Adapting to Changes in Life Expectancy in the Finnish Earnings-Related Pension Scheme

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In this article we discuss the policy choices made in order to adapt to changes in life expectancy in the Finnish earnings-related pension scheme and study different adaptation methods by using the rule-based long-term planning model of the Finnish Centre for Pensions (Tikanmäki et al, 2017). We compare the automatic mechanism (the life expectancy coefficient) that adjusts pension levels to the mechanism that alters both pension levels and the retirement age, thus promoting later retirement. The latter mechanism replaced the first mentioned as the latest pension reform (see e.g. Reipas & Sankala, 2015) came into effect in 2017.

The defined benefit (DB) benefits of the Finnish earnings-related pension scheme are partially funded. About a quarter of accrued pension entitlements are pre-funded and the rest are financed through a pay-as-you-go (PAYG) system. These elements (DB and PAYG) combined call for a balancing mechanism that adjusts pensions as life expectancies rise.

1. Adapting to changes in life expectancy

Demographic changes have been playing major role in the Finnish earnings-related pension reforms over the past two or three decades. The partial funding of the pension scheme has made it easier to adjust and prepare for fluctuations of the pension expenditure or contributions (caused e.g. by economic recessions or the retirement of the baby boomer generation).

After a long post-war period of economic growth it became apparent in the early 1990s that the Finnish earnings-related pension scheme needed reforms to battle the ever-growing expenditure levels and adapt to the persisting trend of rising life expectancies. After cutting back early retirement options, an automatic balancing mechanism called the life expectancy coefficient was introduced in the reform of 2005. The introduction of the life expectancy coefficient helped stabilize the projected ratio of the earnings-related pension expenditure to the wage sum (*pension expenditure ratio*).

The flexible retirement age of 63-68 was introduced together with the life expectancy coefficient in the reform of 2005. This means that old age retirement is possible at age 63 but employees can keep working until 68 if they wish. The flexible retirement age gave an option to insured persons to retire a bit earlier or to compensate the effect of the life expectancy coefficient by working and thus accruing pension longer. This gives an incentive and an opportunity to extend careers as life expectancy increases. The downside of this chosen mechanism is that if people retire too early, they might end up with an inadequate pension. This applies especially to those who end up retiring on a disability pension since the life expectancy coefficient decreases their pensions while they have no possibility to keep on working. The possibility for early retirement could also have a decreasing effect on the size of the workforce and the wage sum.

1.1. The goals of the pension reform of 2017

The economic downturn of 2008 escalated discussion concerning the earnings-related pension scheme and in particular, the incentives it offers employees to extend working careers. It was seen that people should work longer in order to expand the tax base and also accrue larger pensions at the same time. Also, the previous population forecasts had underestimated the rise of life expectancy. The government and the social partners reached a consensus regarding the main goals of the upcoming pension reform in agreements made in 2009 and 2012.

The main goals of the pension reform were:

- ***The effective retirement age*** for a 25-year old should increase by three years in the next 17 years. The effective retirement age is a measure developed in the Finnish Centre for Pensions. The measure is analogous to life expectancy, and reacts to changes in the retirement risk. Furthermore, it is independent of the age structure of the population. For more details, see Kannisto (2016).
- ***The fiscal sustainability of the government*** should be aided such that the fiscal gap decreases by one percentage point. The fiscal gap is measured by using the S2 sustainability indicator of European Commision.

Other goals included stabilizing pension expenditure ratios and setting pension contributions to a sustainable level.

1.2. The pension reform of 2017

In 2014 the social partners and the government reached an agreement on the details of the upcoming pension reform. In order to increase the effective retirement age, it was agreed that the general retirement age[1] will be raised by three months per birth year (cohort) for those born in 1955 and later, until it is 65. As of 2027, the general retirement age will be linked to life expectancy so that the ratio of the theoretical working career to the theoretical time spent at retirement remains unchanged. In this context, the theoretical working career is defined as the time between the age of 18 years and the general retirement age and the theoretical time spent at retirement is defined as the life expectancy at the general retirement age.

The link between the life expectancy and the general retirement age mean that the amount of projected pensionable service (see Appendix) and the level of disability pensions increase if life expectancy increases.

The link is also taken into account in the formula of the life expectancy coefficient. Technically this is done by defining the longevity indicator as the capital value of a unit pension beginning at the general retirement age (see box 1). In practice, this mitigation increases the average pension for people born in 1970 by 1.8 percent and for people born in 1980 by 4.2 percent, as compared to the pre-reform definition.

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[1] In this article, we use the expression “the general retirement age” to describe the lowest age when a person is eligible to the old age pension.

Box 1. *The life expectancy coefficient*

The life expectancy coefficient is an automatic balancing mechanism that is applied to a beginning pension. The purpose of the life expectancy coefficient is to limit the growth in pension expenditure due to the rising life expectancy. It also contributes to prolonged working lives by lowering the incentives to retire early.

Before the reform of 2017, 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. If life expectancy increases, monthly pensions are decreased and if life expectancy decreases, monthly pensions are increased.

In the reform it was decided that 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. It follows from the formula that the mitigation is slightly undercompensating in terms of the capital value of the old age pension.

As a result of the reform, earnings-related pension will accrue as of age 17 at an annual accrual rate of 1.5 per cent. For persons aged 53–62 years, however, pension will accrue at a rate of 1.7 per cent during the transition period until the end of the year 2025. If the pension is deferred past the earliest eligibility age for old age pension, the pension will be increased by 0.4 per cent per each deferred month.

2. The baseline simulations

We assess the effects of the link of the retirement age to life expectancy in the long term by comparing the results of two simulated scenarios: one corresponding to the valid legislation after the reform (Tikanmäki et al, 2017) and an alternative scenario, where the link of the retirement age to mortality is not made and hence the retirement age stays at 65 years indefinitely. This is automatically taken into account in the formula of the life expectancy coefficient, so the life expectancy coefficient is not mitigated and decreases faster than in the reform scenario. The simulations are based on the long-term planning model of the Finnish Centre for Pensions and the simulation horizon extends to 2085. The model is a rule-based deterministic average aggregate model and does not incorporate behavioral equations. The model is described in more detail in Tikanmäki et al (2017).

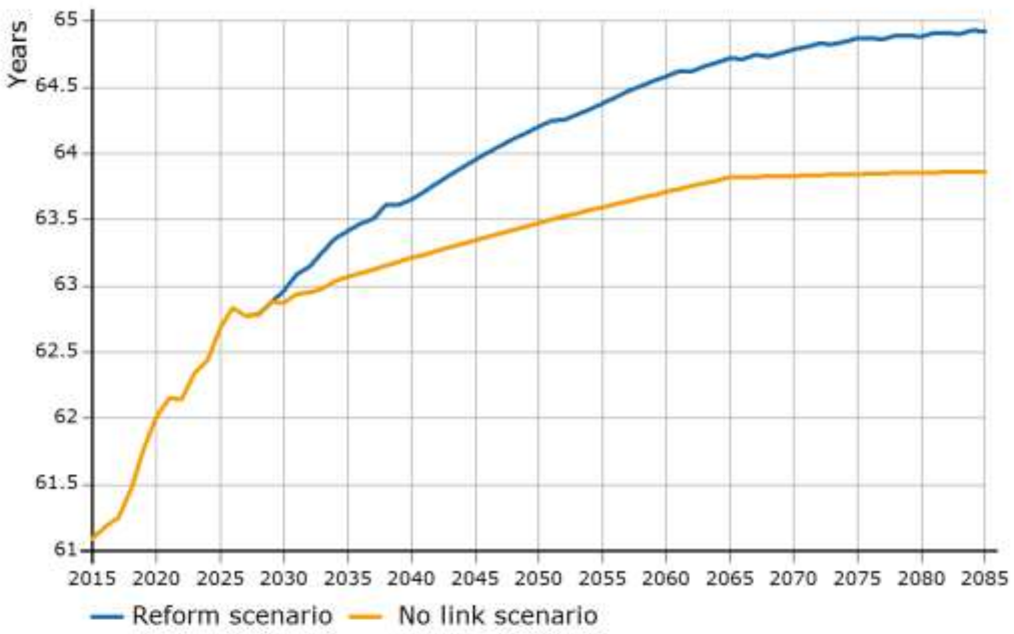
Table 2.1. *The general retirement age and the life expectancy coefficient*

Birth year	General retirement age		Life expectancy coefficient	
	No link	Reform	No link	Reform
1950	63 years	63 years	0.984	0.984
1960	64 years 6 mos	64 years 6 mos	0.935	0.935
1970	65 years	65 years 8 mos	0.886	0.905
1980	65 years	66 years 7 mos	0.846	0.888
1990	65 years	67 years 5 mos	0.813	0.874
2000	65 years	68 years 1 mos	0.786	0.861

The rise of the general retirement age leads to a rise in the effective retirement age. In the first years, each rise of the general retirement age by one year leads to a rise of the effective retirement age by about half a year. Also, the higher the general retirement age rises, the smaller the effect on actual retirement is. There are several reasons for this: firstly, disability pension risks rise with age which leads to a larger portion of people retiring on a disability pension before the general retirement age. Secondly, the number of people postponing retirement beyond the general retirement age is assumed to decrease and postponement durations shorten as the retirement age rises.

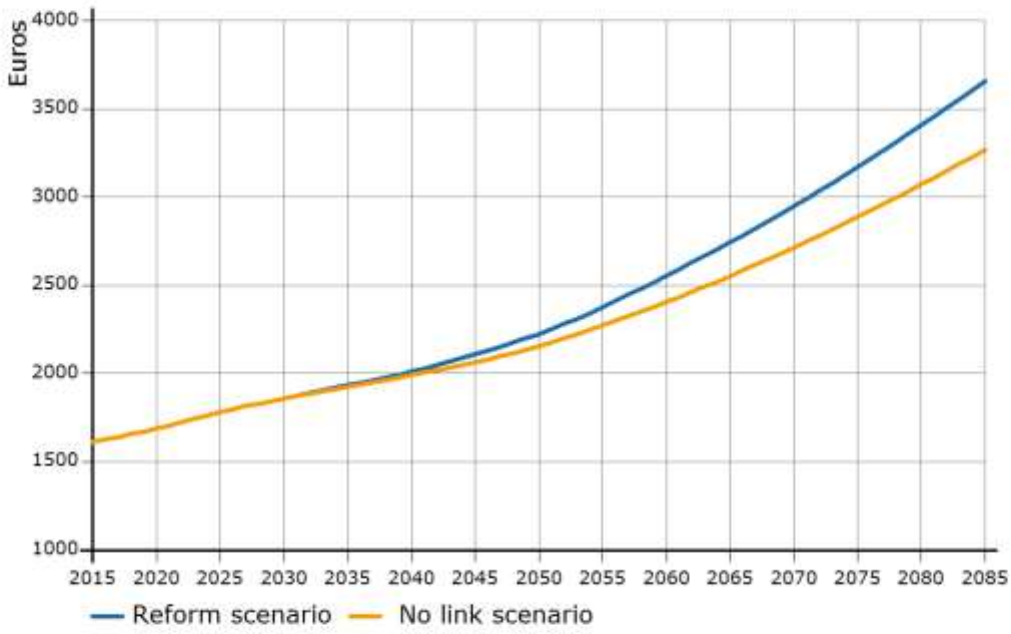
The effective retirement age in Finland was 61.1 years in 2015. In both scenarios, the effective retirement age is 62.7 years in 2025, as the mortality link has not yet had any effect. In the no link scenario it rises to 63.9 years and in the reform scenario to 64.9 years by 2085, hence we can say that the effect of the mortality link on the effective retirement age amounts to one year by 2085 while the effect on the general retirement age is over three years. However it is worth noting that the future realizations of retirement risks and employment rates probably have a high impact on the outcomes. (Figure 2.1)

Figure 2.1. *The expected retirement age for a 25-year-old person, years*



The average pension, including the national and guarantee pensions in addition to the earnings-related pension, was 1613 € in 2015. It increases to 1782 € by 2025 (at 2015 prices) in both scenarios. In the no link scenario it is projected to rise to 3270 € by 2085 (at 2015 prices), with the increase mostly due to increases in real wages both in the past and in the future. In the reform scenario it is 11 % or 336 € higher in 2085 (at 2015 prices), with the increase mostly due to the mitigation of the life expectancy coefficient and longer working careers. (Figure 2.2)

Figure 2.2. *Average pension, €/month.*



The mortality link has a two-fold effect on the expenditure ratio of the earnings-related pension scheme. As the mitigation of the life expectancy coefficient is slightly undercompensating in terms of the capital value of the old age pension, and the rising retirement age has a positive effect on the wage sum, the expenditure ratio decreases in 2030-2050. In the long run, the development of the expenditure ratio is heavily influenced by the disability pension risk as well as the unemployment risk of the elderly workers. In the reform scenario, the number of people drawing a disability pension grows much larger than in the no link scenario. This leads to a situation where the mortality link actually increases the expenditure ratio in the long run. (Figure 2.3)

Figure 2.3. *Earnings-related pension expenditure relative to the sum of earned income 2015–2085.*

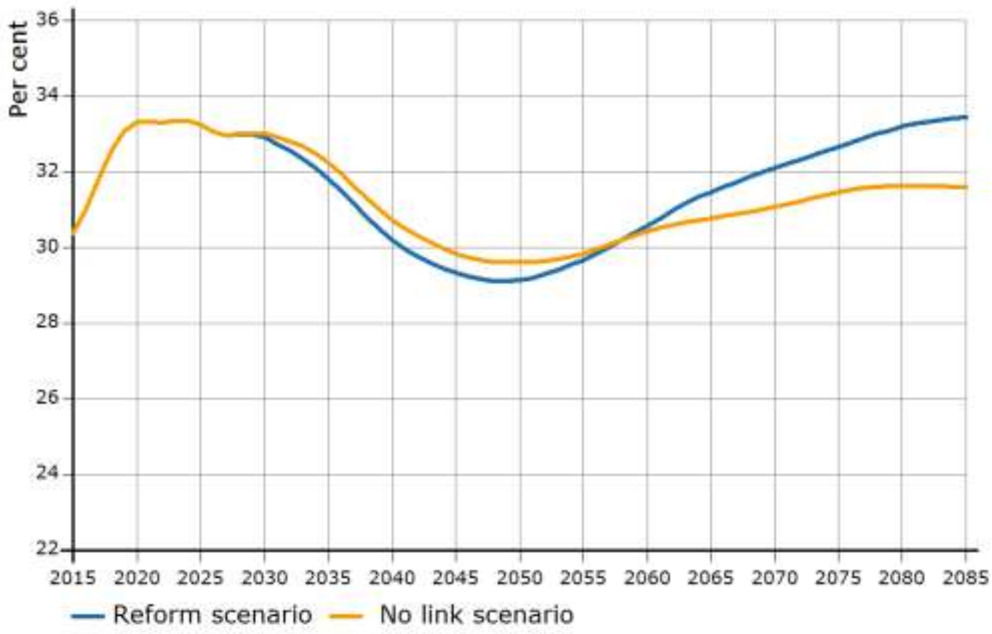


Table 2.2. *Results from the baseline simulations.*

	2015	2025	2045	2065	2085
Effective retirement age, years					
Reform	61,1	62,7	64,0	64,7	64,9
No link	61,1	62,7	63,3	63,8	63,9
Effect of mortality link	-	-	0,6	0,9	1,1
Average pension, €/month at 2015 prices					
Reform	1613	1782	2109	2743	3658
No link	1613	1782	2064	2553	3270
Effect of mortality link	-	-	44	190	388
Pension expenditure (% of wage sum)					
Reform	30,4	33,3	29,3	31,5	33,4
No link	30,4	33,3	29,8	30,8	31,6
Effect of mortality link	-	-	-0,5	0,7	1,8

2.1. Sensitivity analysis on the effect of mortality

We have conducted a sensitivity analysis on the effect of mortality in both the reform and the no link scenarios. This analysis is based on separate simulations done with high and low mortality assumptions. These roughly correspond to the 50 per cent confidence interval for Finnish mortality forecasts given by Alho and Spencer (2005). By 2085, life expectancy at birth reaches 90.5 years in the baseline projection, while in the high and low mortality projections it reaches 88.7 and 95.0 years respectively. Life expectancy at birth in Finland was 81.4 years in 2015.

In the reform scenario, the difference in the effective retirement age in the high and low mortality simulations is about 4-5 months in 2045 and 7 months in 2085. In the no link scenario, mortality has practically no effect on the effective retirement age.

Table 2.3. *Comparison of the different mortality scenarios.*

Expenditure ratio	2015	2025	2045	2065	2085
No link	30,4	33,3	29,8	30,8	31,6
Effect of high mortality	-	-0,1	-0,4	-0,2	-0,2
Effect of low mortality	-	0,2	1,1	1,0	1,4
Reform	30,4	33,3	29,3	31,5	33,4
Effect of high mortality	-	-0,1	-0,4	-0,4	-0,6
Effect of low mortality	-	0,2	0,9	1,4	2,6

Average pension at 2015 prices, €	2015	2025	2045	2065	2085
No link	1613	1782	2064	2553	3270
Effect of high mortality	-	3	33	94	152
Effect of low mortality	-	-4	-41	-143	-276
Reform	1613	1782	2109	2743	3658
Effect of high mortality	-	3	25	73	108
Effect of low mortality	-	-4	-35	-108	-180

In the no link scenario, the only mechanism that explicitly reacts to mortality is the life expectancy coefficient. Hence, mortality has a substantial effect on the size of pensions. In the low mortality projection the average pension in 2085 is 8.4 per cent lower than the baseline, while in high mortality projection it is 4.7 per cent higher. Most of this difference is due to the life expectancy coefficient. Indexation and wage growth also play a minor part, as each birth cohort is likely to have a larger pension then the previous and the indexation is only partially tied to wage growth.

In the reform scenario, mortality affects both the retirement age and the life expectancy coefficient. Due to the mitigation of the life expectancy coefficient, the difference in the average pension in the high and low mortality variants is smaller than in the no link scenario. In the low mortality projection the average pension in 2085 is 4.9 per cent lower than the baseline, while in high mortality projection it is 3.0 per cent higher.

Even though the life expectancy coefficient is designed to theoretically neutralize the effect of mortality on pension expenditure, mortality still has an effect on the expenditure ratio. In the no link scenario, the difference between the high and low mortality expenditure ratio is about one and a half percentage points in the long run. The main reason for this is that the life expectancy coefficient only affects beginning pensions and hence reacts to changing mortality with a delay.

In the reform scenario, the effect of mortality on the expenditure ratio is slightly smaller before the second half of the century. Especially in the low mortality simulation, the expenditure ratio enters rapid growth after 2060 as a consequence of the effective retirement age failing to keep up with the statutory age limit.

3. Conclusions

Different balancing mechanisms react differently to the changes in mortality. The risks of longevity fall mainly on individuals if the balancing is done by altering the pension levels. In comparison, when the balancing is done partially by linking the retirement age to mortality, the risk of drawing an inadequate pension is reduced.

The mechanism that links the retirement age to life expectancy pushes the people to work longer if the life expectancy increases. This improves the adequacy of the future pensions and increases the wage sum of the economy. It could also lower the pension expenditure in relation to the total sum of earned income. However if the people don't have the possibility to continue working to higher ages for example due to disability or unemployment, this kind of an automatic mechanism could increase the total pension expenditure and can be costly to the pension scheme.

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APPENDIX: The Finnish pension system[2]

The statutory pension system in Finland consists of a defined benefit earnings-related pension which is in some cases supplemented by a residence-based national pension and a guarantee pension that ensure minimum security. Nearly 90 per cent of all paid pension expenditure was paid from the earnings-related pension scheme, ten per cent from the national and guarantee pension schemes and only 2 per cent from voluntary pension schemes in 2015.

The Finnish earnings-related pension scheme was established in the 1960s when the majority of the pension acts came into force. The coverage of the pension scheme extended to self-employed persons and farmers in 1970 and is nowadays practically universal.

The most important pension benefits in the earnings-related pension scheme are the old-age and disability pensions. Also survivors' pensions and some rehabilitation benefits are paid.

The amount of earnings-related pension is determined based on annual earnings until retirement. In addition to earnings, some unpaid periods like periods of social benefits (unemployment, child care etc.) and study are taken into account when the total amount of accrual is calculated.

When determining the earnings-related pension, the earnings and income from the insured person's employments are adjusted with the *wage coefficient* to the level of the starting year of the pension. Thereafter, the pension in payment is adjusted annually with the *earnings-related pension index*. In the wage coefficient, the share of change in price level is 20 per cent and the share of wage-earners' income level is 80 percent. In addition to the change in price level, the wage coefficient thus compensates 80 per cent of the real change in wage-earners' income level. In the earnings-related pension index, the share of change in price level is 80 per cent and the share of wage-earners' income level is 20 percent.

After the accrued pension is calculated from the index-adjusted earnings and incomes the pension is adapted to the extended life expectancy with the life expectancy coefficient. The life expectancy coefficient is described in more detail in Box 1.

The disability pension consists of the pension accrued during the work history and the accrued pension for the projected pensionable service, which is calculated from the beginning of the year of the pension contingency to the general retirement age. The accrual for the projected pensionable service is determined on the basis of earnings prior to retirement and is more significant the younger the pensioner is.

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[2] More information about the Finnish earnings-related pension scheme is available on the website of the Finnish Centre for Pensions at http://www.etk.fi/en/.