Assurance dépendance : premiers retours d’expérience sur le risque de maintien

First feedback on survival risk in state of dependency

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« The study and the views expressed here are solely those of the author"
Problematic and context

• Political context: development of long term care insurance offer
• Regulatory context: Solvency 2 and ORSA
• The three main risks of long term care products:
  ➢ Modeling mortality of valid insured
  ➢ Modeling entrance into dependency
  ➢ Modeling survival in state of dependency
• Conventional assumptions of pricing and reserving
Limitations of conventional assumptions

Four main limitations:

• Evolution of the risk over time is ignored in model
• Dependent’s longevity is not differentiated by dependency level
• The transition from a state of dependency to another state is neglected
• The lack of distinction between women and men about laws of entry into dependency and law of survival
Study on two portfolios

• Studies are based on two collective portfolios with voluntary membership

• Focus on the survival law

• Our results show that explicative variables should be integrated in risk assessment, such as:
  - Age of entry into dependency
  - Dependency level
  - Gender
Impact of age of entry into dependency

• In the first portfolio, an increasing trend in the average survival period of dependents has been observed

• Ages with similar behavior regarding the survival in state of dependency are gathered with an ACP (principal component analysis)

• Models used to evaluate the survival function are based on three different non-parametric methods:
  - A company’s internal model
  - The Harrington-Fleming estimator
  - The Kaplan-Meier estimator
Impact of age of entry into dependency

- Mortality for entries into dependency before 74 years old is much higher than for entries into dependency after 75 years old
- Different mortality laws suggest that the origins of dependency are different according to ages
- Analysis of second portfolio confirm these conclusions
Impact dependency level

- The second portfolio gives the opportunity to analyze the survival on a finer level of granularity
- Mortality is much stronger when dependency is heavy
- Dependency level impacts the survival in this state
Impact of gender

- Women show a longer survival period than men
- The difference between mortality laws for men and women confirms that it is necessary to perform segmentation
Conclusion and opening

• The use of aggravated mortality tables to translate mortality for dependent is not relevant

• In the absence of survival laws defined by age, survival curves defined by group of age have to be used

• A young person entering into dependency dies faster than a person entering into dependency at an older age

• The assumption of an equal longevity for the different states of dependency can introduce a significant bias in the valuation of dependency risk

• Finally, women show a longer survival period than men
Conclusion and opening

• Improve modeling of transition between dependency level: work in progress
• Works on incidence and life expectancy without dependency could be deepened
• Pathology causing dependency appears to be an important axis of analysis
L’assureur de toute une vie