Country report – Belgium

<u>General information</u>

According to Belgium statistics, life expectancy for males is 77.15 and 82.43 for females. It is interesting to note that:

· the difference between female and male life expectancy decline during last decade ([from 6.34 to 5.28](#)).

· the difference between the North and the South of the country of about 3 years. Possible causes are a more developed health service and a more educated population (with a higher salary) in the North of the country

All information are available on the following websitehttp://statbel.fgov.be/fr/statistiques/chiffres/population/deces_mort_esp_vie/tables/

<u>Insurance reserving</u>

Reserving bases for classical life insurance are based on Makeham formula: . These are period life tables.

According the main risk driver (survival or death) and the sex of the insured person, parameters may change.

For example, parameters use for the tariff and reserving of a pure endowment (respectively males and females) are:

k= 1.000.266,63 ||k=1.000.048,56

  s= 0,999441703848 ||s=0,999669730966

  g= 0,999733441115 ||g=0,999951440172

  c= 1,101077536030 ||c=1,116792453830

For example, parameters use for tariff and reserving of term/whole life endowment (respectively males and females) are:

k= 1.000.450,59 || k= 1.000.097,39

  s= 0,999106875782 || s= 0,999257048061

  g= 0,999549614043 || g= 0,999902624311

  c= 1,103798111448 || c= 1,118239062025

However due to mortality improvements and the length of the commitment, life annuities should anticipate future mortality trend. Rather than considering projected life tables insurers prefer to use Makeham formula with parameters of classical survival insurance (see above) with a reduction of age of 5 years.

<u>Market valuation of insurance provisions (Solvency II Directive)</u>

Due to the emergence of Solvency II, many insurance undertakings value their technical provisions (except for life annuities) by using market tables which better reflect expected demographic.

Market tables are built using mortality data arising from a collection of insurance and/or pension plans. The rationale for market tables lies usually in social class (i.e. adverse selection) as assessed through occupation, income or education. Social class often induces more difference in longevity than gender. In general, individuals with higher socio-economic status live longer than those in lower socio-economic groups. The effect of social class is significant for insurance market mortality statistics. Indeed, buying life insurance products often reveals that the individual belongs to upper socio-economic classes, which in turn yields lower mortality. Consequently, these market tables are built around three factors: gender, nature of the underlying risk [survival or death guarantee] and type of policy holder [group or individual]

For more details on Market tables, please refer to the attached document [Chapter 4]produced by Michel Denuit (Professor of actuarial science in Belgium) and my-self.

As far as life annuities are concerned, projected life tables are commonly used for valuation. Indeed, the hypothesis of "static" mortality cannot be assumed in principle, at least when long periods of time are referred to. Hence, in Life insurance applications, the use of period life tables should be restricted to products involving short or medium durations, like term insurance or endowment insurance, whilst it should be avoided when dealing with Life annuities and pension schemes. Conversely, these products require life tables which allow for the anticipated future mortality trend constructed on the basis of the experienced mortality trend.

Mortality forecasting

Although several models could be used to project mortality, Lee & Carter methodology remains a benchmark as referred on the Belgian Actuarial Bulletin (www.belgianactuarialbulletin.be) or in my attached document [Chapter 3]. However, new models seem to surpass some difficulties of the Lee &Carter approach.

Note also that official publication has already been performed on that topic:http://www.plan.be/admin/uploaded/200805081112390.pp105_fr.pdf

Mortality miscellaneous

A closed collaboration took place between actuary and notary in order to help notary to find the appropriate life tables to price usufruct.

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