Finnish Country Fiche on Pensions

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Ministry of Finance
Finnish Centre for Pensions
The Social Insurance Institution of Finland

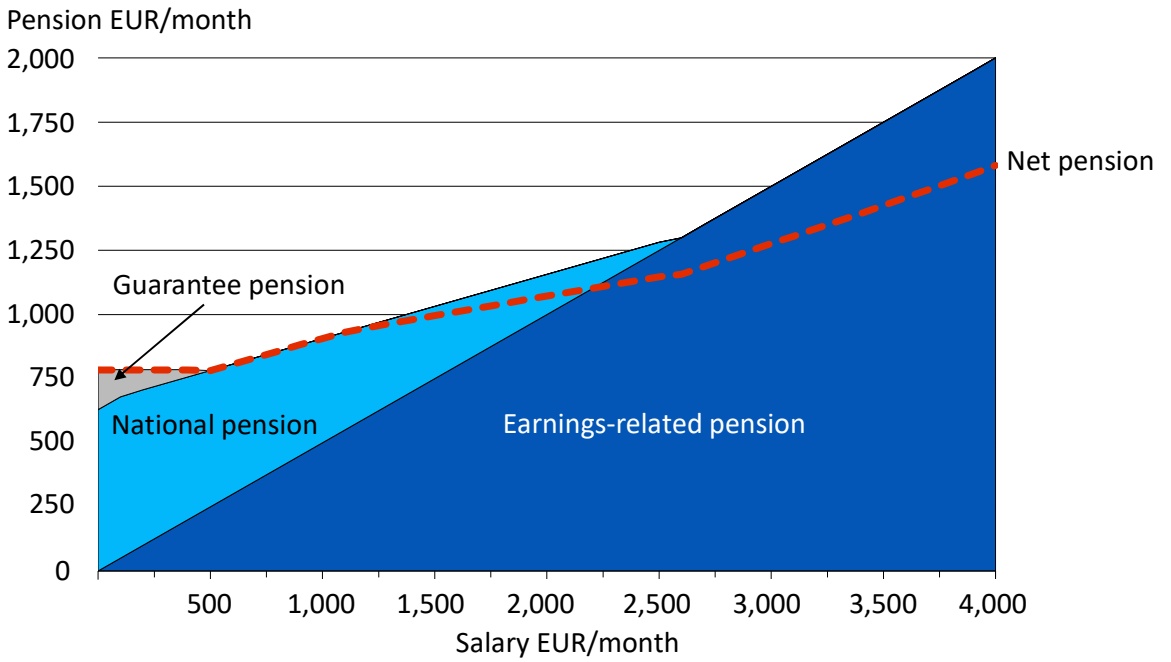
1. Overview of the pension system

1.1. Description

The Finnish public pension scheme (1st pillar) consists of two statutory pension schemes: a national pension scheme guaranteeing a minimum pension to all residents and an employment-based, earnings-related pension scheme.

The statutory schemes are closely linked, with the amount of national pension depending on the size of the earnings-related pension benefits. Increases in the earnings-related pension reduce the national pension by 50 per cent. If the earnings-related pension is above a defined level[1], the national pension is not paid at all. In addition, a guarantee pension is paid if the total pension benefit would otherwise remain below certain threshold.[2] These characteristics of the system are illustrated in Figure 1. At the end of 2019, approximately one third of the pensioners who received an earnings-related pension also received a national pension. At the same time, approximately 6% of pensioners only received national pension and around 7% of pensioners received guarantee pension. Taking all pension types into account, pension recipients in total accounted for 28% of the population at the end of 2019.

FIGURE 1 – TOTAL PENSION IN 2019



Source: Finnish Centre for Pensions

The *earnings-related pension system* is based on a tripartite arrangement, which consists of employees, employers and the government. Private employees belong to four different sector-related schemes run by private pension providers. There are almost 30 pension funds and companies of different sizes. The pension companies compete with each other, and the employer decides among the pension providers. However, there is a shared liability among the funds in the event of bankruptcy. The Finnish Centre for

[1] In 2020, this level is EUR 1368.21 per month for people living single and EUR 1226.13 for people who live in a relationship; full national pension is EUR 662.86 and EUR 591.79 respectively.
[2] In 2020, this level is EUR 834.52 per month.

Pensions is the statutory central body of the private sector pension schemes. The Ministry of Social Affairs and Health is in charge of the general supervision of the earnings-related schemes.

Employees in the central government and local government as well as employees of the Finnish Evangelical-Lutheran Church have their own earnings-related scheme, which is managed by the public sector pension provider Keva. Today the benefits in the different earnings-related pension schemes are harmonised but these schemes are separate mainly due to considerable differences in their financing.

The lowest eligibility age for old-age retirement of the earnings-related pension system is set to increase gradually by two years. From 2018, the lowest old-age retirement age has risen from 63 years by three months for each age cohort. The increase in the eligibility age will continue until the lowest old-age retirement age reaches 65 years in 2027. The upper age limit of the old-age pension is currently 68 years and it will rise to 69 years for those born between 1958 and 1961 and to 70 years for those born in 1962 or later.

The lowest old-age retirement age is linked to life expectancy as of 2030, such that the time spent working in relation to the time spent in retirement will remain at the 2025 level[3]. The annual increase in the retirement age is limited to a maximum of two months. To maintain the time spent working in relation to the time spent in retirement, the development of working careers as well as the economic and social sustainability of the entire earnings-related pension system will be regularly analysed. Development will be monitored on a tripartite basis, led by the Ministry of Social Affairs and Health, at five-year intervals starting in 2026.

Alongside the disability pension, the earnings-related pension scheme contains a years-of-service pension, which can be applied for at the age of 63. From 2030, the minimum age limit for the years-of-service pension will be adjusted so that it is two years lower than the minimum age limit for the old-age pension. The requirement for receiving the pension is a 38-year working career, which, with a few minor expectations, has been in work that is physically or mentally wearing. A further requirement of the years-of-service pension is an impairment of the individual's working capacity due to illness, handicap or disability as well as an impairment of opportunities to continue in work. The years-of-service pension benefit is smaller than the disability pension benefit, because it does not include the projected pension component[4]. The projected period of the disability pension, is linked to the lower limit of the old-age pension, which increases these pension benefits as the retirement age rises.

The earnings-related pension scheme also contains a partial early old-age pension. An individual can draw a part of the accrued old-age pension at the age of 61 years; in 2026 the minimum age limit will rise to 62 years. From 2027, the age limit will be three years lower than the lowest old-age retirement age. Either 25% or 50% of the accrued pension can be drawn. The drawn part of the pension benefit is reduced permanently by 0.4% for each month the pension is drawn early, i.e. 4.8% per year. No pay or working hours monitoring is associated with the partial early old-age pension. The partial early old-age pension does not prevent an individual from receiving an unemployment benefit nor reduces the unemployment benefit.

The earnings-related pension is accumulated according to the following rules. Pensions accrue at the rate of 1.5 per cent of wages a year. However, there is a higher accrual rate of 1.7 per cent for individuals aged 53–62 until 2025 as a transition arrangement from the old pension rules.[5] There is no ceiling for

[3] This ratio, which is kept constant by adjusting the lowest old-age retirement age, is calculated as follow: the difference between the lowest old-age retirement age and 18 years is divided by the life expectancy at the lowest old-age retirement age. The life expectancy at a given time is calculated with the mortality statistics for the latest 5 years.

[4] Projected period is the period between retirement on disability pension (pension event) and the lowest old-age retirement age. The projected period increases, under certain conditions, the disability pension to compensate for the pension not accrued due to disability retirement prior to the minimum old-age retirement age.

[5] During the transition period the employee's pension contributions will be correspondingly 1.5 percentage points higher than they otherwise would be.

the pension benefit or contributions. Upon retirement, the pension is multiplied by a life expectancy coefficient. This coefficient is calculated for each birth cohort in the year they turn 62. It functions to eliminate the increases in the capital value of pensions due to increases in life expectancy after 2009. The life expectancy coefficient will be calculated in a more lenient manner than currently as of 2027, at which time the retirement age for all age cohorts will be 65 years[6]. If an individual does not draw the old-age pension immediately upon reaching the earliest old-age retirement age, the accrued pension will be adjusted by a 0.4% increment for each month of deferred retirement.

There are two indices in the earnings-related pension system. The first (pre-retirement index) valorises past earnings to the present level when computing the pension at the time of retirement. This "*wage coefficient*" puts a weight of 80% on wages and 20% on prices. The second (post-retirement index) aims to keep the purchasing power of earnings-related pensions ahead of inflation. In the *"earnings-related pension index"*, consumer prices have a weight of 80% and wages have a weight 20%.

The financing of earnings-related pensions is a combination of a funded and a pay-as-you-go (PAYG) system. Pension contributions come from both employers and employees. A fraction of earnings-related pensions are financed from the state budget; the central government contributes to farmers' and self-employed persons' pension funding to the degree that the contributions are not sufficient. It also finances seafarers' pensions by a fixed percentage.

In the private sector, the pre-funded scheme covers approximately one quarter of earnings-related pension outlays. The rest (3/4) is financed through a PAYG system. Despite the partially funded pension system, Finland's earnings-related pension scheme is entirely of the defined-benefit type. The pre-funding is collective in the sense that it has no direct effect on the size of the pension. The main purpose of the pre-funding is to cushion the increase in pension contributions as the pension expenditure has increased due to the retirement of large age cohorts.

Pension-tested national pensions are administered by the Social Insurance Institution and supervised by the Parliament. National pensions are intended to provide a basic retirement income for those whose earnings-related pensions are small or non-existent. All residents of Finland are eligible for the national pension if they have lived in Finland for at least 3 years after having reached the age of 16 years. The retirement age for the old age pension is the same as in the earnings-related scheme. However, drawing the pension before the age of 65 is considered early retirement, and the amount of pension is permanently reduced by 0.4% for each month drawn before the age 65. For those born in 1962 and later, early retirement is no longer possible, as the retirement age rises to 65 years.

The national pension is also payable as a disability and survivors' pension like the earnings-related pensions. The supplementary means-tested social assistant components for pensioners are the following: pensioners' housing allowance, pensioners' care allowance, front-veterans' supplements and child increase (for pensioners who have children). National pensions are financed by the state. The purchasing power of national pensions is kept intact by indexation to the consumer price index. The full level of national pension has also been occasionally raised.

The purpose of the *guarantee pension* is to provide residents of Finland with a minimum pension if their total pension income before taxes does not exceed a certain threshold (EUR 834.52 per month in 2020). All residents of Finland are eligible for the guarantee pension if they have lived in Finland for at least 3 years after having reached the age of 16 years. The amount of the guarantee pension is affected by any other pension income one may have from Finland or abroad. A full guarantee pension is payable only

[6] Currently, the life expectancy coefficient for a given year i is defined by the formula E(2009,62)/E(i,62) where E(i,62) is the longevity indicator, defined as the capital value of a unit pension beginning at age 62 using the mortality of the 5 previous years. This way the effect that changes in longevity have on the capital values of pensions is neutralized in the long run. As of 2027, the life expectancy coefficient is defined by (E(2009,62)/E(2026,62))*(E(2026,65)/E(i,x)) where x is current general retirement age. This results in a mitigation of the life expectancy coefficient so the rise in life expectancy is not taken into account twice as the retirement age will be linked to life expectancy.

to those with no other pension income. Other pension income is deducted in full from the full amount of the guarantee pension. The care allowance for pensioners, the front-veterans' supplements or the child increase supplementing a pension do not reduce the amount of guarantee pension payable. The guarantee pension is also not reduced by earnings, capital income or assets, or by the informal care allowance. Just as other pensions, the guarantee pension affects both the amount of housing allowance payable and the amount of social assistance paid to a family. Guarantee pension is indexed to prices and financed by the state. The full level of guarantee pension has also been occasionally raised.

Voluntary pension schemes (the second and third pillar) have played only a minor role in Finland due to the relatively high net replacement ratio of public pensions, the lack of pension ceilings and full coverage of the systems. From the perspective of pension contributions, the statutory pension provision and supplementary provision accounted for 95% and 5% of the total pension provision in 2018, respectively. Thus, by international comparison, the share of supplementary pension provision to the total pension provision is small.

TABLE 2 – QUALIFYING CONDITIONS FOR RETIREMENT

			2019	2030	2040	2050	2060	2070
Qualifying condition for retiring with a full pension	Statutory retirement age - men		63.5	65.1	65.8	66.5	67.1	67.7
	Statutory retirement age - women		63.5	65.1	65.8	66.5	67.1	67.7
	Minimum requirements	Contributory period - men	38	38	38	38	38	38
		Retirement age - men	63	63.3	63.9	64.6	65.2	65.8
		Contributory period - women	38	38	38	38	38	38
		Retirement age - women	63	63.3	63.9	64.6	65.2	65.8
Qualifying condition for retirement *without* a full pension	Early retirement age - men		61	62.3	63.0	63.7	64.3	64.8
	Early retirement age - women		61	62.3	63.0	63.7	64.3	64.8
	Penalty in case of earliest retirement age		0.4% per month, i.e. 4.8% per year - either 25% or 50% of the accrued pension can be drawn					
	Bonus in case of late retirement		0.4% per month, i.e. 4.8% per year - until the upper age limit of the old-age pension					
	Minimum contributory period - men		:	:	:	:	:	:
	Minimum contributory period - women		:	:	:	:	:	:
	Minimum residence period - men		National and guarantee pension: 3 years after having reached the age of 16 years					
	Minimum residence period - women		National and guarantee pension: 3 years after having reached the age of 16 years					

Source: Finnish Centre for Pensions, Ministry of Finance (Finland)

According to commonly agreed EU methodology, there are several *special pension schemes* in Finland. Almost all special pension schemes are included in the projected total pension expenditure. Special pension schemes not included in the projection constitute only a very small share of total pension expenditure, and therefore their omission does not affect the results in practice. Expenditures of main special pension schemes are presented in Table 7 in Section 3.1.

Years-of-service pension (described in more detail above) and the Seafarer's Pensions Act (MEL) fall in the difficult conditions category. Seafarers' effective accrual rate or the equivalent used to be higher, but not any longer. In addition, the State finances one third of expenditures, as stated in the Seafarer's Pensions Act.

The State pays the share of the expenditure that contribution income does not cover for the Self-Employed Persons' Pensions Act (YEL) and the Farmers' Pensions Act (MYEL). Farmers' early retirement aid is fully financed by the State, but it closed to new entrants in 2018 and it will phase out in the next two decades.

Public sector employees are categorised as special pensioners as their conditions for receiving disability pension are less stringent than in the private sector. In addition, they have some more favourable provisions that are phasing out.

There are several small or very small pension schemes that are not separately modelled. These are the military and defence employees' pension, MPs adjustment pension and adjustment allowance, the pension of the President of the Republic and pension for the dancers of Finnish National Ballet, whose retirement age is below the normal retirement age.

Finally, there are State financed supplementary pension for (award-winning) artists and athletes, journalists (phased out) and spouses of diplomats. These supplementary pensions are not included in the projection as they are not paid from the earnings-related pension system.

1.2. Recent reforms of the pension system included in the projections

A major pension reform came into force in Finland as of 2017. The reform makes provision for an increase in life expectancy and its aim is to promote employment and secure the funding of earnings-related pensions, an adequate level of pensions and equality between generations and genders.

1.3. Description of the actual 'constant policy' assumptions used in the projection

The projections are based on the current pension legislation and other guiding regulations with one exception.

The indexation rules applied to the national pension and guarantee pension differ from the current legislation. According to law, national pensions are adjusted by the consumer price index. However, national pensions and guarantee pensions have been adjusted discretionarily every now and then to increase their purchasing power. In the projections, from 2025 onwards, it is assumed that national and guarantee pensions are adjusted by a wage index in line with the common methodology agreed by the AWG. Hence, increases are made to the real value of national and guarantee pensions so that the increases do not lag behind general growth in earnings. This reflects better the 'no-policy-change' assumption that the 'safety net' role of minimum pension is assumed to remain in place.

2. Overview of the demographic and labour force projections

2.1. Demographic developments

Table 2 provide an overview of the demographic developments until 2070. According to the population projections, Finland's total population is expected to increase modestly until the middle of 2020s, after which it begins to slowly decrease. Between 2019 and the end of the projection period in 2070, total population is expected to decrease by 490 thousand or 0.3 percent.

The old-age dependency ratio (the ratio of persons aged 65 and above to 20–64-year-olds) is projected to increase during the whole projection period. In 2019, the old-age dependency ratio was 38.9%, and it is projected to rise to 62.5% in 2070. The projected increase in the old-age dependency ratio is a consequence of the current age structure in Finland. However, given that life expectancy is expected to steadily increase, the old-age dependency ratio will continue to increase even after the impact of the baby-boom generations has faded.

In 2019, life expectancy for men and women were 79.5 and 84.8 years, respectively. By 2070, life expectancy is projected to rise to 86.1 years for men and 90.4 years for women. Thus, life expectancy at birth increases by 5.6 years for women and 6.6 years for men between 2019 and 2070. Life expectancy at 65, which approximates the time spent in retirement, rises by approximately 4.5 years over the projection period for both men and women.

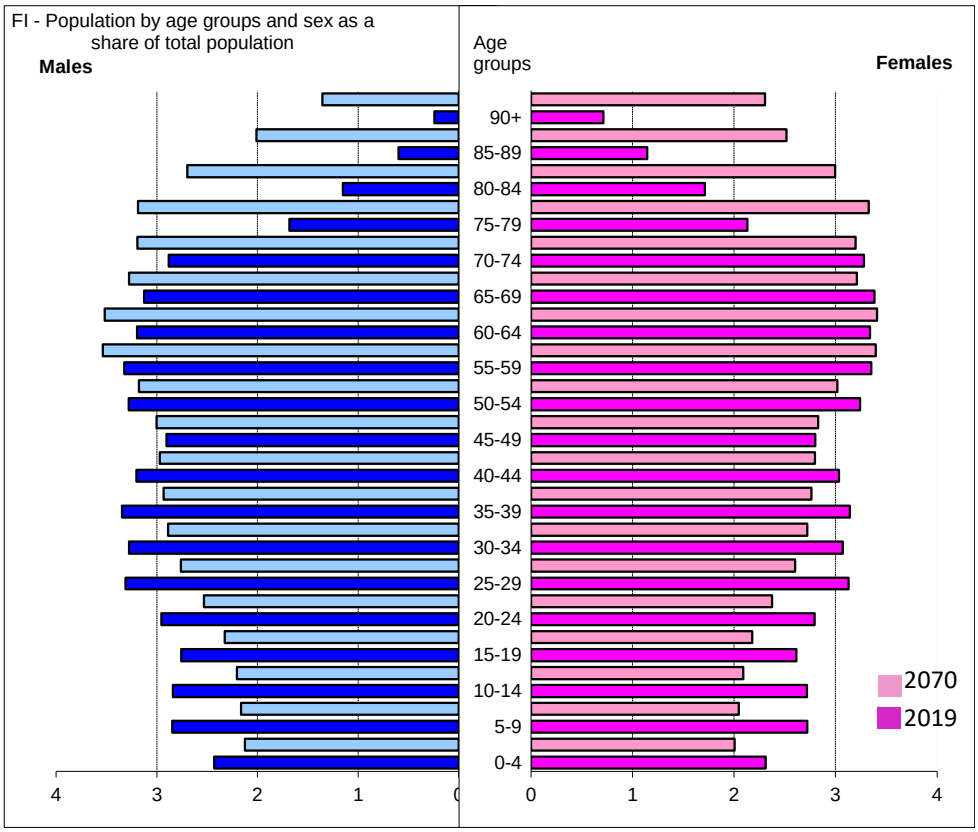
The age pyramid presented in Figure 2 shows the age-distribution of the population in 2019 and 2070. The share of persons aged 75 and above is projected to increase significantly, as life expectancy for both women and men are set to rise. Over the same period, the share of persons aged below 45 years is projected to decrease due to low fertility.

TABLE 2 – MAIN DEMOGRAPHIC VARIABLES

	2019	2030	2040	2050	2060	2070	peak value	peak year	change 2019-2070
Population (thousand)	5 523	5 516	5 420	5 283	5 144	5 032	5538.7	2023	-490.4
Population growth rate	0.1	-0.1	-0.2	-0.3	-0.2	-0.2	0.1	2020	-0.3
Old-age dependency ratio (pop 65+ / pop 20-64)	38.9	46.8	48.4	52.3	58.2	62.5	62.5	2070	23.6
Old-age dependency ratio (pop 75+ / pop 20-74)	13.5	20.5	23.7	24.2	26.8	30.8	30.8	2070	17.3
Ageing of the aged (pop 80+ / pop 65+)	25.2	32.5	38.4	39.4	38.0	41.7	41.7	2070	16.5
Men - Life expectancy at birth	79.5	80.9	82.3	83.7	85.0	86.1	86.1	2070	6.6
Women - Life expectancy at birth	84.8	86.0	87.3	88.4	89.4	90.4	90.4	2070	5.6
Men - Life expectancy at 65	18.9	19.8	20.8	21.7	22.7	23.5	23.5	2070	4.6
Women - Life expectancy at 65	22.3	23.3	24.2	25.1	26.0	26.8	26.8	2070	4.5
Men - Survivor rate at 65+	86.2	88.4	90.1	91.6	92.8	93.8	93.8	2070	7.6
Women - Survivor rate at 65+	93.2	94.2	95.0	95.7	96.3	96.8	96.8	2070	3.6
Men - Survivor rate at 80+	58.3	63.9	68.5	72.6	76.2	79.4	79.4	2070	21.1
Women - Survivor rate at 80+	76.0	79.6	82.5	85.0	87.2	89.1	89.1	2070	13.1
Net migration (thousand)	17.6	11.3	11.5	12.2	12.7	13.2	17.6	2019	-4.4
Net migration over population change	2.5	-2.0	-0.9	-0.8	-1.0	-1.2	10.0	2023	-3.7

Source: EUROSTAT and European Commission

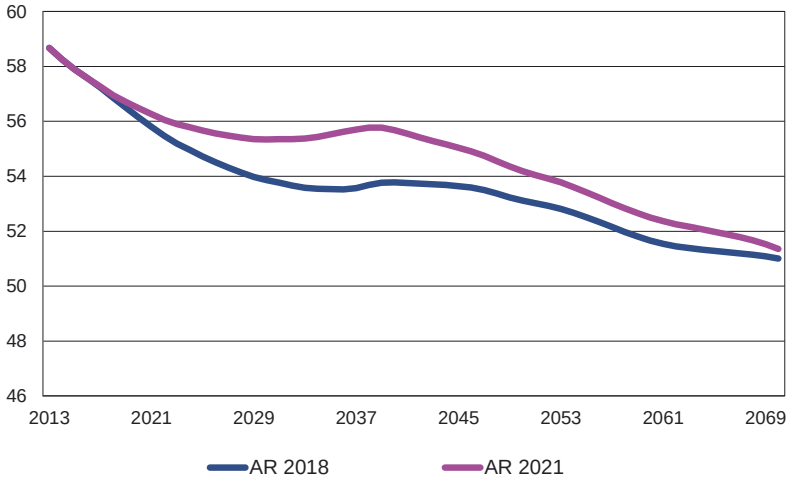
FIGURE 2 – AGE PYRAMID, COMPARISON BETWEEN 2019 AND 2070



Source: EUROSTAT and European Commission

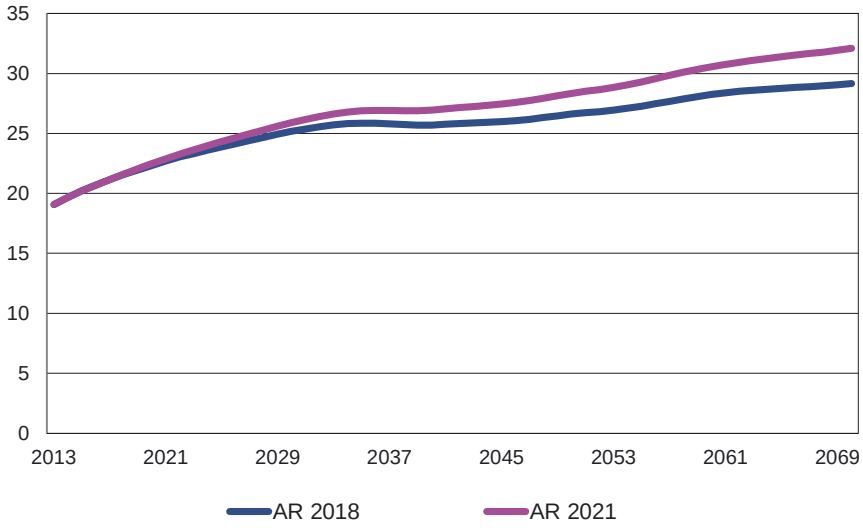
In comparison to population projections in AR 2018, the share of 20–64 year-olds to total population is greater throughout the entire projection period (Figure 3). The share of 65 year-olds is projected to increase more (Figure 4), although total population aged 65 years and older is expected to increase slightly less compared to previous projections (Figure 5). Moreover, between 2019 and 2070, population in nearly all age groups below 55 are projected to decrease more than projected in the previous report.

FIGURE 3 – SHARE OF 20-64 YEAR-OLDS TO TOTAL POPULATION IN AR 2018 AND AR 2021, %



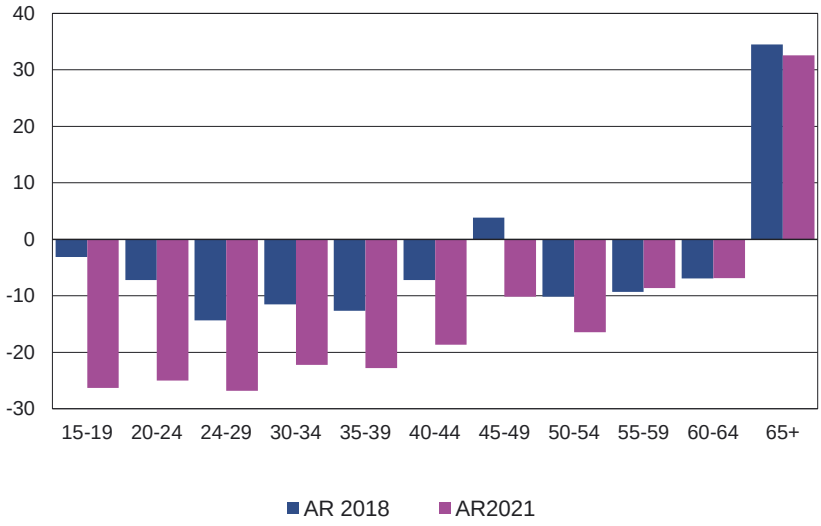
Source: EUROSTAT and European Commission

FIGURE 4 – SHARE OF 65 YEAR-OLDS TO TOTAL POPULATION IN AR 2018 AND AR 2021, %



Source: EUROSTAT and European Commission

FIGURE 5 – POPULATION CHANGE BY AGE GROUP BETWEEN 2019 AND 2070 IN AR 2021 AND AR 2018, %



Source: EUROSTAT and European Commission

2.2. Labour force

Labour force participation rates (LFPR) are projected to increase for older workers. The projected increase is primarily due to delayed retirement, as the minimum eligibility age for old-age retirement is linked to the increasing life expectancy. The labour force projections, which are made using the Cohort Simulation Model (CSM), account for the gradual increase in the retirement age. In addition, people also live longer and healthier lives and they will consequently have to prolong their careers in order to finance longer lifespans.

For people aged 55 to 64 years, the LFPR will increase quite steadily from 71.5% in 2019 to 81.4% in 2070, cf. Table 3. At the same time, the LFPR for people aged 65 to 74 years will increase over two-fold from 11.5% in 2019 to 24.8% in 2070.

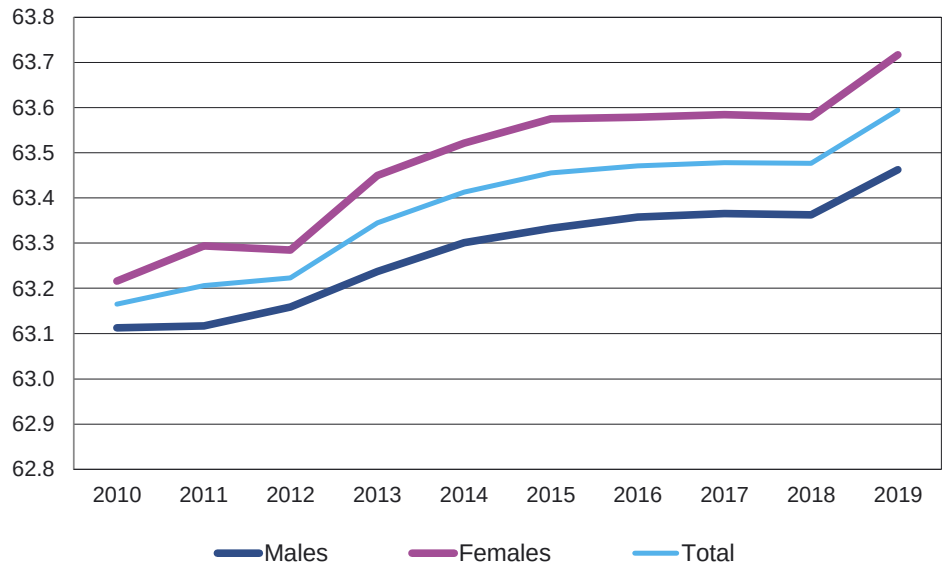
TABLE 3 – PARTICIPATION RATE, EMPLOYMENT RATE AND SHARE OF WORKERS FOR THE AGE GROUPS 20-64, 20-74, 55-64 AND 65-74

	2019	2030	2040	2050	2060	2070	peak value	peak year	change 2019-2070
Labour force participation rate 20-64	82.2	82.6	83.6	84.2	84.7	85.0	85.0	2070	2.8
Employment rate of workers aged 20-64	77.1	77.6	78.4	79.1	79.5	79.7	79.7	2070	2.6
Share of workers aged 20-64 in the labour force 20-64	93.9	94.0	93.8	93.8	93.9	93.8	94.1	2024	-0.1
Labour force participation rate 20-74	69.2	69.8	71.9	71.8	72.0	73.2	73.2	2070	4.0
Employment rate of workers aged 20-74	65.1	65.7	67.6	67.5	67.7	68.9	68.9	2070	3.8
Share of workers aged 20-74 in the labour force 20-74	94.0	94.1	93.9	94.0	94.1	94.1	94.2	2024	0.1
Labour force participation rate 55-64	71.5	69.6	74.8	77.7	79.6	81.4	81.4	2070	9.9
Employment rate of workers aged 55-64	66.8	65.0	69.7	72.4	74.3	76.0	76.0	2070	9.2
Share of workers aged 55-64 in the labour force 55-64	93.4	93.5	93.2	93.2	93.3	93.3	93.6	2025	-0.1
Labour force participation rate 65-74	11.5	11.5	13.3	16.9	20.7	24.8	24.8	2070	13.3
Employment rate of workers aged 65-74	11.2	11.3	13.0	16.6	20.3	24.3	24.3	2070	13.1
Share of workers aged 65-74 in the labour force 65-74	97.9	98.0	97.9	97.9	98.0	98.0	98.0	2024	0.1
Median age of the labour force	41.0	40.0	42.0	43.0	44.0	44.0	44.0	2058	3.0

Source: European Commission

Based on administrative data, the total effective retirement age rose by 0.3 between 2010 and 2016 (Figure 6). Between 2016 and 2018, the effective retirement age remained steady at 63.4 years for men and 63.6 years for women. In 2019, the effective retirement age rose by 0.1 years for both genders due to the 2017 pension reform, which started to increase the lowest retirement age by three months per cohort as of 2018 until it has risen from 63 to 65 years.

FIGURE 6 – EFFECTIVE RETIREMENT AGE (ADMINISTRATIVE DATA)



Source: Finnish Centre for Pensions

The average effective exit age is projected to increase by 3.5 years for men from 2019 to 2070 and by 3.3 years for women (Tables 4A and 4B). This phenomenon is also visible in Figure 7 which depicts the evolution of the average effective retirement age in relation to the old-age retirement age. The average contributory period is projected to increase by 2.2 years for men and 2.7 years for women. The duration of retirement is projected to increase 2.3 and 0.9 years by 2070 for men and women, respectively.

TABLE 4A – LABOUR MARKET EXIT AGE, EFFECTIVE RETIREMENT AGE AND EXPECTED DURATION OF LIFE SPENT IN RETIREMENT – MEN

	2020	2030	2040	2050	2060	2070	peak value	peak year	change 2020-2070
Average effective retirement age (administrative data)*	63.5								
Average labour market exit age (CSM)**	63.9	64.7	65.4	66.1	66.7	67.4	67.4	2069	3.5
Contributory period	35.0	34.9	35.1	35.8	35.8	37.2	37.2	2070	2.2
Duration of retirement***	19.5	19.8	20.8	20.9	21.0	21.8	21.8	2070	2.3
Duration of retirement/contributory period	0.56	0.57	0.59	0.58	0.59	0.59	0.60	2023	0.03
Percentage of adult life spent in retirement****	29.8	29.8	30.5	30.3	30.1	30.6	30.7	2056	0.8
Early/late exit*****	0.8	1.0	1.5	1.6	1.1	2.1	2.1	2070	1.3

Source: European Commission

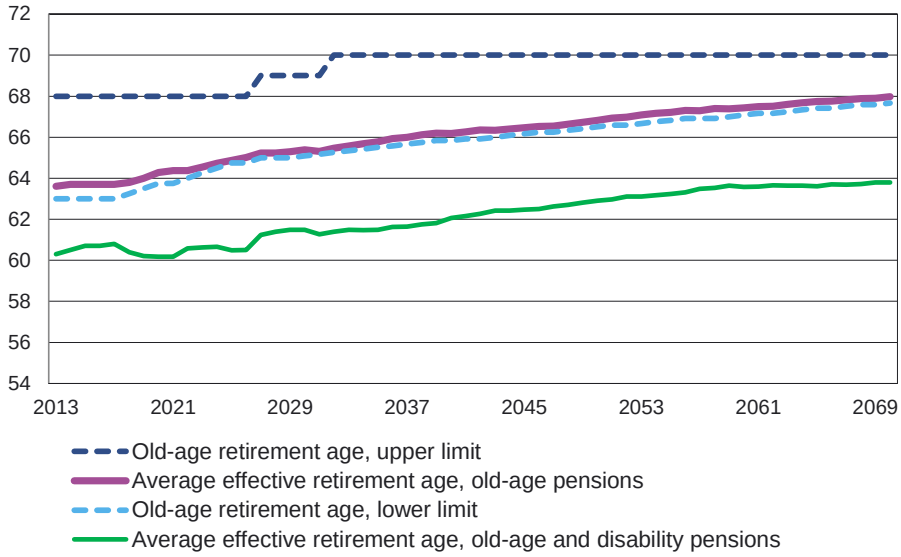
TABLE 4B – LABOUR MARKET EXIT AGE, EFFECTIVE RETIREMENT AGE AND EXPECTED DURATION OF LIFE SPENT IN RETIREMENT – WOMEN

	2020	2030	2040	2050	2060	2070	peak value	peak year	change 2020-2070
Average effective retirement age (administrative data)*	63.7								
Average labour market exit age (CSM)**	63.5	64.1	64.8	65.5	66.1	66.8	66.8	2069	3.3
Contributory period	34.4	35.3	34.6	35.9	35.8	37.1	37.1	2069	2.7
Duration of retirement***	24.0	24.1	24.2	25.1	25.1	24.9	25.5	2065	0.9
Duration of retirement/contributory period	0.70	0.68	0.70	0.70	0.70	0.67	0.71	2023	-0.03
Percentage of adult life spent in retirement****	34.5	34.3	34.1	34.6	34.3	33.8	34.7	2036	-0.8
Early/late exit*****	0.9	1.0	1.8	2.4	1.3	3.2	3.2	2069	2.3

Source: European Commission

** The effective retirement age shows the age at which people on average start receiving a pension benefit. It is calculated on the basis of the administrative data for 2019 (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.*

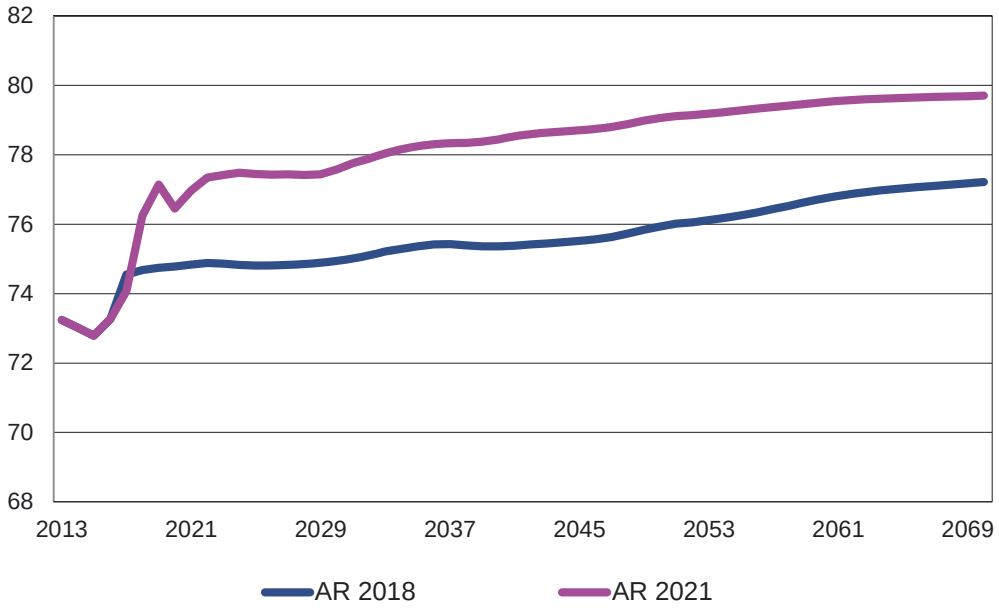
FIGURE 7 – THE AVERAGE EFFECTIVE RETIREMENT AGE AND OLD-AGE RETIREMENT AGE



Source: Finnish Centre for Pensions

The employment rate projection for Finland is now clearly more favourable than in the previous AR 2018 projections (Figure 8) mainly due to updated data used in the Cohort Simulation Model. The upward trend in the current and previous projections is mainly owing to the gradual increase in the increasing statutory retirement age.

FIGURE 8 – EMPLOYMENT RATE (20-64 YEAR-OLDS) IN AR 2021 AND AR 2018



Source: European Commission

3. Pension projection results

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

The long-term projection model consists of several interconnected modules, presented in the graphs in section 4.5. In the model, the calculation of pension expenditure covers the earnings-related pension acts of the private and the public sectors, as well as the national pension and SOLITA pensions. SOLITA pensions include the pension provision from military injuries insurance, motor liability insurance and workers' compensation insurance. National pensions, including guarantee pensions, are simulated separately from the earnings-related pensions with a model developed in the Social Insurance Institution of Finland.

There are only very small differences between the ESSPROSS and AWG definitions of pension expenditure (Table 5).

TABLE 5 – EUROSTAT (ESSPROS) VS. AGEING WORKING GROUP DEFINITION OF PENSION EXPENDITURE (% GDP)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	change 2009-2017
Eurostat total pension expenditure	12.0	12.1	11.9	12.4	12.9	13.3	13.2	13.4	13.4	:	1.4
Eurostat public pension expenditure (A)	11.7	11.9	11.7	12.2	12.7	13.1	13.0	13.2	13.2	:	1.5
Public pension expenditure (AWG: outcome) (B)	11.6	11.7	11.7	12.2	12.7	13.1	13.2	13.1	13.1	:	1.4
Difference Eurostat/AWG: (A)-(B)	0.1	0.2	0.0	-0.1	0.0	0.0	-0.2	0.1	0.1	:	0.0
Expenditure categories not considered in the AWG definition	:	:	:	:	:	:	:	:	:	:	:

Source: EUROSTAT and Ministry of Finance (Finland)

3.2. Overview of projection results

The share of public pension expenditure to GDP is projected to increase from 13.0% in 2019 to 14.4% in 2070 (Table 6 and Figure 9). In the 2020s the share is expected to increase to 13.7% in 2030. The share of public pension expenditure is projected to increase sharply in 2020 due to a fall in GDP resulting from the COVID-19 pandemic. During the rest of the decade, the share is projected to remain relatively stable as the increase in gross expenditures is largely offset by the rebound in GDP growth. In the 2030s and 2040s the GDP share of public pension expenditures then declines by almost 1pp due to the falling replacement rate at retirement. However, the ratio pension of expenditure to GDP increases again from the 2050s onwards by almost 2pps. This is because the benefit ratio will no longer decrease and the number of pension recipients will continue to grow. As for net total pension expenditure, an assumption of a constant tax rate of 20.8% has been used based on tax revenues from pension income in 2019.

In 2019, total pension contributions were almost 22% relative to GDP with property income from pension asset being almost 10% relative to GDP. This is mainly due to large reserves and an increase in stock prices. Between 2020 and 2070, total pension contributions are projected to rise quite steadily from almost 13% to 14% relative to GDP.[7] In the first decades of the projection, the increase in contributions results from rising property income as the real interest rate is assumed to rise from very low levels to 2%. Thereafter, the pension expenditure starts to grow and the private sector contribution rate is assumed to be adjusted according to current legislation. This means that contribution rate is determined so that it covers the funded part of pension liabilities and keeps the buffer funds at their target level. Occupational and non-mandatory private pensions play a minor role in Finland, and therefore they have not been included in the projections.

[7] Revenues from the pension assets are also included in total contributions (read more form section 3.4.).

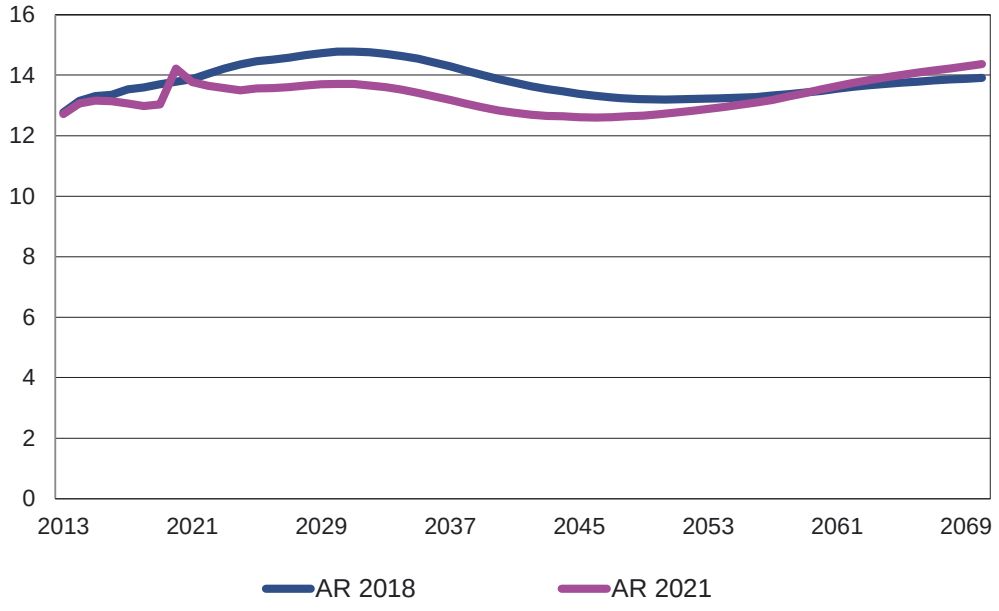
TABLE 6 – PROJECTED GROSS AND NET PENSION SPENDING AND CONTRIBUTIONS (% GDP)

Expenditure	2019	2030	2040	2050	2060	2070	peak value	peak year	change 2019-2070
Gross public pension expenditure	13.0	13.7	12.8	12.7	13.5	14.4	14.4	2070	1.3
Private occupational pensions	:	:	:	:	:	:	:	:	:
Private individual mandatory pensions	:	:	:	:	:	:	:	:	:
Private individual non-mandatory pensions	:	:	:	:	:	:	:	:	:
Gross total pension expenditure	13.0	13.7	12.8	12.7	13.5	14.4	14.4	2070	1.3
Net public pension expenditure*	10.3	10.9	10.2	10.1	10.7	11.4	11.4	2070	1.0
Net total pension expenditure*	10.3	10.9	10.2	10.1	10.7	11.4	11.4	2070	1.0
Contributions	2019	2030	2040	2050	2060	2070	peak value	peak year	change 2019-2070
Public pension contributions	21.7	12.8	12.9	13.2	13.5	13.9	21.7	2019	-7.8
Total pension contributions	21.7	12.8	12.9	13.2	13.5	13.9	21.7	2019	-7.8

Source: European Commission

** net pension expenditure excludes taxes on pensions and compulsory social security contributions paid by beneficiaries.*

FIGURE 9 – PROJECTED PUBLIC PENSION EXPENDITURE IN AR 2021 AND AR 2018 (% RELATIVE TO GDP)



Source: European Commission, Ministry of Finance (Finland)

Table 7 shows a breakdown of gross pension expenditure projections by type of pension and also includes expenditures for main special pension schemes. These special pension schemes are fully included in the projected total pension expenditure and they are described in more detail in Section 1.1.

TABLE 7 – PROJECTED GROSS PUBLIC PENSION SPENDING BY SCHEME (% GDP)

Pension scheme	2019	2030	2040	2050	2060	2070	peak value	peak year	change 2019-2070
Total public pensions	13.0	13.7	12.8	12.7	13.5	14.4	14.4	2070	1.3
Old-age and early pensions	11.2	11.9	11.0	10.9	11.7	12.5	12.5	2070	1.3
Flat component	:	:	:	:	:	:	:	:	:
Earnings-related	10.6	11.3	10.4	10.3	11.0	11.7	11.7	2070	1.2
Minimum pensions (non-contributory) i.e. minimum income guarantee for people above 65	0.6	0.6	0.6	0.6	0.7	0.7	0.7	2070	0.1
Disability pensions	1.1	1.2	1.2	1.3	1.4	1.4	1.4	2070	0.2
Survivors' pensions	0.7	0.7	0.7	0.6	0.5	0.5	0.8	2020	-0.2
Other pensions	:	:	:	:	:	:	:	:	:

Special pension schemes (included in the total public pensions)	2019	2030	2040	2050	2060	2070	Peak value	Peak year	change 2019-2070
Seafarers (difficult conditions)	0.06	0.08	0.06	0.05	0.04	0.04	0.1	2020	0.0
Years-of-service pension (difficult conditions)	0	0.01	0.01	0.01	0.01	0.01	0.01	2027	0.0
Self-employed (partially financed by state)	0.5	0.6	0.6	0.6	0.6	0.7	0.7	2070	0.1
Farmers (mostly financed by state)	0.4	0.3	0.2	0.2	0.1	0.1	0.4	2020	-0.3
State employees	2.0	1.7	1.3	0.9	0.7	0.6	2.1	2020	-1.4
Local government employees	2.3	2.6	2.4	2.4	2.5	2.6	2.6	2070	0.4
Other public sector employees	0.1	0.2	0.1	0.1	0.1	0.1	0.2	2020	0.0

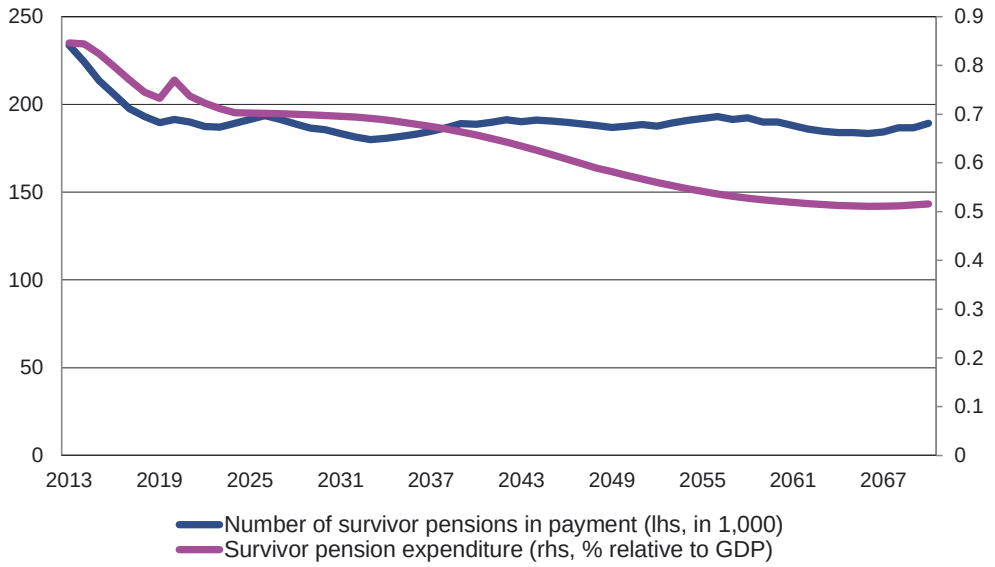
Source: European Commission

Disability pension expenditure relative to GDP has decreased throughout the 2000s from almost 2% to 1.1% in 2010. This trend is largely due to the decreasing number of people on a disability pension, as the incidence rate of disability pensions has decreased and baby boomers have reached their retirement age (disability pension is transformed into old age pension when the statutory retirement age is reached). However, disability pension expenditure relative to GDP is projected to start increasing during the projection period as the rising retirement age results in a growing number of people retiring on a disability pension. In addition, the benefit level of disability pensions are projected to increase as a result of the 2017 pension reform.

Minimum or non-earnings related pension (i.e. guarantee and national pensions) expenditure to GDP has almost halved in the last two decades. This is mainly due to indexation of pensions to prices, with a few exceptions, and the fact that each year more and more individuals are entitled to earnings-related pension schemes. Minimum pension expenditure is projected remain stable at 0.6% relative to GDP until 2050. This is due to the assumption that these pensions are indexed to wages from 2025 onwards, and therefore, the expenditures are projected to increase at a rate close to GDP growth. After 2050, the expenditure share is projected to increase gradually to 0.7% at the end of the projection period.

Survivors' pension expenditure relative to GDP is expected to remain quite stable until the 2030s after which it starts to slowly decline (Graph 9). The reason is that survivors' average earnings-related pensions increase, as the pension system matures. This in turn lowers the survivors' pensions, because survivors' pension is means-tested. After falling sharply in the last two decades, the number of survivor pensions in payment is expected to remain at around the current level until the end of the projection period. This is mostly due to demographic factors, since the baby boom generations have all but begun to receive survivors' pension. In addition, the survivors will spend less time being a widow or widower as, in the future, mortality of both genders will be concentrated to a narrower age interval according to the population projections.

FIGURE 10 – SURVIVOR PENSION EXPENDITURE RELATIVE TO GDP AND NUMBER OF SURVIVOR PENSIONS IN PAYMENT



Source: European Commission, Ministry of Finance (Finland)

In Finland, there are several harmonised earnings-related pension schemes (private sector, central government, local government, entrepreneurs and farmers; these schemes are separate mainly due to considerable differences in their financing). Expenditure in the Farmers' Pension Act (MYEL) is slowly decreasing relative to GDP, as the sector has become relatively small in Finland, and this trend is projected to continue. The same holds for state employees' pensions system, as the number of employees covered by this system has declined considerably since the beginning of 1990s due to corporatisation, privatisation and changes in the legislation. In all, the Employees' Pension Act (TyEL), Self-Employed Persons' Pensions Act (YEL) and the local government pensions system are growing and, at the same time, substituting the declining pension acts.

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

This section provides more details about the development of public pension expenditures (Table 8a and Table 8b). It uses a standard arithmetic disaggregation of the pension expenditures-to-GDP ratio to disentangle the impact of the dependency ratio, coverage ratio, benefit ratio and a labour market effect (Figure 11, first equation). The impact of the labour market effect and the coverage ratio may be further decomposed to take into account changes the characteristics of the population and the labour market. The coverage ratio can be further split to look into the take-up ratios for old-age pensions and early pensions (second equation in Figure 11). The labour market indicator can be further disaggregated according to the third equation in Figure 11.

FIGURE 11 – DISAGGREGATION OF PUBLIC PENSION EXPENDITURE

$$\frac{pension\ \ expenditure}{GDP} = \underset{\downarrow}{\frac{population\ \ 65+}{population\ \ 20-64}} \times \underset{\downarrow}{\frac{number\ \ of\ pensioners}{population\ \ 65+}} \times \underset{\downarrow}{\frac{average\ \ pension\ \ income}{\frac{GDP}{hours\ \ worked\ \ 20-74}}} \times \underset{\downarrow}{\frac{population\ \ 20-64}{hours\ \ worked\ \ 20-74}} \quad [1]$$

dependency ratio; coverage ratio; benefit ratio; labour market effect

$$\frac{number\ \ of\ pensioners}{population\ \ 65+} = \underset{\downarrow}{\frac{number\ \ of\ pensioners\ \ 65+}{population\ \ 65+}} + \left(\underset{\downarrow}{\frac{number\ \ of\ pensioners\ \ \leq 65}{population\ \ 50-64}} \times \underset{\downarrow}{\frac{population\ \ 50-64}{population\ \ 65+}}\right) \quad [2]$$

coverage ratio old-age; coverage ratio early-age; cohort effect

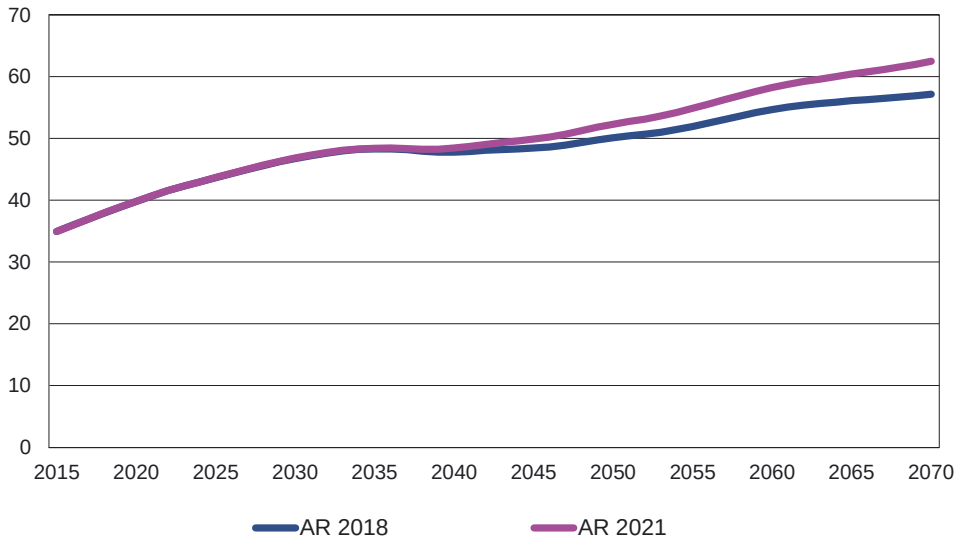
$$\frac{population\ \ 20-64}{hours\ \ worked\ \ 20-74} = \underset{\downarrow}{\frac{population\ \ 20-64}{employed\ \ people\ \ 20-64}} \times \underset{\downarrow}{\frac{employed\ \ people\ \ 20-64}{hours\ \ worked\ \ by\ people\ \ 20-64}} \times \underset{\downarrow}{\frac{hours\ \ worked\ \ by\ people\ \ 20-64}{hours\ \ worked\ \ by\ people\ \ 20-74}} \quad [3]$$

1/employment rate; 1/labour intensity; 1/career shift

Source: European Commission

The dependency ratio effect is the only positive and by far the largest factor behind the change in the projected public pension expenditures (Table 8)[8]. In the current decade, the increase in the old-age dependency ratio in Finland is projected to be one of the fastest in the EU (Figure 12).

FIGURE 12 – OLD-AGE DEPENDENCY RATIO (PEOPLE AGED 65+ TO 20-64 YEAR-OLDS), %



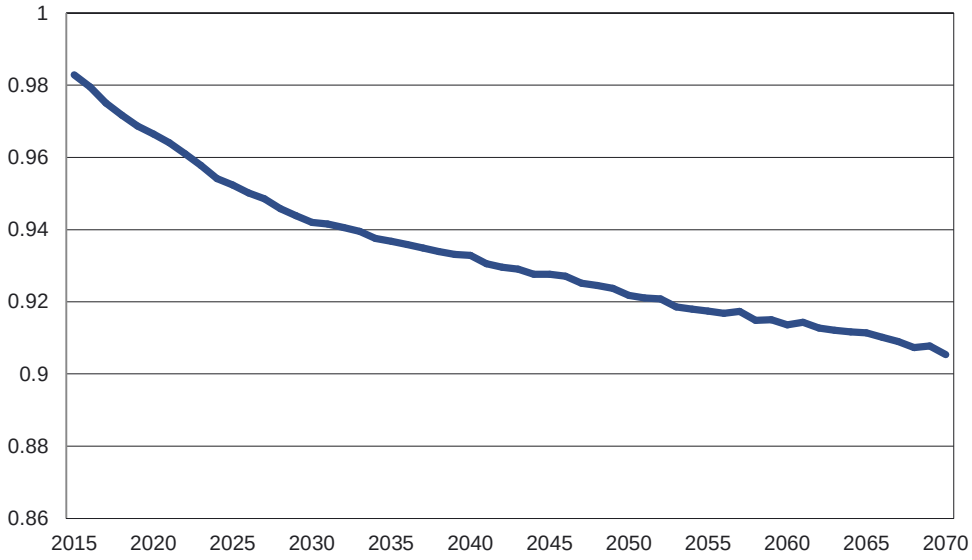
Source: EUROSTAT, European Commission

[8] The breakdown is calculated on the basis of pensioners (Table 8), with the disaggregation based on pensions reported in annex (Table A3).

The coverage ratio effect contributes to lower public pension expenditures in the future. The contribution of the coverage ratio is the largest prior to 2030, after which the effect diminishes slightly. A plausible explanation is that people continue more often at work after the age of 65 due to the two year increase in the old-age retirement age between 2018 and 2027 and the link between the retirement age and life expectancy thereafter. Moreover, there may be economic incentives to continue at work beyond the lowest old-age retirement age.

The benefit ratio effect also contributes negatively to the projected pension expenditures. The contribution of the effect is the largest prior to 2050. Although the contribution of the benefit ratio effect remains negative throughout much of the projection period, it weakens considerably in the 2050s and eventually turns positive between 2060 and 2070. The benefit ratio effect reflects mostly the life expectancy coefficient (the Finnish sustainability/adjustment factor) which begun to cut new earnings-related pension benefits increasingly from year 2010 onwards. The life expectancy coefficient is defined such that the capital value of the pension adjusted with the coefficient is the same as the unadjusted capital value of the pension in the base year 2009. However, the coefficient will be calculated in a more lenient manner as of 2027 to take into account the increases in statutory retirement age thereafter (Figure 13). Life expectancy coefficient, which is taken into account in all calculations, reduces the new pensions permanently. In practice, for an individual, it is possible to counteract the effect of the life expectancy coefficient by postponing retirement, but this is not taken into account in the employment scenarios of the CSM.

FIGURE 13 – LIFE EXPECTANCY COEFFICIENT (FINNISH SUSTAINABILITY FACTOR)



Source: Finnish Centre for Pensions

The labour market effect also negatively contributes to the change in pension expenditure between 2019 and 2070. The negative contribution is partly attributed to an increase the employment rate and extending the working careers for older workers. The employment rate between persons aged between 20 and 64 years is projected to increase by 2.6 percentage points from 77.1% in 2019 to 79.7% in 2070, while the employment rate for persons aged between 65 and 71 is expected to rise by 19.3 percentage points from 13.1% in 2019 to 32.4% in 2070.

TABLE 8 – FACTORS BEHIND THE CHANGE IN PUBLIC PENSION EXPENDITURE BETWEEN 2019 AND 2070 (PERCENTAGE POINTS OF GDP) – PENSIONERS

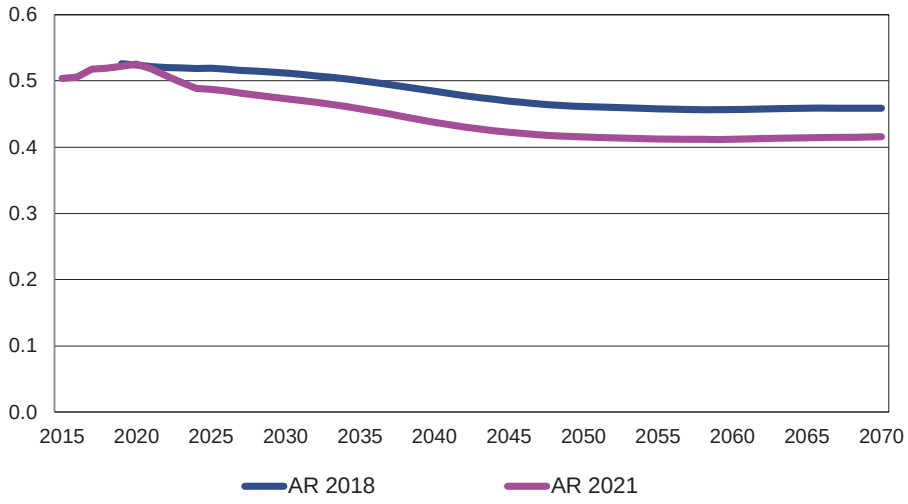
	2019-30	2030-40	2040-50	2050-60	2060-70	2019-70
Public pensions to GDP	0.7	-0.9	-0.1	0.8	0.8	1.3
Dependency ratio effect	2.7	0.5	1.0	1.4	1.0	6.5
Coverage ratio effect*	-0.9	-0.2	-0.2	-0.2	-0.1	-1.7
Coverage ratio old-age	0.2	-0.1	0.0	0.0	0.0	0.1
Coverage ratio early-age	-3.3	-1.7	-1.2	-1.0	-0.6	-7.7
Cohort effect	-3.3	0.4	-0.3	-1.2	-0.7	-5.1
Benefit ratio effect	-0.8	-0.9	-0.7	-0.1	0.1	-2.4
Labour market effect	-0.1	-0.2	-0.3	-0.3	-0.2	-1.0
Employment ratio effect	-0.1	-0.2	-0.1	-0.1	0.0	-0.4
Labour intensity effect	0.0	0.0	0.0	0.0	0.0	0.0
Career shift effect	0.0	0.0	-0.2	-0.2	-0.1	-0.5
Residual	-0.1	0.0	0.0	0.0	0.0	-0.2

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

Source: European Commission

The replacement rate[9] is projected to decrease until the end of 2030s, with the largest decline occurring in the first ten years of the projection period (Table 9). The replacement rate then begins to increase gradually from 2040s until the end of the projection period. The benefit ratio[10] is likewise expected to decrease in the first decades of the projection, albeit more gradually (Figure 14). The benefit ratio is projected to decrease from 49% in 2019 to 39% in 2050, after which it is expected to remain constant until the end of the projection period.

FIGURE 14 – TOTAL BENEFIT RATIO IN AR 2021 AND AR 2018 PROJECTIONS



Source: European Commission, Ministry of Finance (Finland)

[9] The replacement rate at retirement (RR) is defined as the average first pension of those who retire in a given year over the average wage they earned before retirement.
[10] Benefit ratio is defined as the average public pension in relation to the average wage.

The development of benefit ratio reflects several aspects of the 2017 pension reform, which enhances both the sustainability of the pension system and, in part, the pension adequacy for the age cohorts retiring from 2040s onwards. First, as of 2017 the accrual of pension are calculated for higher earnings than previously, when employees' earnings-related pension insurance contributions are no longer deducted from pensionable earnings. In 2016, employees' contribution rate was on average a bit over 6% of earnings. Second, beginning in 2027 the life expectancy coefficient (sustainability/adjustment factor) will be calculated in a more lenient manner than currently. Third, the contributory period is projected to increase considerably due to increases in the lowest eligibility age for old-age retirement.

TABLE 9 – BENEFIT RATIO (BR), REPLACEMENT RATE AT RETIREMENT (RR) AND COVERAGE BY PENSION SCHEME (IN %)

	2019	2030	2040	2050	2060	2070	change 2019-2070 (pps)
Public scheme (BR)	52 %	47 %	44 %	42 %	41 %	42 %	-11 %
Coverage	100.1	100.0	100.0	100.0	100.0	100.0	-0.1
Public scheme: old-age earnings related (BR)	49 %	44 %	41 %	39 %	38 %	39 %	-10 %
Public scheme: old-age earnings related (RR)	46 %	37 %	35 %	36 %	36 %	37 %	-9 %
Coverage	86.2	87.2	87.0	87.1	87.3	87.6	1.4
Private occupational scheme (BR)	:	:	:	:	:	:	:
Private occupational scheme (RR)	:	:	:	:	:	:	:
Coverage	:	:	:	:	:	:	:
Private individual schemes (BR)	:	:	:	:	:	:	:
Private individual schemes (RR)	:	:	:	:	:	:	:
Coverage	:	:	:	:	:	:	:
Total benefit ratio	52 %	47 %	44 %	42 %	41 %	42 %	-11 %
Total replacement rate	46 %	37 %	35 %	36 %	36 %	37 %	-9 %

Source: European Commission

Coverage of each pension scheme is calculated as a ratio of the number of pensioners within the scheme and the total number of pensioners in the country. In case data on pensioners are not available, the calculation is based on the number of pensions.

The number of pensioners is set to increase at a fast pace in the current decade, as ageing of the baby boom generation increases the number of persons aged 65 and older (Table 10). This development continues, but more slowly, to the end of the projection period due to increasing life expectancy. Employment is projected to be on a declining trend between 2019 and 2070. The decline in employment coincides with a decline of the working age population, but this effect is partly offset by an increase in employment rate of older cohorts due to the gradual increase in the retirement age. The projected increase in the pension system dependency ratio is driven by the decline in the working age population and the increase in pensioners over the next decades. However, the system efficiency ratio is projected to decrease to some extent as the old-age dependency ratio is set to increase more than the pension system dependency ratio.

TABLE 10 – SYSTEM DEPENDENCY RATIO AND OLD-AGE DEPENDENCY RATIO

	2019	2030	2040	2050	2060	2070	change 2019-2070
Number of pensioners (thousand) (I)	1556	1706	1712	1732	1792	1823	267
Employment (thousand) (II)	2577	2532	2513	2437	2350	2274	-304
Pension system dependency ratio (SDR) (I)/(II)	60.4	67.4	68.1	71.1	76.2	80.2	19.8
Number of people aged 65+ (thousand) (III)	1218	1429	1461	1497	1572	1615	397
Working age population 20-64 (thousand) (IV)	3131	3053	3018	2863	2701	2585	-546
Old-age dependency ratio (OADR) (III)/(IV)	38.9	46.8	48.4	52.3	58.2	62.5	23.6
System efficiency (SDR/OADR)	1.6	1.4	1.4	1.4	1.3	1.3	-0.3

Source: European Commission

The share of pensioners to inactive population in the age groups 55–59 and 60–64 is projected to decrease significantly until 2050s (Table 11a). These figures reflect the scheduled increase in the retirement age and, to some extent, limiting access to the so-called unemployment pipeline to retirement. However, as of 2050, the share of pensioners to inactive population is projected to increase in the older age groups as the increasing retirement age decreases the inactive population, while the use of disability pensions and early pathways to retirement slow down the increase of effective retirement age.

Whereas the share of pensioners to inactive population in the age group 65–69 is expected to fall only modestly, the share of pensioners to total population is projected to decrease substantially during the projection period. Moreover, the share of pensioners to total population is projected to decline throughout the entire projection period in the age groups 55–59, 60–64 and 65–69. The reason for the higher than 100 % shares in the tables below is that the pensioners' figures include those living abroad. Similar observations can be made separately for the female population (Table 12a and Table 12b).

TABLE 11A – PENSIONERS (PUBLIC SCHEMES) TO INACTIVE POPULATION RATIO BY AGE GROUP (%)

	2019	2020	2030	2040	2050	2070
Age group -54	6.4	6.4	7.2	7.2	6.6	6.0
Age group 55-59	79.0	74.6	59.9	62.1	63.6	65.1
Age group 60-64	111.3	109.5	64.4	67.4	68.5	74.2
Age group 65-69	116.8	118.3	119.3	114.1	111.0	111.5
Age group 70-74	113.0	111.7	114.9	112.7	120.4	123.4
Age group 75+	104.3	103.3	105.1	107.5	109.2	112.8

Source: European Commission

TABLE 11B – PENSIONERS (PUBLIC SCHEMES) TO POPULATION RATIO BY AGE GROUP (%)

	2019	2030	2040	2050	2060	2070
Age group -54	2.5	2.6	2.6	2.4	2.3	2.2
Age group 55-59	12.3	10.2	9.4	8.9	8.6	8.3
Age group 60-64	46.4	27.5	24.2	21.2	19.3	18.1
Age group 65-69	98.7	98.1	89.0	81.5	74.7	66.9
Age group 70-74	104.8	109.4	107.0	112.8	112.2	111.8
Age group 75+	104.3	105.1	107.5	109.2	111.9	112.8

Source: European Commission

TABLE 12A – FEMALE PENSIONERS (PUBLIC SCHEMES) TO INACTIVE POPULATION RATIO BY AGE GROUP (%)

	2019	2030	2040	2050	2060	2070
Age group -54	5.9	6.8	6.8	6.2	6.1	5.6
Age group 55-59	81.9	63.9	62.6	67.9	67.6	68.3
Age group 60-64	107.7	64.9	69.6	75.4	78.1	80.3
Age group 65-69	111.6	110.6	106.2	101.7	104.6	106.8
Age group 70-74	110.0	109.8	108.2	115.6	117.1	119.2
Age group 75+	103.5	104.3	105.8	107.6	110.5	112.1

Source: European Commission

TABLE 12B – FEMALE PENSIONERS (PUBLIC SCHEMES) TO POPULATION RATIO BY AGE GROUP (%)

	2019	2030	2040	2050	2060	2070
Age group -54	2.4	2.6	2.5	2.4	2.3	2.1
Age group 55-59	11.7	10.6	9.9	9.5	9.0	8.8
Age group 60-64	44.7	27.3	24.7	22.3	20.7	19.6
Age group 65-69	98.8	95.3	87.3	79.3	73.8	66.2
Age group 70-74	104.7	106.9	105.1	111.4	111.4	111.8
Age group 75+	103.5	104.3	105.8	107.6	110.5	112.1

Source: European Commission

The projected new old-age and early earnings-related pension expenditure and its disaggregation is reported in Table 13a (and separately to males and females in Table 13b and Table 13c, respectively).

The average contributory period is expected to increase from 34.7 years in 2019 to 37.1 years in 2070. The average numbers conceal variation in the dynamics of the contributory period between genders during the first decades of the projection period. In 2019, the contributory period for females and males was 34.2 and 35.2 years, respectively. Between 2019 and 2030, the contributory period for females is projected to increase to 35.3 years in 2030 and return back to 34.6 years in 2040. For males, the contributory period is, in turn, expected to decline to 34.9 years in 2030 and then increase to 35.1 years by 2040. As of 2050, the contributory period is expected to develop similarly for both females and males with both expected to remain largely stable until 2060s and then set to increase by 2070. The reason for the temporarily declining contributory periods is that the employment rates of aged people are rising and the careers of new employed people are shorter than the average.

The average accrual rate at the beginning of the period is only 1.7%, even though the normal accrual rate is 1.5% and, until 2016, the accrual rate for persons aged 53-63 and 63-68 years was 1.9% and 4.5%, respectively. This is explained by the fact that until 2016 the earnings-related pension insurance contribution of employees was deducted from pensionable earnings before the accrual rate in law was applied (in 2016 the employees' contribution rate was on average a bit over 6% of earnings). Hence, the average accrual rate has been lower than the accrual rates set in law. The average accrual rate is decreasing first as the higher accrual rates for older workers were abolished as of 2017 with an exception for the transition period. The accrual rate is 1.5% as of 2017 for all other workers but it is 1.7% for 53–62 year-olds until the end of 2025. This higher accrual rate is not enough to compensate for the lower accruals before the reform. Therefore, the average accrual rate goes temporarily below 1.5%, as some

generations do not receive either the higher accrual rates at the end of their careers according to the old system nor the better accruals at their early careers according to the new system.

The average accrual rate starts to increase in 2040s because as of 2017 the accrual of pension is calculated for higher earnings than previously as the earnings-related pension insurance contribution of employees will no longer be deducted from pensionable earnings. Hence, the 1.5% accrual rate set in law will become gradually effective. However, the accrual rate increases to a bit over 1.5% in the long term, because the increase of the statutory retirement age increases the level of disability pension benefits as the projected period (the period between retirement on disability pension and the lowest old-age retirement age) lengthens. The higher level of disability benefits results in an increase in new old-age pensions because disability pension is replaced by old-age pension upon reaching the statutory retirement age.

TABLE 13A – DISAGGREGATION OF NEW PUBLIC PENSION EXPENDITURE (OLD-AGE AND EARLY EARNINGS-RELATED PENSIONS) – TOTAL

New old-age earnings-related pensions	2019	2030	2040	2050	2060	2070
Projected new pension expenditure (million EUR)*	697	904	1166	1832	2703	3511
I. Number of new pensions (1000)	73.0	79.1	74.7	78.4	81.1	71.1
II. Average contributory period (years)	34.7	35.1	34.9	35.9	35.8	37.1
III. Average accrual rate (%)	1.7	1.5	1.4	1.5	1.5	1.6
IV. Monthly average pensionable earnings (1000 EUR)	2.9	3.9	5.6	7.9	11.0	15.6
V. Sustainability/adjustment factors	0.97	0.94	0.93	0.92	0.91	0.91
VI. Average number of months paid the first year	6.0	6.0	6.0	6.0	6.0	6.0
(Monthly average pensionable earnings) / (monthly economy-wide average wage)	89 %	84 %	85 %	84 %	83 %	83 %

**New pension expenditure equals the product of I, II, III, IV, V & VI*

Source: European Commission

TABLE 13B – DISAGGREGATION OF NEW PUBLIC PENSION EXPENDITURE (OLD-AGE AND EARLY EARNINGS-RELATED PENSIONS) – MALE

New old-age earnings-related pensions	2019	2030	2040	2050	2060	2070
Projected new pension expenditure (million EUR)*	390	506	664	1038	1514	1966
I. Number of new pensions (1000)	36.5	40.7	38.7	41.4	42.2	37.5
II. Average contributory period (years)	35.2	34.9	35.1	35.8	35.8	37.2
III. Average accrual rate (%)	1.6	1.4	1.4	1.4	1.5	1.5
IV. Monthly average pensionable earnings (1000 EUR)	3.2	4.4	6.3	8.7	12.3	17.3
V. Sustainability/adjustment factors	0.97	0.94	0.93	0.92	0.91	0.91
VI. Average number of months paid the first year	6.0	6.0	6.0	6.0	6.0	6.0
(Monthly average pensionable earnings) / (monthly economy-wide average wage)	101 %	94 %	96 %	94 %	93 %	92 %

**New pension expenditure equals the product of I, II, III, IV, V & VI*

Source: European Commission

TABLE 13C – DISAGGREGATION OF NEW PUBLIC PENSION EXPENDITURE (OLD-AGE AND EARLY EARNINGS-RELATED PENSIONS) – FEMALE

New old-age earnings-related pensions	2019	2030	2040	2050	2060	2070
Projected new pension expenditure (million EUR)*	307	398	503	793	1190	1545
I. Number of new pensions (1000)	36.5	38.4	36.0	37.0	38.8	33.7
II. Average contributory period (years)	34.2	35.3	34.6	35.9	35.8	37.1
III. Average accrual rate (%)	1.7	1.5	1.5	1.6	1.6	1.7
IV. Monthly average pensionable earnings (1000 EUR)	2.5	3.4	4.8	6.9	9.6	13.7
V. Sustainability/adjustment factors	0.97	0.94	0.93	0.92	0.91	0.91
VI. Average number of months paid the first year	6.0	6.0	6.0	6.0	6.0	6.0
(Monthly average pensionable earnings) / (monthly economy-wide average wage)	77 %	73 %	74 %	74 %	73 %	73 %

**New pension expenditure equals the product of I, II, III, IV, V & VI*

Source: European Commission

3.4. Financing of the pension system

The financing of earnings-related pensions vary considerably between the pension schemes (private sector, local government and state employees, self-employed persons and farmers) although the benefits are currently almost harmonised. The Employees' Pension Act (TyEL) is a partially funded system, whereas the Self-Employed Persons' Pensions Act (YEL) and the Farmers' Pensions Act (MYEL) are financed from the PAYG system, such that the State pays the share of the expenditure that the contribution income does not cover. The local government and state employees' pension schemes are PAYG schemes with significant buffer funds. The Seafarer's Pensions Act (MEL) is partially funded scheme of which the state finances one third of expenditures.

TABLE 14 – FINANCING OF THE PUBLIC PENSION SYSTEM

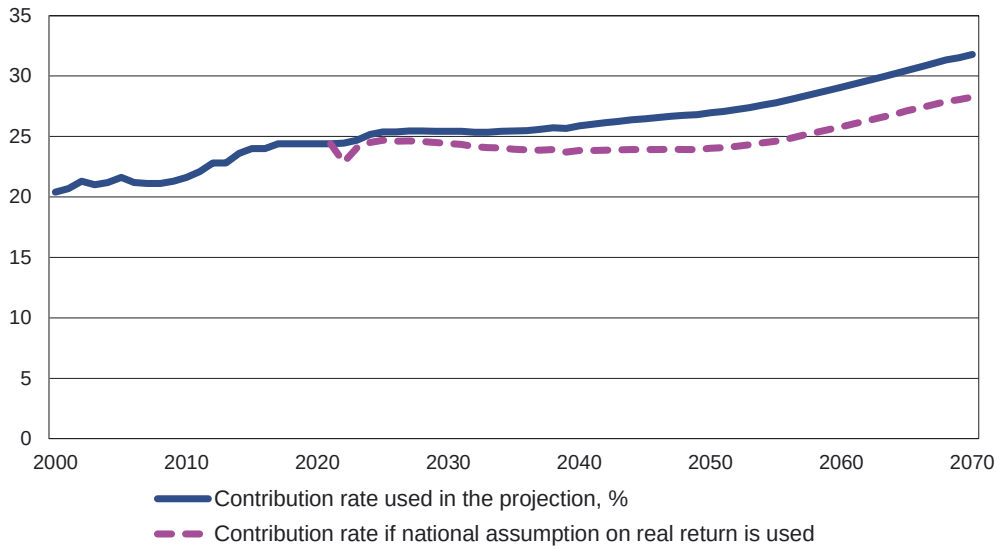
	Public employees	Private employees	Self-employed
Contribution base	Wages and salaries	Wages and salaries	Pensionable income
Contribution rate/contribution			
Employer	Earnings-related pensions: 21.17% for local government 17.10% for state employers	Earnings-related pensions: 17.35%	.
Employee	Earnings-related pensions: 6.75% (17-52 and 63-68) & 8.25% (53-62 year-olds)	Earnings-related pensions: 6.75% (17-52 and 63-68) & 8.25% (53-62 year-olds)	Earnings-related pensions: 24.1% (17-52 and 63-68) & 25.6% (53-62 year-olds) (if pensionable income is above a certain threshold)
*State**	State employees: 60% of earnings-related expenditure (State pension fund receives contribution income and it finances the rest 40%). National pensions: 100%. Pensions accrued during child-care and studying: 100%	Seafarers: 1/3 of earnings-related expenditure National pensions: 100%. Pensions accrued during child-care and studying: 100%	Share of the earnings-related expenditure that the contribution income does not cover. National pensions: 100%. Pensions accrued during child-care and studying: 100%
*Other revenues**	Earnings-related pensions: Property income form considerable buffer funds	Earnings-related pensions: Some 25% of private sector pension are prefunded.	.
Maximum contribution	.	.	.
Minimum contribution	.	.	.

*only legislated contributions are reported

Source: European Commission, Ministry of Finance (Finland)

Contribution rates for private sector employees' pension scheme (TyEL) are determined so that they cover the funded part of pension liabilities and, in addition, keep the buffer funds at their target level. In the projections, the contribution rate for the private sector employees' scheme (TyEL) evolves according to the current legislation. The contribution rate is projected to increase considerably from the current level of 24.4% of wage sum (Figure 15). The contribution rate of entrepreneurs and farmers is the same as the average contribution rate for private sector employees' pension scheme, if their pensionable income is above a certain threshold. The sum of employee and employer contribution rate for local government and state employees' pension schemes is fixed in the future.

FIGURE 15 – CONTRIBUTION RATE OF THE PRIVATE SECTOR EMPLOYEES' PENSION SCHEME (TYEL) USED IN THE PROJECTION



Source: Finnish Centre for Pensions

In Table 15, the pension contributions paid by local government and state employers are classified as employer contributions. State contribution only includes direct transfers form the state budget to the pension system. State contribution includes: 100% funding of the national pension scheme; 60% funding of the state employees' pension scheme[11] and the shares of the expenditure in self-employed persons' and farmers' pensions schemes that the contribution income does not cover, one third of expenditures in seafarer's pensions scheme and 100% of pensions accrued during child-care and studying.

TABLE 15 – REVENUE FROM CONTRIBUTIONS, NUMBER OF CONTRIBUTORS IN THE PUBLIC SCHEME, TOTAL EMPLOYMENT

	2019	2030	2040	2050	2060	2070	change 2019-2070 (pps)
Public pension contributions (%GDP)	21.7	12.8	12.9	13.2	13.5	13.9	-7.8
Employer contributions	6.5	6.6	6.7	6.8	7.0	7.2	0.6
Employee contributions	3.0	3.4	3.5	3.8	4.2	4.8	1.7
*State contribution**	2.6	2.4	2.0	1.8	1.8	1.8	-0.8
*Other revenues**	9.6	0.3	0.7	0.8	0.5	0.1	-9.5
Number of contributors (I) (1000)	2353	2362	2356	2276	2191	2122	-232
Employment (II) (1000)	2577	2532	2513	2437	2350	2274	-304
(I) / (II)	0.91	0.93	0.94	0.93	0.93	0.93	0.02

*only legislated contributions are reported

Source: European Commission

[11] State pension fund receives all central government pension contributions. The fund pays 40 % of yearly pension expenditure to the State budget and rest of contributions and interest revenues after expenses are funded.

3.5. Pension assets and return on assets

Property income from pension assets is an important element in financing the Finnish public pension system as in 2019 (31 Dec.), the pension assets added up to 90% relative to GDP. In the baseline projection, the real return on pension assets follows, after a transition period, the long-term interest rate on government bonds i.e. 2.0%, an assumption agreed by the AWG. In the national projections, the Finnish Centre for Pensions assumes that real return on pension assets will be 2.5% until 2028 and 3.5% from 2029 onwards[12]. The surplus of earnings-related pension schemes accumulates pension assets. It is assumed that the surplus of earnings-related pension schemes is calculated by adding up the property income and employer, employee and state contributions and subtracting the earnings-related pension expenditure and the administrative costs[13].

From the founding of the earnings-related pension schemes until the 2010s, the pension contributions have nearly always exceeded the pension expenditure. Recently, the expenditure exceeded the contribution income and the difference is financed with returns on pension assets. They are projected to decline rapidly to some 30% relative to GDP in 2040 and thereafter decrease slowly towards zero in 2070. If the national assumption (2.5% real return until 2028 and 3.5% as of 2029) is used, pension assets would remain quite steadily at the 2019 level of 90% relative to GDP. At the end of 2019, private sector (TyEL) pension assets were 62% of all pension assets and were 218% of private sector annual wage sum. The funding ratio[14] of the entire earnings-related pension scheme was at the end of 2017 over 24% and that of the private sector employees' pension scheme (TyEL) almost 26%.

TABLE 16 – PENSION ASSETS AND RESERVES (% GDP) AND RETURN ON ASSETS (%)

	average 1999-2008	average 2009-2018	2019	2030	2040	2050	2060	2070	average 2019-2070
Public pension scheme									
assets and reserves		80.2	90.0	52.7	29.8	20.9	12.5	1.4	33.1
average return		7.7	11.7	0.5	2.2	4.0	4.0	4.0	2.7
Private occupational schemes									
assets and reserves									
average return									
Private individual mandatory schemes									
assets and reserves									
average return									
Private individual non-mandatory schemes									
assets and reserves									
average return									

Source: European Commission

[12] This assumption can be seen as more realistic as the majority of pension funds are invested in risker assets than government bonds. In the end of 2019, the portfolio of earnings-related pension funds consisted of listed stocks (39.4%), private equity (10.1%), hedge funds (8.3%), real estate (8.5%), bonds and loans (28.8%) and money market investments (4.8%). Indicatively, the historic annual real return of pension fund assets in 1997–2019 (4.2%) has exceeded the implicit real interest rate on government securities of Finland, which was 2.0% in the same period.

[13] Total expenditure of earnings-related pension schemes except pension expenditure (according to national accounts).

[14] The funding ratio is the earnings-related pension funds divided by the capital value of accrued pensions (the value of accrued pensions has been calculated using a 1.5% real discount rate until 2028 and 2.5% as of 2029).

3.6. Sensitivity analysis

Sensitivity analysis is performed to illustrate the evolution of public pension expenditures in alternative economic, demographic and policy scenarios. Table 17 presents the results of the alternative scenarios as deviations (percentage points relative to GDP) from the baseline.

TABLE 17 – PUBLIC AND TOTAL PENSION EXPENDITURES UNDER DIFFERENT SCENARIOS (PPS DEVIATION FROM THE BASELINE)

Public pension expenditure	2019	2030	2040	2050	2060	2070	change 2019-2070 (pps)
Baseline (% GDP)	13.0	13.7	12.8	12.7	13.5	14.4	1.3
Higher life expectancy at birth (+2y)	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Higher migration (+33%)	0.0	-0.1	-0.2	-0.3	-0.5	-0.6	-0.6
Lower migration (-33%)	0.0	0.1	0.2	0.4	0.5	0.7	0.7
Lower fertility (-20%)	0.0	0.0	0.1	0.4	0.9	1.6	1.6
Higher employment rate of older workers (+10 pps.)	0.0	-0.5	-0.3	-0.3	-0.3	-0.2	-0.2
Higher TFP growth (convergence to 1.2%)	0.0	0.0	-0.2	-0.4	-0.5	-0.5	-0.5
TFP risk scenario (convergence to 0.8%)	0.0	0.1	0.3	0.4	0.5	0.6	0.6
Policy scenario: linking retirement age to change in life expectancy	:	:	:	:	:	:	:
Policy scenario: unchanged retirement age	0.0	0.4	0.8	1.2	1.6	1.9	1.9
Policy scenario: offset declining pension benefit ratio	0.0	0.0	1.0	1.7	1.9	1.9	1.9
Lagged recovery scenario	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
Adverse structural scenario	0.0	0.2	0.5	0.7	0.8	0.9	0.9

Total pension expenditure	2019	2030	2040	2050	2060	2070	change 2019-2070 (pps)
Baseline (% GDP)	13.0	13.7	12.8	12.7	13.5	14.4	1.3
Higher life expectancy at birth (+2y)	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Higher migration (+33%)	0.0	-0.1	-0.2	-0.3	-0.5	-0.6	-0.6
Lower migration (-33%)	0.0	0.1	0.2	0.4	0.5	0.7	0.7
Lower fertility (-20%)	0.0	0.0	0.1	0.4	0.9	1.6	1.6
Higher employment rate of older workers (+10 pps.)	0.0	-0.5	-0.3	-0.3	-0.3	-0.2	-0.2
Higher TFP growth (convergence to 1.2%)	0.0	0.0	-0.2	-0.4	-0.5	-0.5	-0.5
TFP risk scenario (convergence to 0.8%)	0.0	0.1	0.3	0.4	0.5	0.6	0.6
Policy scenario: linking retirement age to change in life expectancy	:	:	:	:	:	:	:
Policy scenario: unchanged retirement age	0.0	0.4	0.8	1.2	1.6	1.9	1.9
Policy scenario: offset declining pension benefit ratio	0.0	0.0	1.0	1.7	1.9	1.9	1.9
Lagged recovery scenario	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
Adverse structural scenario	0.0	0.2	0.5	0.7	0.8	0.9	0.9

Source: European Commission

In the higher life expectancy scenario, pension expenditure is projected to be 0.1pps higher relative to GDP in comparison to the baseline projection, as the average time spent in retirement increases. Nevertheless, the positive effect on public pension expenditure is dampened by the linkage of the retirement age to life expectancy, which effectively increases labour force participation in older age groups. Moreover, the life expectancy coefficient (sustainability/adjustment factor) lessens the effect of the increase in pension expenditures by adjusting the benefit levels downwards as life expectancy increases. However, these policies are not able to counteract all the effects of the rising life expectancy on expenditure. First, the old-age retirement age does not increase as much as life expectancy, as the linkage is defined such that the time spent working in relation to the time spent in retirement will remain constant. Secondly, the life expectancy coefficient does not adjust the pension levels of those who have already retired. Furthermore, the life expectancy coefficient does not apply to minimum pensions (national and guarantee pensions).

Higher migration decreases pension expenditure relative to GDP by 0.6pps relative to GDP in the long term. This is largely owing to the increase in GDP, whereas the effect on pension expenditure is relatively small. This is due to the fact that immigrants, who typically enter the country at a young age,

have not yet reached the eligibility age for the old-age pension before 2070. The lower migration scenario has similar effects, but in the opposite direction. It should be noted that the results are very sensitive to the assumed employment rate for the migrants.

Lower fertility leads to a substantial (1.6pps) increase in public pension expenditure relative to GDP in the long term. This is largely due to a fall in GDP, which is only partially offset by a small negative effect on pension expenditure via disability and survivor schemes. However, lower fertility does not affect other pension schemes, given that none of new-borns reaches the eligibility age for the old age pension before 2070.

Higher employment rate of older workers reduces public pension expenditure relative to GDP by 0.5pps in 2030 compared to the baseline scenario, but the effect diminishes towards the end of the projection period (-0.2pps in 2070). Older workers' employment decreases public pension expenditure for two reasons. First, it leads to higher GDP growth, and second, it reduces the number of inactive persons and pensioners in the older age groups, thus lowering pension expenditure. However, higher employment also results in higher accrued pension benefits, and hence, the downward effect on pension expenditure gradually diminishes over time (i.e. after 2030). The effect is so large because the probabilities to retire on old-age and disability pensions have to decrease by some 80% in certain age groups in order to achieve the assumed remarkable change in employment of older workers. Higher employment particularly affects disability pension expenditures. On the other hand, the effect on old-age pension expenditure is limited due to the actuarially neutral increment for deferred retirement.

Higher labour productivity growth decreases pension expenditure relative to baseline scenario largely owing to a higher growth rate in GDP over the long-term. The effect is some -0.5pps relative to GDP in 2070. The purchasing power of the earnings-related pensions in payment would increase to some extent due to partial (20%) indexation to wages, although, for the same reason, they would decrease relative to average earnings. However, the level of new pensions will increase due to higher pensionable earnings. In the long term, the contribution rate for private sector employees' pension scheme (TyEL) would be lower in comparison to the baseline projection. Lower labour productivity would affect pension expenditure in a similar way, but in the opposite direction.

The first policy scenario is similar to baseline scenario given that the retirement age will be linked to increases in the life expectancy as of 2030. Hence, the results from this scenario are not presented in Table 17.

In the second policy scenario, where retirement age is assumed unchanged at 2019 level, the share of pension expenditure to GDP increases relative to the baseline scenario towards the end of the projection period. In 2070, public pension expenditure is 1.9pps larger than in the baseline scenario. A constant retirement age increase the share of pension expenditure to GDP for two reasons. First, the number of pensioners increase pension expenditures, and second, the reduced labour force participation reduces GDP.

The third policy scenario, in which the declining benefit ratio is offset, assumes that policy measures are taken in the case where the earnings-related public pension benefit ratio decreases below 90% of its level in the base year. The scenario keeps the benefit ratio of old-age earnings-related pensions constant at a bit over 44% between 2031 and 2070. This scenario is modelled such that that the pensions in payment are indexed more generously than should be done according to the current law. This scenario substantially increases the share of pension expenditure to GDP relative to the baseline scenario from 2040s onwards. In the long-term the effect is similar in magnitude (almost 2pps relative to GDP) to the second policy scenario, when retirement age is assumed unchanged.

Finally, there are two alternative scenarios for how the COVID-19 pandemic may affect to the economy in the short and in the long term. A lagged recovery scenario has a negative effect on the pension expenditure to GDP, although the effect is overall quite modest, -0.1pps relative to GDP. This is because employment is lower compared to the baseline scenario in the 2020s, which leads to lower earnings-related pension expenditures in the long term. However, the GDP catches up and it is only -0.3% lower compared to the baseline scenario in the long term.

In the adverse structural scenario, pension expenditure to GDP increases relative to the baseline scenario, with the effect growing in importance towards the end of the projection period when the effect is 0.9pps relative to GDP. This is because the level of GDP remains lower compared to the baseline scenario, whereas pension expenditure does not react as much. In addition to these sensitivity scenarios, it is worth mentioning that the rate of return on pension funds' assets has a significant impact on the financial sustainability of the Finnish pension system. The pension assets and their returns constitute a large share of the revenues of the system as dividend and interest income of pension funds was 1.8% relative to GDP in 2019 despite the low interest rates.

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

The projected increase in public pension expenditure relative to GDP over the whole projection period is almost 1pp higher in AR 2021 compared to AR 2018 (Table 18). When analysing the subcomponents of the pension expenditure in Table 18, the considerable negative dependency ratio effect has remained stable since the last projection round, whereas the dependency ratio is now higher at the end of the projection period compared to previous population projections. This is because the dependency ratio has been on steeply increasing path between 2016 and 2019 (see Figure 12 in Section 3.3).

Compared to AR 2018, the clearly negative coverage ratio effect is less negative in the new projections. This difference is most pronounced in the 2020s, because, the growth in number of pensioners is higher at the beginning of the projection period.

The benefit ratio effect is now more negative compared to the previous projection round. This is because, the employment rate of aged workforce is higher compared to the last projection round and new retirees have shorter than average careers.

The labour market effect is now less negative than in AR 2018. This is due to the fact that the employment rate has risen faster than projected in the previous round, thus reducing the negative effect in the beginning of the projection period (see Figure 8 in Section 2.2).

Prolonging the projection period from 2060 in AR 2015 to 2070 in AR 2018 was a key factor underlying the higher projected pension expenditure in AR 2018, as pension expenditure relative to GDP was projected to rise markedly between 2060 and 2070. In addition, the 2017 pension reform was for the first time included in the AR 2018 projections, although its effects were counteracted by the less favorable projection assumptions compared to projections in AR 2015. When comparing the projections in AR 2015 to those in AR 2012, lower pension expenditure in AR 2015 was mainly due to more favorable population projections. The projected changes in public pension expenditure were quite stable in the AR 2006, AR 2009 and AR 2012 projections.

TABLE 18 – CHANGE IN THE PUBLIC PENSION EXPENDITURE-TO-GDP RATIO AND DISAGGREGATION FOR CONSECUTIVE PROJECTION EXERCISES (PPS OF GDP)

	Public pension expenditure	*Dependency ratio effect*	*Coverage ratio effect*	*Benefit ratio effect*	*Labour market effect*	*Residual (incl. interaction effect)*
2006 Ageing Report (2004-2050)	**3.33**	*8.76*	*-3.07*	*-0.85*	*-0.89*	*-0.61*
2009 Ageing Report (2007-2060)	**3.33**	*8.69*	*-3.14*	*-0.86*	*-0.61*	*-0.74*
2012 Ageing Report (2010-2060)	**3.19**	*8.57*	*-3.20*	*-0.90*	*-0.54*	*-0.73*
2015 Ageing Report (2013-2060)	**0.06**	*6.04*	*-2.51*	*-2.74*	*-0.50*	*-0.25*
2018 Ageing Report (2016-2070)	**0.56**	*6.57*	*-2.46*	*-2.00*	*-1.33*	*-0.223*
2021 Ageing Report (2019-2070)	**1.32**	*6.54*	*-1.66*	*-2.39*	*-0.95*	*-0.209*

- The disaggregation for 2006/2009/2012 is on the basis of pensions; for 2015/2018/2021 it is on the basis of pensioners.

- The projection horizon has been extended over consecutive Ageing Reports, limiting comparability over time.

Source: European Commission

The table presents the total change in public pension expenditure during the consecutive projection horizons and the contribution of the different components to that overall change.

Table 19A presents a comparison of projections in AR 2018 with actual public pension expenditure between 2016 (the previous base year) and 2019 (the new base year). Between 2016 and 2019, pension expenditure has evolved as expected, whereas GDP growth has been considerably higher than projected. Hence, in 2019, the share of pension expenditure to GDP was 0.7pps lower than projected in AR 2018.

TABLE 19A – DISAGGREGATION OF THE DIFFERENCE BETWEEN THE 2018 PROJECTIONS AND ACTUAL PUBLIC PENSION EXPENDITURE IN 2016-2019 (% GDP)

	2016	2017	2018	2019
Ageing Report 2018 projections	13.4	13.5	13.6	13.7
Assumptions (pps of GDP)	-0.2	-0.5	-0.6	-0.7
Coverage of projections (pps of GDP)	0.0	0.0	0.0	0.0
Constant policy impact (pps of GDP)	0.0	0.0	0.0	0.0
Policy-related impact (pps of GDP)	0.0	0.0	0.0	0.0
Actual public pension expenditure	13.1	13.1	13.0	13.0

Source: Finnish Centre for Pensions, the Social Insurance Institution of Finland, Ministry of Finance

The decomposition of the difference between 2015 and the new public pension projection is reported in Table 19B. The change in assumptions (i.e. labour productivity, demographic development and employment) is the most important reason for the differences. In the AR 2018 projections, the level of GDP in current prices was underestimated for the near future, and thus the pension expenditure relative to GDP is lower until 2019. In addition, the higher employment rate lowers the pension expenditure relative to GDP after the recovery following the current pandemic until the end of the 2030s. However, the pension expenditure relative to GDP will increase in the long term (by almost 1pp in 2070) due to more rapidly increasing old-age dependency ratio compared to the AR 2018 projection.

There have been some improvements in the modelling, which have resulted in gradually lower pension expenditures over the projection period. In 2070, the pension expenditure is some 0.6pps lower than in the previous projection because the disability rates are lower in the model, given that disability pension's take-up rates are projected to decrease more rapidly than previously expected.

There have been no changes in the interpretation of constant policy. Finally, there has been only one moderate policy-related change as the minimum pensions (national and guarantee pensions) were increased in total by 0.1pps relative to GDP in the beginning of 2020. This effect is assumed to be the same relative to GDP for the whole projection period because the minimum pensions are assumed to be indexed according to wages from 2025 onwards.

TABLE 19B – DISAGGREGATION OF THE DIFFERENCE BETWEEN THE 2018 AND THE NEW PUBLIC PENSION PROJECTIONS (% GDP)

	2019	2030	2040	2050	2060	2070
Ageing Report 2018 projections	13.7	14.8	13.9	13.2	13.5	13.9
Change in assumptions (pps of GDP)	-0.7	-0.9	-0.7	-0.1	0.5	0.9
Improvement in the coverage or in the modelling (pps of GDP)	0.0	-0.2	-0.4	-0.5	-0.6	-0.6
Change in the interpretation of constant policy (pps of GDP)	0.0	0.0	0.0	0.0	0.0	0.0
Policy-related changes (pps of GDP)	0.0	0.1	0.1	0.1	0.1	0.1
New projections	13.0	13.7	12.8	12.7	13.5	14.4

Source: Finnish Centre for Pensions, the Social Insurance Institution of Finland, Ministry of Finance

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

4.1. Institutional context in which the projections are made

The Finnish Centre for Pensions runs the earnings-related model, and the Social Insurance Institution of Finland runs the national pension model. There is no formal national peer review of the projections other than review experts in the Ministry of Finance, Finnish Centre for Pensions and the Social Insurance Institution of Finland. However, the national long-term projections by the Finnish Centre for Pensions have been evaluated externally. The Finnish Centre for Pensions has requested the Actuarial Society of Finland to select one or two persons to review the content of the two latest projection reports. The evaluations made by the appointed persons have also been published.

4.2. Assumptions and methodologies applied

The results of this fiche have been calculated using the long-term projection models of the Finnish Centre for Pensions and the Social Insurance Institution of Finland. The models simulate the functioning of the Finnish pension system and can be used to make projections for the purposes of planning and forecasting.

4.3. Data used to run the model

The earnings-related projection model requires the following data to describe the initial state, specified by pension act as well as by the age and gender of the insured:

1. population distribution over different acts and different states under the acts
2. salaries of the insured
3. amounts of pension accrued
4. technical provisions and the amount of pension assets
5. amounts of the pensions payable
6. transition probabilities between different states

Figures describing the initial values for the projection (2019) have been provided by the Finnish Centre for Pension's employment and pension registers, the joint statistics of the Social Insurance Institution and the Finnish Centre for Pensions, the Local Government Pension Institution and the State Treasury.

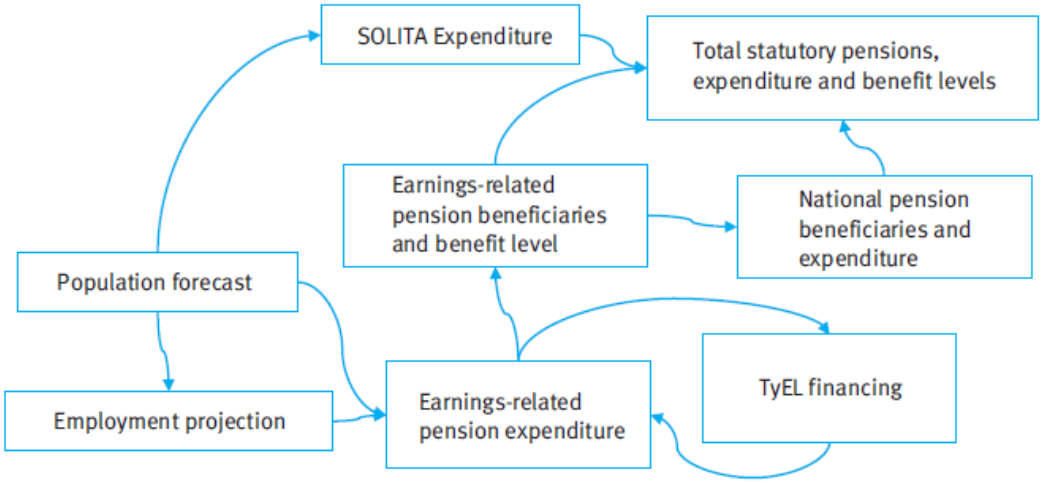
4.4. Reforms incorporated in the model

Please see above (section 1.2.) for reforms made into the earnings-related model and to the national pension scheme.

4.5. General description of the model(s)

The results concerning the earnings-related pensions have been calculated using the long-term planning model of the Finnish Centre for Pensions. The model is deterministic and replicates the functioning of the earnings-related pension scheme. The model consists of several interconnected modules (Figure 16).

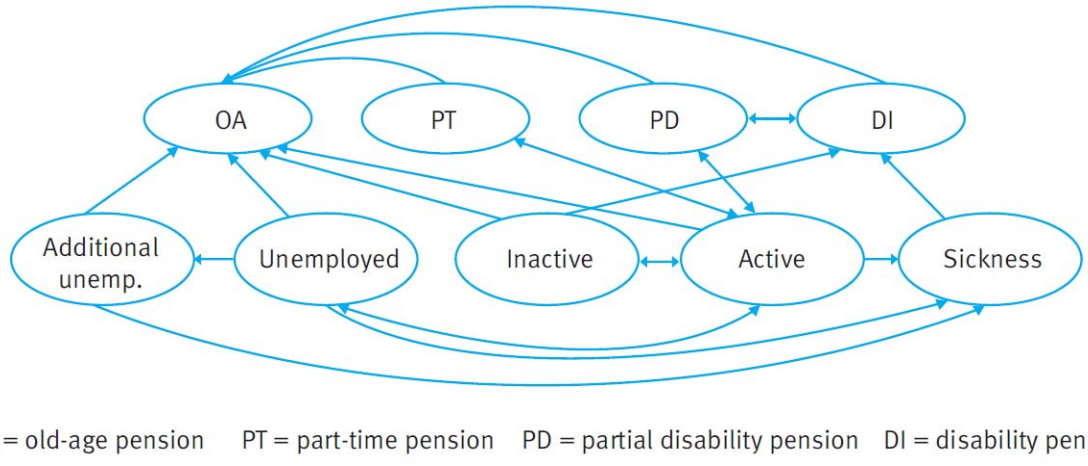
FIGURE 16 – MODULES OF THE PROJECTION MODEL



Source: Finnish Centre for Pensions

The earnings-related pension expenditure module. Earnings-related pension expenditure is projected separately for each earnings-related pension act. Pensions are paid out to pensioners on an annual basis, insured persons accrue future pensions, and persons move between different states (employed, unemployed, pensioner etc.) according to given probabilities. The model's states and transitions between these states are presented in Figure 17. Unemployment pensions were eliminated in 2011. In the future, the transition from unemployment will be made directly to old-age pension.

FIGURE 17 – PROJECTION MODEL'S STATES AND TRANSITIONS BETWEEN THESE STATES



Source: Finnish Centre for Pensions

Those active in the model are in gainful employment, their earnings accrue a pension, and their contributions are levied on the basis of the earnings. The unemployed are divided into three different states in the model. Persons aged less than 61 who receive an earnings-related unemployment allowance are categorized as unemployed. Long-term unemployed persons aged over 61 years are entitled to an

earnings-related unemployment allowance for additional days until their pension starts. These two groups of unemployed accrue an earnings-related pension during their periods of unemployment.

Other unemployed persons do not accrue a pension (currently about half of the unemployed) and they are categorized as inactive. Persons transferred to the category of inactive also include those who exit the labour force, and those who transfer from work covered by the act under observation to work covered by some other act. The inactive are those persons who have accrued a pension under the act under observation, but who no longer work in a job covered by this act, and who are not drawing a pension.

In addition to the transitions presented in Figure 17, new employees are added, on an annual basis, to the active category in accordance with population and employment forecasts. Persons in each state also die over the course of a year, and some of these deaths result in the award of a survivor's pension to living family member(s).

Within the model's states, people are grouped by the age and gender. An average technique is applied in these groups. For example, all 50-year-old men working in employment contracts covered by TyEL are assumed to be identical to each other. It is easier to use an average modelling technique as opposed to an individual-level projection, but at the same time it produces less information. For example, a distribution of pensions by size cannot be calculated.

The average technique used by the model does not prevent capturing the selectiveness of transitions between different states. The following phenomena have been included to the model:

1. Accrued pension and salary for projected pensionable service for those transferring to disability pension are typically lower than for those continuing in gainful employment.
2. The mortality for persons drawing a disability pension is higher than the average for the population in general, while the mortality for non-disabled persons is correspondingly lower.
3. Among old-age pensioners, a large pension is associated with low mortality when age and gender are taken in the account.
4. Pension accruals for those dying while still within the active age range are lower than average for the insured.

The private sector employees' act (TyEL) financing module is used to calculate the development of TyEL's contribution rate, technical provisions and assets. It contains a detailed description of the legislation and the bases of calculation pertaining to TyEL financing.

The financing module is joined to the TyEL expenditure module via a two-way connection: TyEL expenditure and wage sums affect the contribution level and the formation and dissolution of technical provisions. Conversely, the size of the employee's pension contribution affects pension accrual and therefore pension expenditure. Premium income is composed of a pooled component, a funded component and a remaining component, which contains operating expenses and client bonuses. The pooled component is used to finance pay-as-you-go pensions, and the funded premium income is accumulated into technical provisions for the pension providers. Technical provisions are also dissolved to finance annually paid pensions. Since the required amounts of technical provisions are calculated per age group for each calendar year, the age-specific allocation of old-age pension liability supplements can be investigated with the help of the model.

The number of earnings-related pension recipients and the average earnings-related pension are calculated once the pension expenditure of all earnings-related pension acts is known. The number of insured persons and earnings-related pension recipients is calculated by pooling all the earnings-related pension schemes together. This projection is analogous to the scheme-specific projections, but it encompasses all the insured persons and all pensioners in Finnish earnings-related pension schemes.

In the national pension module, the number and the size of national pensions is calculated. The earnings-related pension projection serves as a basis for determining the national pensions. However,

the model does not provide information on the size distribution of earnings-related pensions. Therefore, in order to calculate national pensions, it is assumed that the shape of the commencing earnings-related pension distribution remains unchanged across time.

The model allows the national pension index to be a pure price index, a pure earnings-level index or a weighted average of these indexes. Since the 2008 increase, no decisions have yet been made regarding the next general increase in the national pension scheme. Historically, however, the practice has been to increase occasionally the real value of national pensions. In the baseline projection, increases have been taken into account by assuming that the national pension index is equal to half of price growth plus half of average earnings growth.

The SOLITA[15] module is a simple description of the development of SOLITA expenditure based on a population forecasts. The starting point for the projection is current SOLITA expenditure, by age and gender. For those of active age (18-62-year olds), SOLITA pensions grow at the same rate as the general wage level. For those who are 63 or older, SOLITA pensions grow at the same rate as the earnings-related pension index.

The national pension model

The national pension model run by the Social Insurance Institution of Finland estimates the total national pension expenditure and the number of recipients of the national pension. Old-age, disability, survival and guarantee pensions are treated separately. The model is deterministic and uses the population and employment forecasts as well as the information of changes in consumer prices and average earnings growth.

In order to determine the number of recipients of the national pension and guarantee pension, the total number of pensioners is first estimated. The number of the new national pensioners is calculated from the total number of the new pensioners using the distribution of earnings-related pension income. The shape of the distribution is not assumed to change over the time. The level of average earnings-related pensions is assumed to evolve as in the near past, considering the changes in average income and employment rates.

In the calculation of the average level of the national pension in different age groups, both long-term changes in the level of employment and average wages are taken into account. In the model, the level of the national pension is indexed to one half of the price growth plus one half of the average earnings growth. Using the earnings growth in the indexation simulates the occasional increases of the real level of the national pension.

4.6. Additional features of the projection model

- Number of different persons modelled per generation.

The model is an average aggregate model, in which people are divided into two genders and ca. 20 population states corresponding to workers, unemployed persons, retirees etc. Persons are not simulated on an individual level.

- How is the replacement rate of new retirees calculated?

Replacement rate of the old-age earnings-related pensions is calculated by dividing the new old-age earnings-related pension expenditure (multiplied by two because the new pensioners receive the pension in the first year only in 6 months on average) by the number of new old-age earnings-related pensioners. This number is divided by the economy-wide average wage at retirement.

[15] SOLITA-pensions refer to military accident and injury, traffic insurance and accident insurance laws.

- How are careers modelled?

The employment projection is based on the population forecast, the assumed long-term equilibrium unemployment rate, and estimated entry and exit rates that depict changing labour force participation.

- How are survivors' pension calculated?

The average size and number of new earnings-related survivors' pensions is calculated based on pensioners and people with pension entitlements dying during the same year. The age of the surviving spouse depends on the age and gender of the deceased. Survivors' pensions are indexed to the earnings-related pension index and the mortality difference of survivors and the whole population is assumed to stay unchanged.

- How is the retirement age and its development over the projection period computed?

The statutory retirement age is raised from 63 to 65 during the years 2018–2027. After 2030, the statutory retirement age is linked to life expectancy as described in section 1.1. The expected effective retirement age for a given year is calculated as the age at which people would retire on average, if the age-specific retirement and mortality rates would remain unchanged. Hence, it is not affected by changes in demography.

Methodological annex

Economy-wide average wage at retirement

In the projection, it is assumed that economy-wide average wage at retirement grows faster than the economy-wide average wage as the retirement age increases over time and the average wage increases with age for older employees.

TABLE A1 – ECONOMY WIDE AVERAGE WAGE AT RETIREMENT (1000 EUR)

	2019	2030	2040	2050	2060	2070	% change 2019-2070
Economy-wide average gross wage at retirement	41.7	62.2	88.8	128.2	185.4	264.4	534.4
Economy-wide average gross wage	38.5	55.6	78.6	111.6	158.4	225.1	484.4

Source: European Commission, Finnish Centre for Pensions

Pensioners vs. pensions

Total number of pensioners sums up from the subcategories so that people getting some sort of minimum pension are calculated only once. Hence, the number of pensioner receiving minimum pensions is the number of people receiving *only* guarantee pension or national pension. These pensioners do not receive earnings-related pension at all and those who receive also earnings-related pension are included only in the category of earnings-related pensioners. The same logic is used also with disability pensioners.

For the numbers of pensions it is done on the contrary: If the pensioner gets at the same time earnings-related pension and national or guarantee pension he/she is calculated twice. However, if the pensioner gets at the same time guarantee pension and national pension (the two types of minimum pension) he/she is calculated only once.

Pension taxation

As for net total pension expenditure, an assumption of a constant tax ratio of 20.8% has been used based on tax revenues from pension income in 2019.

Disability pensions

Age-specific incidence rates for disability pensions have decreased steadily since the 1990s. This trend is assumed to continue into the future. However, as the retirement age rises, more people face the risk to retire on a disability pension. Consequently, the average age and the number of people retiring on a disability pension increases. Disability pensions are transformed into old-age pensions at the statutory retirement age or at most two years later for public sector pensions.

TABLE A2 – DISABILITY RATES BY AGE GROUPS (%)

	2019	2030	2040	2050	2060	2070
Age group -54	1.2	1.2	1.1	1.1	1.1	1.0
Age group 55-59	9.7	8.2	7.6	7.2	6.9	6.8
Age group 60-64	14.6	17.4	16.4	15.5	15.4	15.0
Age group 65-69	0.0	0.4	4.0	6.3	10.8	13.6
Age group 70-74	0.0	0.0	0.0	0.0	0.0	0.0
Age group 75+	0.0	0.0	0.0	0.0	0.0	0.0

Source: Finnish Centre for Pensions

Survivors' pensions

The driving forces behind the projections of survivors' benefits are described in section 4.6.

Non-earnings related minimum pension

After the maturation of the earnings-related pension scheme, the level and coverage of the earnings-related pensions have increased. The share of the minimum pensions provided by the Social Insurance Institution of Finland has dropped to some 7% of total pension expenditure. In addition, the ratio of minimum pension expenditure to GDP has nearly halved since 1990 despite the fact that a new minimum pension benefit, the guarantee pension, was introduced in 2011.

Mortality among persons receiving a national old-age pension is, standardised for age and sex, higher than in the general population. Mortality is assumed to follow the same rate of decline as estimated in the population projection. The relative difference to mortality in the general population is retained. Furthermore, particularly among men, mortality is more pronounced in those receiving a higher-than-average national pension.

The main factors that influence the expenditures of the minimum pensions are indexation and the pension reform 2017. The projection assumes that the minimum pensions are increased by real wage growth starting from 2025. The higher level of minimum pensions leads to higher number of recipients and higher total expenditures. On the other hand the pension reform affects the other direction with the higher level of the earnings-related pensions and the rising age limits decreasing the number of minimum pension recipients.

With indexation assumption used in projection the ratio of minimum pension expenditure to GDP will remain roughly at its current level in projection period.

Contributions

The assumptions and the calculation of the contributions are described in section 3.4.

Alternative pension spending disaggregation

Table A3 is similar in structure to Table 8, but provides a disaggregation based on pension data as compared to pensioners in Table 8.

TABLE A3 – FACTORS BEHIND THE CHANGE IN PUBLIC PENSION EXPENDITURE BETWEEN 2019 AND 2070 (PERCENTAGE POINTS OF GDP) – PENSIONS

	2019-30	2030-40	2040-50	2050-60	2060-70	2019-70
Public pensions to GDP	0.7	-0.9	-0.1	0.8	0.8	1.3
Dependency ratio effect	2.7	0.5	1.3	2.0	1.4	7.9
Coverage ratio effect*	-1.5	-0.3	-0.1	-0.2	0.0	-2.1
Coverage ratio old-age	-0.4	-0.2	0.1	0.2	0.2	0.0
Coverage ratio early-age	-2.8	-1.1	-0.7	-0.6	-0.3	-5.5
Cohort effect	-2.9	0.3	-0.3	-0.9	-0.4	-4.3
Benefit ratio effect	-0.1	-0.8	-0.6	-0.1	0.1	-1.6
Labour market effect	-0.1	-0.2	-0.3	-0.2	-0.1	-0.9
Employment ratio effect	-0.1	-0.1	-0.1	-0.1	0.0	-0.4
Labour intensity effect	0.0	0.0	0.0	0.0	0.0	0.0
Career shift effect	0.0	0.0	-0.2	-0.2	-0.1	-0.5
Residual	-0.3	-0.2	-0.4	-0.6	-0.5	-2.0

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

Source: European Commission

Administrative data on new pensioners

Tables A4a/A4b/A4c show the administrative data reported for the base year 2019. The old-age figures are used to calculate the average effective retirement ages in Tables 4a and 4b.

TABLE A4A – NUMBER OF NEW PENSIONERS BY AGE GROUP IN 2019 (ADMINISTRATIVE DATA) – MEN

Age group	All	Old-age	Disability	Survivor	Other (including minimum)
15 - 49	4420	24	4036	360	0
50 - 54	1613	198	1324	91	0
55 - 59	3034	253	2632	149	0
60 - 64	18759	15853	2669	237	0
65 - 69	4695	4380	0	315	0
70 - 74	545	37	0	508	0
75+	1821	3	0	1818	0

Source: European Commission

TABLE A4B – NUMBER OF NEW PENSIONERS BY AGE GROUP IN 2019 (ADMINISTRATIVE DATA) – WOMEN

Age group	All	Old-age	Disability	Survivor	Other (including minimum)
15 - 49	5013	10	4511	492	0
50 - 54	1765	2	1516	247	0
55 - 59	3401	40	2898	463	0
60 - 64	20811	17000	3017	794	0
65 - 69	6504	5263	0	1241	0
70 - 74	1988	23	0	1965	0
75+	5777	7	0	5770	0

Source: European Commission

TABLE A4C – NUMBER OF NEW PENSIONERS BY AGE GROUP IN 2019 (ADMINISTRATIVE DATA) – TOTAL

Age group	All	Old-age	Disability	Survivor	Other (including minimum)
15 - 49	9433	34	8547	852	0
50 - 54	3378	200	2840	338	0
55 - 59	6435	293	5530	612	0
60 - 64	39570	32853	5686	1031	0
65 - 69	11199	9643	0	1556	0
70 - 74	2533	60	0	2473	0
75+	7598	10	0	7588	0

Source: European Commission