Planning Department
Ville Merilä

28 November 2019

THE LIFE EXPECTANCY COEFFICIENT FOR 2020 ACCORDING TO THE EMPLOYEES PENSIONS ACT

According to Section 83 of the Employees Pensions Act, the Ministry of Social Affairs and Health confirms the **life expectancy coefficient** for each calendar year starting from 2009. The life expectancy coefficient referred to in Section 82 of the Employees Pensions Act is used to adjust the pension provision to changes in life expectancy.

The life expectancy coefficient is defined so that the capital value of the pension adjusted with the coefficient is the same when calculated with the available mortality rates of Statistics Finland for the previous five years as the unadjusted capital value of the pension in the base year 2009 calculated using the mortality rates for 2003−2007. When calculating the capital value, a two-per-cent interest rate is used (Employees Pensions Act, Section 83).

According to the Employees Pensions Act, the life expectancy coefficient must be announced no later than one month before the beginning of the calendar year to which it will be applied.

Mortality

The mortality risk rates used when calculating the 2020 life expectancy coefficient are based on Statistics Finland's mortality rates for 2014−2018. The mortality risk rates are indicated as a permillage with two-decimal (2) accuracy (Appendix 1).

Longevity indicator and life expectancy coefficient

Based on the aforementioned mortality risk rates **the longevity indicator** for 2020 is calculated. **The life expectancy coefficient** for 2020 is calculated by dividing the longevity indicator (with 6 decimals) for the base year 2009 with the longevity indicator for year 2020 (with 6 decimals). The life expectancy coefficient is given with five (5) decimals.

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LONGETIVITY INDICATOR FOR 2020

The longevity indicator for 2020 (EAL^{2020}) is calculated using the formula:

$$EAL^{2020} = \sum_{x=62}^{n} 1,02^{-(x+0,5-62)} \cdot \frac{L_x^{2020}}{l_{62}^{2020}},$$ in which

x = the age used in the calculation, x = 62, 63, ... ,100,

l_x^{2020} = the number of persons alive at the age x with respect to base value l_{62}^{2020} = 1; the number of persons alive at age x+1 (l_{x+1}^{2020}) is obtained using the formula: l_{x+1}^{2020} = (1 - q_x^{2020} / 1000) · l_x^{2020} ,

q_x^{2020} = Based on the mortality statistics of Statistics Finland for 2014−2018, the mortality risk rate for 2020 at age x, which is used when calculating the value for l_x^{2020} (the last cohort for which Statistics Finland reports mortality risk rates is 99; in the calculation of the longevity indicator at age 100 q_{100}^{2020} = 1000 is used),

L_x^{2020} = the average number of persons alive at age cohorts x, x+1, L_x^{2020} = (l_x^{2020} + l_{x+1}^{2020}) / 2.

As a result, the EAL^{2020} value is **17,586629**.

LIFE EXPECTANCY COEFFICIENT FOR 2020

The life expectancy coefficient for 2020 (EAK^{2020}) is received by dividing the longevity indicator for the base year 2009 with the longevity indicator for 2020, that is, with the following formula

$$EAK^{2020} = \frac{EAL^{2009}}{EAL^{2020}} = \frac{16,778288}{17,586629}$$ = **0,95404**.

In other words, the life expectancy coefficient for 2020 is **0,95404**.

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TARGET RETIREMENT AGE FOR THOSE BORN IN 1958

The target retirement age is calculated separately for each birth year. When retiring at the target retirement age (which is higher than the retirement age), the increment for late retirement offsets the cutting effect that the life expectancy coefficient has on the old-age pension.

The target retirement age for the age group born in 1958 is determined based on the life expectancy coefficient confirmed for 2020. The retirement age for those born in 1958 is 64 years. In order for the increment for late retirement to equal or surpass the cutting effect of the life expectancy coefficient for this cohort, they need to postpone their retirement by 13 months.

It follows that the target retirement age referred to in Chapter 75 section c of the Employees Pensions Act of those born in 1957 is **65 years and 1 month.**

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APPENDIX 1. The age-specific mortality risk rates (q_x) equalised for five years. and the l_x and L_x values derived from them for the calculation of the life expectancy coefficient for the years 2009 and 2020 (source: Statistics Finland).

Vuosi	2009				2020			
	Mortality risk rates 2003−2007 (q_x) and derived l_x- ja L_x values				Mortality risk rates 2014−2018 (q_x) and derived l_x- ja L_x values			
Ikä, x	q_x , o/oo	l_x	L_x	$1{,}02^{-(x+0.5-62)} * L_x / l_{62}$	q_x , o/oo	l_x	L_x	$1{,}02^{-(x+0.5-62)} * L_x / l_{62}$
62	9,59	1,00000	0,99521	0,98540	7,92	1,00000	0,99604	0,98623
63	10,29	0,99041	0,98531	0,95648	8,88	0,99208	0,98768	0,95877
64	11,05	0,98022	0,97480	0,92772	9,70	0,98327	0,97850	0,93124
65	12,31	0,96939	0,96342	0,89891	10,50	0,97373	0,96862	0,90376
66	13,02	0,95745	0,95122	0,87012	11,11	0,96351	0,95816	0,87647
67	13,69	0,94499	0,93852	0,84167	11,97	0,95280	0,94710	0,84937
68	15,26	0,93205	0,92494	0,81323	13,40	0,94140	0,93509	0,82215
69	16,54	0,91783	0,91024	0,78461	14,14	0,92878	0,92222	0,79494
70	18,40	0,90265	0,89434	0,75579	15,66	0,91565	0,90848	0,76774
71	20,32	0,88604	0,87704	0,72663	16,95	0,90131	0,89367	0,74042
72	21,98	0,86803	0,85849	0,69733	18,40	0,88603	0,87788	0,71307
73	25,28	0,84895	0,83822	0,66751	19,80	0,86973	0,86112	0,68574
74	26,72	0,82749	0,81644	0,63741	22,61	0,85251	0,84287	0,65805
75	30,65	0,80538	0,79304	0,60701	24,62	0,83324	0,82298	0,62992
76	33,10	0,78070	0,76778	0,57615	27,49	0,81272	0,80155	0,60149
77	38,32	0,75486	0,74039	0,54470	30,53	0,79038	0,77831	0,57260
78	43,19	0,72593	0,71025	0,51228	34,94	0,76625	0,75286	0,54302
79	47,67	0,69458	0,67802	0,47945	39,00	0,73948	0,72506	0,51271
80	53,66	0,66147	0,64372	0,44627	44,18	0,71064	0,69494	0,48177
81	60,03	0,62597	0,60718	0,41268	48,27	0,67924	0,66285	0,45052
82	66,50	0,58840	0,56883	0,37904	55,20	0,64645	0,62861	0,41887
83	76,00	0,54927	0,52840	0,34519	61,83	0,61077	0,59189	0,38667
84	83,82	0,50752	0,48625	0,31143	72,53	0,57301	0,55223	0,35368
85	94,07	0,46498	0,44311	0,27823	81,09	0,53145	0,50990	0,32017
86	106,44	0,42124	0,39882	0,24551	94,66	0,48835	0,46524	0,28640
87	117,49	0,37640	0,35429	0,21382	105,21	0,44212	0,41887	0,25280
88	130,85	0,33218	0,31045	0,18369	118,90	0,39561	0,37209	0,22016
89	149,96	0,28871	0,26707	0,15492	133,75	0,34857	0,32526	0,18868
90	162,49	0,24542	0,22548	0,12823	151,51	0,30195	0,27907	0,15871
91	188,32	0,20554	0,18619	0,10381	166,40	0,25620	0,23488	0,13096
92	202,56	0,16683	0,14994	0,08196	185,55	0,21357	0,19375	0,10591
93	225,06	0,13304	0,11807	0,06327	208,98	0,17394	0,15577	0,08348
94	238,53	0,10310	0,09080	0,04771	232,17	0,13759	0,12162	0,06390
95	257,39	0,07851	0,06840	0,03523	255,71	0,10565	0,09214	0,04746
96	283,97	0,05830	0,05002	0,02526	277,59	0,07863	0,06772	0,03420
97	309,15	0,04174	0,03529	0,01747	304,10	0,05680	0,04817	0,02385
98	332,80	0,02884	0,02404	0,01167	323,08	0,03953	0,03314	0,01609
99	349,08	0,01924	0,01588	0,00756	341,42	0,02676	0,02219	0,01056
100	1000,00	0,01252	0,00626	0,00292	1000,00	0,01762	0,00881	0,00411
101		0,00000				0,00000		
$\sum 1{,}02^{-(x+0{,}5-62)} * L_x / l_{62}$				**16,778288**				**17,586629**

* Statistics Finland publishes mortality risk rates until the age 99, which is why the calculation of the life expectancy coefficient is terminated at age 100. From a calculational point of view, this is done by ascribing the value 1000 to q_x at age 100.