

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 VERP

Public old-age pension is paid upon application from the age of 65. 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 61½ years, but who are not yet 65 years old.

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, this 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* and the two reforms are described in detail in the supplementary annex.

Box 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 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 the calculated age limits for both old-age and early retirement is based on the life expectancy in the EUROPOP2015, *cf. figure 1* and *2*. The statutory retirement age will increase by 9 years from 65 years in 2016 to 74 years in 2070 correspondingly early retirement age increases by 9½ years from 61½ years in 2016 to 71 years in 2070, *cf. table 1*.

The increase in the statutory retirement age should also be seen in the light of improved health etc., i.e. a 74 year old in 2070 will be healthier than a 74 year old in 2016.

Figure 1
Remaining life expectancy for a 60 year old
(unweighted average for men and women)

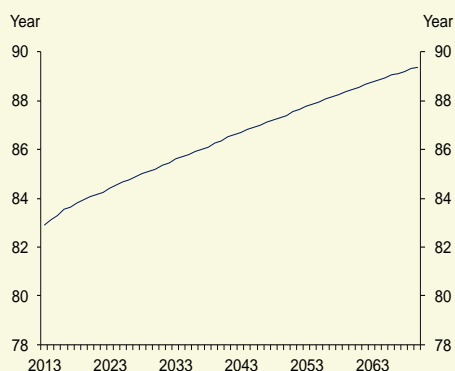
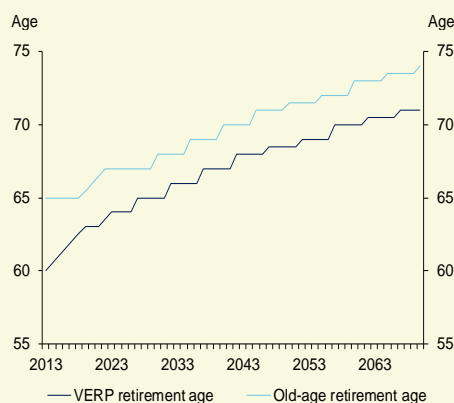


Figure 2
Age thresholds for VERP and public old-age
pension



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. In the projection, it is assumed that Parliament confirms these increases in the retirement age.

Source: Own calculations based on EUROPOP2015

Tabel 1
Qualifying condition for retiring

			2016	2020	2030	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		65	66	68	70	71½	73	74
	Statutory retirement age - women		65	66	68	70	71½	73	74
Qualifying condition for retirement WITHOUT a full pension	Early retirement age – men ²		61½	63	65	67	68½	70	71
	Early retirement age – women ²		61½	63	65	67	68½	70	71
	Penalty in case of earliest retirement age		:	:	:	:	:	:	:
	Bonus in case of late retirement		Varies ¹						
	Minimum contributory period - men		:	:	:	:	:	:	:
	Minimum contributory period - women		:	:	:	:	:	:	:
	Minimum residence period – men		:	:	:	:	:	:	:
	Minimum residence period - women		:	:	:	:	:	:	:

Note.: 1) Postponement of retirement to a higher age than the statutory retirement age results in a higher pension. It is possible to postpone retirement with up to 10 years. 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.

2) 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 EUROPOP2015 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). In the projection, it is assumed that Parliament confirms these increases in the retirement age.

Source: Own calculations

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 persons 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 the *table 2* or the pension projection.

Table 2
Number of new pensioners by age group – administrative data (year 2015)

Age group	All	Old age	Disability	Survivor	Early retirement
15 - 49	2.793	:	2.793	:	:
50 - 54	1.329	:	1.329	:	:
55 - 59	1.512	:	1.512	:	:
60 - 64	18.150	:	1.371	:	16.881
65 - 69	21.126	21.024	:	:	:
70 - 74	3.630	3.630	:	:	:

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.

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 2016 was thus fixed on the basis of wage developments from 2013 to 2014.

As a part of the 2012 Tax Reform, the indexation of all income transfers were lowered in the period 2016-2023, according to *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

	2016	2017	2018	2019	2020	2021	2022	2023
Change, %-points	-0,3	-0.4	-0.75	-0.75	-0.75	-0.75	-0.75	-0.75

Source: Danish Ministry of Finance

1.2 Recent reforms of the pension system included in the projections

In June 2017 a new pension reform was adopted in Parliament. The main elements of the reform was to increase the incentives to both postpone retirement and ensure that persons close to the retirement age have incentives to pay contributions to a private labour market pension. Before the reform a large group of persons had a high implicit marginal tax, when they were close to the retirement age as private contributions lead to deduction in public pensions. The reform reduces these high implicit tax rates.

With the reform private pensions can be payed out three years before the old-age retirement age as opposed to five years before the reform. Postponement of retirement allows for increased pension benefits, the reform allows for a one-off payment rather than a permanent increased benefit.

Furthermore the eligibility rules for receiving disability pensions has been harmonized such that fugitives are subject to the same eligibility rules as Danes and other foreigners living in Denmark.

2. Overview of the demographic and labour forces projections

2.1 Demographic development

The population in Denmark expected to increase from 5.7 million inhabitants in 2016 to 6.8 million in 2070, *cf. table 4*. Furthermore, the old-age dependency ratio is projected to increase from 29,5 in 2016 to 50,2 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 with 5.9 years for both men and women respectably.

Net migration is projected to stay positive throughout the entire projection period. Due to the refugee crisis net migration peaked in 2016, but is projected to fall throughout the projection period.

Table 4
Main demographic variables evolution

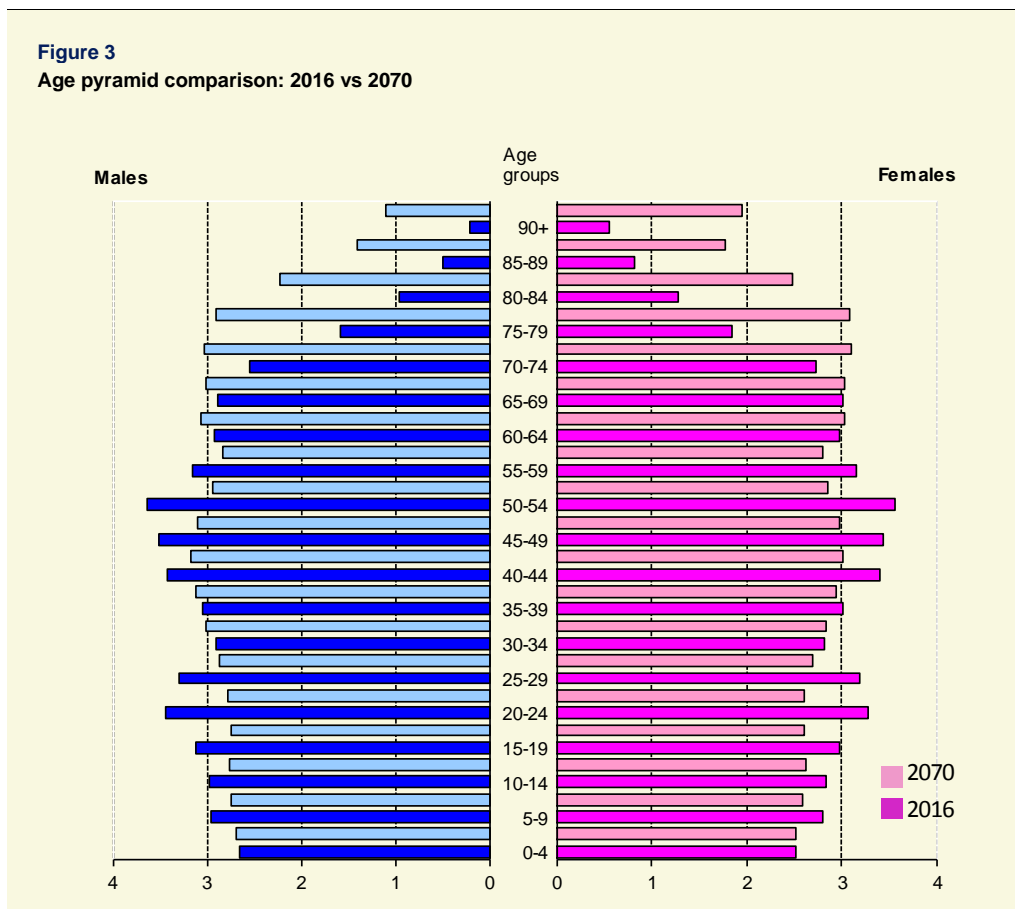
	2016	2020	2030	2040	2050	2060	2070	Peak year*
Population (thousand)	5.731	5.909	6.316	6.573	6.688	6.760	6.829	2070
Population growth rate	0,8	0,7	0,6	0,3	0,1	0,1	0,1	2016
Old-age dependency ratio (pop65/pop15-64)	29,5	31,1	35,9	39,8	39,9	45,0	50,2	2070
Ageing of the aged (pop80+/pop65+)	22,8	24,0	31,8	33,2	39,0	38,1	37,6	2055
Men - Life expectancy at birth	78,8	79,5	81,0	82,4	83,7	84,9	86,1	2070
Men - Life expectancy at 65	18,1	18,5	19,5	20,5	21,5	22,4	23,3	2070
Men - Life expectancy at 60	21,8	22,5	23,6	24,7	25,8	26,8	27,7	2070
Women - Life expectancy at birth	82,9	83,6	85,0	86,4	87,7	88,9	90,0	2070
Women - Life expectancy at 65	20,8	21,3	22,4	23,5	24,5	25,5	26,4	2070
Women - Life expectancy at 60	25,1	25,6	26,8	28,0	29,0	30,1	31,0	2070
Men - Survivor rate at 65+	86,3	87,2	89,1	90,7	92,1	93,2	94,2	2070
Men - Survivor rate at 80+	57,2	59,4	64,4	68,9	73,0	76,6	79,7	2070
Women - Survivor rate at 65+	91,4	92,0	93,2	94,2	95,1	95,8	96,5	2070
Women - Survivor rate at 80+	69,5	71,4	75,7	79,4	82,6	85,3	87,6	2070
Net migration	36,7	33,4	26,8	18,9	10,7	11,4	9,3	2016
Net migration over population change	0,8	0,8	0,8	1,0	1,5	1,5	1,6	2053

Note: This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2016 to 2070.

Source: EUROSTAT and Commission Services

Figure 3 shows the development in the population pyramid from 2016 to 2070. As in other member states, a larger share of the population in 2070 will be in older cohorts, compared to 2016.

Figure 3
Age pyramid comparison: 2016 vs 2070



Source: Commission Services.

2.2 Labour forces

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 71.1 % in 2016 to 77 % in 2070, *cf. table 5*. The largest increase will occur in the period until 2020 where the LFPR will already have increased to 75.3 %. The cyclical upswing in the Danish economy also contributes to the increase the participation rates.

For people aged 65-74, the LFPR has a much lower starting point at 14.2 %, mainly reflecting the statutory retirement age of 65 years. As the retirement age is increased to 74 in 2070, the LFPR in this age group increases to 33.7 % in 2070.

Table 5**Participation rate, employment rate and share of workers for the age groups 55-64 and 65-74**

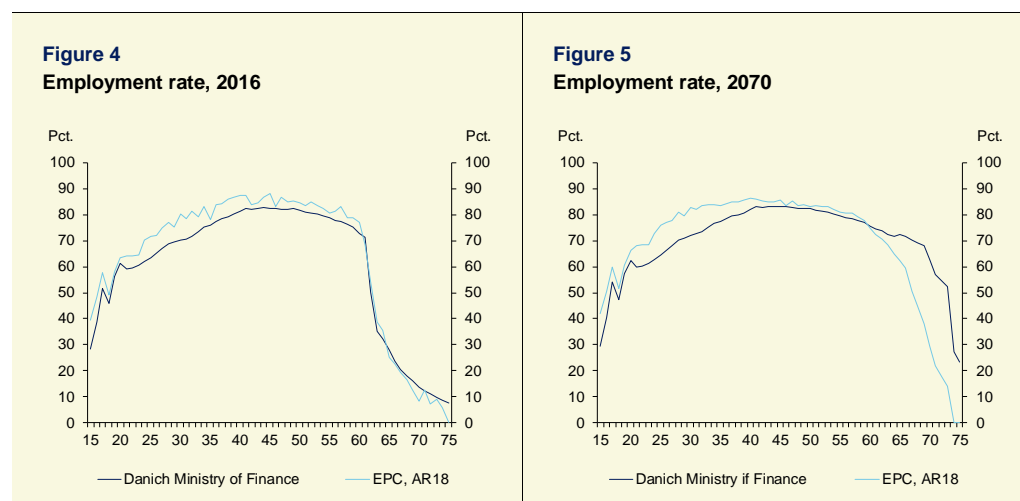
	2016	2020	2030	2040	2050	2060	2070	Peak year*
Labour force participation rate 55-64	71,1	75,3	76,0	75,3	76,6	77,0	77,0	2065
Employment rate for workers aged 55-64	68,3	72,9	73,9	73,2	74,5	74,9	74,9	2065
Share of workers aged 55-64 on the labour force 55-64	96,0	96,8	97,2	97,2	97,2	97,2	97,2	2029
Labour force participation rate 65-74	14,2	13,9	21,7	24,0	26,3	33,5	33,7	2070
Employment rate for workers aged 65-74	14,2	13,9	21,7	24,0	26,3	33,5	33,7	2070
Share of workers aged 65-74 on the labour force 65-74	99,8	99,8	99,8	99,8	99,9	99,9	99,9	2067
Median age of the labour force	40,0	40,0	39,0	41,0	41,0	42,0	41,0	2051

Note: This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2016 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 commission, *cf. figure 4 and 5*.

This could indicate that the Commission does not take fully account of the increase in the statutory retirement age or has very conservative view of the projected employment rate for older age groups due to harmonized assumptions for the Ageing Report. In 2070 the retirement age in Denmark will be 74 years, the EPC projects an employment rate of 0 per cent compared to 20 per cent. in the projection by the Danish Ministry of Finance. In 2016 almost 8 pct. of the 74 year olds were employed.



Source: Commission Services and own calculations.

Due to pension reforms, the Commission projects the average effective exit age to increase with 2.8 years for men from 2016-2070 and with 3.8 years for women, *cf. table 6.*

However, the increase in the average effective exit age is smaller than the increase in e.g. the statutory old-age pension age, which increases from 65 years in 2016 to 74 years in 2070, an increase of 9 years, *cf. table 1 in part 1.* Therefore, the Commission has not included the full effect of the increase in the statutory retirement age in the projection in the calculation of the average effective exit age.

Table 6
Labour market entry age, exit age and expected duration of life spent at retirement

	2016	2020	2030	2040	2050	2060	2070	Peak year*
Men								
Average effective exit age (CSM) (II)								
Contributory period	65,2	65,8	66,9	67,1	67,5	67,9	68,0	2016
Duration of retirement**	:	:	:	:	:	:	:	2016
Duration of retirement/contributory period	18,2	17,8	18,0	18,9	19,8	19,8	20,6	2069
Percentage of adult life spent at retirement***	:	:	:	:	:	:	:	:
Early/late exit****	27,8	27,2	26,9	27,8	28,6	28,4	29,2	2069
WOMEN								
Average effective exit age (CSM) (II)								
Contributory period	:	:	:	:	:	:	:	2016
Duration of retirement**	21,8	21,3	21,6	22,6	22,7	22,8	23,6	2070
Duration of retirement/contributory period	:	:	:	:	:	:	:	:
Percentage of adult life spent at retirement***	32,1	31,0	31,2	32,0	31,7	31,4	32,1	2046
Early/late exit****	1,9	1,8	2,5	2,5	3,4	3,5	0,0	2016

Note: This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2016 to 2070. ** Duration of retirement is calculated as the difference between the life expectancy at average effective exit age and the average effective exit age itself. *** The percentage of adult life spent at retirement is calculated as the ratio between the duration of retirement and the life expectancy diminished by 18 years. **** Early/late exit, in the specific year, is the ratio of those who retired and aged less than the statutory retirement age and those who retired and are aged more than the statutory retirement age. Early/late exit, in the specific year, is the ratio of those who retired and aged less than the statutory retirement age and those who retired and are aged more than the statutory retirement age.

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, LD, 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 (about 0.5 percentage points of GDP), *cf. table 7*.

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

	2007	2008	2009	2010	2011	2012	2013	2014
1 Eurostat total pension expenditure	11,7	11,7	13,0	12,6	12,7	12,7	13,4	14,0
2 Eurostat public pension expenditure	8,3	8,4	9,2	9,3	9,5	9,6	9,7	9,7
3 Public pension expenditure (AWG)	8,9	9,0	9,8	9,8	10,0	10,0	10,1	10,1
4 Difference (2) - (3)	-0,6	-0,5	-0,6	-0,5	-0,5	-0,4	-0,4	-0,4

Kilde: EUROSTAT and Member States

3.2 Overview of projection results

Public pension expenditures decrease from 10.0 % of GDP to 8.1% of GDP in 2070, a decrease of 1.9 % of GDP, *cf. table 8*. More than half of the decline occurs in the period 2016-2023. The decrease in the public pension expenditures is a result of a number of different factors, see below. From 2060 to 2070 public pension expenditure increases from 7.5% to 8.1% of GDP.

Table 8
Projected gross and net pension spending and contributions (% of GDP)

Expenditure	2016	2020	2030	2040	2050	2060	2070	Peak year*
Gross public pension expenditure	10,0	9,3	8,6	8,2	7,8	7,5	8,1	2016
Private occupational pensions	4,4	5,1	4,9	6,0	6,3	6,3	7,0	2070
Private individual pensions	:	:	:	:	:	:	:	:
<i>Mandatory private</i>	:	:	:	:	:	:	:	:
<i>Non-mandatory private</i>	:	:	:	:	:	:	:	:
Gross total pension expenditure	14,3	14,4	13,5	14,1	14,1	13,9	15,1	2070
Net public pension expenditure	7,1	6,6	6,2	5,9	5,7	5,6	6,0	2016
Net total pension expenditure	9,6	9,6	8,4	8,7	8,7	8,5	9,2	2017
Contributions	2016	2020	2030	2040	2050	2060	2070	Peak year*
Public pension contributions	0,1	0,1	0,0	0,0	0,0	0,0	0,0	2016
Total pension contributions	6,2	5,9	5,8	5,8	5,8	5,8	5,8	2016

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 2016-2060 as well as the tax revenue from public pensions followed by a small increase from 2060 to 2070. In the projection, the tax rate on each of the public schemes are kept constant at the 2016-level. However, the average tax rate is not the same for the different pension schemes and the total implicit tax shows a declining trend due to compositional effects; see *part 4* for more details concerning tax rates.

Benefits paid from private schemes are increasing over time from 4,4 % of GDP in 2016 to around 7 % of GDP in 2070, mainly reflecting the maturation of the pension schemes, cf. the description in *part I*. Contributions as a share of wages remain constant in the projection at around 5.8 % of GDP. However, as a share of GDP, contributions decline slightly until 2022 due to higher growth in productivity compared to wages in the period 2019-2022, see discussion below.

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 taxes on private pensions increase from 1.8 % of GDP in 2016 to 3.7 % 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*.

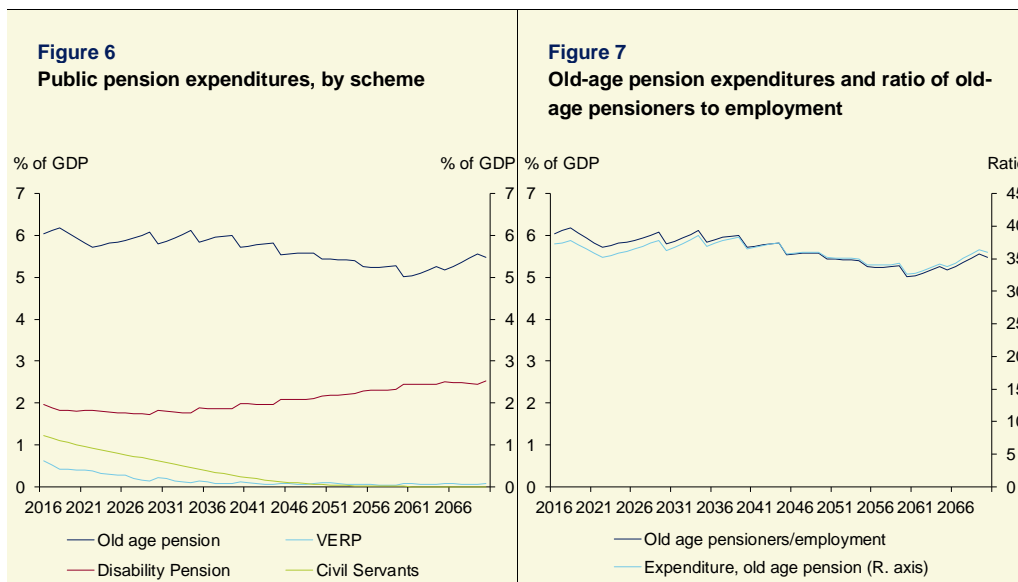
	2016	2020	2030	2040	2050	2060	2070	Peak year*
Pension scheme								
Total public pensions	10.0	9.3	8.6	8.2	7.8	7.5	8.1	2016
of which								
Old age and early pensions:								
<i>Flat component</i>	:	:	:	:	:	:	:	:
<i>Earnings related</i>	1.3	1.2	0.7	0.3	0.1	0.0	0.0	2016
<i>Minimum pensions (non-contributory) i.e. minimum income guarantee for people above 65</i>	6.0	5.9	5.8	5.7	5.4	5.0	5.5	2018
Disability pensions	2.0	1.8	1.8	2.0	2.2	2.5	2.5	2070

Source: Commission Services

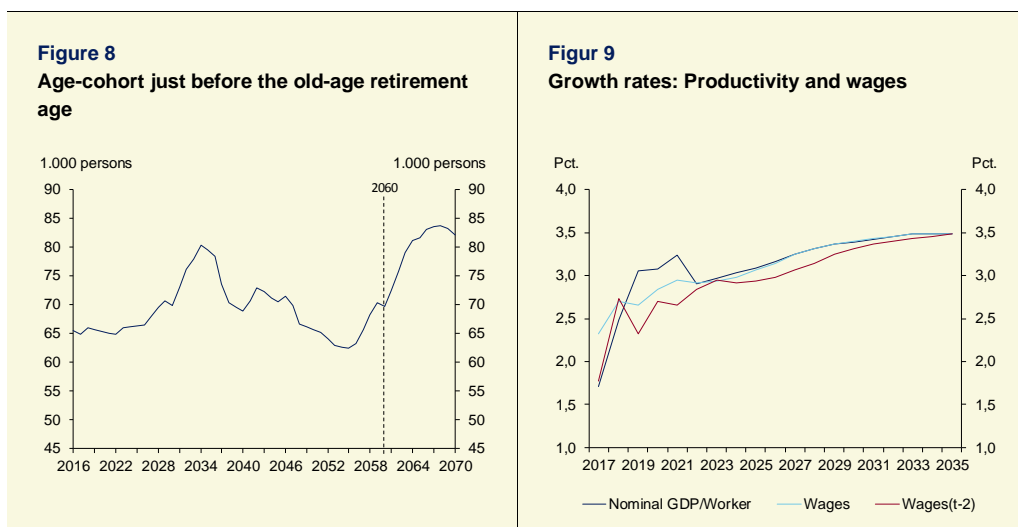
The reform of VERP in 2011 (a part of the Retirement Reform) contributes to the decline in VERP expenditures from 0.6 % of GDP in 2016 to 0.1 % of GDP in 2032 and remain at that level until the end of the projection period.

Expenditures to civil servants pensions also drop from 1.2 % of GDP in 2016 to 0.0 % of GDP. 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 declining expenditures on old age pension at a level about 6 % of GDP, because the ratio of old age pensioners to employment is almost constant. The old age pension expenditures increase from 5.0% of GDP in 2060 to 5.5% of GDP in 2070 due to increases in the ratio of old age pensioners to employment coming from large cohorts of new old age pensioners, cf. figure 6, 7 and 8.



Source: Own calculations.



Source: Own calculations

Finally, expenditures on disability pension drops from 2.0% of GDP in 2016 to 1.8% in 2023, partly because the indexation of disability benefits are reduced in the period 2016-2023 due to the 2012 tax reform, as described in part 1. From around 2030, expenditures on disability benefits begin to increase to about 2.5% 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 2014 (65 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 the period 2016-2018 the expenditures increase, partly because the ratio of old-age pensioners to employment increases. However the increase is enlarged, because the productivity per worker increases less than wages, which leads to higher expenditures as a share of GDP, *cf. figure 6,7 and 9*. Similarly, in the period 2019-2022, 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 2019-2022, *cf. figure 9*.

3.3 Description of main driving forces behind the projection results and their implications for main items from a pension questionnaire

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

Tabel 10
Projected gross and net pension spending and contributions (% of GDP)

	2016	2020	2030	2040	2050	2060	2070	Average annual change
Public pensions to GDP	-0,7	-0,7	-0,4	-0,4	-0,2	0,5	-1,9	-0,035
Dependency ratio effect	0,5	1,3	1,0	0,0	0,9	0,9	4,6	8,4%
Coverage ratio effect	-0,7	-1,2	-0,7	-0,2	-0,9	-0,2	-3,9	-7,3%
Coverage ratio old-age*	-0,2	-0,8	-0,7	-0,3	-0,9	-0,1	-2,9	-5,3%
Coverage ratio early-age*	-2,5	-1,6	0,2	-0,6	-0,1	0,2	-4,4	-9,3%
Cohort effect*	-0,4	-1,5	-1,3	1,0	-0,9	-1,2	-4,2	-8,1%
Benefit ratio effect	-0,2	-0,5	-0,5	-0,3	0,1	-0,1	-1,6	-2,7%
Labour Market/Labour intensity effect	-0,2	-0,2	-0,1	0,1	-0,3	0,0	-0,8	-1,7%
Employment ratio effect	-0,2	0,0	0,0	0,0	0,0	0,0	-0,3	-0,8%
Labour intensity effect	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0%
Career shift effect	0,0	-0,2	-0,1	0,0	-0,2	0,0	-0,5	-1,0%

Residual	0,0	-0,1	0,0	0,0	-0,1	0,0	-0,2	-0,1%
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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 2016 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 % in 2016 to 34 % 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 % in 2016 to 38 % by 2070, due to the maturation of the occupational schemes. The total reported benefit ratio is projected to increase from 60% in 2016 to 64% in 2070. Civil servants pension is the only earnings related public old age pension scheme. The benefit ratio from this scheme is around 30% during the projection period. However the coverage is declining towards 0.1%, *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 (in %)

	2016	2020	2030	2040	2050	2060	2070
Public scheme (BR)	42	41	38	36	35	35	34
Public scheme (RR)	38	37	35	33	32	32	31
Coverage	100	100	100	100	100	100	100
Public scheme old-age earnings related (BR)	30	31	31	30	30	30	30
Public scheme old-age earnings related (RR)	27	28	28	28	27	27	27
Coverage	12	11	8	5	2	0	0
Private occupational scheme (BR)	23	28	27	32	35	38	38
Private occupational scheme (RR)	21	25	24	29	32	35	35
Coverage	42	41	38	36	35	35	34
Private individual scheme (BR)							
Private individual scheme (RR)							
Coverage							
Total (BR)	60	63	60	62	63	64	64
Total (RR)	55	57	55	57	57	58	59

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

As mentioned in *part 1*, currently more than 90 % 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 increases during most of the projection period. On the other hand, employment is projected to increase until 2060. This results in a decline in the Pension System Dependency Ratio (SDR) until 2060, *cf. table 12*. After 2060 the SDR decreases again due to a decrease in 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 remains relatively stable.

Table 12
System Dependency Ratio and Old-age Dependency Ratio

	2016	2020	2030	2040	2050	2060	2070
Number of pensioners (thousand) (I)	1340,9	1341,9	1396,0	1436,5	1449,8	1412,2	1497,4
Employment (thousand) (II)	2854,9	2984,7	3147,6	3209,2	3292,5	3323,2	3248,3
Pension System Dependency Ratio (SDR) (I)/(II)	47,0	45,0	44,4	44,8	44,0	42,5	46,1
Number of people aged 65+ (thousand) (III)	1085,6	1172,5	1391,0	1561,8	1611,8	1775,3	1930,1
Working age population 15 - 64 (thousand) (IV)	3685,6	3771,2	3875,9	3927,6	4040,6	3948,1	3843,6
Old-age Dependency Ratio (ODR) (III)/(IV)	29,5	31,1	35,9	39,8	39,9	45,0	50,2
System efficiency (SDR/ODR)	1,6	1,4	1,2	1,1	1,1	0,9	0,9

Source: Commission Services

Number of pensioners compared with inactive and total population

The total number of pensioners as a share of the inactive population is close to 100 in 2016 for the age groups older than 59 years, *cf. table 13a and 13b*. However, for the age groups 60-74, 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 74.5, so it is not possible for this age group to receive old-age pension. Furthermore, the VERP age is 71.5 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 is projected to between 17 and 21 %, 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 (%)

	2016	2020	2030	2040	2050	2060	2070
Age group -54	7,3	5,9	4,7	4,9	4,8	4,6	4,4
Age group 55-59	80,5	73,7	66,4	61,5	61,6	61,7	61,9
Age group 60-64	85,4	67,4	50,8	52,3	54,3	55,5	55,9
Age group 65-69	117,3	110,1	82,7	37,5	38,2	36,8	37,7
Age group 70-74	108,5	106,7	106,4	106,8	82,4	59,6	44,6
Age group 75+	99,5	99,6	99,6	99,2	99,1	98,7	97,8

Source: Commission Services

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

	2016	2020	2030	2040	2050	2060	2070
Age group -54	2,7	2,2	1,8	1,9	1,8	1,8	1,7
Age group 55-59	12,6	12,0	10,7	11,4	10,8	10,7	10,8
Age group 60-64	36,8	23,1	16,2	16,0	16,4	15,7	15,7
Age group 65-69	94,8	87,6	55,3	23,3	22,2	18,7	18,4
Age group 70-74	99,1	98,8	97,7	96,2	73,6	50,7	37,2
Age group 75+	99,5	99,6	99,6	99,2	99,1	98,7	97,8

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 (%)

	2016	2020	2030	2040	2050	2060	2070
Age group -54	7,3	5,8	4,7	5,0	5,0	4,7	4,6
Age group 55-59	79,8	69,2	62,9	57,5	59,2	59,6	59,7
Age group 60-64	85,4	72,8	51,8	52,8	54,2	56,5	56,9
Age group 65-69	110,2	108,0	81,5	38,5	39,7	39,6	40,9
Age group 70-74	105,6	102,8	105,0	105,2	85,1	63,6	49,3
Age group 75+	100,1	100,1	100,1	100,0	100,0	100,0	99,9

Source: Commission Services

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

	2016	2020	2030	2040	2050	2060	2070
Age group -54	2,9	2,3	1,9	2,0	2,0	1,9	1,9
Age group 55-59	14,0	13,4	12,1	12,8	12,0	12,0	12,0
Age group 60-64	42,3	25,9	17,9	17,9	18,1	17,4	17,4
Age group 65-69	97,6	90,1	58,4	26,0	24,8	21,0	20,7
Age group 70-74	99,8	99,9	99,4	98,7	78,5	54,9	41,4
Age group 75+	100,1	100,1	100,1	100,0	100,0	100,0	99,9

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:

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

$$\text{New}(y,a) = \text{Stock}(y,a) - \text{stock}(y-1,a-1) + \text{deaths}(y,a)$$

,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 2060 and with ½ year in 2020, 2050 and 2070. Therefore, there are almost no new old-age pensioners in 2030, 2040 and 2060 and only half a cohort in 2020 2050 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 15 also shows minimum and average public pensions. The minimum public old-age pension is received by people with substantial additional income, see description in *part 1*. Only a small fraction of the population of pensioners has such a large additional income. The ratio between the average pension and the minimum pension declines slightly over the projection period due to the increase in occupational pension benefits which lowers the public pension supplement (and therefore lowers the average pension), but does not affect the minimum pension (because the supplement is already phased out for people receiving the minimum pension).

Table 15a
Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) - Total

	2016	2020	2030	2040	2050	2060	2070
I Projected new pension expenditure (millions EUR)	1.025,2	636,0	188,6	264,2	1.632,7	508,2	3.933,6
Ib Projected new pension expenditure (millions EUR) - average over 5 years	1025,2	897,5	1245,2	1815,8	2588,1	3238,1	6128,1
II. Number of new pensions ('000)	65,3	36,4	8,0	8,2	36,2	8,0	43,9
IIb. Number of new pensions ('000) - average over 5 years	65,3	54,2	56,4	59,9	61,4	54,4	73,0
III. Minimum amount	9.752	10.808	14.633	20.554	29.053	41.317	58.710
IV Average new pension (I/II)	15.707,4	17.461,7	23.476,9	32.249,1	45.075,5	63.729,4	89.663,6
V. Pension relative to minimum amount (IV/III)	1,6	1,6	1,6	1,6	1,6	1,5	1,5

Source: Commission Services

The projected average pension for new male and female pensioners is assumed to be equal, *cf. above*. Therefore, the projected new expenditures are almost equal for men and women.

Table 15b
Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) - Males

	2016	2020	2030	2040	2050	2060	2070
I Projected new pension expenditure (millions EUR)	512.215	318.534	123.190	199.767	849.673	404.115	2.013.858
Ib Projected new pension expenditure (millions EUR) - average over 5 years	512,2	454,1	622,9	912,0	1262,6	1626,0	2942,7
II. Number of new pensions ('000)	32,6	18,2	5,2	6,2	18,8	6,3	22,5
IIb. Number of new pensions ('000) - average over 5 years	32,6	27,4	28,2	30,1	29,9	27,3	35,0
III. Minimum amount	9.752	10.808	14.633	20.554	29.053	41.317	58.710
IV Average new pension (I/II)	15.707,4	17.461,7	23.476,9	32.249,1	45.075,5	63.729,4	89.663,6
V. Pension relative to minimum amount (IV/III)	1,6	1,6	1,6	1,6	1,6	1,5	1,5

Source: Commission Services

Table 15c
Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) - Females

	2016	2020	2030	2040	2050	2060	2070
I Projected new pension expenditure (millions EUR)	512.945	317.437	65.429	64.389	782.991	104.059	1.919.716
Ib Projected new pension expenditure (millions EUR) - average over 5 years	512,9	443,4	622,3	903,8	1325,5	1612,1	3185,4
II. Number of new pensions ('000)	32,7	18,2	2,8	2,0	17,4	1,6	21,4
IIb. Number of new pensions ('000) - average over 5 years	32,7	26,8	28,2	29,8	31,4	27,1	37,9
III. Minimum amount	9.752	10.808	14.633	20.554	29.053	41.317	58.710
IV Average new pension (I/II)	15.707,4	17.461,7	23.476,9	32.249,1	45.075,5	63.729,4	89.663,6
V. Pension relative to minimum amount (IV/III)	1,6	1,6	1,6	1,6	1,6	1,5	1,5

Source: Commission Services

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 (million), number of contributors in the public scheme (in 1000), total employment (in 1000) and related ratios (%)

	2016	2020	2030	2040	2050	2060	2070
Public contribution	356,4	271,5	193,9	217,9	278,1	415,7	578,9
<i>Employer contribution</i>	:	:	:	:	:	:	:
<i>Employee contribution</i>	356,4	271,5	193,9	217,9	278,1	415,7	578,9
<i>State contribution</i>	0,0	0,0	0,0	0,0	0,0	0,0	0,0
<i>Other revenues</i>	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Number of contributors (I)	447,0	315,3	170,0	136,0	122,8	129,1	126,5
Employment (II)	2854,9	2984,7	3147,6	3209,2	3292,5	3323,2	3248,3
Ratio of (I)/(II)	0,2	0,1	0,1	0,0	0,0	0,0	0,0

Source: Commission Services

3.5 Sensitivity analysis

The results from the sensitivity analyses are reported in *table 17*.

Table 17

Public and total pension expenditures under different scenarios (deviation from the baseline)

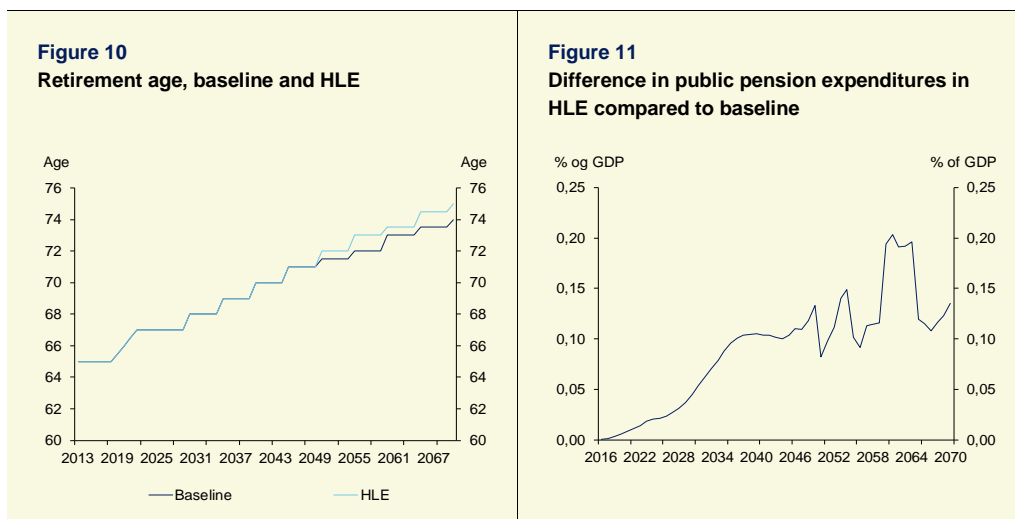
	2016	2020	2030	2040	2050	2060	2070
Public Pension Expenditure							
Baseline	10,0	9,3	8,6	8,2	7,8	7,5	8,1
Higher life expectancy (2 extra years)	0,0	0,0	0,0	0,1	0,1	0,2	0,1
Higher Total Factor Productivity Growth (+0.4 pp.) Higher lab. productivity (+0.25 pp.)	0,0	0,0	0,0	0,0	0,0	0,0	0,1
Lower Total Factor Productivity Growth (-0.4 pp.) Lower lab. productivity (-0.25 pp.)	0,0	0,0	0,0	0,0	0,0	0,0	-0,1
Higher emp. rate (+2 pp.)	0,0	0,0	-0,2	-0,2	-0,2	-0,2	-0,2
Lower emp. rate (-2 pp.)	0,0	0,0	0,2	0,2	0,2	0,2	0,2
Higher emp. of older workers (+10 pp.)	0,0	-0,1	-0,5	-0,4	-0,4	-0,4	-0,5
Higher migration (+2033%)	0,0	-0,1	-0,3	-0,3	-0,3	-0,3	-0,2
Lower migration (-2033%)	0,0	0,1	0,3	0,4	0,4	0,3	0,2
Lower fertility	0,0	0,0	0,0	0,2	0,4	0,7	1,1
Risk scenario	0,0	0,0	0,0	0,0	0,0	0,0	-0,1
Policy scenario: linking retirement age to increases in life expectancy	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Reform Breakdown	0,0	0,0	0,0	0,6	1,0	1,8	2,3
Total Pension Expenditure							
Baseline	14,3	14,4	13,5	14,1	14,1	13,9	15,1
Higher life expectancy (2 extra years)	0,0	0,0	0,0	0,1	0,0	0,0	0,0
Higher Total Factor Productivity Growth (+0.4 pp.) Higher lab. productivity (+0.25 pp.)	0,0	0,0	0,0	-0,2	-0,5	-0,7	-0,9
Lower Total Factor Productivity Growth (-0.4 pp.) Lower lab. productivity (-0.25 pp.)	0,0	0,0	0,0	0,2	0,5	0,8	1,1
Higher emp. rate (+2 pp.)	0,0	-0,1	-0,3	-0,3	-0,3	-0,2	-0,2
Lower emp. rate (-2 pp.)	0,0	0,1	0,3	0,3	0,3	0,3	0,3
Higher emp. of older workers (+10 pp.)	0,0	-0,1	-0,6	-0,6	-0,5	-0,5	-0,5
Higher migration (+3320%)	0,0	-0,1	-0,4	-0,6	-0,6	-0,6	-0,5
Lower migration (-3320%)	0,0	0,1	0,4	0,7	0,7	0,7	0,5
Lower fertility	0,0	0,0	0,0	0,3	0,8	1,3	2,1
Risk scenario	0,0	0,0	0,2	0,4	0,5	0,6	0,6
Policy scenario: linking retirement age to increases in life expectancy	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Reform Breakdown	0,0	0,0	-0,1	1,0	1,5	2,3	2,9

Source: Commission Services

Higher life expectancy

Higher life expectancy increases public expenditures with about 0.1 % 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, the maximum increase in the retirement age is 1 year every 5 years, and this maximum increase already takes place in the baseline until 2045. Therefore, it is only from 2050-2070 that the retirement age is affected, 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 and higher employment 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 2 year increase is not twice as large as the effect from a 1 year increase.



Source: Own calculations

Higher/lower labour productivity and risk-scenario

Since pensions are indexed in line with nominal wages, a change in the labour 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, Lower and Higher employment rate

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 and vice versa for a lower employment rate.

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.

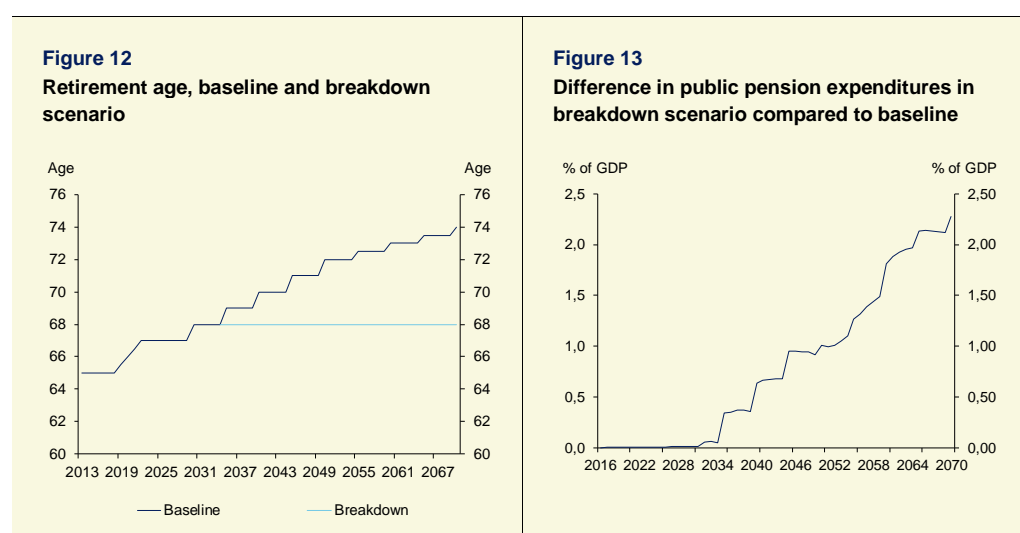
Policy scenario

Since the retirement age is already linked to life expectancy in the baseline scenario, the impact of the policy scenario is very limited.

Reform breakdown scenario

The reform breakdown scenario investigates the effect on pension expenditures if the danish indexation mechanism of the statutory VERP-age and OAP-age breaks down after 2030. The statutory VERP-age is 65 years and the statutory OAP-age is 68 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 71 years and 74 years in 2070 *cf. figure 12*.

Public pension expenditures are projected to increase gradually with 2.3 pct. points of GDP from 2030 to 2070, if the indexation mechanism is suspended from 2030, because the period individuals can claim public pensions is prolonged as life expectancy increases *cf. figure 13*.



Source: Own calculations

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

Since the 2006-report, pension reforms have contributed to a lowering of the change in pension expenditures from +3.2 % of GDP in the 2006-report to -1.9 % of GDP in 2018, *cf. table 18*.

Compared to the 2015-report, expenditures increase with 1.2 % of GDP in the current projections, which is mainly comes from a higher effect from the dependency ratio and also a higher effect from the benefit 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

Average annual change in public pension expenditure to GDP during the projection period under the 2006, 2009, 2012 and 2015 projection exercises

	Public pensions to GDP	Dependency ratio	Coverage ratio	Employment effect	Benefit ratio	Labour intensity	Residual (incl. Interaction effect)
2006 *	3,20	7,21	-2,80	-0,39	-0,48	:	-0,33
2009 **	0,11	6,47	-4,95	-0,14	-0,53	:	-0,73
2012 ***	-1,15	5,66	-4,34	-0,48	-1,21	0,01	-0,79
2015****	-3,11	3,63	-4,22	-0,47	-1,38	0,02	-0,68
2018*****	-1,90	4,61	-4,82	-0,29	-0,64	-0,02	-0,73

Note: *The Table presents the average annual change of pension expenditure and the contributions of the underlying component to that change. * 2004 - 2050, ** 2007 - 2060, *** 2010 - 2060, **** 2013 - 2060, ***** 2016 - 2070. Please note that the five components do not add up because of a residual component.*

Source: Commission Services

The change compared to the 2015-report is further explained in *table 19*.

There AWG 2015-projections of public pension expenditure and the AWG 2018-projections are very similar for the part of the projection period, that is covered by both projections, that is 2016-2060, partly because there has been no major pension reforms in the period between AWG 2015 and AWG 2018. The Retirement Reform 2017, has little impact on the public pension expenditures, *cf. above*. From 2060 to 2070 public pension expenditures increase due to relatively large cohorts of new pensioners, *cf. above*.

Table 19**Decomposition of the difference between 2015 and the new public pension projection (% of GDP)**

	2016	2020	2030	2040	2050	2060	2070
Ageing report 2015	9,8	8,9	8,5	8,1	7,6	7,3	
<i>Change in assumption</i>	:	:	0,1	0,2	0,3	0,2	:
<i>Improvement in the coverage or in the modelling</i>	:	:	:	:	:	:	:
<i>Change in the interpretation of constant policy</i>	:	:	:	:	:	:	:
<i>Policy related changes</i>	0,0	-0,1	-0,1	0,0	0,0	0,0	0,1
<i>Residual</i>	0,1	0,5	0,1	-0,1	-0,1	0,0	
New projection	10	9,3	8,6	8,2	7,8	7,5	8,1

Source: Own calculations

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

4.1 Old-age pension and disability pension

4.1.1 General description of the model

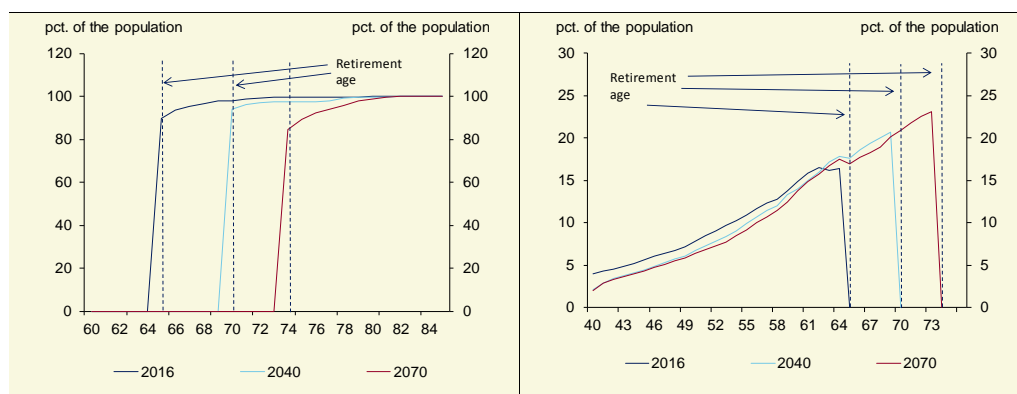
The principle behind the projection is to keep the shares of the population in the various schemes constant (broken down by age, gender and ethnic origin). The number of recipients of public pensions is then driven by the demographic changes of the population.

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*.

Figure 14
Effect of indexation: Share of population on old age pension

Figure 15
Effect of indexation: Share of population on disability pension



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.

Furthermore, in the last 5 years before the old-age retirement, a flattening of the disability pension profile is currently observed. However, this is mainly due to people receiving VERP benefits instead of disability pension. As VERP becomes less utilized in the projection period, the flattening of the profile is removed from the projection.

4.1.2 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.

4.1.3 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 2016 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 % of GDP, public expenditures on old-age pension decreases with 0.12 % of GDP.

The tax rates used in the projections are based on the implicit tax rates in 2016, *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 (2016)

	Tax rate
Old-age pension	24,3
Disability pension	30,0
VERP	29,4
Civil servants pension	40,8

Source: Own calculations

4.2 VERP

4.2.1 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

4.3.1 Institutional context

The AWG calculations relating to private pensions are carried out with a model developed by the Ministry of Finance and DREAM¹.

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

4.3.2 Assumptions and methodologies applied

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

4.3.3 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 are 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 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.

¹ Danish Rational Economic Agents Model (www.dreammodel.dk).

- 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 and LD. 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 annuity while LD is paid out as capital pensions. 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 =age and t =time. Contribution ratio is 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:

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

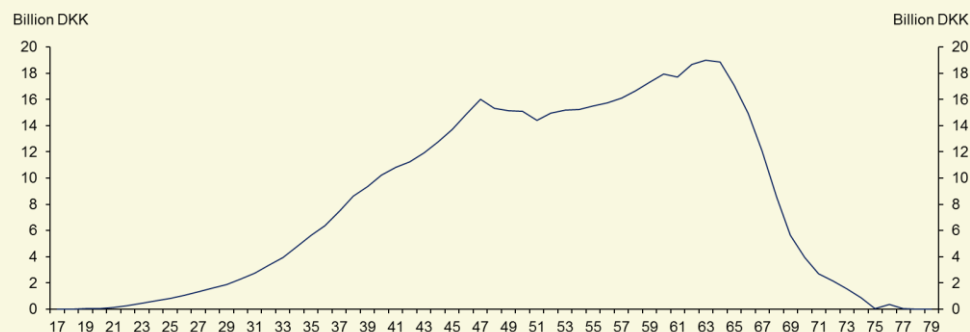
The benefit share is defined as the share of pension wealth in the previous period, which is paid out as benefits. The profile for the benefit share moves in line with increases in the retirement ages.

Pension wealth

Given the formulas to calculate contributions and benefits, assumptions on interest rate at 5 % and constant tax rate on pension yields at 15.3 %, pension wealth is given.

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

Figure 16
Pension wealth, rate pensions, by age



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 2016 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	40,0
Capital pensions (ETT-scheme)	42,8
Capital pensions (TTE-scheme)	0
ATP	38,9

Source: Own calculations

Methodological annex

Table A1
Economy wide average wage at retirement evolution (in 100.000 thousands euro)

	2016	2020	2030	2040	2050	2060	2070
Economy-wide average wage	142.018	163.198	234.136	335.509	487.093	699.264	970.970
Economy-wide average wage at retirement	297	305	425	443	390	585	921

Note: 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.

Source: Commission Services and own calculations

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 53,500 (euro 7,200) in 2017.

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 5.000 (euro 670) in 2018 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 45.000 kr. (euro 6.000) in 2018.

Disability pension

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.

	2016	2020	2030	2040	2050	2060	2070
Age group -54	2,7	2,2	1,8	1,9	1,8	1,8	1,7
Age group 55-59	12,6	12,0	10,7	11,4	10,8	10,7	10,8
Age group 60-64	16,0	17,0	16,2	16,0	16,4	15,7	15,7
Age group 65-69	0,0	3,4	12,0	19,2	20,2	18,7	18,4
Age group 70-74	0,0	0,0	0,0	0,0	6,7	14,3	17,6
Age group 75+	0,0	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*.

Contribution

This is described in *part 3 and 4*.

Alternative pension spending decomposition

Tabel A3

Factors behind the change in public pension expenditures between 2016 and 2070 (in percentage points of GDP) - pensions

	2016-20	2020-30	2030-40	2040-50	2050-60	2060-70	2016-70
Public pensions to GDP	-0,7	-0,7	-0,4	-0,4	-0,2	0,5	-1,9
Dependency ratio effect	0,5	1,5	1,4	0,0	1,7	1,8	7,0
Coverage ratio effect	-0,8	-1,3	-0,9	-0,3	-0,8	-0,2	-4,4
<i>Coverage ratio old-age*</i>	-0,3	-1,2	-1,0	-0,5	-0,9	-0,1	-3,8
<i>Coverage ratio early-age*</i>	-2,6	-1,3	0,0	-0,5	-0,1	0,1	-4,3
<i>Cohort effect*</i>	-0,4	-1,5	-1,1	0,9	-0,9	-1,0	-4,1
Benefit ratio effect	-0,1	-0,3	-0,3	0,0	0,2	-0,1	-0,7
Labour Market/Labour intensity effect	-0,2	-0,2	-0,1	0,1	-0,3	-0,1	-0,9
<i>Employment ratio effect</i>	-0,2	0,0	0,0	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	0,0
<i>Career shift effect</i>	0,0	-0,2	-0,1	0,0	-0,3	0,0	-0,6
Residual	0,0	-0,3	-0,6	-0,1	-1,0	-1,0	-2,9

Source: Commission Services

Tabel A4

Factors behind the change in public pension expenditures between 2016 and 2070 (in percentage points of GDP) - pensioners

	2016-20	2020-30	2030-40	2040-50	2050-60	2060-70	2016-70
Public pensions to GDP	-0,7	-0,7	-0,4	-0,4	-0,2	0,5	-1,9
Dependency ratio effect	0,5	1,5	1,4	0,0	1,7	1,8	7,0
Coverage ratio effect	-0,7	-1,1	-0,7	-0,2	-0,8	-0,2	-3,7
<i>Coverage ratio old-age*</i>	-0,2	-0,9	-0,7	-0,3	-0,9	-0,1	-3,0
<i>Coverage ratio early-age*</i>	-2,5	-1,2	0,1	-0,5	0,0	0,1	-4,0
<i>Cohort effect*</i>	-0,4	-1,5	-1,1	0,9	-0,9	-1,0	-4,1
Benefit ratio effect	-0,2	-0,6	-0,6	-0,3	0,1	-0,1	-1,7
Labour Market/Labour intensity effect	-0,2	-0,2	-0,1	0,1	-0,3	-0,1	-0,9
<i>Employment ratio effect</i>	-0,2	0,0	0,0	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	0,0
<i>Career shift effect</i>	0,0	-0,2	-0,1	0,0	-0,3	0,0	-0,6
Residual	0,0	-0,3	-0,5	0,0	-0,8	-1,0	-2,6

Source: Commission Services

ANNEXES (for additional information)

The Danish pension system can be divided into three pillars:

1. The **first pillar** consists primarily of the public old-age 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.

1. First Pillar Pensions

The old-age pension and the disability pensions 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 72,750 (euro 9,750) annually in 2016 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 316,200 (euro 42,400) 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 556,400 (euro 74,600).

The pension supplement is DKK 76,800 (euro 10,300) annually for single pensioners and DKK 37,650 (euro 5,050) annually for married or cohabiting pensioners in 2016. 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 69,800 (euro 9,400), the phase-out rate is 30.9 % and the supplement is completely phased out at an additional income of DKK 324,000 (euro 43,400).

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 16,600 (euro 2,250) in 2016. To receive the supple-

mentary pension benefit, the pensioner cannot have more than DKK 82,600 (euro 11,100) in liquid wealth.

The full benefit is received if the pensioner does not have income (apart from old-age pension) in excess of DKK 20,100 (euro 2,700) for singles and DKK 39,000 (euro 5,200) 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 69,800 (euro 9,400) for singles and DKK 140,000 (euro 18,800) for married or cohabiting couples.

In 2016 the old-age pension expenditure amounted to 6.0 % of GDP.

Disability pension

The disability pension is DKK 232,600 (euro 31,200) annually in 2016 for singles and DKK 193,600 (euro 25,950) 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 74,300 kr. (euro 10,000) for singles and DKK 117,700 (euro 15,800) 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 percent of the income above the threshold; although only with 15 percent if the spouse also has a right to a social pension (disability or old-age pension).

In 2016 the disability pension expenditure amounted to 2.3 % 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 37 % of GDP in 2016.

In 2016 benefits from ATP amounted to 0.8 % 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 % of GDP in 2016. In 2012 benefits from LD amounted to 0.2 % of GDP.

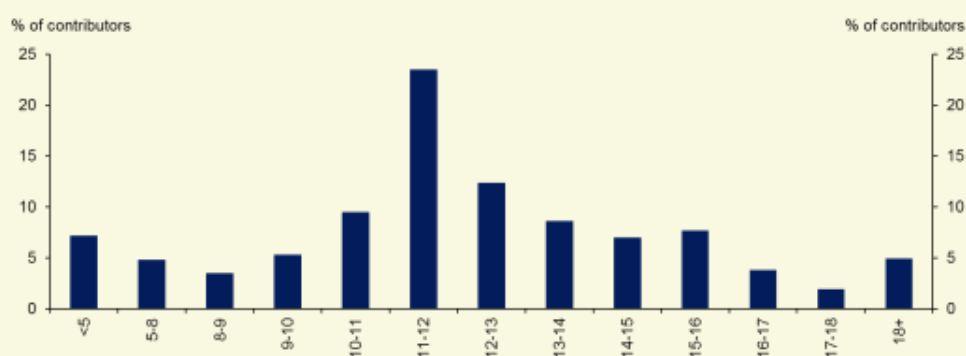
2. Second Pillar Pensions

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 % of wage earners between 25 and 59 years.

Total savings in the labour market pension schemes are estimated at 105 % of GDP in 2016.

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 % of those with contributions have a contribution rate between 10 and 17 %, cf. *figure A1*.

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



Source: Ministry of Economic affairs and the Interior

Furthermore, the coverage of the occupational schemes has also increase from 73 % in 1995 to more than 90 % in 2012, cf. *figure A2*. 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 % of GDP in 1980 to 4.8 % of GDP in 2016. If private contributions are also included, pension contributions increased from 2.3 % of GDP in 1980 to 5.5 % of GDP in 2016 (Contributions to the Labour Market Supplementary Pension Scheme and Employee's Capital Scheme are not included).

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 2016 benefits from occupational and private schemes amounted to 3.4 % of GDP (Benefits from the Labour Market Supplementary Pension Scheme and the Employee's Capital Scheme are not included).

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 % 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 1,000 persons receive civil servant pension in 2060 compared to around 165,000 persons in 2016.

In 2016 the civil servant pension expenditure amounted to 1.2 % of GDP.

3. 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 28% of GDP in 2016

Voluntary early retirement pension

The basic benefit paid in the VERP is DKK 201,000 (euro 26,900) annually, if retiring before the age of 62½ in 2017. This amount is further reduced based on the person's pension wealth. As a general rule, VERP benefits are reduced by 3 per cent of pension wealth above a threshold of DKK 308,000 (euro 41,300).

If retiring at the age of 62½ or later, the basis benefit is raised to DKK 220,740 (euro 29,600) in 2017. In 2016 the VERP expenditure amounted to 0.6 % 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:

1. 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.
2. 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:

4. 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*.
5. 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.
6. 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 are 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

Source: Own calculations