

RETIREMENT AGE IN CZECHIA AND OTHER EUROPEAN COUNTRIES BASED ON RELATIVE PROSPECTIVE AGE

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Abstract

The rise in life span results in increase the period of old-age pension receipt which can cause financial unsustainability of pension systems. In many European countries there are intensions to rise the retirement age. A possible adjustment of the retirement age to the level of mortality can be based on the concept of relative prospective age: ratio of the remaining life expectancy to the total expected life span. This paper brings methodological background of definition of relative prospective age and computations of its value for Czechia since 1960 until 2080 as well as for the European Union member countries in the year 2016. Values of retirement age for both males and females in Czechia as well as in other countries of the EU are compared with the corresponding values of prospective age. Recommended increase of the retirement age in Czechia after the year 2030 based on this principle is shown.

Key words: population ageing, pension system, prospective age, relative prospective age.

JEL Code: J26, J11, J14.

Introduction

One of the most frequently discussed demographic phenomenon at present times is the ageing of population (e.g. Gavrilov and Heuveline, 2003). There are several reasons for population ageing. The first is permanently continued increase in life span, the second one decrease of fertility, which dropped in many countries even below the replacement level. In some countries or regions the ageing of population is accelerated by massive emigration of young adult people in reproductive age. This third reason is not frequently mentioned. Population ageing is very often regarded as a serious threat to the sustainability of national welfare system (mainly of the pension and health care systems) because of increase of population of retirees and decrease of productive population. But concerns of such type are usually based on standard assumption of the fixed threshold of “old” age (usually equal to 65 years).

The idea of re-examination of the concept of fixed threshold of old age has been first published by Ryder. “*We measure age in terms of the number of years elapsed since birth. This*

seems to be a useful and meaningful index of the stages of development from birth to maturity. Beyond maturity, however, such an index becomes progressively less useful as a clue to other important characteristics. To the extent that our concern with age is what it signifies about the degree of deterioration and dependence, it would seem sensible to consider the measurement of age not in terms of years elapsed since birth but rather in terms of the number of years remaining until death.” (Ryder, 1975, p. 16.) He suggested that the age to be considered the point of entry into old age can be defined as age at which the life expectancy is equal to a given value, say, e.g. 10 years. This proposal was first mentioned very rarely because in the 70th the population ageing has not been considered to be a serious threat. Ten years later Fuchs (1984) also proposed the idea of flexible old age depending on the life expectancy. Siegel (1993) suggested the old-age threshold defined as the age when the life expectancy equals to 15 years.

The idea of human's age based of forward-looking conception was treated in great detail by Sanderson and Scherbov in several papers. They introduced a new forward-looking definition of age and argued that its use (along with the traditional backward-looking concept of age) will bring a more informative basis to discuss population aging (Sanderson and Scherbov, 2005). They introduced the concept of prospective age, defined as the age, in which the remaining life expectancy is the same as the remaining life expectancy of a person in given standard year. (Sanderson and Scherbov, 2007). The indicators of ageing based on prospective age instead of biological age show that the increase of the ratio of older persons will not be so dramatically increasing in comparison with standard indicators (Sanderson and Scherbov, 2010, 2013). Computations of indicators of this type for Czech population are presented e.g. by Klapková, Šídlo and Šprocha (2015). “

In the old-age pension systems the rise in life span resulted in increase of the period of pension receipt. In many European countries there is therefore a tendency of increasing the retirement age, even above the usual level of 65 years of age. In some countries the value of retirement age is (or should be in the future) adjusted to the development of mortality, more precisely to life expectancy gains (European Commission, 2018, p.126, Table 10.).

The Czech Expert Committee on Pension Reform discussed the idea of determination the retirement age in such a way that the average duration of the receipt of the old-age pension would be roughly constant, say 20 years; the retirement age would then be determined not by the usual concept of given constant retrospective age, but constant prospective age. This would mean, however, that, assuming a rise in the length of life, the retirement age would rise and thus also the expected length of economic activity, but the period of receipt of the pension would remain the same and the relative period of receipt of the pension would drop. The Committee

therefore finally approved the recommendation that the value of the retirement age should be determined so that people reaching senior age should receive an old-age pension on average for the last quarter of their lives (Expert Committee, 2015). Cohort life tables should be used for computations (Fiala, Langhamrová, 2015).

This proposal means that the retirement age would be determined not by the absolute value of remaining life expectancy and corresponding prospective age mentioned above but by the *relative* value of the remaining life span with respect to the total life span. The corresponding age can be then called *relative* prospective age.

The aim of this paper is to introduce more precisely the concept of relative prospective age. Pension age threshold based on this concept is the way of possible adjustment of the pension age to increasing life span. It means the increase not only in period of economic activity but also in time of pension receipt in such a way that the ratio of the length of pension receipt and the total lengths of life would be stable.

Proposed development of pension age based on this concept for Czechia until 2080 has been computed using the baseline mortality scenario of the latest Eurostat population projection (Eurostat, 2017b). The unisex period life tables for Czechia for 2030 (which is the year when the retirement age of males will reach 65 years) have been used as standard mortality pattern. Values of relative prospective age for EU member countries for 2016 have been computed and compared with corresponding retirement age.

1 Prospective age and relative prospective age

The concept of prospective age is based on the assumption that for adult people living in different periods it can be more important not the lengths of the time interval they already lived (usually used chronological age) but the (average) lengths of their *remaining* life (life expectancy at their age). Sanderson and Scherbov recommended to use the attribute *remaining* life expectancy to emphasize the difference between the life expectancy at births usually used and the life expectancy at higher ages (Sanderson and Scherbov, 2007). In fact the remaining life expectancy means life expectancy at ages higher than zero defined by standard way.

Let us denote by $e_x^{(t)}$ the remaining life expectancy at the age x in the year t . Choosing some standard mortality pattern, the prospective age $y(x,t)$ of a person of (retrospective) age x in the year t means the age for which the remaining life expectancy in the year t is the same as the remaining life expectancy e_x^* at the age x in the standard mortality pattern. The prospective age should thus fulfill the equation

$$e_{y(x,t)}^{(t)} = e_x^* \quad (1)$$

Of course usually there exist no integer value $y(x,t)$ fulfilling (1). The prospective age would be found by the following linear interpolation formula

$$y(x,t) = y_0(x,t) + \frac{e_{y_0(x,t)}^{(t)} - e_x^*}{e_{y_0(x,t)}^{(t)} - e_{y_0(x,t)+1}^{(t)}}, \quad (2)$$

where $y_0(x,t)$ is the (unique) integer value for which $e_{y_0(x,t)}^{(t)} \geq e_x^*$, while $e_{y_0(x,t)+1}^{(t)} < e_x^*$.

It would be natural to use cohort life expectancy for such computations. But it was proved that in some cases the cohort and period prospective ages have almost identical values (Sanderson and Scherbov, 2007, Chapter 3 and 4). Of course it *does not mean* identity of values of the remaining life expectancy which is in cohort tables usually higher in comparison with period tables.

The prospective age takes into account only the lengths of remaining life, not the lengths of years lived. More informative to analyze aging and its economic and social consequences would be combining both age measures: a backward- and a forward-looking. Possible indicator of such a type could be remaining *relative* life expectancy defined as a proportion of the remaining life expectancy of the expected total life span

$$re_x^{(t)} = \frac{e_x^{(t)}}{x + e_x^{(t)}}, \quad (3)$$

which characterizes the length of remaining life not absolutely (the expected *number of years* left) but relatively (the expected *proportion of life* left).

Relative prospective age can be then defined by an analogous way to prospective age. The relative prospective age $ry(x,t)$ of a person of (retrospective) age x in the year t is defined as the value for which the remaining *relative* life expectancy in the year t is the same as the remaining *relative* life expectancy re_x^* at the age x of the standard mortality pattern. The computation formula is analogous to (2)

$$ry(x,t) = ry_0(x,t) + \frac{re_{y_0(x,t)}^{(t)} - re_x^*}{re_{y_0(x,t)}^{(t)} - re_{y_0(x,t)+1}^{(t)}}, \quad (4)$$

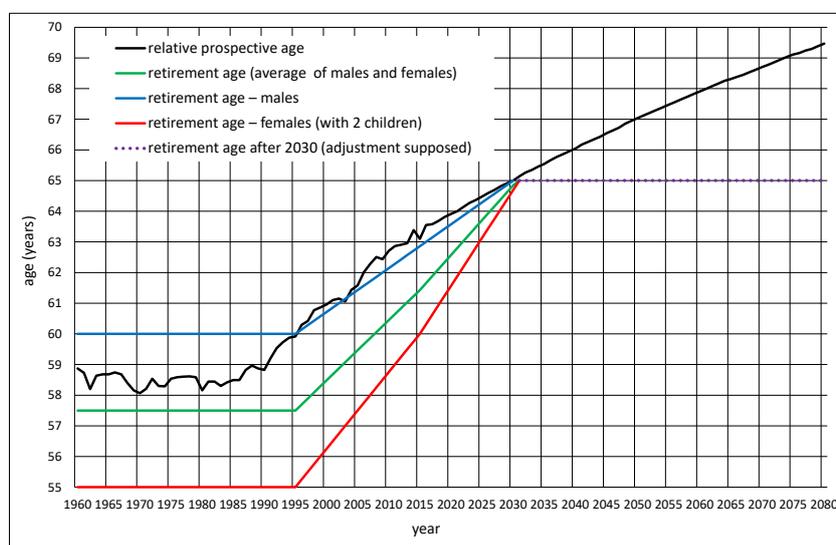
where $y_0(x,t)$ is the integer value of age for which $re_{y_0(x,t)}^{(t)} \geq re_x^*$, while $re_{y_0(x,t)+1}^{(t)} < re_x^*$.

2 Retirement age in Czechia and corresponding relative prospective age

Since 1948 the retirement age for males in former Czechoslovakia and later in the Czechia was 60 years and did not change for almost 50 years. In 1996 the retirement age starts continually to increase by 2 months for each subsequent births cohort. E.g. males born in 1936 had retirement age 60 years 2 months, for males born 1937 it was 60 years 4 months etc. Males born in 1965 will retire at 65 years (which is the usual retirement age in many European countries at present time) in the year 2030. Retirement age for females, which depends on the number of their children, is growing faster to reach the level of males in early 30th (Zákon 155/1992 Sb.). According to the baseline mortality variant of the Eurostat population projection 2015 (Eurostat, 2017b), the period relative remaining life expectancy (average value for both sexes) in 2030 at the age of 65 years in Czechia should be 23.2%.

This mortality pattern has been chosen as a standard for computations of relative prospective age in the Czechia in the period 1960–2080. Period life tables published by Eurostat (Eurostat, 2017a) have been used for the period 1960–2016, life tables of the baseline mortality variant of the Eurostat projection 2015 (Eurostat, 2017b) for the future period 2017–2080.

Fig. 1: Relative prospective age and retirement age in Czechia



Source: Eurostat source data, own computations

The values of relative prospective age in the 60th, 70th and early 80th are fluctuating between 58 and 59 years of age (Fig. 1). It is caused by the fact, that mortality of males almost did not change at that period (in some years it was even growing) and mortality of females was decreasing very slow. Since late 80th when the life expectancy of both males and females started to grow relatively rapidly, we can observe corresponding increase of relative prospective age

(see Fig. 1). It is remarkable that the “mechanical” increase of retirement age corresponds in a considerable extent to the growth of relative prospective age. Especially for males there are since 1995 negligible differences between the values of retirement age and prospective age. In other words the proportion of the period of average pension receipt with respect to the average total life span of the pensioner would be for males retiring in the period 1995–2030 approximately the same. Higher retirement age for younger birth cohorts was, or is (according to the projection) expected to be, compensated by higher remaining life expectancy after retiring.

Retirement age after 2030 is according to present legislation equal to 65 years but it is supposed to be changed using the principle of stable relative prospective age (Zákon 582/1991 Sb.). If the development of mortality in Czechia would follow the scenario of the baseline variant of Eurostat projection 2015, the retirement age (unique for males and females regardless the number of their children) should grow to almost 70 years of age until 2080 (see Fig. 1).

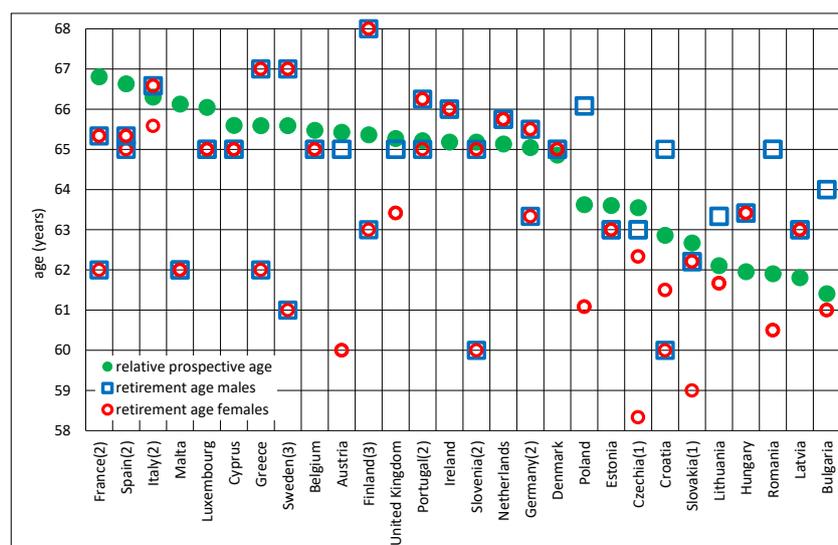
3 Relative prospective age in 2016 for EU member countries

Czechia is some times criticized for low increase of retirement age. The Council of the European Union, recommended the Czech Republic to “... *ensure the long-term sustainability of the public pension scheme, in particular by accelerating the increase of the statutory retirement age ...*” (European Council, 2014, p. 15). From demographical point of view, lower retirement age and its relatively low increase to the “usual” value 65 years can be justified by higher level of mortality in Czechia in comparison with practically all countries of Western, Northern and Southern Europe. Consequences of these differences to the pension age can be judged by comparing present values of retirement age for males and females with values of relative prospective age corresponding the Czech mortality pattern 2030 at the age of 65 with period value of relative life expectancy 23.2%. In some countries the retirement age is not a “universal” value but is depending also on number of children raised (for females in Czechia and Slovakia), on the contribution period and/or the sector of employment (in France, Spain, Italy, Portugal, Slovenia and Germany) or is flexible linked to benefit level (Sweden and Finland). In Italy, Austria, United Kingdom and many former socialist countries the retirement age for females is still lower than for males (see Fig. 2).

While the value of relative prospective age in post-socialist countries (except Slovenia) lies between 61–64 years of age, in other countries it reaches 65–67 years. In many countries the value of retirement age is relatively close to the relative prospective age (e.g. in Italy,

Cyprus. Belgium, Finland, Denmark, for males also in Austria and U.K.), in other countries it is still remarkably lower (e.g. in France and Malta). In many former socialist countries the retirement age for males is (some time considerably) higher than the value of relative prospective age while the value for females is still lower. In Czechia and in Slovakia the retirement age for males is lower but relatively close to the value of relative prospective age.

Fig. 2: Relative prospective age and retirement age in EU member countries, 2016

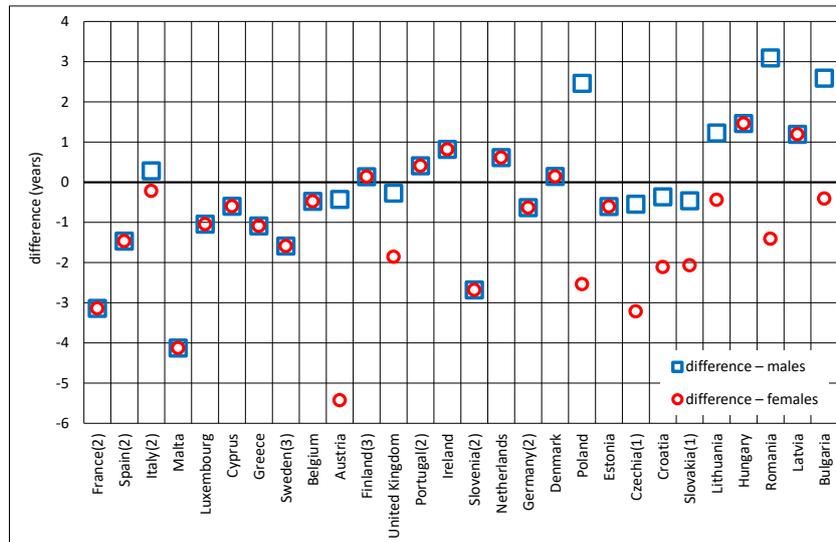


Source: European Commission 2018, pp. 126-127, Table 10, own computations

- (1) Retirement age of females depends on the number of children raised
- (2) Retirement age depends on the contribution period and/or the sector of employment
- (3) Flexible retirement age linked to benefit level

In most countries of Western, North and South Europe the difference between average retirement age and relative prospective age is between -2 and +1 years. In France and Slovenia the retirement age is about 3 years lower than the relative prospective age, in Malta the difference is about four years and the retirement age of Austria's females is more than 5 years lower than the value of corresponding relative prospective age (see Fig. 3). In former socialist countries Poland, Romania and Bulgaria the retirement age of males is more than 2 years, in Lithuania, Hungary and Latvia about one year higher than relative prospective age. In Estonia, Czechia, Croatia and Slovakia the retirement age for males is still several months lower than the relative prospective age. Retirement age for females (with the exception of Estonia, Hungary and Latvia) in these countries is still several years lower than for males and thus lower than the value of relative prospective age.

Fig. 3: Difference of average retirement age with respect to relative prospective age in EU member countries, 2016



Source: European Commission 2018, pp. 126-127, Table 10, own computations and graph

- (1) Retirement age of females depends on the number of children raised
- (2) Retirement age depends on the contribution period and/or the sector of employment
- (3) Flexible retirement age linked to benefit level

There is a tendency to adjust the retirement age to the life expectancy gains. After 2020 it should be so in many European countries (European Commission, 2018, Table 10, pp. 126-127). The concept of relative prospective age is a possible way of such adjustment which is intended also in Czechia after 2030 (Zákon 582/1991 Sb.).

Conclusion

The concept of prospective age where the age is measured not retrospectively (as usual) but prospectively shows that the development of many indicators of ageing will be not so critical as it seems when using retrospective age. In determination of the retirement age it seems to be more correct to use the concept of relative prospective age when the “age“ is not defined by the remaining life expectancy but by relative life expectancy (the proportion of the remaining life expectancy to the expected total life span). The retirement age based on this concept would grow in such a way that not only the economic active period but also the period of pension receipt would increase in such a way that the proportion of pension receipt time with respect to the total life span would remain relatively stable. Using standard mortality pattern expected in Czechia for 2030 (when the retirement age in Czechia should reach 65 years) computations show that at present time in most EU countries the difference between retirement age and relative prospective age is lower than 2 years.

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