

Finland – Cohort and Gender Specific Measures of Lifetime Pension Benefits & Contributions



Lifetime pension contributions and benefits under the private sector earnings-related pension system has been studied by analysing the cohorts born between 1940 and 2000 by birth year and gender. The study is based on a combination of historical statistics (years 1962 to 2013) and the results of the long-term projections of the Finnish Centre for Pensions.

Pension benefits under evaluation include all benefits payable to beneficiaries; i.e. old-age, disability, unemployment, part-time and survivors' pensions.

Pension contributions include the share paid by the employer, the share paid by the employee and a separate contribution with which pension accrual during non-contributory periods is financed.

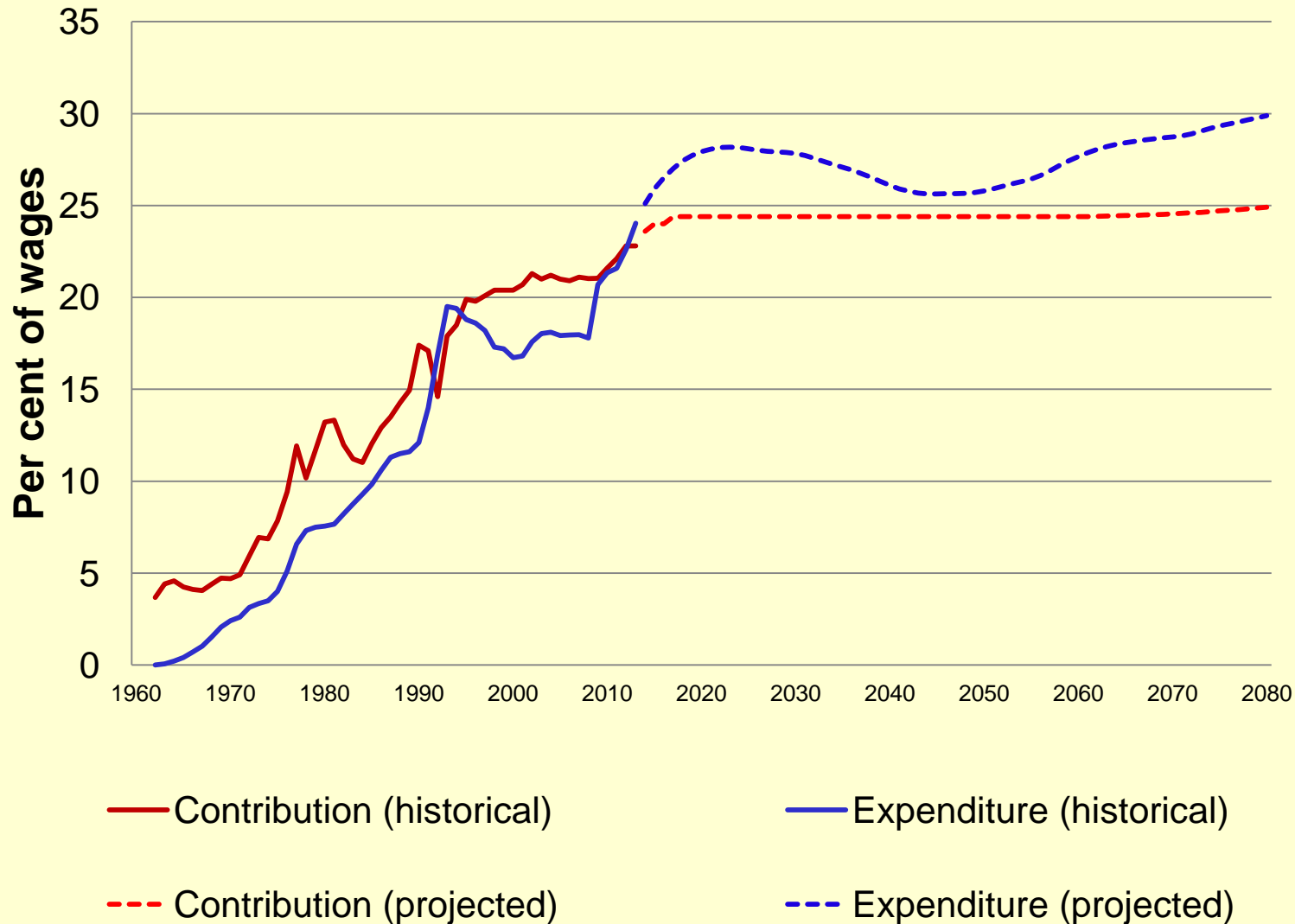
Operating costs of the pension system are included in the realised and the projected pension contributions

The employee's pension contribution (introduced in 1993) has not been included in the **earnings**; this way, the concept of earnings is as comparable as possible between different birth cohorts

Pension contributions are tax-deductible and pensions are taxable income for the pension recipients. **Taxation** is not taken into account in the estimates as they are limited only to the earnings-related pension system for private-sector wage-earners.

National pension which is targeted to persons with low or no earnings-related pension is excluded.

Pension expenditure and contribution as % of wage sum, Private sector employees.





The internal rate of return of each group is the interest rate with which the present value of pension contributions and the present value of pension benefits are equalised. It has been calculated using the following formula (*):

$$\sum_{y=1962}^{2110} \frac{\text{contribution}_{ac,y}}{\text{cpi}_y} (1 + r_{ac})^{2110-y} = \sum_{y=1962}^{2110} \frac{\text{benefit}_{ac,y}}{\text{cpi}_y} (1 + r_{ac})^{2110-y}.$$

Where:

$\text{contribution}_{ac,y}$, the pension contribution of persons in the age cohort ac in year y .

$\text{benefit}_{ac,y}$, the pension benefit received by the age cohort ac in year y .

cpi_y , the consumer price index for year y

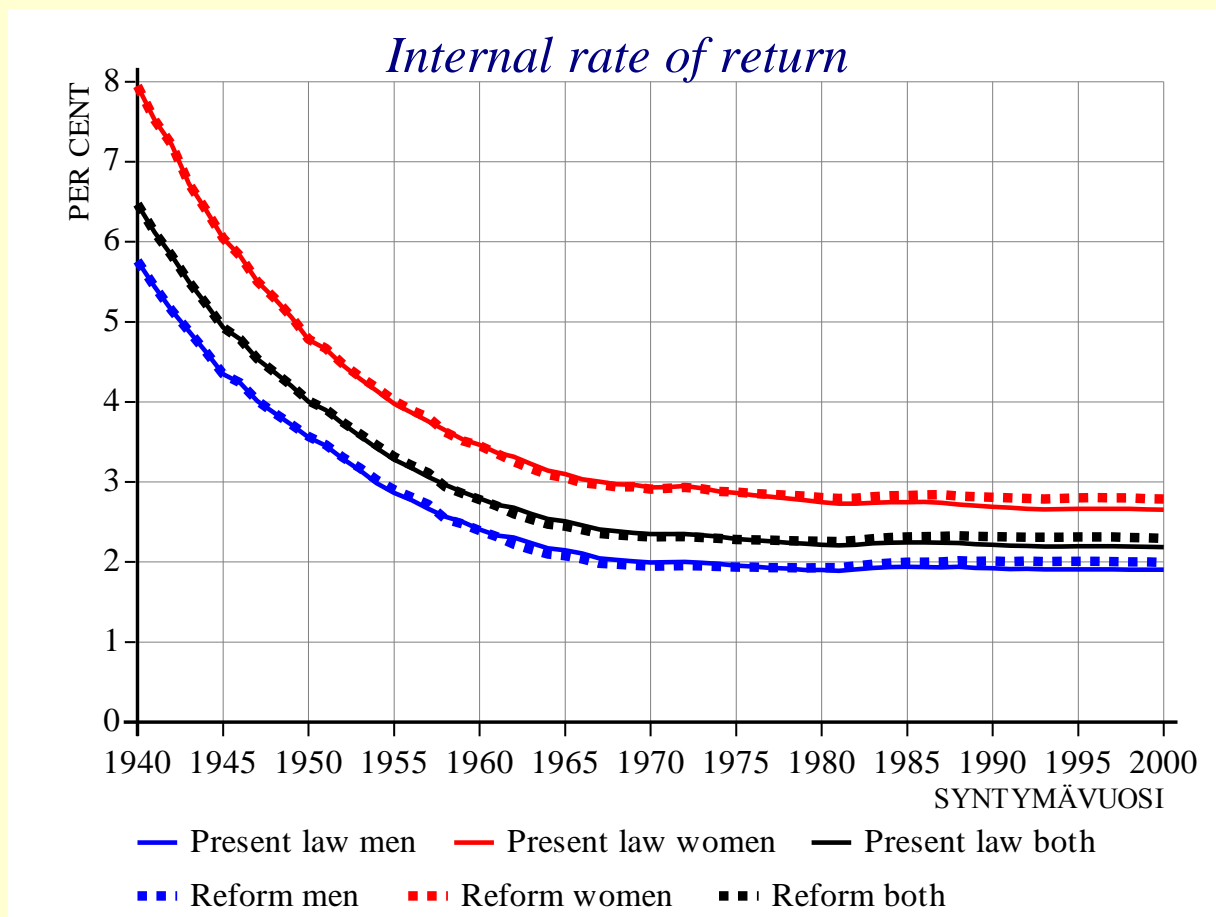
r_{ac} , the internal rate of return for the generation born in year ac .

() The results for the older generations are based on their realised working lives and partly realised time in retirement. The results for the younger generations are based completely on projections. Hence, these results come with significant uncertainty*

The unisex internal rate of return decreases from the 6.5 per cent for the cohort born in 1940 to 2.3 per cent for that born in 1970. After that, the internal rate of return remains at 2.3 per cent until the generation born in 2000.

Real internal rate of return on pension contributions, by cohort and gender

Year of birth			
	Men	Women	Total
1940	5.8	7.9	6.5
1945	4.3	6.0	4.9
1950	3.6	4.8	4.0
1955	2.9	4.0	3.3
1960	2.4	3.5	2.8
1965	2.1	3.1	2.4
1970	1.9	2.9	2.3
1975	1.9	2.9	2.3
1980	1.9	2.8	2.3
1985	2.0	2.8	2.3
1990	2.0	2.8	2.3
1995	2.0	2.8	2.3
2000	2.0	2.8	2.3



Reform = a new pension legislation effective as of January 1st 2017.

Present values of pension benefits and contributions



The present value of the pension benefits for each birth cohort has been calculated using the following formula (*):

$$Present\ Value\ (benefit_{ac}) = \sum_{y=1962}^{2110} \frac{benefit_{y,ac}}{(1+r)^{y-2015}} \times \frac{cpi_{2015}}{cpi_y}$$

Where:

$benefit_{y,ac}$, the nominal-valued pension benefits of persons of the age cohort ac in the year y .

cpi_y , the consumer price index for the year y

r , the real discount rate (**) equivalent to the assumed return on the pension assets during the projection period.

() The results for the older generations are based on their realised working lives and partly realised time in retirement. The results for the younger generations are based completely on projections. Hence, these results come with significant uncertainty*

*(**) $r = 3.5\%$; this value can be seen as a rough approximation of the return on a portfolio with a weight on interest-bearing instruments from the early 1960s to the present time.*

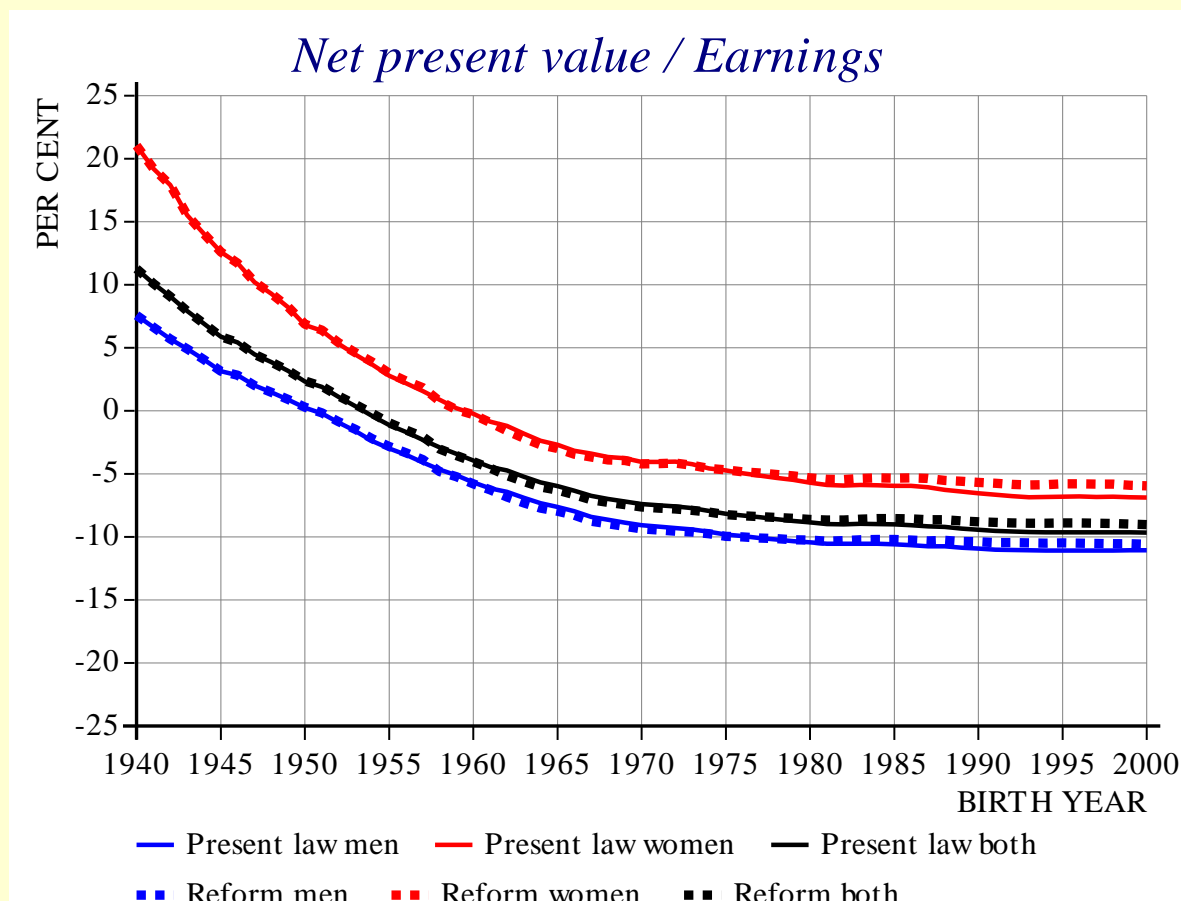
Results, present value of pensions

The present values of pension benefits, contributions and earnings are at their highest for the cohorts born between 1945 and 1950. The differences in sizes of the age cohorts and the discounting of the monetary amounts affect the present values substantially. Discounting, in particular, explains why the capital values are almost systematically smaller the younger the cohorts are.

present values of lifetime earnings, benefits and contributions by cohort

Year of birth	Million EUR				% of earnings			Benefit/ Contribn
	Earnings	Benefit	Contribn	Net	Benefit	Contribn	Net	
1940	63 895	14 085	6 883	7 202	22.0	10.8	11.3	2.05
1945	105 640	19 896	13 685	6 211	18.8	13.0	5.9	1.45
1950	104 581	18 331	15 837	2 493	17.5	15.1	2.4	1.16
1955	88 638	14 669	15 503	-834	16.5	17.5	-0.9	0.95
1960	77 259	12 316	15 429	-3 113	15.9	20.0	-4.0	0.80
1965	70 083	10 980	15 390	-4 410	15.7	22.0	-6.3	0.71
1970	55 677	8 989	13 239	-4 249	16.1	23.8	-7.6	0.68
1975	53 332	8 908	13 302	-4 393	16.7	24.9	-8.2	0.67
1980	49 592	8 435	12 705	-4 270	17.0	25.6	-8.6	0.66
1985	46 515	8 227	12 208	-3 980	17.7	26.2	-8.6	0.67
1990	44 374	7 989	11 890	-3 901	18.0	26.8	-8.8	0.67
1995	39 495	7 162	10 673	-3 510	18.1	27.0	-8.9	0.67
2000	34 059	6 146	9 220	-3 073	18.0	27.1	-9.0	0.67

Results, present value of pensions



Note: present values are sensitive with respect to interest rate assumption, qualitative result is robust however.

- The real internal rate of return on the earnings-related pension contribution of those born in 1940 is estimated to be 6.5 per cent. - The return of generations older than this is even higher.
- Women's rate of return will be slightly below 8 per cent and men's slightly below 6 per cent.
- The internal rate of return will decline evenly per generation up to those born in the 1970s and then stabilise at 2.3 per cent.. *The most important reason for the declining internal rate of return is the rising level of the earnings-related pension contribution rate. The gender gap in the internal rate of return is due to women's higher life expectancy and the fact that most surviving spouse's pensions are paid to women*
- The earnings-related pensions of the cohorts born in the 1940s have been determined more generously compared to those of later generations
- The birth cohorts born after the 1940s will receive a more-or-less equal amount of pensions relative to their earnings. The lifetime pension contributions relative to the earnings, on the other hand, will increase up until the generations born in the 1990s.
- The net present value will be positive for those born at the beginning of the 1950s and earlier. For younger generations, the net present values will be negative.

The presented projections are linked to discussions on intergenerational fairness. Yet, intergenerational fairness cannot be evaluated solely based on pensions.