old scheme the postponed payments were divided into yearly payments for the remaining lifetime. The reform adds options to claim the postponed pension as a one-off payment or in instalments after retirement.
- 4) *For workers with small incomes, the threshold for deducting labour marked income in the old age pension payments* is increased from DKK 60,000 (about euros 8,000, 2019-level) to DKK 100,000 (about euros 13,000, 2019-level). The threshold was later increased to DKK 122,000 (about euros 16,000, 2019-level).
- 5) *The general threshold before means testing labour marked income in the old age pension payments* is also increased by DKK 15,000 (about euros 2,000, 2019-level) for singles and DKK 30,000 (about euros 4,000, 2019-level).
- 6) *A tax free senior premium for workers at the old age pension age:* Workers working at the old age pension age can claim a tax free senior premium of DKK 42,000 (about euros 5,600, 2019 level). Later, an extra premium of DKK 25,000 (about euros 3,300, 2019 level) was added for workers working 1 year after the old age pension age.

In June 2019, the *Senior Pension* scheme was adopted by Parliament, which is a pension scheme that worn out old workers can apply for. To claim Senior Pension, it requires an assessment by the authorities.

Box 1.2

Ongoing reform discussions

In August 2020, the Danish Government announced a proposal to introduce the right to early pension for people who have entered the labour market early and have long labour market experience. The right to obtain early pension is measured at the age of 61 years. People with 44 years of labour market seniority (at the age 61 years) obtain the right to retire on early pension 3 years before the old age pension age - that is from the age 64 years in 2022. People with respectively 42 years and 43 years of labour market seniority obtain the right to receive early pension payments 1 and 2 years before the pension age. 22,000 people are estimated to apply for early old age pension, and employment is estimated to decrease equivalent to 5,000 full time workers in 2022.

This government proposal to introduce the right to early pension is considered to underpin the general support for the continuing indexation of the old age pension age. The proposal is yet to be adopted by Parliament with negotiations ongoing. The right to early pension must be viewed in connection with *Senior Pension*, cf. above.

In August 2020, the Government announced the terms of reference and the chairman of a new commission considering pension and retirement of older workers. The commission must investigate the effect of the indexation of the old

age pension age, such that the old age pension age is increasing more slowly for people who enter the old age pension age from 2040 onwards. In 2040, the old age pension age is projected to be 70 years.

1.4 Description of the actual ‘constant policy’ assumptions used in the projection

The projections included in this aging report for Denmark assumes ‘constant policy’, meaning that only reforms that has been adopted by Parliament is included in the projections including the reforms mentioned above.

In the projections, the old age pension age increases according to the indexation rule decided in the *Welfare Agreement - 2006* and the *Retirement Reform – 2011*. Even though the next increase of the old age pension age (from 68 years to 69 years in 2035) must be approved by Parliament late 2020. The politically agreed upon mechanism is therefore the basis of the Danish projections – as it is also the case in the yearly Convergence Programmes etc. This issue has been discussed in previous projections rounds and it was agreed to project the increases according to the indexation rule. However, the employment rates are not linked with the increases in old age pension age after 2030. This compromise is also applied in the AWG2021-projection round.

2. Overview of the demographic and labour force projections

2.1 Demographic developments

The population in Denmark is expected to increase from 5.8 million inhabitants in 2019 to 6.2 million in 2070, *cf. table 4*. Furthermore, the old-age dependency ratio (pop 65+/pop 20-64) is projected to increase from 30.9 in 2019 to 48.7 in 2070, which – all else equal – will lead to higher expenditures on public pensions.

Life expectancy at 60 is an important number in the Danish retirement system as the retirement age is linked to this number, and it is, therefore, also included in *table 4*. Life expectancy at 60 increases by 5 and 6 years for men and women, respectively.

Net migration is projected to stay positive throughout the entire projection period, but is projected to fall throughout the projection period.

Table 4
Main demographic variables evolution

	2019	2030	2040	2050	2060	2070	Peak value	Peak year ¹⁾	Change 2019-2070
Population (1,000 persons)	5,809	5,970	6,058	6,100	6,124	6,156	6156	2070	347
Population growth rate	0.3	0.2	0.1	0.1	0.0	0.1	0.3	2025	0
Old-age dependency ratio (pop 65+ / pop 20-64)	34.1	41.4	47.4	47.9	51.2	53.8	53.8	2070	20
Old-age dependency ratio (pop 75+ / pop 20-74)	12.5	17.5	20.7	23.7	23.8	26.1	26.1	2070	14
Ageing of the aged (pop 80+ / pop 65+)	23.4	31.5	32.9	38.9	39.5	39.3	40.3	2056	16
Men - Life expectancy at birth	79.5	81.0	82.4	83.7	84.9	86.1	86.1	2070	6.6
Women - Life expectancy at birth	83.3	84.8	86.2	87.5	88.7	89.8	89.8	2070	6.5
Men - Life expectancy at 65	18.5	19.5	20.5	21.5	22.4	23.3	23.3	2070	4.8
Men - Life expectancy at 60	22.4	23.6	24.7	25.8	26.8	27.7	27.7	2070	5
Women - Life expectancy at 65	21.1	22.2	23.3	24.4	25.3	26.3	26.3	2070	5.2
Women - Life expectancy at 60	25.3	26.7	27.8	28.9	29.9	30.9	30.9	2070	6
Men - Survivor rate at 65+	87.0	89.1	90.7	92.1	93.2	94.2	94.2	2070	7.2
Women - Survivor rate at 65+	91.8	93.2	94.2	95.1	95.8	96.5	96.5	2070	4.6
Men - Survivor rate at 80+	58.8	64.4	68.9	73.0	76.6	79.7	79.7	2070	20.9
Women - Survivor rate at 80+	71.0	75.7	79.4	82.6	85.3	87.6	87.6	2070	16.6
Net migration (thousand)	-1.6	12.4	12.5	11.3	11.0	11.0	12.7	2036	12.6
Net migration over population change	-0.1	0.9	2.1	3.6	5.1	2.6	5.2	2059	2.7

Note: 1) This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2019 to 2070.

Source: EUROSTAT and Commission Services.

Figure 3 shows the development in the population pyramid from 2019 to 2070. As in other member states, a larger share of the population in 2070 is expected to be in older cohorts compared to 2019.

Figure 3



Source: Commission Services.

2.2 Labour force

Labour force participation rates (LFPR) are projected to increase for older workers due to the increase in the retirement ages described in *part 1*. For people aged 55-64, the LFPR will increase from 74.4 per cent in 2019 to 81.7 per cent in 2070, *cf. table 5*. The largest increase will occur in the period 2030-2040 where the LFPR will already have increased from 74.4 per cent to 77.0 per cent.

For people aged 65-74, the LFPR has a much lower starting point at 14.6 per cent, mainly reflecting the statutory retirement age of 66 years. As the retirement age is increased to 74 in 2070, the LFPR in this age group increases to 38.4 per cent in 2070.

Table 5
Participation rate, employment rate, and share of workers

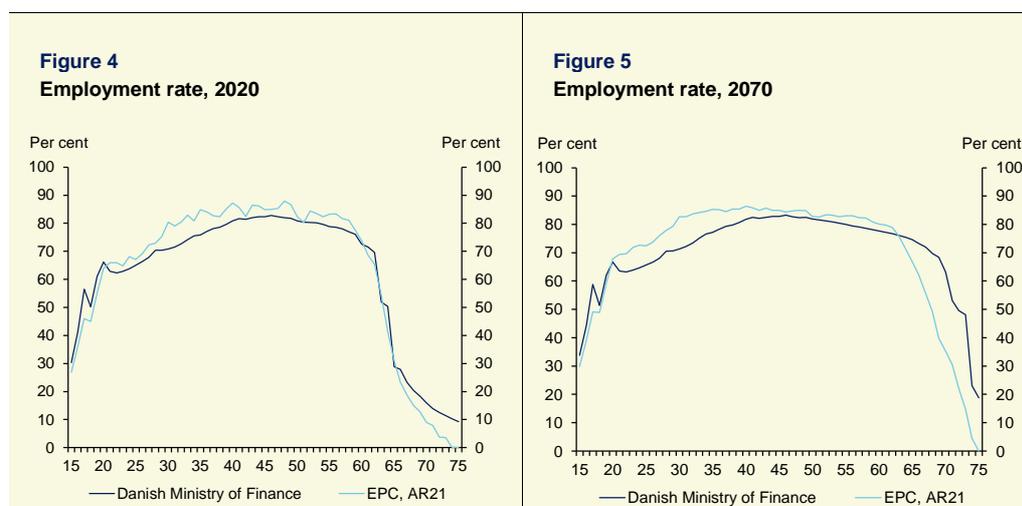
	2019	2030	2040	2050	2060	2070	Peak value	Peak year ¹⁾	Change 2019-2070
Labour force participation rate 20-64	82.3	82.0	82.7	83.0	83.5	83.7	83.7	2070	1.4
Employment rate of workers aged 20-64	78.4	79.3	80.0	80.3	80.7	80.9	80.9	2070	2.5
Share of workers aged 20-64 in the labour force 20-64	95.3	96.7	96.7	96.7	96.7	96.7	96.8	2042	1.4
Labour force participation rate 20-74	71.4	71.2	71.8	73.9	74.6	75.5	75.5	2070	4.2
Employment rate of workers aged 20-74	68.1	69.0	69.6	71.6	72.3	73.2	73.2	2070	5.1
Share of workers aged 20-74 in the labour force 20-74	95.4	96.8	96.9	96.9	96.9	96.9	96.9	2070	1.5
Labour force participation rate 55-64	74.4	74.4	77.0	79.2	80.9	81.7	81.7	2070	7.3
Employment rate of workers aged 55-64	71.9	72.6	75.1	77.3	78.9	79.7	79.7	2070	7.8
Share of workers aged 55-64 in the labour force 55-64	96.6	97.6	97.6	97.6	97.6	97.6	97.6	2046	0.9
Labour force participation rate 65-74	14.6	18.1	22.6	27.4	34.4	38.4	38.4	2070	23.9
Employment rate of workers aged 65-74	14.3	17.9	22.4	27.1	34.0	38.0	38.0	2070	23.7
Share of workers aged 65-74 in the labour force 65-74	98.3	98.8	98.9	98.9	98.9	98.9	98.9	2046	0.6
Median age of the labour force	41.0	40.0	41.0	42.0	42.0	42.0	42.0	2049	1.0

Note: 1) This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2019 to 2070.

Source: Commission Services.

For the age groups above 60 years, the national projection from the Danish Ministry of Finance of the employment rate is much higher than that of the AWG/EPC projection, *cf. figure 4 and 5*.

This indicates that the AWG/EPC relies on different assumptions regarding the impact of the increases in the statutory retirement age on the projected employment rate of older age groups, reflecting the harmonized assumptions used for the Ageing Report. In 2070, the retirement age in Denmark will be 74 years. The EPC projects an employment rate of 4.6 per cent compared to 23 per cent in the projection by the Danish Ministry of Finance. In 2020, an estimated 10 per cent of the 74 year olds are employed.



Source: Commission Services.

Due to pension reforms, the AWG/EPC projects the average effective exit age to increase with 4.5 years for men from 2019-2070 and with 5.1 years for women, *cf. table 6*.

However, this projected increase in the average effective exit age is smaller than the increase in e.g. the statutory old-age pension age, which increases from 66 years in 2020 to 75 years in 2070, an increase of 9 years, *cf. table 1 in part 1*. Therefore, in the AWG/EPC projections, the increase in the statutory retirement age does not imply a projected increase of the average effective exit age at the same magnitude.

Table 6a
Labour market effective exit age and expected duration of life spent at retirement – Men

	2020	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2020-2070
Average effective retirement age (administrative data)*	67,9								
Average labour market exit age (CSM)**	65,0	66,1	67,2	68,0	69,0	69,5	69,5	2069	4,5
Contributory period									
Duration of retirement***	18,4	18,7	18,9	19,0	19,0	19,8	19,8	2070	1,4
Duration of retirement/contributory period									
Percentage of adult life spent in retirement****	28,1	28,0	27,8	27,5	27,1	27,8	28,3	2034	-0,4
Early/late exit*****	0,8	2,0	2,7	4,3	4,8	6,5	6,5	2070	5,7

* The effective retirement age shows the age at which people on average start receiving an old-age pension benefit. It is calculated on the basis of the administrative data for 2018 (see Annex Tables A4a and A4b)

** The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter

*** 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself

**** The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years

***** Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: Commission Services.

Table 6b
Labour market effective exit age and expected duration of life spent at retirement – Women

	2020	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2020-2070
Average effective retirement age (administrative data)*	66,9								
Average labour market exit age (CSM)**	64,1	65,5	66,7	67,6	68,5	69,2	69,2	2069	5,1
Contributory period	:	:	:	:	:	:	:	:	:
Duration of retirement***	21,9	21,4	21,6	21,7	22,6	22,6	22,6	2060	0,7
Duration of retirement/contributory period	:	:	:	:	:	:	:	:	:
Percentage of adult life spent in retirement****	32,2	31,0	30,7	30,4	30,9	30,6	32,2	2020	-1,6
Early/late exit*****	2,9	2,4	3,7	4,9	6,1	6,5	6,5	2070	3,5

* The effective retirement age shows the age at which people on average start receiving an old-age pension benefit. It is calculated on the basis of the administrative data for 2018 (see Annex Tables A4a and A4b)

** The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter

*** 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself

**** The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years

***** Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: Commission Services.

3. Pension projection results

3.1 Extent of the coverage of the pension schemes in the projections

All pension schemes are included in the projections, including old age pension, disability pension, civil servant pension and VERP, ATP, occupational and private labour market schemes. Public pension expenditures include old age pension, disability pension, civil servant pension and VERP.

Pension expenditures in the ESSPROS database from Eurostat are a little lower than what has been reported to the AWG until 2015 (between 0.6-0.4 percentage points of GDP). However, the discrepancy seems to have been reduced over time, cf. table 7.

Table 7
Eurostat (ESSPROS) vs. Ageing Working Group definition of pension expenditure

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Change 2009-2018
Per cent of GDP											
Eurostat total pension expenditure	13.0	12.6	12.8	12.7	13.7	14.0	13.5	12.6	12.5	12.3	-0.7
Eurostat public pension expenditure (A)	9.2	9.3	9.5	9.5	9.7	9.6	9.5	9.1	9.1	9.0	-0.2
Public pension expenditure (AWG: outcome) (B)	9.8	9.8	10.0	10.0	10.1	10.1	10.0	9.7	9.5	9.4	-0.4
Difference Eurostat/AWG: (A)-(B)	-0.6	-0.5	-0.5	-0.5	-0.5	-0.4	-0.4	-0.5	-0.4	-0.4	0.2

Source: EUROSTAT and Commission services

3.2 Overview of the projection results

Public pension expenditures decrease from 9.3 per cent of GDP to 7.9 per cent of GDP in 2070, a decrease of 2.0 per cent of GDP, *cf. table 8*. Almost half of the decline occurs in the period 2019-2030. The decrease in the public pension expenditures is a result of a number of different factors, *see below*.

Table 8
Projected gross and net pension spending and contributions

	2019	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2019-2070
Per cent of GDP									
<i>Expenditure</i>									
Gross public pension expenditure	9.3	8.5	8.1	7.6	7.2	7.3	9.7	2020	-2.0
Private occupational pensions	4.8	5.0	5.7	5.9	5.8	6.0	6.0	2070	1.3
Gross total pension expenditure	14.0	13.5	13.8	13.5	13.0	13.3	15.0	2020	-0.7
Net public pension expenditure*	4.6	3.6	3.0	2.6	2.4	2.3	4.7	2020	-2.3
Net total pension expenditure*	9.4	8.6	8.7	8.5	8.2	8.4	10.0	2020	-1.0
<i>Contributions</i>									
Public pension contributions	0.1	0.1	0.0	0.0	0.0	0.0	0.1	2019	0.0
Total pension contributions	5.9	5.8	5.8	5.8	5.7	5.6	6.3	2020	-0.4

Note: Private occupational pensions also include individual voluntary pensions, because the Danish pension projection model does not distinguish between these two pension schemes. The contributions to public pensions schemes only consist of VERP-contributions. Only the total of occupational and private schemes together are reported.

Source: Commission Services.

Net public pension expenditures also decline throughout the period 2019-2070 as well as the tax revenue from public pensions. In the projection, the tax rate on each of the public schemes are kept constant at the 2019-level.

Benefits paid from private schemes are increasing over time from 4.8 per cent of GDP in 2019 to around 6 per cent of GDP in 2070, mainly reflecting the maturation of the pension schemes, *cf.* the description in *part I*.

Private pension contributions as a share of wages are approximately 12 per cent during the period 2019-2070. As a share of GDP, contributions decline slightly from 5.9 per cent in 2019 to 5.6 per cent in 2070.

Tax revenues on private pensions are substantial in absolute terms. Due to the increase in benefits paid out and the increase in average pension wealth, the tax revenues on private pensions increase from 2.0 per cent of GDP in 2019 to 3.0 per cent of GDP in 2070. The taxes on private pensions include income tax on the benefit payments and taxes on the returns on the pension funds.

The projected decline in public pension expenditures is due to a number of factors, *cf.* *table 9* and *figure 6* and *7*.

Table 9
Projected gross public pension spending by scheme

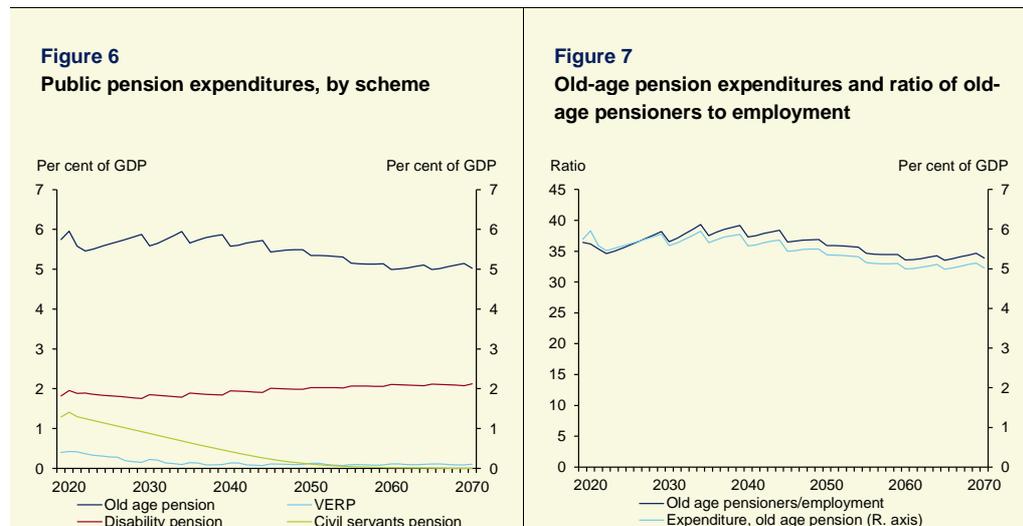
	2019	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2019-2070
Per cent of GDP									
Total public pensions	9.3	8.5	8.1	7.6	7.2	7.3	9.7	2020	-2.0
of which									
Old-age and early pensions:	7.4	6.7	6.1	5.6	5.1	5.1	7.8	2020	-2.3
- Flat component	6.1	5.8	5.7	5.5	5.1	5.1	6.4	2020	-1.0
- Earnings-related	1.3	0.9	0.4	0.1	0.0	0.0	1.4	2020	-1.3
- Minimum pensions (non-contributory) i.e. minimum income guarantee for people above 65	5.7	5.6	5.6	5.3	5.0	5.0	5.9	2020	-0.7
Disability pensions	1.8	1.9	2.0	2.0	2.1	2.1	2.1	2070	0.3

Source: Commission Services.

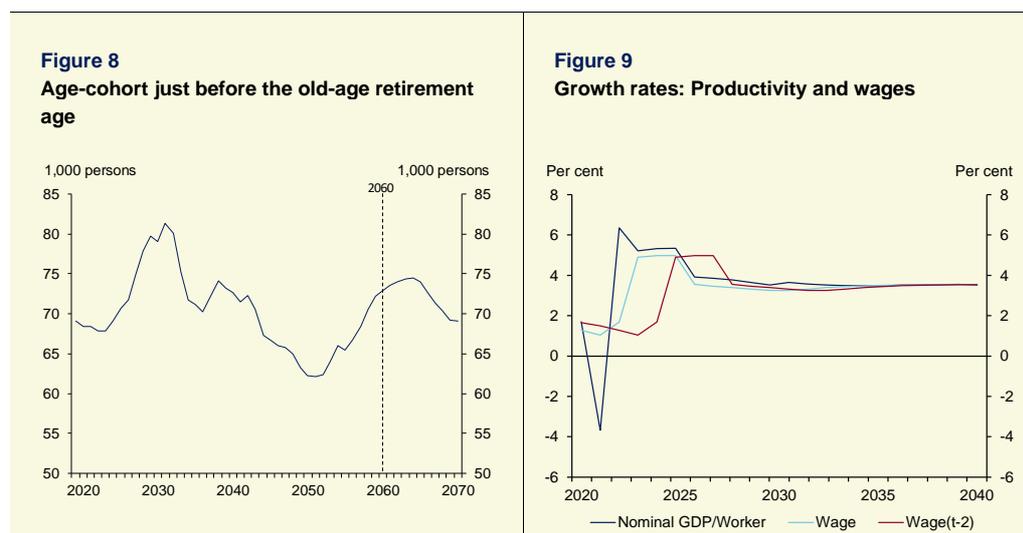
The reform of VERP in 2011 (a part of the Retirement Reform) contributes to the decline in VERP expenditures from 0.4 per cent of GDP in 2019 to 0.1 per cent of GDP in 2032 and remain at that level until the end of the projection period.

Expenditures to civil servants pensions also drop from 1.3 per cent of GDP in 2019 to 0.0 per cent of GDP in 2055. This occurs because only very few people are hired as civil servants (primarily within the armed forces and the police). All other public employees are instead enrolled in the occupational pension schemes.

The increase in the statutory old-age pension age as described in *part 1* contribute to slightly declining expenditures on old age pension at a level about 6 per cent of GDP until 2045, because the ratio of old age pensioners to employment is almost constant. After 2045, the expenditures decline to 5.2 per cent in 2070, *cf.* *figure 6*, *7*, and *8*.



Source: Own calculations.



Source: Own calculations.

Finally, expenditures on disability pension are about 1.8 per cent of GDP in the period 2019-2034. From around 2035, expenditures on disability benefits begin to increase to about 2.1 per cent in 2070. This is due to the increase in statutory pension ages, where it is assumed that the share of people on disability pension above the retirement age in 2019 (66 years) and below the increased retirement age are projected to increase relative to younger age groups. See model description in *part 4*. Disability pension is awarded until the old age pension age.

In 2020, the expenditures are enlarged, because the productivity per worker are less than wages, which leads to higher expenditures as a share of GDP, *cf. figure 6, 7 and 9*. Similarly, in the period 2021-2024, the expenditures decline, partly because the productivity per worker increases more than wages, which leads to lower expenditures as a share of GDP. This feature of the macroeconomic assumptions affects all pension expenditures. Furthermore, income transfers are regulated in

line with wage growth 2 years before, which also leads to a lower indexation in the period 2021-2024, cf. figure 9.

3.3 Description of main driving forces behind the projection results and their implications

The decomposition of the development in public pension expenditures (pensioners) is shown in *table 10*.

Table 10
Factors behind the change in public pension expenditures between 2019 and 2070 – pensioners

	2019-30	2030-40	2040-50	2050-60	2060-70	2019-70
Percentage points of GDP						
Public pensions to GDP	-0.7	-0.4	-0.5	-0.4	0.0	-2.0
Dependency ratio effect	1.9	1.2	0.1	0.5	0.4	4.0
Coverage ratio effect*	-1.6	-0.7	-0.2	-0.6	-0.2	-3.4
<i>Coverage ratio old-age</i>	-0.9	-0.6	-0.2	-0.6	-0.2	-2.6
<i>Coverage ratio early-age</i>	-2.6	0.2	-0.5	-0.1	0.0	-2.9
<i>Cohort effect</i>	-1.6	-1.5	0.4	-0.6	-0.5	-3.7
Benefit ratio effect	-0.7	-0.6	-0.3	0.0	-0.1	-1.7
Labour market effect	-0.2	-0.2	-0.1	-0.2	-0.1	-0.8
<i>Employment ratio effect</i>	-0.1	-0.1	0.0	0.0	0.0	-0.3
<i>Labour intensity effect</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Career shift effect</i>	-0.1	-0.1	0.0	-0.2	-0.1	-0.5
Residual	-0.1	-0.1	0.0	0.0	0.0	-0.2

Note: * Subcomponents of the coverage ratio effect do not add up necessarily.

Source: Commission Services.

The decomposition shows that the increase in the dependency ratio contributes to higher public pension expenditures. The expenditures are lower in 2070 compared to 2019 primarily due to the decrease in the coverage ratio, which is caused by the increase in the retirement age. The decline in the benefit ratio also contributes to the decrease in expenditures. The decrease in the benefit ratio occurs due to 5 factors:

- Lower indexation of VERP and disability benefits compared to wages due to 2012 Tax Reform as described in *part 1*.
- Composition effect: In 2070, there will be relatively more people on old-age pension than on pensions with higher benefits such as VERP, disability, and civil servant pension.
- Recipients of civil servant pensions decrease over time and is almost phased out in 2070. Since most recipients of civil servants pension also receives old-age pension, this leads to a decrease in the benefit ratio.
- The increase in supplementary income from private pensions leads to a reduction of the public old age pension and, hence, a reduction in the benefit ratio.

- Income transfers are regulated in line with wage growth 2 years before, which leads to a lower indexation in the first couple of years, *cf. above*.

Virtually everyone is covered in the old age pension scheme, *cf. table 11*. The benefit ratio for public pensions decreases from 42 per cent in 2016 to 34 per cent in 2070 due to the first 5 factors mentioned above. For old-age pensions, the benefit ratio is constant in the projection period. For occupational and private schemes, the benefit ratio increases from 23 per cent in 2016 to 38 per cent by 2070 due to the maturation of the occupational schemes. The total reported benefit ratio is projected to increase from 60 per cent in 2016 to 64 per cent in 2070. Civil servants pension is the only earnings related public old age pension scheme. The benefit ratio from this scheme is around 30 per cent during the projection period. However, the coverage is declining towards 0.1 per cent, *cf. above*.

The replacement rate develops in line with the benefit ratio. The only difference is that since the wage at retirement is higher than the average wage, the replacement rate is lower than the benefit ratio. The benefits used for the replacement rate and the benefit ratio are the same. In the projection, there is no difference between the benefit for new and older pensioners belonging to the same scheme.

Table 11
Replacement rate at retirement (RR) and coverage by pension scheme

	2019	2030	2040	2050	2060	2070	Change 2019-2070 (pps)
Per cent							
Public scheme (BR)	43	41	38	37	36	36	-7
- Coverage	100	100	100	100	100	100	0
Public scheme: old-age earnings related and flat component (BR)	41	38	35	33	33	32	-9
Public scheme: old-age earnings related and flat component (RR)	36	33	31	29	28	38	-8
- Coverage	84	83	83	81	80	80	-5
Private occupational scheme (BR)	27	29	33	35	37	38	11
Private occupational scheme (RR)	24	26	29	31	32	33	9
- Coverage	80	81	81	80	79	79	-2
Total benefit ratio	65	64	65	65	65	66	1
Total replacement rate	57	56	57	57	57	58	1

Note: Private occupational pensions also include individual voluntary pensions, because the Danish pension projection model does not distinguish between these two pension schemes.

Source: Commission Services.

Currently, more than 90 per cent of wage earners contribute to occupational schemes. However, the pension model for occupational and private schemes does not follow each individual, but follows the contribution, wealth, and benefits for a cohort as a whole. Therefore, the model is not well designed to calculate the coverage ratio for occupational and private schemes. See *part 4* for a more detailed description. In the calculation of the benefit ratio for occupational schemes, the

number of recipients is therefore based on number of recipients of old-age pension.

Furthermore, only the total benefit ratio for occupational and private schemes is reported, since the decomposition into occupational and private schemes is rather uncertain.

Dependency ratios

The number of pensioners is about 1.3 million during the projection period. On the other hand, employment is projected to increase until 2070. This results in a decline in the Pension System Dependency Ratio (SDR) until about 2060, *cf. table 12*. After 2060, the SDR increases again, because the number of pensioners increases more than employment. This can be compared with an increase in the old-age dependency ratio during the entire projection period, due to a large increase in the number of people aged 65+, while the population aged 15-64 declines slightly.

Table 12
System dependency ratio and old-age dependency ratio

	2019	2030	2040	2050	2060	2070	Change 2019-2070
Number of pensioners (thousand) (I)	1,305	1,308	1,333	1,326	1,281	1,296	-8
Employment (thousand) (II)	2,880	2,890	2,892	2,941	2,979	2,982	101
Pension system dependency ratio (SDR) (I)/(II)	45.3	45.3	46.1	45.1	43.0	43.5	-1.8
Number of people aged 65+ (thousand) (III)	1,146	1,370	1,526	1,560	1,641	1,706	560
Working age population 20-64 (thousand) (IV)	3,364	3,310	3,223	3,257	3,207	3,174	-191
Old-age dependency ratio (OADR) (III)/(IV)	34.1	41.4	47.4	47.9	51.2	53.8	19.7
System efficiency (SDR/OADR)	1.3	1.1	1.0	0.9	0.8	0.8	-0.5

Source: Commission Services.

Number of pensioners compared with inactive and total population

The total number of pensioners as a share of the population is close to 100 in 2019 for the age groups older than 64 years, *cf. table 13a* and *13b*. However, for the age groups 65-74, the share falls as the retirement age increases.

An example can illustrate these results: Take the age group 65-69. In 2070, the old-age retirement age is 75, so it is not possible for this age group to receive old-age pension. Furthermore, the VERP age is 72 years, so no one in the age group could be eligible. In any case, not many people contribute to this scheme any longer. Also, one has to contribute for 30 years, so it is not possible to receive VERP benefits if this has not happened.

The share of the age group on disability benefits in 2070 is projected to be between 14 per cent and 16 per cent, which is higher than for younger age groups, see *part 4* for a more detailed description.

The source of income for people that have retired, but have not yet reached the statutory retirement age can be occupational and private pensions, which – as a general rule – can be paid out 5 years before the public old-age pension age. Furthermore, occupational and private pensions with contributions before May 1st 2007 can be paid out at the age of 60 (5 years before the current public old-age pension age). New occupational pensions with initial contributions after January 1st 2018 can be paid out 3 years before the old age pension age. Another source of income can be private savings outside the pension system.

Early pay out of occupational and private pensions is not explicitly modelled in the pension projection. However, for the assessment of fiscal sustainability it does not make a significant difference when the occupational and private pensions are paid out.

Table 13a
Pensioners (public schemes) to inactive population ratio by age group

	2019	2020	2030	2040	2050	2070
Per cent						
Age group -54	6.6	6.6	5.8	6.0	5.9	5.7
Age group 55-59	74.4	72.9	61.5	60.4	59.1	60.5
Age group 60-64	69.7	61.0	38.9	45.7	52.3	59.7
Age group 65-69	113.4	105.7	77.4	35.3	35.0	34.0
Age group 70-74	102.9	96.6	91.1	96.3	78.3	54.1
Age group 75+	95.3	95.1	94.8	94.2	93.8	92.1

Source: Commission Services.

Table 13b
Pensioners (public schemes) to inactive population ratio by age group

	2019	2020	2030	2040	2050	2070
Per cent						
Age group -54	2.6	2.3	2.4	2.4	2.3	2.3
Age group 55-59	11.4	9.9	10.3	9.8	9.7	9.6
Age group 60-64	25.8	13.6	13.1	13.3	12.6	12.3
Age group 65-69	88.5	53.5	22.0	19.6	16.2	15.2
Age group 70-74	95.3	88.4	89.4	69.6	54.7	42.5
Age group 75+	95.3	94.8	94.2	93.8	93.3	92.1

Source: Commission Services.

The ratio of pensioners to inactive population is lower for the age group 65-69 than for the age group 60-64 from 2040 and onwards. This reflects that there are more inactive people in the age group 65-69 compared to the age group 60-64, which again reflects a lower participation rate for the age group 65-69. Compared to the total population, there are more pensioners in the age group 65-69 compared to ages 60-64 throughout the projection period.

For the age group 60-64, the ratio of pensioners to inactive population declines until 2030, due to fewer people on VERP, as the statutory retirement age for VERP reaches 65 years in 2027. From around 2040, the ratio increases slightly, which is due to a higher ratio of people on disability pension. This mainly reflects a higher participation rate as the ratio of pensioners to population is approximately constant from 2030 to 2060.

The tables for female pensioners to inactive population and for female pensioners resemble the corresponding tables for all pensioners, *cf. table 13a, 13b, 14a and 14b*. In general, the ratio of pensioners to inactive population in the age groups above the statutory retirement ages is lower for women compared to all pensioners, because the ratio of inactive population to the total population is higher for women. Also, the ratio of pensioners to population tends to be higher for women.

Table 14a
Female pensioners (public schemes) to inactive population ratio by age group

	2019	2020	2030	2040	2050	2070
Per cent						
Age group -54	6.6	5.5	5.7	5.6	5.5	5.5
Age group 55-59	72.7	58.0	56.2	54.8	56.1	56.4
Age group 60-64	70.0	38.6	47.1	51.6	55.3	57.7
Age group 65-69	105.9	79.3	38.3	37.4	33.8	34.7
Age group 70-74	97.7	96.4	101.2	83.1	69.0	59.8
Age group 75+	98.1	97.7	97.3	97.0	96.7	96.0

Source: Commission Services.

Table 14b
Female pensioners (public schemes) to inactive population ratio by age group

	2019	2020	2030	2040	2050	2070
Per cent						
Age group -54	2.7	2.3	2.4	2.4	2.3	2.3
Age group 55-59	12.8	11.5	11.8	11.2	11.0	11.0
Age group 60-64	30.4	15.4	15.2	15.2	14.4	14.1
Age group 65-69	92.3	58.9	25.4	22.8	18.6	17.4
Age group 70-74	95.7	94.0	95.0	75.1	59.5	47.7
Age group 75+	98.1	97.7	97.3	97.0	96.7	96.0

Source: Commission Services.

New pension expenditures

Expenditures on new public pensions are not an output from the public pension models, but have to be calculated ex-post.

The number of new pensioners has been calculated using the following formula, where it is utilized that the change in the stock of old-age pensioners for the same cohort between two periods can either be due to new pensioners or deaths:

$$Stock(y, a) - stock(y - 1, a - 1) = New(y, a) - deaths(y, a) \Rightarrow$$

$$New(y, a) = Stock(y, a) - stock(y - 1, a - 1) + deaths(y, a)$$

, where y is year, and a is age.

The reported numbers in *table 15* are strongly dependent on the increases in the retirement age, since virtually everybody receives old-age pension at the earliest possible date, see also description in *part 4*. The retirement age for the old-age pension is increased with 1 year in 2030, 2040, and 2050 and with ½ year in 2060 and 2070. Therefore, there are almost no new old-age pensioners in 2030, 2040,

and 2050 and only half a cohort in 2060 and 2070. For this reason, the numbers in table 14 underestimate the underlying trend in number of new pensioners. Therefore, a 5 year average has been calculated, which better reflects the underlying trend.

Total expenditures on new pensions are calculated as the number of new pensioners times the average pension. However, only data on the average pension is available and not for the average new pension. Using the average pension for new old-age pensioners leads to slightly biased results, since younger cohorts will have larger payouts from private pensions than older cohorts due to the build-up of the occupational scheme. This leads to lower public pension expenditures for younger cohorts. This is not taken into account with this rough estimate, which therefore overestimates the expenditures for younger cohorts in each year, and therefore it overestimates the expenditures on new pensions.

Table 15a**Projected and disaggregated new public pension expenditure (only flat component pensions)**

	2019	2030	2040	2050	2060	2070
I Projected new pension expenditure (millions EUR)	742	115	155	1,577	2,357	3,512
<i>Ib Projected new pension expenditure (millions EUR) - average over 5 years</i>	710	1,397	1,849	2,659	3,944	5,320
II. Number of new pensions ('000)	43.6	4.7	4.6	33.0	34.8	36.7
<i>IIb. Number of new pensions ('000) - average over 5 years</i>	42.7	56.7	54.3	55.6	58.0	57.8
III. Minimum amount	10,172	14,732	20,738	29,432	41,824	59,382
IV Average new pension (I/II)	17,016	24,563	33,917	47,798	67,811	95,695
V. Pension relative to minimum amount (IV/III)	1.7	1.7	1.6	1.6	1.6	1.6

Note: There is no data available for pensioners on the only earning related scheme (Civil Servant's Pension). Instead, the new pensioners on minimum pension scheme are reported.

Source: Commission Services and own calculations.

Table 15b
Projected and disaggregated new public pension expenditure (only flat component pensions) - Men

	2019	2030	2040	2050	2060	2070
I Projected new pension expenditure (millions EUR)	374	55	95	780	1,183	1,729
<i>Ib Projected new pension expenditure (millions EUR) - average over 5 years</i>	348	669	878	1,271	1,927	2,564
II. Number of new pensions ('000)	22.0	2.2	2.8	16.3	17.4	18.1
<i>IIb. Number of new pensions ('000) - average over 5 years</i>	20.9	27.1	25.8	26.6	28.3	27.9
III. Minimum amount	10,172	14,732	20,738	29,432	41,824	59,382
IV Average new pension (I/II)	17,016	24,563	33,917	47,798	67,811	95,695
V. Pension relative to minimum amount (IV/III)	1.7	1.7	1.6	1.6	1.6	1.6

Note: There is no data available for pensioners on the only earning related scheme (Civil Servant's Pension). Instead, the new pensioners on minimum pension scheme are reported.

Source: Commission Services and own calculations.

Table 15c
Projected and disaggregated new public pension expenditure (only flat component pensions) – Women

	2019	2030	2040	2050	2060	2070
I Projected new pension expenditure (millions EUR)	368	60	60	798	1,174	1,783
<i>Ib Projected new pension expenditure (millions EUR) - average over 5 years</i>	362	729	971	1,388	2,017	2,756
II. Number of new pensions ('000)	21.6	2.4	1.8	16.7	17.3	18.6
<i>IIb. Number of new pensions ('000) - average over 5 years</i>	21.7	29.6	28.5	29.0	29.7	30.0
III. Minimum amount	10,172	14,732	20,738	29,432	41,824	59,382
IV Average new pension (I/II)	17,016	24,563	33,917	47,798	67,811	95,695
V. Pension relative to minimum amount (IV/III)	1.7	1.7	1.6	1.6	1.6	1.6

Note: There is no data available for pensioners on the only earning related scheme (Civil Servant's Pension). Instead, the new pensioners on minimum pension scheme are reported.

Source: Commission Services and own calculations.

3.4 Financing of the pension system

All public pensions are financed on a PAYG basis, i.e. financed by general taxes. To become eligible for the VERP scheme, however, one must pay contributions for 30 years. Therefore, the only contributions in table 16 are contributions to the VERP scheme. The reform of VERP in 2011 (a part of the Retirement Reform) has induced most people to opt out of the scheme and the contributions (as a share of GDP) to the scheme declines significantly over the projection period.

Table 16

Revenue from contribution, number of contributors in the public scheme (in 1,000), total employment (in 1,000) and related ratios (in per cent)

	2019	2030	2040	2050	2060	2070	Change 2019-2070 (pps)
Per cent of GDP							
Public pension contributions	0.09	0.05	0.05	0.05	0.04	0.04	-0.05
<i>Employer contributions</i>	<i>0.0</i>						
<i>Employee contributions</i>	<i>0.09</i>	<i>0.05</i>	<i>0.05</i>	<i>0.05</i>	<i>0.04</i>	<i>0.04</i>	<i>-0.05</i>
<i>State contribution*</i>	<i>0.0</i>						
<i>Other revenues*</i>	<i>0.0</i>						
1,000 persons							
Number of contributors (I)	360.6	215.5	199.6	194.4	193.9	186.9	-174
Employment (II)	2,880.2	2,890.3	2,892.0	2,940.6	2,978.7	2,981.6	101
Ratio of (I) / (II)	0.13	0.07	0.07	0.07	0.07	0.06	-0.06

Note: *Only legislated contributions are reported.

Source: Commission Services.

3.5 Sensitivity analysis

The results from the sensitivity analysis are reported in table 17.

Table 17
Public and total pension expenditure under different scenarios (pps deviation from the baseline)

	2019	2030	2040	2050	2060	2070	Change 2019-2070 (pps)
Public pension expenditure							
Baseline (per cent of GDP)	9.3	8.5	8.1	7.6	7.2	7.3	-2.0
<i>Higher life expectancy at birth (+2y)</i>	0.0	0.0	0.1	0.2	0.2	0.2	0.2
<i>Higher migration (+33 per cent)</i>	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.2
<i>Lower migration (-33 per cent)</i>	0.0	0.0	0.1	0.1	0.2	0.2	0.2
<i>Lower fertility (-20 per cent)</i>	0.0	0.0	0.1	0.3	0.6	0.9	0.9
<i>Higher employment rate of older workers (+10 pps.)</i>	0.0	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3
<i>Higher TFP growth (convergence to 1.2 per cent)</i>	0.0	0.0	0.0	0.0	0.1	0.1	0.1
<i>TFP risk scenario (convergence to 0.8 per cent)</i>	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1
<i>Policy scenario: unchanged retirement age</i>	-0.1	0.7	1.2	1.4	2.0	2.2	2.3
<i>Policy scenario: offset declining pension benefit ratio</i>	0.0	-0.4	0.1	0.4	0.4	0.5	0.5
<i>Lagged recovery scenario</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Adverse structural scenario</i>	0.0	0.2	0.2	0.1	0.1	0.0	0.0
Total pension expenditure							
Baseline (per cent of GDP)	14.0	13.5	13.8	13.5	13.0	13.3	-0.7
<i>Higher life expectancy at birth (+2y)</i>	0.0	0.0	0.1	0.1	0.0	-0.1	-0.1
<i>Higher migration (+33 per cent)</i>	0.0	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4
<i>Lower migration (-33 per cent)</i>	0.0	0.1	0.2	0.3	0.3	0.5	0.5
<i>Lower fertility (-20 per cent)</i>	0.0	0.0	0.2	0.6	1.0	1.6	1.6
<i>Higher employment rate of older workers (+10 pps.)</i>	0.0	-0.2	-0.3	-0.1	-0.2	-0.2	-0.2
<i>Higher TFP growth (convergence to 1.2 per cent)</i>	0.0	0.0	-0.2	-0.4	-0.5	-0.7	-0.7
<i>TFP risk scenario (convergence to 0.8 per cent)</i>	0.0	0.0	0.1	0.3	0.4	0.6	0.6
<i>Policy scenario: unchanged retirement age</i>	-0.1	1.0	1.9	1.9	2.5	2.5	2.6
<i>Policy scenario: offset declining pension benefit ratio</i>	0.0	-0.4	0.1	0.4	0.4	0.5	0.5
<i>Lagged recovery scenario</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Adverse structural scenario</i>	0.0	0.3	0.5	0.7	1.0	1.3	1.3

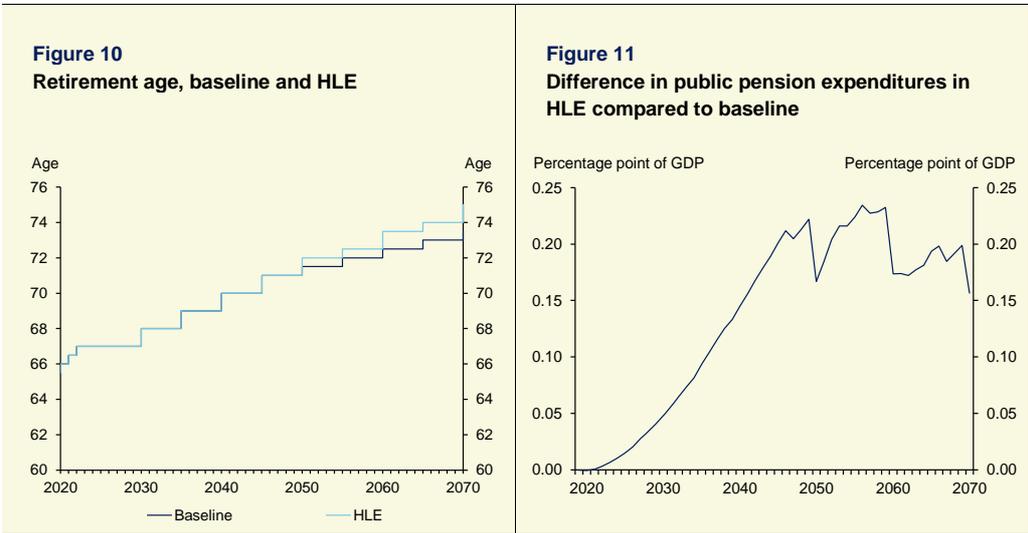
Source: Commission Services.

Higher life expectancy

Higher life expectancy increases public expenditures with about 0.1-0.2 per cent of GDP in 2040 and until 2070. Higher life expectancy for 60 year olds will have an effect on the retirement age due to the indexation rule. However, in accordance

with the rules of the indexation mechanism for the statutory retirement ages, the maximum increase in the retirement age is 1 year every fifth year. The projected increases of the retirement ages in the baseline scenario is already capped by maximum increase of one year until 2045. Therefore, it is only from 2050-2070 that the retirement age is affected by a higher life expectancy, cf. figure 10. As a result of this, expenditures increase until around 2060 as the number of pensioners increase, cf. figure 11. From around 2060, the effect from the higher retirement age on the number of pensioners kicks in and leads to a lower effect in 2070 compared to 2060.

The fact that the indexation rule includes a maximum increase of 1 year every 5 years also means that the effect of this sensitivity scenario is not linear, i.e. the effect of a 2 year increase is not twice as large as the effect from a 1 year increase.



Source: Own calculations.

Higher/ lower productivity and risk-scenario

Since pensions are indexed in line with nominal wages, a change in the productivity does not alter the results in any perceptible way. There is a very small effect on the old-age pension supplement as e.g. lower productivity increases private pension benefits as a share of GDP which leads to a reduction in the old-age pension supplement.

Higher employment rate for older workers

Public pensions are flat rate and therefore not earnings related. Therefore, public pension expenditures do not increase when people spend more years on the labour market.

A higher employment rate increases GDP which lowers the public pension expenditures as a share of GDP.

Higher and lower migration

Lower migration scenario results in higher expenditures than in the baseline scenario. The nominal expenditures decreases slightly due to a lower number of pensioners, but the lower inflow of migrants reduces labour supply and hence nominal GDP, thereby increasing the expenditures as a share of GDP. Vice versa for higher migration.

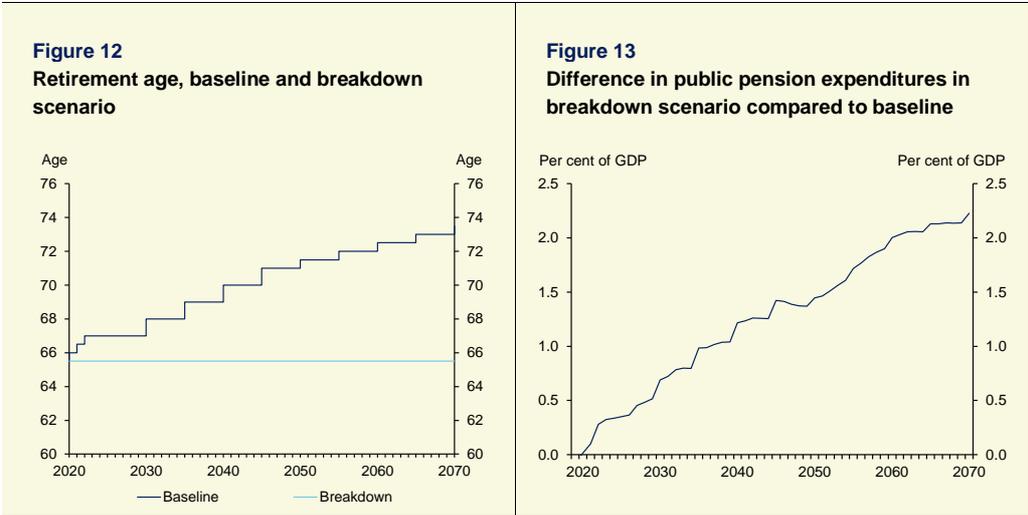
Policy scenario: Offset declining benefit ratio scenario

In the declining benefit ratio scenario public pension expenditures are projected, such that the benefit ratio (BR) remains at 90 per cent of the BR in the baseline year. This is achieved by adjusting the indexation of public pension payments. In the baseline projection, the BR with respect to public pensions is declining constantly throughout the projection period, and in 2035 the BR is approximately 10 per cent lower than in the base year. Thus, the offset declining BR scenario implies reducing public pension expenditures until about 2035. After 2035, public pension are projected to increased in this sensitivity scenario.

Unchanged old age pension age scenario

The unchanged retirement age scenario investigates the effect on pension expenditures if the Danish indexation mechanism of the statutory VERP-age and OAP-age breaks down after 2019. The statutory VERP-age is 63 years in 2019 and the statutory OAP-age is 65½ years in 2030 and will remain at this level in the breakdown scenario. In the baseline scenario the statutory VERP-age and OAP-age will increase to respectively 70½ years and 73½ years in 2070 *cf. figure 12*.

Public pension expenditures are projected to increase gradually with 2.2 per cent of GDP from 2019 to 2070 if the indexation mechanism is suspended from 2019, because the period individuals can claim public pensions is prolonged as life expectancy increases *cf. figure 13*. Note, pension expenditures is reported to decline with 0.1 per cent of GDP in 2019. This is not accurate but a result of how the scenario has been implemented in our projection model.



Source: Own calculations.

Lagged recovery and adverse structural scenario

In the adverse structural shock scenario, employment, productivity, and GDP decrease permanently compared to the baseline projection. Public pension expenditures also decrease, because public pension payments are indexed to wage growth. However, the fall in employment as well as productivity combines to a larger fall in GDP. Thus, public pension expenditures as a share of GDP increases throughout the projection period.

In the lagged recovery scenario it is assumed that activity returns after a few years, and, thus, the shock is not visible (i.e. negligible) in table 17.

3.6 Description of the changes in comparison with the 2006, 2009, 2012, 2015, and 2018 projections

Since the 2006-report, pension reforms have contributed to a lowering of the change in pension expenditures from +3.2 per cent of GDP in the 2006-report to -2 per cent of GDP in 2021, *cf. table 18*.

Compared to the 2018-report, expenditures decrease slightly with 0.1 per cent of GDP in the current projections, which mainly comes from a smaller effect from the dependency ratio.

The change in pension expenditures relative to GDP in different Ageing Reports are also affected by output and employment gaps in the starting year. If the employment gap is large and negative, the closing of this gap will – all else equal – lead to a decline in expenditures. The flipside of the coin is that expenditures are higher as a share of GDP in the starting year than would be the case if output and employment gaps were 0. This should be kept in mind when different versions of the Ageing Reports are compared.

Table 18
Overall change in public pension expenditure to GDP under the 2006, 2009, 2012 and 2015 projection exercises

	Public pension expenditure	Dependency ratio effect	Coverage ratio effect	Benefit ratio effect	Labour market effect	Residual (incl. interaction effect)
Change in percentage points						
2006 Ageing Report (2004-2050)	3.20	7.21	-2.80	-0.48	-0.39	-0.33
2009 Ageing Report (2007-2060)	0.11	6.47	-4.95	-0.53	-0.14	-0.73
2012 Ageing Report (2010-2060)	-1.15	5.66	-4.34	-1.21	-0.47	-0.79
2015 Ageing Report (2013-2060)	-3.11	3.63	-3.63	-0.93	-0.18	-0.66
2018 Ageing Report (2016-2070)	-1.90	4.61	-3.89	-1.61	-0.78	-0.23
2021 Ageing Report (2019-2070)	-2.00	4.02	-3.35	-1.67	-0.78	-0.22

Note: Please note that the five components do not add up because of a residual component.
Source: Commission Services.

The change compared to the 2018-report is further explained in *table 19*.

The AWG 2018-projections of public pension expenditure and the AWG 2021-projections are very similar, partly because there has been no major pension reforms in the period between AWG 2018 and AWG 2021. The introduction of the mandatory pension savings schemes for recipients of unemployment benefits in 2018 has little impact on the public pension expenditures, *cf. above*. Compared to the 2018 report, the public pension expenditures decrease with 0.8 percentage points in 2070. In the 2018 report the old age pension expenditure for the year 2070 were overestimated. This has been corrected in the AWG2021 report, *cf. above*. A breakdown of the difference between the two projections with respect to the historical years 2016-2018 is not available.

Tabel 19a
Breakdown of the difference between the 2018 projections and outcome figures

	2016	2017	2018	2019
Per cent of GDP				
Ageing Report 2018 projections	10.0	9.9	9.7	9.5
<i>Assumptions (pps of GDP)</i>				0.00
<i>Coverage of projections (pps of GDP)</i>				
<i>Constant policy impact (pps of GDP)</i>				
<i>Policy-related impact (pps of GDP)</i>				0.00
Actual public pension expenditure	9.7	9.5	9.4	9.3

Source: Commission Services.

Tabel 19b
Breakdown of the difference between the 2018 and the new public pension projection

	2019	2030	2040	2050	2060	2070
Per cent of GDP						
Ageing Report 2018 projections	9.5	8.6	8.2	7.8	7.5	8.1
<i>Change in assumptions (pps of GDP)</i>	-0.02	0.02	0.05	0.09	0.10	-0.52
<i>Improvement in the coverage or in the modelling (pps of GDP)</i>						
<i>Change in the interpretation of constant policy (pps of GDP)</i>						
<i>Policy-related changes (pps of GDP)</i>	0.00	0.00	0.00	-0.01	-0.01	-0.01
New projections	9.3	8.5	8.1	7.6	7.2	7.3

Source: Commission Services.

4. Description of the pension projection model and its base data

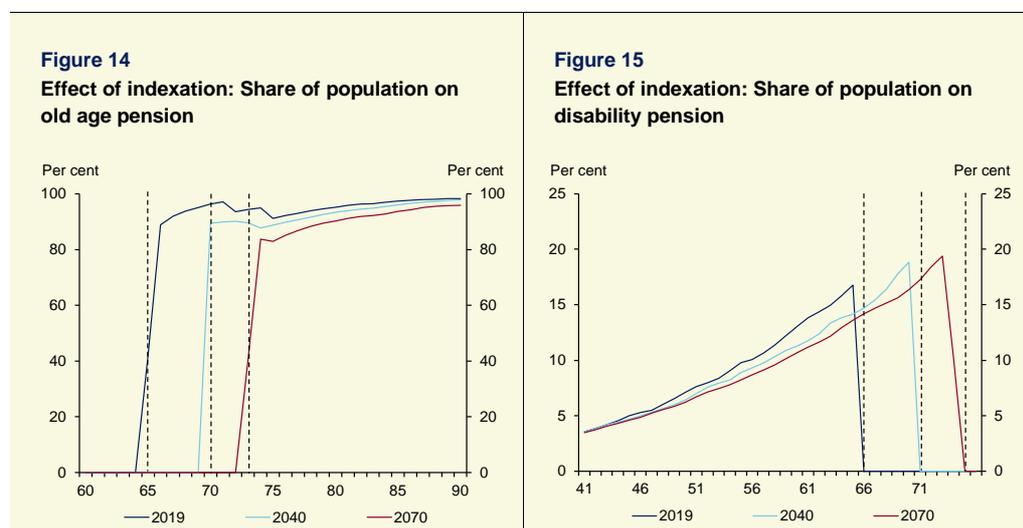
4.1 Old-age pension and disability pension

General description of the model

The principle behind the projection is to keep the shares of the population in the various schemes constant (broken down by age, gender, and ethnic origin). The number of recipients of public pensions is then driven by the demographic changes of the population.

On top of the pure demographic projection, the effect of the most recent economic reforms are included. Most noteworthy for the number of pensioners are the two pension reforms: “The Welfare agreement” and “The Retirement Reform” which, among other initiatives, index the retirement age to life expectancy, *see figure 14*.

As a counterpart to the increasing retirement age, the share of the population receiving other forms of public transfers, primarily disability pension, is likewise expected to increase. As a result, the observed increasing trend for receiving disability pension in the age group 45-54 is extrapolated until the retirement age, as illustrated in *figure 15*.



Source: Own calculations.

Due to the 2012-reform of disability pension, disability pension is only awarded to people above the age of 40. This is projected to shift the age profile downwards, because the starting point at age 40 is lower. People below 40 years are instead assigned to a “resource program” in order to improve their work capacity. This is not considered disability pension and is therefore not included in the projection.

Revised projection method for the employment of age groups above the old age pension age

The Danish ministry of finance has performed an inspection of the projection method with respect to the employment effect of changes in the old age pension age and increases in the average life expectancy. The inspection is based on the experiences in the last two decades with older workers retirement behaviour - including the experiences with increases in the old pension age and increasing life expectancy. As a result, the projection method for the employment of older workers that continues to work after the old age pension age is adjusted. The adjustment does not relate to the majority of workers who retire before or at the old age pension age and, thus, has little effect on the baseline employment projection. However, the effect in alternative scenarios for the old age pension ages may be a little larger.

The experiences with older workers retirement behaviour show that increases in the old age pension age and the VERP pension age have contributed to large increases in the labour market participation among older workers. However, labour market participation among older workers has also increased in periods with unchanged formal pension ages, which is considered among others to be related to better health and longer life expectancy of older workers. The former effect was included in the old projection method, but the latter was not.

The adjusted projection method includes a separate positive effect on the employment rate (above the old age pension age) from increases in the average life expectancy. Furthermore, the projected effect on the employment rate (above the old age pension age) from increases in the old age pension age is adjusted downwards.

The adjusted projection method implies a small downward adjustment of the employment in the projections of the Danish Ministry of Finance (equivalent to 13,000 full time workers or 0.4 per cent in 2050). The revised projection method has no bearing on the employment in the AWG-projections, because the employment rates are specified by the Commission/Eurostat. However, there is a small secondary effect on the number of old age pensioners, which the revised projection method increases.

Data

The number of pensioners in each scheme broken down by age, gender, and ethnic origin is from the "Register based labour force statistics" (RAS) provided by Statistics Denmark. The levels from RAS are adjusted to measure full-year recipients in the "Cohesive social statistics" also published by Statistics Denmark.

Assumptions and methodologies applied

In the projection, the distribution by origin is the same as in the national projection (the population projection by AWG is not distributed by origin).

The average pension benefit (per pensioner) in the projection is based on the 2019 level. In nominal terms, the pensions are indexed to the wage growth in the AWG

assumptions two years earlier as to match the Danish indexation rules under the Rate Adjustment Percentage Act, *cf. part 1*.

The pension supplement in the public old-age pension system is reduced if the pensioner has income in addition to the public old-age pension, for example benefits from the private pension schemes (although only from rate pensions and life-long annuity pensions, not from capital pensions). The benefits from the occupational and private schemes are projected to increase, and the expenditures on the pension supplement per pensioner will hence decrease over time. Concretely, it is assumed that when private benefits from rate pensions and life-long annuity pensions increase with 1 per cent of GDP, public expenditures on old-age pension decrease with 0.12 per cent of GDP.

The tax rates used in the projections are based on the implicit tax rates in 2019, *cf. table 20*. The tax rate is lower for old-age pension compared to disability and VERP, because the benefit is lower and therefore the basic deduction is relatively more important. For civil servants, it is assumed that the basic deduction is applied to other sources of income (typically old-age pension), and therefore the tax rate is higher than for VERP and disability.

Table 20
Tax rates used in projections of tax revenue from pension benefits, public schemes (2019)

	Tax rate
Old-age pension	24.7
Disability pension	30.1
VERP	28.8
Civil servants pension	40.8

Source: Own calculations.

4.2 VERP

General description of the model

The Danish VERP requires that the member has been a member of an unemployment insurance fund and paid the voluntary early retirement contributions for 30 years. Furthermore, it is a precondition that the membership and the contributions start no later than the age of 30.

The MoF's model of VERP recipients projects presently active contributors along with future entrants as well as to what extent people utilize VERP-eligibility.

Assumptions on entrances to the VERP-scheme follows historical patterns corrected for policy changes (in particular, the VERP-scheme in the 2011-reform and the recent reform from 2017). The projection allows for different characteristics

and/or behavior between gender, 5 groups of origins, and 5 groups of highest education attained.

Assumptions on the number of people who utilize their VERP-eligibility are based on expected lifetime at VERP-age (affecting the value of the marginal year as a pensioner), private pension size (income effect) and means testing (substitution effect), own payment rate (sorting effect, discouraging people with low propensity to utilize), and demographics (including education).

4.3 Private and occupational pension schemes

Institutional context

The AWG calculations relating to private pensions are carried out with a model developed by the Ministry of Finance and DREAM².

In relation to the AWG calculations, only data and assumptions have been changed – not the model.

Assumptions and methodologies applied

All relevant macro numbers are implemented in line with the AWG assumptions.

Data used to run the model

In addition to the data from AWG, data from Statistics Denmark (originally from the tax authorities) is used to construct contributions to occupational and private pensions. Microlevel register data on the distribution of pension contributions are used to calculate the contributions for age and gender groups. Furthermore, data on the distribution of assets in the starting year is used to calculate the timing of the payments. This data is also based on micro-level register-data from 2014.

General description of the model

The projection of occupational and individual private pensions schemes are based upon a cohort approach. Each generation accumulates pension wealth (PW) according to:

$$PW_t = C_t - B_t + (1 + i_t(1 - \tau))PW_{t-1}$$

Where C is the annual contribution, B is the annual payment from the pension scheme as retiree, i is the rate of return on the accumulated pension wealth, and τ is the pension yield tax (15.3 percent). The generational pension wealth evolves with net contributions and rate of return (net of tax) on accumulated assets.

Occupational and private pensions can be paid out either as a lump-sum payment (capital pension) or over several years (either as an annuity for 10-25 years (rate

² Danish Rational Economic Agents Model (www.dreammodel.dk).

pension) or as a life-long payment). In the model it is assumed that the 3 pension types are paid out over a number of years:

- Capital pension: Paid out lump-sum but payments are distributed over 15 years starting from the statutory old age pension age minus 5 years. This captures the fact that each individual in a generation can choose to have the pension paid out in different years.
- Rate pension: Once payments have started, rate pensions are paid out over 10 years. Payments are assumed to start over a period of 11 years starting from the statutory old age pension age minus 5 years.
- Life-long pension: Once payments have started, life-long pensions are paid out until death. Payments are assumed to start over a period of 11 years starting from the statutory old age pension age minus 5 years.

The pension model covers both occupational and private schemes as well as ATP. Occupational and private schemes are modelled together because the split in the data between occupational and private schemes is subject to uncertainty. Therefore, only aggregate numbers for the total of occupational and private schemes are covered. ATP is paid out as a life-long pension. The basic principles of the model can be illustrated with the modelling of the rate pension scheme:

Contributions

Contributions are age-specific and are calculated according to the following formula for each cohort:

$$C(a, t) = \text{contribution ratio}(a, t) * \text{wages}(a, t) * (1 - \text{payroll tax}(t))$$

Where a denotes age and t denotes time. The contribution ratio is the share of wages that are contributed to rate pensions. In the projection, the contribution rates are initially kept constant. However, as the pension age increases in line with the Retirement Reform, it is assumed that the extra years of contributions to the labour market schemes are partly neutralized through lower contributions to private individual schemes.

Benefits

Benefits are calculated according to the following formula for each cohort:

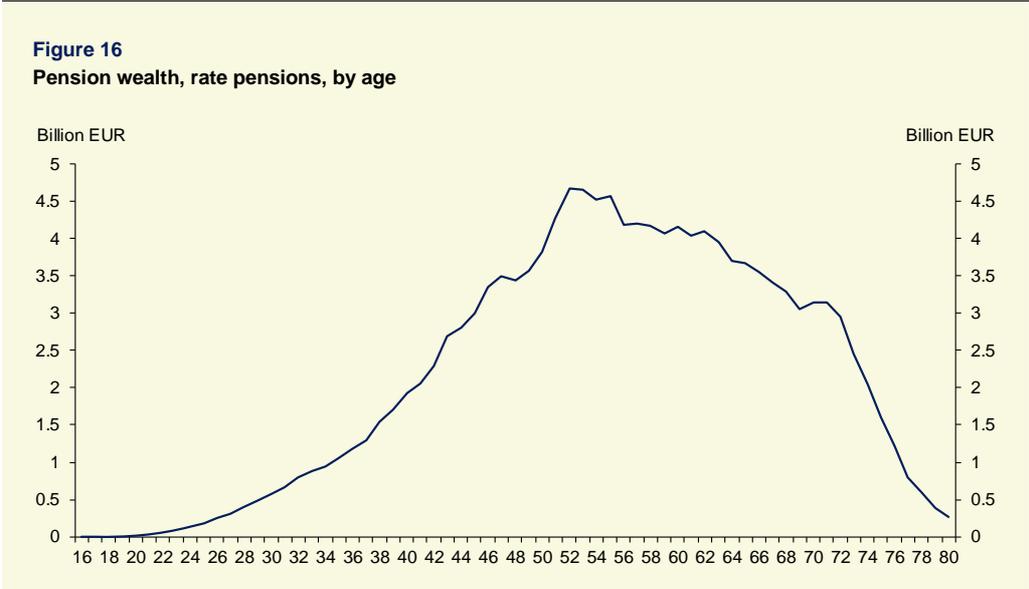
$$B(a, t) = \text{benefit share}(a, t) * \text{Pension wealth}(a - 1, t - 1)$$

The benefit share is defined as the share of pension wealth in the previous period, which is paid out as benefits. The profile for the benefit share moves in line with increases in the retirement ages.

Pension wealth

Given the formulas to calculate contributions and benefits, assumptions on the long run interest rate at 4.5 per cent and constant tax rate on pension yields at 15.3 per cent, pension wealth is given.

Below, the distribution of wealth over age for rate pensions is shown, cf. figure 16.



Source: Danish Ministry of Finance.

It is also important to underline that the focus of the model is the cohort – not the individual. I.e. the primary focus of the model is the size of contributions, wealth benefits for each cohort, while the model is not well suited to project the number of contributors and recipients.

The tax payments on benefits have been calculated as the implicit tax rate for each scheme in 2019 multiplied by the benefits. The implicit tax rates are shown in table 21.

Payments from pensions are taxed as personal income, except for the new capital pensions that were introduced with the 2012 Tax Reform, since contributions to these pensions are taxed, while benefits are not. It is assumed that the basic deduction is used on the other sources of income (typically old-age pension).

The progressivity of the tax system has not been modelled. As benefits from private schemes increase in the future, this assumption leads to an underestimation of tax revenues.

Table 21
Tax rates used in projections of tax revenue from pension benefits, private schemes

	Tax rate
Rate pensions and life-long annuities	40.8
Capital pensions (ETT-scheme)	40.0
Capital pensions (TTE-scheme)	0
ATP	40.3

Source: Own calculations.

Methodological annex

Economy-wide average wage at retirement

Table A1
Economy wide average wage at retirement

	2019	2030	2040	2050	2060	2070	Percentage change 2019-2070
1,000 EUR							
Economy-wide average gross wage at retirement	58.9	85.4	120.2	170.5	242.3	344.1	483.8
Economy-wide average gross wage	51.6	74.7	105.1	149.2	212.0	301.0	483.8

Source: Commission Services.

Pensioners vs. pensions

The agreed labour force projections have been fully implemented in the pension projection by calibrating the national model of labour force projection to the projections provided by the EPC. The projection of pensioners is described in *part 4*.

Pension taxation

Taxation of public pension

Public pensions (old-age, disability, VERP, and civil servant) is subject to regular personal income taxation. However, they are not taxed with the 8 per cent payroll tax.

Taxation of private pensions

Both labour market pension schemes (2nd pillar) and individual pension schemes (3rd pillar) are, as a general rule, taxed ETT (contributions exempt, returns taxed, benefits taxed).

Contributions to private and occupational pensions can be deducted from ordinary income tax at the time they are paid into the schemes. However, contributions

are still taxed with the 8 per cent payroll tax. Furthermore, there is a ceiling on the size of contributions to rate pensions at DKK 57,200 (euro 7,700) in 2020.

When benefits are paid out from life-long and rate pensions they are subject to the personal income tax, but not the payroll tax. Benefits from capital pensions are taxed with a flat 40 per cent rate. In the assessment of fiscal sustainability the contributions received and payments made from the pension sector must be included, because pension savings are not taxed until the pensions are paid out, while contributions to pension schemes can be deducted from ordinary income tax at the time they are paid into the schemes. All else equal, the future rise in revenue resulting from increasing pension payments will improve public finances.

Due to the 2012 tax reform, there can be no new contributions to tax-exempted capital pensions (last contributions in 2012). Instead, contributions can be made to a new capital pension (first contributions in 2013), where contributions are not exempted from taxation, but where benefits are not taxed (so capital pensions have changed from ETT to TTE). Contributions to the new capital pensions cannot be larger than DKK 5,300 (euro 700) in 2020 for people younger than the statutory old age pension age minus 5 years. People between this age and the statutory old age pension age may contribute with up to DKK 50,200 (euro 6,700) in 2020.

Disability pensions

Projection of disability pension is fully described in *part 1* and *part 4*. To sum up *table A2*, the driving force is the disability pension from 2012 *cf. part 1* and the extrapolation of the frequencies as retirement age for old-age pension increases.

	2019	2030	2040	2050	2060	2070
1,000 persons						
Age group -54	102.2	88.7	93.2	89.3	86.3	85.8
Age group 55-59	43.7	38.2	34.2	38.4	34.8	33.8
Age group 60-64	52.0	52.8	45.5	47.5	46.4	44.5
Age group 65-69	6.0	40.3	59.9	53.1	58.1	52.8
Age group 70-74	0.0	0.0	0.0	18.7	33.9	45.1
Age group 75+	0.0	0.0	0.0	0.0	0.0	0.0

Source: Own calculations.

Non-earnings related minimum pension

This is described in *part 3*.

Contributions

This is described in *part 3 and 4*.

Alternative pension spending disaggregation

Table A3

Factors behind the change in public pension expenditure between 2019 and 2070 – Pensions

	2019-30	2030-40	2040-50	2050-60	2060-70	2019-70
Percentage points of GDP						
Public pensions to GDP	-0.7	-0.4	-0.5	-0.4	0.0	-2.0
Dependency ratio effect	2.0	1.6	0.1	0.9	0.7	5.3
Coverage ratio effect*	-1.7	-0.9	-0.3	-0.6	-0.2	-3.7
Coverage ratio old-age	-1.4	-0.9	-0.4	-0.6	-0.1	-3.4
Coverage ratio early-age	-2.2	0.2	-0.5	-0.2	0.0	-2.7
Cohort effect	-1.6	-1.3	0.3	-0.5	-0.4	-3.4
Benefit ratio effect	-0.4	-0.3	-0.1	0.1	0.0	-0.8
Labour market effect	-0.2	-0.2	-0.1	-0.3	-0.1	-0.8
Employment ratio effect	-0.1	-0.1	0.0	0.0	0.0	-0.3
Labour intensity effect	0.0	0.0	0.0	0.0	0.0	0.0
Career shift effect	-0.1	-0.1	0.0	-0.2	-0.1	-0.6
Residual	-0.4	-0.6	-0.1	-0.5	-0.4	-2.0

Source: Own calculations.

Administrative data on new pensioners

Table A4a

Administrative data on new pensioners (2018) - Men

	All	Old age	Disability	Survivor	Other (including minimum)
Age group					
15 - 49	2,478	0	2,478	0	0
50 - 54	930	0	930	0	0
55 - 59	1,065	0	1,065	0	0
60 - 64	7,086	0	1,149	0	5,937
65 - 69	10,362	10,053	0	0	309
70 - 74	2,583	25,32	0	0	51
75+	1,191	1,191	0	0	0

Source: Danish administrative data and own calculations.

Table A4b
Administrative data on new pensioners (2018) - Women

	All	Old age	Disability	Survivor	Other (including minimum)
Age group					
15 - 49	2,283	0	2,283	0	0
50 - 54	1,245	0	1,245	0	0
55 - 59	1,287	0	1,287	0	0
60 - 64	10,056	0	1,305	0	8,751
65 - 69	9,729	9,531	0	0	198
70 - 74	1,464	1,446	0	0	18
75+	441	441	0	0	0

Source: Danish administrative data and own calculations.

Table A4c
Administrative data on new pensioners (2018) - Total

	All	Old age	Disability	Survivor	Other (including minimum)
Age group					
15 - 49	4,761	0	4,761	0	0
50 - 54	2,175	0	2,175	0	0
55 - 59	2,352	0	2,352	0	0
60 - 64	17,142	0	2,454	0	14,688
65 - 69	20,091	19,584	0	0	507
70 - 74	4,047	3,978	0	0	69
75+	1,632	1,632	0	0	0

Source: Danish administrative data and own calculations.

The Danish pension system

This supplementary annex elaborates further on the Danish pension system. This includes a description of the public old-age pension schemes, labour market schemes, and, lastly, the individual and voluntary pension schemes.

First Pillar Pensions

The old-age pension and the disability pension are considered as belonging to the first pillar pensions. In the following sections each of these is described separately.

Public old-age pension consists of a basic amount and a pension supplement

The basic amount is DKK 75,800 (euro 10,000) annually in 2019 and taxable. The basic amount is reduced only on the basis of earnings from earned income. If the pensioner has earned income of more than DKK 336,900 (euro 45,200) annually, the basic amount is reduced by 30 per cent of the part of the earned income that exceeds the threshold. The basic amount is fully phased out if earned income is higher than DKK 583,000 (euro 78,300).

The pension supplement is DKK 85,500 (euro 11,500) annually for single pensioners and DKK 42,900 (euro 5,750) annually for married or cohabiting pensioners in 2019. The pension supplement is taxable and reduced if the pensioner or his/her spouse or cohabitant has other income above a certain limit besides public old-age pension (e.g. earned income, benefits from occupational or private schemes and capital income). The supplement is reduced with 16-31 per cent of the income that exceeds a specified threshold. The percentage reduction and the threshold depend on the marital status of the pensioner and whether the spouse is a pensioner or not. E.g. if the pensioner is single, the phase-out of the supplement starts at an additional income of DKK 88,700 (euro 11,900), the phase-out rate is 32 per cent and the supplement is completely phased out at an additional income of DKK 305,400 (euro 41,000).

People who are eligible for old-age pension, can also be eligible for the “supplementary pension benefit”, which is targeted at the poorest pensioners. The maximum yearly benefit is DKK 17,600 (euro 2,360) in 2019. To receive the supplementary pension benefit, the pensioner cannot have more than DKK 89,800 (euro 12,000) in liquid wealth.

The full benefit is received if the pensioner does not have income (apart from old-age pension) in excess of DKK 35,800 (euro 4,800) for singles and DKK 71,000 (euro 9,500) for married or cohabiting couples. The supplementary pension is reduced if the income is larger than this threshold and is fully phased out if the income is larger than DKK 88,200 (euro 11,800) for singles and DKK 176,600 (euro 23,700) for married or cohabiting couples.

In 2019, the old-age pension expenditure amounted to 6.3 per cent of GDP.

Disability pension

The disability pension is DKK 229,100 (euro 30,700) annually in 2019 for singles and DKK 194,700 (euro 26,150) for married and cohabiting people.

Disability pension is means tested based on earned income and capital income. The pension is reduced if this income is larger than DKK 80,300 (euro 10,800) for singles and DKK 127,400 (euro 11,100) for married or cohabiting couples. Furthermore, the benefit also depends on the spouse’s income and on whether the spouse is a pensioner. The disability pension is reduced with 30 per cent of the

income above the threshold; although only with 15 per cent if the spouse also has a right to a social pension (disability or old-age pension).

In 2019 the disability pension expenditure amounted to 2 per cent of GDP.

The *Labour Market Supplementary Pension Scheme (ATP)* is a contribution-defined and savings-based schemes. Almost all citizens of working age pay contributions to ATP. Furthermore, several groups of persons temporarily or permanently outside the labour market contribute to ATP. Thus, this scheme ensures almost all future pensioners supplementary pension besides public old-age pension. For a full-time employee, the employer contributes DKK 189 (euro 25) per month, while the employee contributes DKK 95 per month (euro 13). Total savings in ATP amounts to 38 per cent of GDP in 2019.

In 2019, benefits from ATP amounted to 0.8 per cent of GDP.

Employees' capital fund (LD) is based on mandatory contributions from wage earners in the period 1977-1979 and is closed for new contributions. Total savings amount to 2 per cent of GDP in 2019. In 2019 benefits from LD amounted to 0.2 per cent of GDP.

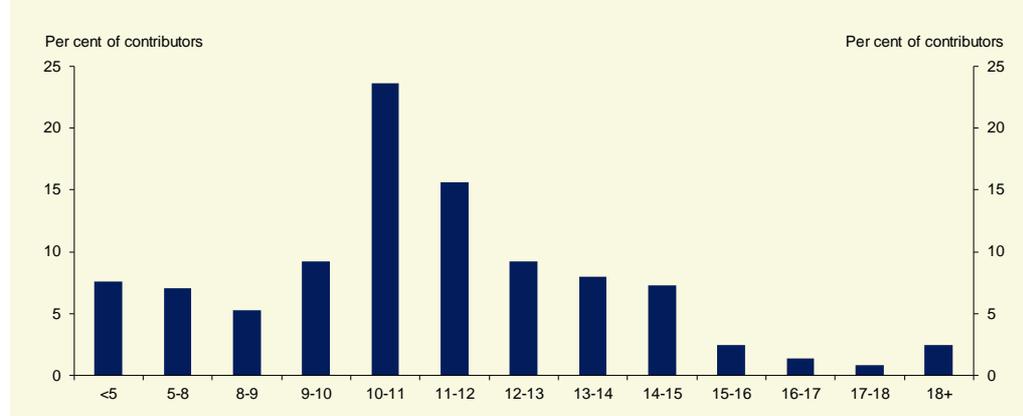
Second Pillar Pensions

The second pillar consists primarily of (privately organized) labour market pension schemes and aims to secure citizens a reasonable replacement rate when they retire. Labour market pension schemes presently cover more than 90 per cent of wage earners between 25 and 59 years.

Total savings in the labour market pension schemes are estimated at 120 per cent of GDP in 2019.

Labour market pensions are contribution-defined, i.e. the pension benefits depend on the contributions paid and the accumulated return on savings. Contribution rate varies depending on the wage agreement. 60 per cent of those with contributions have a contribution rate between 10 and 17 per cent, *cf. figure A1*.

Figure A1
Contributions to occupational schemes as a share of wages, by size of contribution, wage earners, 25-59 years



Source: Statistics Denmark and own calculations

Furthermore, the coverage of the occupational schemes has also increased from about 70 per cent in 1995 to almost 90 per cent in 2018. Before 1995, the coverage was much lower as occupational schemes were only introduced in the private labour market in the beginning of the 1990s. This is also illustrated by the size of contributions from occupational schemes, which has increased from 1.3 per cent of GDP in 1980 to 5.3 per cent of GDP in 2019. If private contributions are also included, pension contributions increased from 2.3 per cent of GDP in 1980 to 6.0 per cent of GDP in 2019.

The composition of benefits in the labour market pension schemes varies considerably. Typically, a life-long current retirement pension is provided, which may be combined with rate pension (paid out over 10-25 years) and/or capital pension (paid out as a lump-sum benefit). To this may be added disability pension and spouse's and child's pensions.

In 2019, benefits from occupational and private schemes amounted to 5.3 per cent of GDP (before deduction of income tax).

Civil servant pensions are defined-benefit schemes. The amount of the pension depends on the number of years of employment as a public servant and the final salary. The maximum pension is 57 per cent of the final salary and is achieved for people who have worked 37 years as a civil servant. Pensions are funded by government, regional, or local authorities out of current income, i.e. taxes.

Defined-benefit pension schemes in the form of civil servant pension schemes will have diminishing importance in both the central government and the local government sectors going forward. This is due to changes in the employment form where few new public employees are hired as civil servants. Instead, all public employees are enrolled in the labour market pension schemes described above.

The share of the population receiving civil servant pension is gradually reduced so that 1,700 persons receive civil servant pension in 2060 compared to around 160,000 persons in 2020.

In 2019, the civil servant pension expenditure amounted to 1.3 per cent of GDP.

Third Pillar Pensions

Individual, private pension savings plans are started on the initiative of private individuals and are independent of employment conditions. In these schemes, the individual makes his/her own choices about the size of the contributions, the composition of benefits etc.

Individual pension schemes can be set up with banks, insurance companies, or pension funds as defined contribution plans.

The individual schemes are typically capital pension or rate pension schemes, but may also be life-long annuity pensions. The pension benefit depends on the savings (including return) made by the individual. Total savings in private pension plans are estimated at 29 per cent of GDP in 2019.

Voluntary early retirement pension

The basic benefit paid in the VERP is DKK 208,000 (euro 28,000) annually if retiring before the age of 64 in 2019. This amount is further reduced based on the person's pension wealth. As a general rule, VERP payments are reduced by 64 per cent of private pension payments.

If retiring at the age of 64 or later, the basis benefit is raised to DKK 228,000 (euro 30,600) in 2020. In 2019, the VERP expenditure amounted to 0.4 per cent of GDP.

Essential reforms of the pension system

Welfare agreement - 2006

In 2006, The Danish Government (at the time consisting of The Liberal Party and The Conservative Party) concluded the *Welfare Agreement* with the Social Democrats, the Danish People's Party and the Social-Liberal Party. Thus, a large majority of the Danish Parliament is behind the agreement. The key elements are:

The increase in the voluntary early retirement pension (VERP) age from 60 to 62 years in 2019 to 2022, and the public old-age pension age from 65 to 67 years in 2024 to 2027.

The indexation of the age thresholds in the retirement system as of 2025 for the early retirement age and 2030 for the public old-age pension.

The Welfare Agreement introduces a principle of indexation to help ensure that longer life expectancy and better health also leads to more active years in the labour market.

A specific formula for calculating the VERP and pension age on the basis of future observed mean life expectancy for 60 year olds is enshrined in the legislation. Changes in the VERP and pension age shall be calculated every 5 years – based on the latest observed life expectancy – and confirmed by Parliament 10 years before they take effect (15 years before for old-age pension). It is a key requirement for the Government's long-term fiscal strategy that current legislation describing the indexation rule is adhered to. In the light of the fact that Parliament has to confirm the increase in the retirement age – and therefore also has the power to say no to the increase – it is an important part of the agreement that it is backed by a large majority of Parliament.

If life expectancy does not increase relative to 2004/2005 the above-mentioned new age limits will remain in force. If life expectancy increases, the age threshold for VERP and old-age pension will in the long run increase in line with life expectancy for 60-year olds.

Retirement reform - 2011

In December 2011, a new pension reform was adopted in Parliament. The reform has 3 main elements:

1. The reform brings forward the increase in the retirement ages in the Welfare Agreement from 2006. The retirement age for VERP will increase from 60 to 62 years from 2014-2017 (as opposed to from 2019-2022 in the Welfare Agreement), while the public old-age pension age will increase from 65 to 67 years in 2019-2022 (as opposed to from 2024-2027). From 2027, the VERP and old-age pension retirement age is linked to the life expectancy as described in the Welfare Agreement, *cf. table A5*.
2. VERP is reduced from 5 to 3 years from 2018-2023. Private pension wealth lowers the VERP amount to a higher degree than now. Furthermore, the system of enrolment into the VERP is changed. At present members of unemployment insurance schemes are automatically enrolled at the age of 30, while leaving the scheme requires a written letter. With the reform, this is changed so that members of the unemployment insurance schemes must actively inform the insurer that they wish to join the VERP-scheme.
3. A new senior disability pension is introduced as an administrative fast track into the disability pension for persons 5 years before the statutory retirement age, however, the objective criteria for receiving the disability pension is unchanged.

Table A5
Statutory retirement age, VERP, and old age pension with reforms

	Statutory retirement ages, 2006-reform		Statutory retirement ages, 2011-reform	
	VERP	Old age pension	VERP	Old age pension
2012	60	65	60	65
2013	60	65	60	65
2014	60	65	60½	65
2015	60	65	61	65
2016	60	65	61½	65
2017	60	65	62	65
2018	60	65	62½	65
2019	60½	65	63	65½
2020	61	65	63	66
2021	61½	65	63	66½
2022	62	65	63½	67
2023	62	65	64	67
2024	62	65½	64	67
2025	63	66	64	67
2026	63	66½	64	67
2027	63	67	65	67
2028	63	67	65	67
2029	63	67	65	67
2030	64	68	65	68
Later	Indexed to life expectancy	Indexed to life expectancy	Indexed to life expectancy	Indexed to life expectancy

Source: Own calculations.

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