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Session on

**Understanding the Non-financial Defined-Contribution (NDC) pension scheme:
concept, implementations and management**

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Increasing longevity, NDC implementations and all that

1. Computing and indexing the NDC pension
2. The reasons for diversifying divisors: the Swedish choice 'by cohort'
3. Measuring obsolescence and the reasons to get rid of seniority pensions
4. The drawbacks of the Italian implementation and the possible remedies

Premise 1: *one-to-one correspondence between pensions and contributions (gross of interests) requires that the interest rate be credited on individual account balances both before and after retirement.*

Premise 2: *sustainability of the NDC system requires one-to-one correspondence and that the interest rate be the sustainable one.*

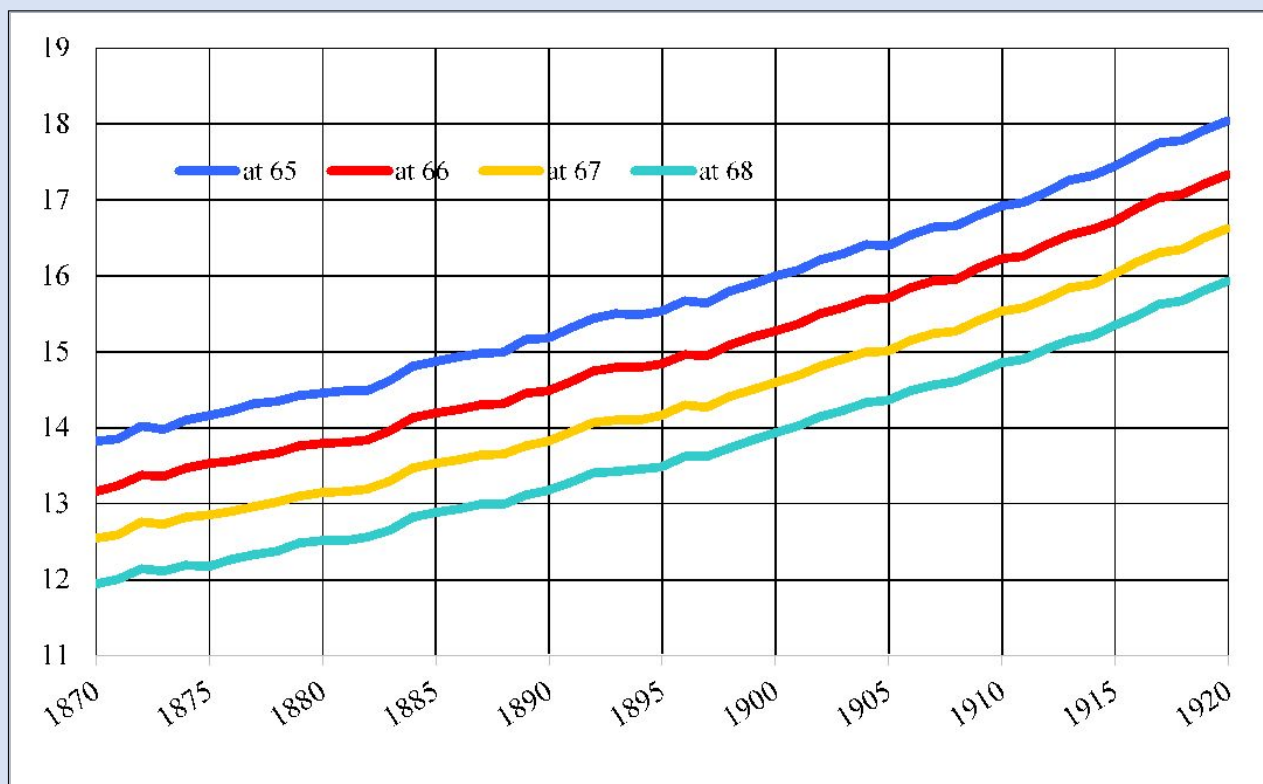
Conclusion 1: *one-to-one correspondence is ensured if*

1. First-pension-award rule: the account balance at retirement is divided by a divisor reflecting workers' life expectancy at retirement and, possibly, an anticipation of the future interests accruing on the account after retirement.
2. Indexation rule: Pensions are yearly indexed at the sustainable interest factor 'discounted' by the interest rate (if any) anticipated within the divisor.

Conclusion 2: *anticipating future interests within the divisors increases the first pension but reduces the indexation rate.*

The thorny issue of diversifying divisors by 'attributes'

The Swedish choice: attributing divisors to each birth cohort at the eve of the year in which the cohort reaches the lowest possible retirement age



At every age, each birth cohort lives around 30 days longer than the preceding one. Actually, the 'gains' of life days tends to increase through time, given that it has been of around 43 days for the 1920 cohort relative to the 1919 cohort, while it had been of around 20 days for the 1871 cohort relative to the 1870 cohort.

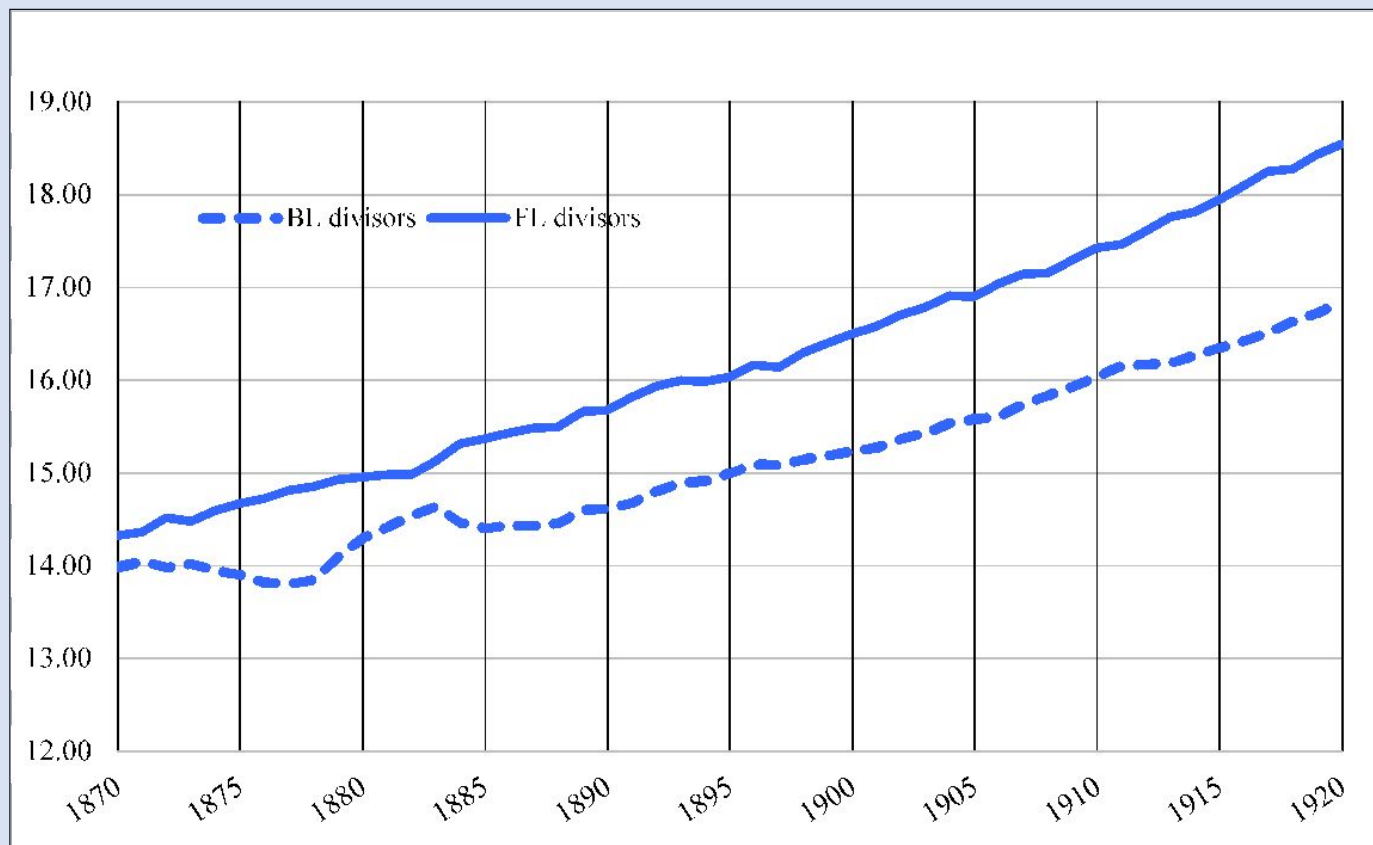
Figure 1-Life expectancy at 65, 66, 67 and 68 years for the cohorts born in Sweden between 1870 and 1920 (Source: Human Mortality Database (University of California, Berkeley (USA) and Max Planck Institute for Demographic Research, 2021).

Obsolescence (1)

- In the year in which the set of divisors needs to be assigned, the specific life table of the cohort turning 64 is incomplete. For instance, the survival rates between 65 and the maximum age of 110 of those born 1957, who have been assigned the divisors in 2021, will be observable only between 2023 and 2067;
- Sweden has chosen to compute divisors relying on the most updated ‘period’ (PL) life table, registering the survival rates experienced by all the 110 cohorts overlapping in the year in which data are gathered.
- The survival rates at the ages ranging from 65 to 110 ‘belong’ to cohorts that are older than the retiring one. Therefore, the divisors based on those tables are *backward looking* (BL) and distort life expectancy downwards.
- Divisors’ obsolescence represents a serious obstacle that prevents the NDC scheme from reaching its fundamental goals.

Obsolescence (2)

- We measured obsolescence 'retrospectively' for the 'now extinguished' cohorts by comparing FL divisors with the BL divisor that the Swedish protocol would have hypothetically assigned to the same cohorts.



The vertical distance between the two lines measures **obsolescence**, i.e. the **number of extra annuities paid 'free of charge'**, to the representative cohort member.

Obsolescence increases with the year of birth. The same pattern can be found for the divisors at 66, 67 and 68, which is consistent with the ongoing increase in longevity

Obsolescence (3)

- If seniority pensions were admitted in Sweden, definitive divisors should be attributed when the cohort turns 56, with the consequence that ...

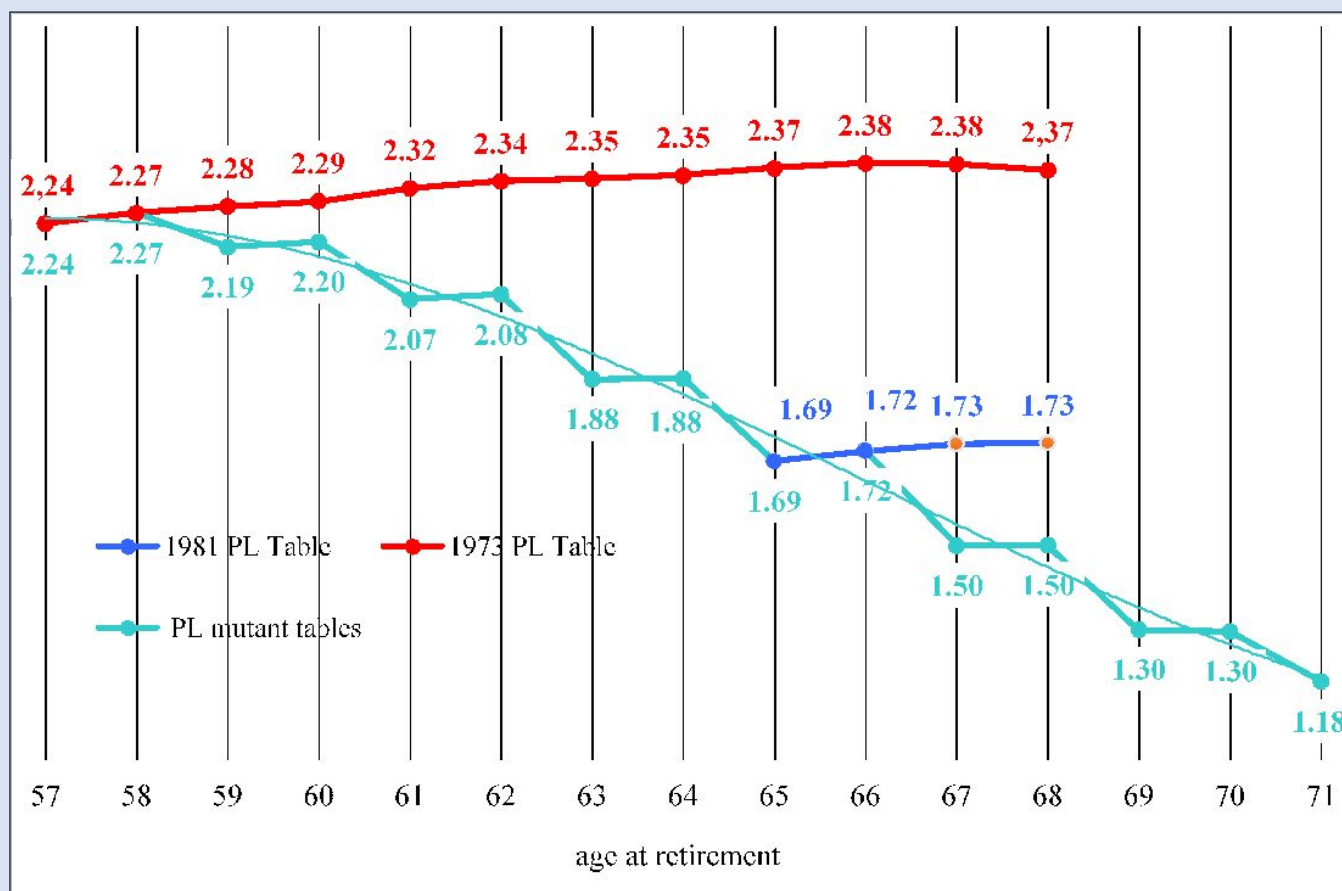


Figure 1-Divisors' obsolescence for the cohort born in 1920

Obsolescence depends on the average 'distance' between the retiring cohort and the preceding ones whose mortality rates have been used to compute the BL divisors;

The blue line shows the present level of obsolescence in Sweden of around 1.7 annuities (the pension cut to ensure 'correspondence' amounts to 11%);

The red line shows the dramatic increase in obsolescence due to the hypothetical presence of seniority pensions;

The green line shows obsolescence with seniority pensions and the Italian protocol (periodical revision *erga omnes*).

All that ...

- The Italian NDC misses the fundamental leg of indexation without which its fundamental goals cannot be reached;
- Introducing the NDC indexation in the new economic and demographic scenario requires recomputing divisors with a lower anticipated rate of interest (e.g. 0.75%, as it is in Norway);
- The negative effect on the first pension can be offset by introducing a separate, non automatic, survivor protection *à la Suedoise*;
- The present mechanism of periodical revision of the divisors prevents Italian workers from planning their retirement and penalizes (through the divisors' update) those who postpone retirement either by choice or by necessity;
- The ever changing retirement rule should give way to a stable and universal retirement age interval with a sufficiently high lower bound.

“even though the fundamental principles are not difficult to grasp and it is relatively easy to gain a good overall picture of how the system works, the system in its entirety is complex. An ability to administer the system presupposes a profounder knowledge of the whole and of how the parts work” (The Pension Group - Ministry of Health and Social Affairs, 2009, p. 3).

THANK YOU!