Longevity is increasing – what about the retirement age?

by Christina Lindell

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Pension schemes and life expectancy
In most countries the continuously decreasing mortality trend and thus the corresponding increasing life expectancy has continued for a very long time. When looking at the pension expenditure in the long term, it is essential whether this trend will continue as in the past or whether it is slowing down or stopping. When making long-term projections concerning the cost of a pension scheme, the fluctuation and uncertainty concerning the economical assumptions are well-known but the demographic and especially the mortality fluctuation has often been considered to be under control.

However, worldwide experience shows that usually calculations concerning the population projections have failed. Life expectancy has in most countries been growing faster than projected even if life expectancy in some developing countries has decreased rapidly due to AIDS. According to United Nations statistics, the life expectancy at birth grew during the past five decades in the world by 20 years, in Europe by 8 years and in Finland by 12 years.

When designing or analysing a pension scheme, more important than the life expectancy at birth is the life expectancy at the entrance to the labour market, say 25 years, and the life expectancy at the entrance to retirement, say 65 years. The difference between the life expectancy at birth and the life expectancy for a certain age is visualized using statistics concerning life expectancy in Finland. During the first half of the last century, the mortality rates for young people in Finland decreased very rapidly, as shown in the graph on the left in chart 1. As the total life expectancy at birth increased by 19 years, three thirds of this increase was due to decreased mortality rates for young people aged less than 25, and only one tenth of the increase was due to decreased mortality rates among elderly people aged 65+. For the last half of the century, the situation changed significantly. As the life expectancy at birth increased by 12 years, only one third was due to decreased mortality rates among young people under 25

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and almost half of the change was due to decreased mortality rates among elderly people aged 65+.

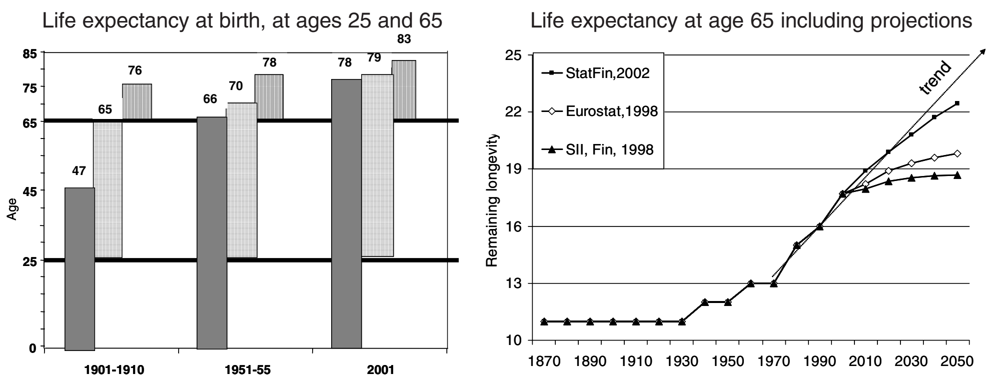
The life expectancy was 11 years until 1940s for people aged 65 as is shown on the right hand graph of chart 1. The life expectancy began to grow in the 1940s, but not very rapidly. Thus, when designing the pension schemes in Finland in the 1930s and 1950s there was not much use for past statistics when projecting future life expectancy and thus the future pension costs.

A rough estimate shows that with fixed retirement ages and an average time of 20 years in retirement (including early retirement) the pension expenditure grows by 5 per cent for each year the longevity of pensioners aged 60+ is growing. Thus, using the present falling mortality trend, the life expectancy for old-age pensioners may continue to increase by one year per decade and thus the pension expenditure by 25 per cent during the next 50 years. As the costs of the pension schemes in most countries are increasing also due to many other reasons than longevity (e.g. the baby-boomers born after the Second World War are reaching the retirement age and the pension schemes reach maturity), the question of adjusting the retirement age to the changes in life expectancy will in most countries arise sooner or later. There are of course a lot of reasons why people retire early, such as labour market reasons, poor health, burnout, stress and other problems influencing the atmosphere at the workplaces. Therefore a successful postponing of the effective retirement age also requires a co-operation between social, health and labour authorities and between employees and employers. The aim of this paper is to sort out technical alternatives of adjusting the retirement age to the changes in life expectancy. The main attention is paid to old-age pensions and a brief review of the situation in selected countries is included.

Adjusting the pension scheme to increasing longevity by gradually raising the set retirement age

The traditional way of adjusting the pension scheme to increasing longevity is to raise the set retirement age. The raise can be done by raising the retirement age once and later decide if there are need for additional raises, or by agreeing on a plan of successive raises of the retirement age, or it can be tied to a suitable indicator, like keeping the proportion between working years and years in retirement unchanged. The first is probably the most common alternative but it is actually a special case of the second one, which we shall look at in more detail in the following. The last alterna-

Chart 1. Changes in life expectancy in Finland



tive is rather close to the use of an adjustment indicator, which will be discussed later.

When raising the retirement age successively according to a predetermined plan, it may be carried out by raising the retirement age by a whole year. The problem connected with this type of raise is that the difference in retirement age may be a whole year for people born in December and January, even if the difference in age is as small as one day. To avoid too big differences in retirement ages for two successive cohorts the retirement age could be tied to a monthly level for each cohort. As the life expectancy for elderly has increased by 4 years since the 1960s, a suitable raise could be to raise the retirement age by one year per decade. A more moderate criterion would be to raise the retirement age by one month per cohort.

The greatest problem with raising the set retirement age according to a predetermined plan is connected to the uncertainty related to the changes in mortality rates. The target is that the retirement age is set already before a person enters the labour market and maintained unchanged until retirement age. When looking at the past 40 years the changes in mortality rates have been much greater than expected. If mortality rates in the future decrease more than expected, the retirement age need to be adjusted further and if mortality rates decrease less than expected, the raises already carried out may be oversized.

Raising the retirement age is closely related to the accrual rates in a defined benefit scheme. When designing a pension scheme, usually a target level of the pension is fixed. If the accrual rate remains unchanged it means that the target level of the pension increases. Paid pension contributions may however justify the increase. Probably the greatest problem concerning unchanged accrual rates is connected with early retirement. Disability and other pensions, including projected pensionable service, would increase with unchanged accrual rates, and that is hardly the intention.

An alternative would be to decrease the accrual rates in proportion to the raise of the retirement age, but cutting the past accrual rates would be difficult to justify. A further alternative would be to maintain the past accrual rates unchanged but change the future accrual rate with the intension to maintain the target level unchanged. This alternative may however result in separate accrual rates for each cohort.

Changes in retirement ages in selected countries

In most countries the retirement ages in the statutory pension schemes are preset. Previously changes in retirement ages were not so common. The trend was more to offer pathways for early retirement besides the standard retirement age. Since the 1990s the trend has changed. Countries are looking for solutions to decrease the effect of increased longevity on pension costs. Only in three countries, Denmark, Iceland and Norway, the retirement age is over 65 and only one country, the USA, has decided to raise the retirement age beyond 65. In 2003 it was also proposed in Germany that the standard retirement age would be raised gradually from 65 to 67, but this proposal was rejected by the Government. The most common changes are to equalise the retirement age for men and women and to raise the retirement age up to 65. Exceptions are Denmark and Finland[1]. In both countries the retirement age is lowered together with tightened conditions for early retirement. The aim of lowering the retirement age is, however, to raise the average effective retirement age. Table 1 gives an overview of selected countries where the retirement age is higher than 65 years and countries where the retirement age is changing. Changes in early or deferred retirement ages are not included.

Table 1: The retirement age in selected countries

Country	*Current retirement age*	*Changes in retirement ages*
Austria	65(M) 60(F)	60 -> 65 (2024-2033) (F)
Denmark	67	65 (1.7.2004) (national pension)
Finland	65	63-68 (2005) (earnings-related pensions)
Greece	65	60->65(2007 ->) (F old system)
Great Britain	65(M), 60(F)	60->65 (2010-2020) (F)
Hungary	62(M), 59(F)	55(1996) ->62 (2009) (F)
Iceland	67	-
Italy	65(M), 60(F) [1)] (gradually phased out in 19 years)	57-65 (gradually implemented in 19 years)
Japan	60	60->65 (2013-2025) [2)]
Norway	67	-
Poland	65(M), 60(F)	- [3)]
Switzerland	65(M), 63(F)	63->65 (2009) (F)
United States	65y 4m	65->67 (2003) (2027)

1) In the current system one can retire after 35 years of coverage at age 57, regardless of age after 38 years of coverage. The years of coverage rise to 39 years in 2006 and to 40 years in 2008.
2) The retirement age for basic pensions in Japan is already raised to 65 by 2013.
3) According to a government bill in Poland the retirement age for women will in 2009 start to raise gradually to 65. The raise is suggested to be 6-9 month per year.

Adjusting the pension scheme to increased longevity by a factor

Also other solutions than changing the retirement age are looked for in order to keep the pension costs in check. One method recently spread is to adjust pensions to increased longevity instead of raising the set retirement age. Often the adjustment is combined with flexible retirement ages and forces the insured to make a choice: retire at the same age as earlier cohorts with a slightly reduced pension or receive an unreduced pension by continuing to work a little bit longer.

A factor suitable for adjusting both defined benefit and defined contribution schemes to increased longevity can be found using actuarial mathematics. Define the probable present value of a pension at retirement age as the value of a lump sum sufficient to finance the future pension expenditure, taking into account the life expectancy and a supposed yield from investing the lump sum. The present value thus depends on two main components, the mortality rates and the discount rate. The discount rate is in the long term reflecting the difference between the average yield of the lump sum and the average index used for adjusting the accrued pension rights.

The adjustment indicator, called a longevity factor, is now the probable present value of a unit pension (eg. a pension of one euro per year), which is regularly recalculated using new information on mortality rates. Mortality rates and life expectancy are often calculated separately for males and females. However, only one shared factor for both genders is developed, because in a statutory pension scheme the benefits are not allowed to be determined gender-specifically. If the discount rate used is zero, the longevity factor is equal to life expectancy. Thus the value of the longevity factor changes with the age of calculation: the higher the calculation age, the smaller the factor. The theoretical background and formulas of the adjustment factor is described in Lindell [2004].

The longevity factor is used in a different way depending on whether the pension scheme is a (notional) defined contribution ((N)DC) scheme or a defined benefit (DB) scheme. Roughly the two schemes may be described as follows. In (N)DC pension schemes an accumulated (notional) pension capital is changed into a series of payments or life annuities by dividing the capital with the probable present value of a unit pension. In DB schemes the payments (accrued pensions) or life annuities are known, while the probable present value is calculated by multiplying the accrued pensions by the probable present value of a unit pension.

Adjusting the pensions to increased longevity in DC and NDC schemes is simply achieved when changing the accumulated (notional) capital into life annuities by dividing the capital with the longevity factor (or equivalently by multiplying with the inverse value of this factor) calculated at the effective age of retirement. In (N)DC pension schemes the longevity factor automatically takes into account early pension reductions and deferred pension increases. In DB schemes adjusting pensions to increased longevity is achieved by multiplying the accrued pension by a coefficient, which is the quotient of two longevity factors calculated at the set retirement age at a base year t_0 , which is the year when the longevity factor was introduced, and at year t, which is the year when the insured reaches the set retirement age (or equivalently by dividing by the inverse value of this quotient)[2] . In DB pension schemes, where the pension may be taken earlier or postponed, the longevity coefficient may further be developed to automatically take into account also early pension reductions and deferred pension increases. In these calculations the longevity coefficient is calculated as a quotient of two longevity factors at the effective retirement age in year t given the set retirement age and year t_0.

Recalculating the longevity factor using statistical or projected mortality rates?

An adjustment factor actually should take into account the past, present and future changes in mortality rates. But as a consequence of the unexpectedly rapidly falling mortality rates it is very difficult to make reliable projections concerning life expectancy. It seems therefore to be unfair if possible fails in mortality projections would affect the pension level. An alternative is to recalculate the longevity factor only with observed mortality statistics. In practice it is easy and transparent to recalculate a longevity factor based on statistics, because the statistical office in each country already produces life and mortality tables. But statistics always describe the past, with the consequence that the longevity factor follows the actual mortality trend with some lag. By recalculating the pensions each year according to new observed changes in mortality rates, the lag could be minimized. An easier and more obvious way is to make the changes only once when the pension is granted. Even if such a factor reflects the changes in mortality with some portion of lag, it does not play a very significant role in a PAYG scheme. Mortality has decreased for decades but the adjustment factor is used from a certain year onwards. As a consequence of updating the longevity factor by statistics and applying it only once per person, increased longevity influences not only increased working years (or a reduced pension) but to some extent also increased years in retirement.

Applying the longevity factor on disability, unemployment and other early pensions

As a starting point the longevity factor is applied on the whole population when reaching the retirement age. The disability pension could also be adjusted already when granted, but would such a pension benefit be enough especially for breadwinners with children? The situation for these early pensioners are on, one hand, to some extent contradictory, because their possibilities of increasing their old-age pension by continuing to work a little bit longer are very limited. On the other hand, it is difficult to leave the early pensioners outside the adjustment system at least when they reach the retirement age. The incentive for the active population to work longer decreases if there is a possibility of avoiding pension adjustment by receiving some type of early benefit before the old-age pension. The nearer the old-age pension, the more difficult it also is to distinguish between who is disabled and who is not.

Adjusting the pension scheme to increasing longevity in selected countries

The pension schemes using the adjustment method are all defined contribution (DC) or notional defined contribution (NDC) schemes. But the adjustment method may as well be applied in a defined benefit (DB) scheme. In Finland, the laws including an adjustment method passed Parliament in February 2003 and in Norway a similar adjustment method is in January 2004 proposed by the pension committee. The adjustment method can be either automatic, the adjustment factor can be set once or a decision may be made to recalculate the factor at certain intervals. An example of the first method is Sweden and of the latter is Italy.

Sweden reformed its statutory pension scheme in 1999 and it will be gradually implemented. Sweden changed its scheme from a defined benefit scheme to a mainly notional defined contribution scheme. In this new scheme, the main part is financed using PAYG and the pension rights accrue according to paid contributions. The contributions accumulate during the working life to a notional pension capital. The pension can be withdrawn beginning from age 61. The notional pension capital is changed to monthly life annuity payments by dividing it by the longevity factor. This factor is determined separately for each cohort upon retirement using the latest available statistics on mortality rates and a discount rate of 1.6%. Similar methods are also used in Poland and Lithuania.

In Italy pension rights are accruing according to a notional contribution into a notional pension capital. At retirement age the notional capital is changed to life annuity payments by multiplying the pension capital with a factor which equals the inverse value of a longevity factor. The factor is fixed for each retirement age (57-65). Unlike the Swedish scheme, the factor may be changed only every ten years by a decision of the Ministry of Labour and Social Policy in order to take into account changes in longevity and GDP.

In Switzerland a reform is underway, where the mandatory occupational DC pension is changed. Today the accrued pension capital is multiplied by 7.2%, which equals the inverse value of a longevity factor. The plan is to lower the percentage due to increased longevity.

Beginning in 2005, statutory earnings-related pensions in Germany will be adjusted according to a new sustainability factor. This factor will take into account the relationship between the number of pensioners and the number of contributors to the system. The factor will have the effect of reducing the annual pension adjustment if the ratio of pensioners to contribution payers changes to the detriment of the contribution payers. The new sustainability factor will thus in addition to the life expectancy take into account the birth rate, immigration and emigration and the labour force participation rate. Compared to the longevity factor, this sustainability factor is not cohort-specified.

In Norway the pension committee proposed in January 2004 a flexible (62-70) retirement age and an automatic adjustment of the Norwegian defined benefit pension scheme to increased longevity. The longevity coefficient is suggested to be calculated as the inverse value of the quotient of two longevity factors described earlier and thus adjusting pensions to longevity is achieved by dividing the pensions with this coefficient. The proposal also includes an automatic adjustment to longevity of early retirement reductions and deferred retirement increases.

The Finnish pension reform 2005 and adjusting the scheme to changing longevity

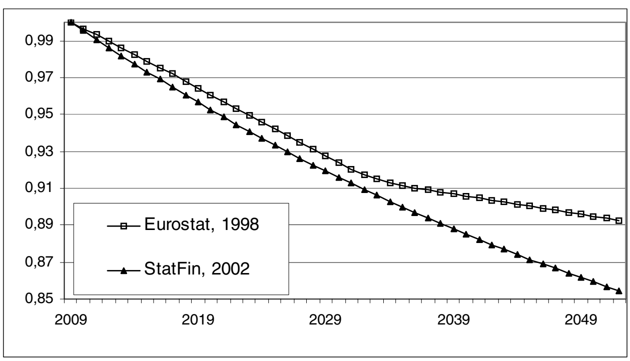
The main goals of the reform are to postpone the average effective retirement age by 2-3 years, to adjust the pension scheme to increased life expectancy, to minimize the need to raise the contributions and to support the ageing population's well-being at work.

The retirement age will become flexible between ages 62 and 68. The accrued old-age pension will be granted without reduction between the ages 63 and 68. Only pensions granted at the age of 62 will be reduced and in case retirement is postponed past the age of 68, an increment of 0.4% per month will be granted. At the same time pathways to early retirement will be blocked. Working an extra year today implies foregoing one year of pension and paying additional contributions, with often little or no increase in future pensions. Therefore the accrual rate is raised to 4.5% per year if a person continues working beyond the age of 63, while the normal accrual rate will be 1.5% per year. The high accrual rate also justifies the lack of deferred coefficients between the ages 63 and 68. Additional working years will also be made financially worthwhile by abolishing the 60% ceiling of the accrued pension.

The pension scheme will be further adjusted to increased life expectancy by introducing a longevity coefficient. The aim of the coefficient is to reflect part of the increase in life expectancy in the number of working years. This means that, starting from the year 2010, the amount of new old-age pensions will depend on the development of life expectancy compared to the year 2009. Only one longevity coefficient is determined for each year. It is always calculated for the cohort which turns 62 and it will be fixed for this cohort irrespective of the retirement age. Also disability pensions will be adjusted by the longevity coefficient at age 63. The discount rate will be 2%. The decision to leave early pension reductions and deferred pension increases outside the longevity adjustment as well as the decision to fix only one coefficient per cohort irrespective of retirement age was made on purpose. The adjustment to longevity is perhaps a bit inexact, but the adjustment system will be easy to achieve and transparent.

Chart 2 shows that using projected mortality rates from either Eurostat or StatFin the longevity coefficient will in the future de-

Chart 2. Longevity coefficient using projected values of mortality by Eurostat and StatFin.



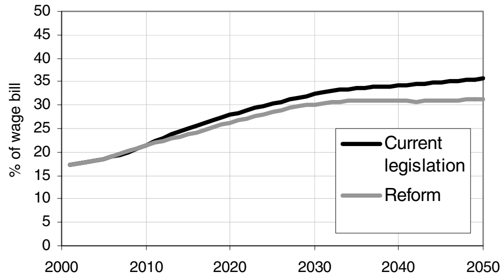
crease by 11-15%. But there is a large portion of uncertainty related to the mortality projections. The longevity coefficient is however decreasing very slowly. For a person with average income, the pension for each new cohort is decreasing by 4-6 euros per month. The additional working time needed to compensate for the decrease caused by the longevity coefficient is about 2-3 weeks for every new cohort. Table 2 shows that the additional working time needed to compensate for the longevity coefficient in the long term, around 2050, is not more than one and a half years. However, according to the Eurostat population projection, the life expectancy at age 62 increases by 3-4 years during the same period. The short additional working time compared to the increase in life expectancy is explained by the triple accrual coefficient for people working in the age bracket 63 to 68.

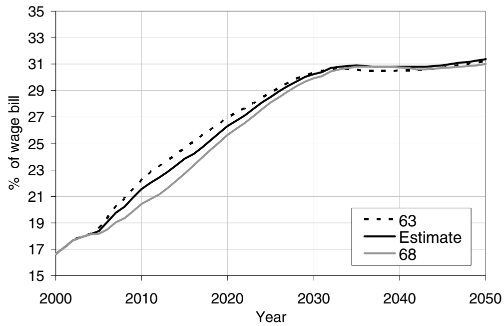
Table 2. The longevity coefficient for selected cohorts and the additional working time needed to compensate for the coefficient

Year of birth	Year of retirement	Longevity coeff.	Additional working time compensating for the coefficient	
			Accrued pension 50% wages	Accrued pension 60% wages
1957	2020	0.956	5 m	6 m
1967	2030	0.917	11 m	1 y 1 m
1977	2040	0.892	1 y 2 m	1 y 5 m
1987	2050	0.880	1 y 4 m	1 y 7 m

Long-term pension projections made by the Finnish Centre for Pensions use a population projection based on the one made by Eurostat. Chart 3 shows that in the year 2050 the pension expenditure without a reform increases to about 36% of the wage sum, while the reform decreases the expenditure by 4.3 percentage points. The effect of the longevity coefficient is about 2.5 percentage points. At this stage it is very difficult to assess how the insured will react to the flexible retirement

Chart 3. Pension expenditures in per cent of the wage sum for private-sector employees and the sensitivity in regard to the choice of retirement age





age. Will everyone retire at 63 or will the triple accrual rate induce people to continue working? The sensitivity of the pension expenditure as a percentage of the wage sum was tested in relation to the choice of retirement age. For the test, the assumption was that everybody will retire at 63, at 68, or between the ages 63 and 68.

As seen from the right-hand figure of chart 3 the result was that the choice of retirement age was not very significant with regard to pension expenditure as a percentage of the wages. If everyone retires at 63, the pension expenditures rise in the beginning but decrease later, compared to the alternative of everyone retiring at 68. In general it is possible to say that the flexible retirement age is cost neutral as regards the pension expenditures in relation to the wage sum.

Notes

[1] The Finnish reform is described later in this paper.

[2] The purpose is to stress that the terms dividing and multiplying are used in both DC and DB pension schemes. The difference between the adjusting methods are that in a DB scheme the starting value is 1 (the quotient of two identical longevity factors) and this value either increases or decreases in time depending on whether the adjusting is carried out by dividing or multiplying the pension with the longevity coefficient. In a (N)DC scheme there is no starting value. Dividing the accumulated capital with the longevity factor, say 15, is equivalent to multiplying the capital with the inverse value 0.067 or 6.7%.

References

Introduction to the Hungarian Pension System. Central administration of national pension insurance (ONYF)- Hungary.

Kannisto V. – Nieminen M., Revised Life Tables for Finland 1881-1990, Population 1996:2, Statistics Finland, 1996.

Laitinen-Kuikka S.-Bach J.-Vidlund M., Eläketurva Länsi-Euroopassa. Finnish Centre for Pensions, 2002.

Lag om inkomstgrundad Ålderspension, Government Proposal to Parliament 1997/98:151. Sweden.

Life expectancy, statistics and projections, United Nations, 2001. www.un.org.

Lindell Christina, Longevity is increasing – what about the retirement age? Finnish Centre for Pensions. Working Papers 6. Finland, 2004.

Lindell Christina, Elinaika pitenee – miten käy eläkeiän? Finnish Centre for Pensions. Report 18. Finland, 1999.

Modernisert folketrygd - bærekraftig pensjon for framtida. Norges offentlige utredninger, NOU. 2004:1. GAN Grafisk AS, Oslo (www.pensjonsreform.no).

Mortality rates, statistics and projections, The Social Insurance Institute. Finland, 1998.

Mortality rates, statistics and projections , Statistics Finland, 2002.

Mortality rates, projections, Eurostat, 1998.

Nachhaltigkeit in der finanzierung der sozialen sicherungssysteme, Bericht der Kommission, Germany, August 2003, www.Soziale-sicherungssysteme.de/index.html.

USA: Social Security Administration, SSA. www.ssa.gov.

ZUS, Social Insurance institution. Social insurance in Poland. Information, facts. Warsaw 2002. www.zus.pl.