

Rotation of the age pattern of mortality improvements in the European Union

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The study background

Human mortality tends to decline in the long run, which is fortunate for humans, but less so for pension and health insurance schemes and annuity providers. Empirical studies have shown that rates of mortality improvement depend heavily on the age, gender and country in question, and additionally, they also tend to change in time.

More specifically, the historical acceleration of mortality decreases among the elderly and a simultaneous slowdown of improvement at younger ages, which are sometimes jointly referred to as the rotation of the age pattern of mortality decline, have been observed in several populations.

Objective

After a concise summary of the most relevant literature, this paper suggests a simple, largely data-driven methodology with few assumptions for the empirical examination of the rotation phenomenon in historical mortality datasets.

Data and methods

These techniques are then applied on United Nations data from the period between 1950 and 2015 for both genders and all 28 countries of the European Union.

Results

The results indicate that rotation has indeed taken place in numerous member states, but its presence is far from universal, and it appears to have been notably more prevalent in populations

of women than among men. Additionally, its presence and strength are largely unrelated to life expectancies at birth, despite prominent literature that suggests otherwise.

Conclusion

As the rotation phenomenon may jeopardize the reliability of mortality forecasts for pension schemes as well as life and health insurers, which may lead to severe financial consequences, it is essential to be aware of the possibility of its presence and apply appropriate forecasting procedures that take it into consideration, whenever necessary.

Keywords mortality, longevity, demography, rotation, Europe