ASTIN COLLOQUIUM LISBOA 2016

31 May - 03 June 2016
at
ISEG- Lisbon School of Economics and Management

If you intend to submit a paper for the ASTIN COLLOQUIUM LISBOA 2016, you need to provide a **Synopsis** (using the template on the next page), complete this **Submission Form** and submit both to astincolloquium2016@gmail.com by **Saturday 7 May 2016.** Synopses and submission forms must be sent as MSWord attachments, please do not supply them in the body of an email. You will be advised of the outcome and, if accepted, your abstract will be uploaded to the website.

SUBMISSION FORM

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Title of Paper / Presentation / Session to appear in program:

Correlations between insurance lines of business: An illusion or a real phenomenon? Some methodological considerations

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3. **Bernard Wong (presenting author)** **4.**

What will your final submission be? **Presentation and Paper** ☐ Presentation Only ☐

If selected, what level of knowledge will delegates attending your session require? (please select only) one
☐ No prior knowledge ☐ **General industry knowledge assumed** ☐ Technical/specific industry knowledge assumed

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ABSTRACT

Correlations between insurance lines of business: An illusion or a real phenomenon? Some methodological considerations

Benjamin Avanzi, Greg Taylor, Bernard Wong

Key words: Actuarial Models, Dependence, Capital margin, Correlation, Real data, Reserving, Risk margin

Purpose of your paper: This paper is concerned with dependency between business segments in the non-life insurance industry. We consider how much correlation some real data sets actually display, and explain how and why correlations can be illusory (and what we mean by that).

Abstract:

This paper is concerned with dependency between business segments in the non-life insurance industry. When considering the business of an insurance company at the aggregate level, dependence structures can have a major impact in several areas of Enterprise Risk Management, such as in claims reserving and capital modelling. The accurate estimation of the diversification benefits related to the dependence structures between lines of business ("LoBs") is crucial for (i) capital efficiency, as one should avoid holding unnecessarily high levels of capital, and (ii) solvency of the insurance company, as an underestimation, on the other hand, may lead to insufficient capitalisation and safety.

There seems to be a great deal of preconception as to how dependent insurance claims should be. Often, presence of dependence is taken as a given and rarely discussed or challenged, perhaps because of the lack of extensive data sets to be publicly analysed. In this paper, we take a different approach, and consider how much correlation some real data sets actually display (the Meyers-Shi dataset from the USA, and the AUSI dataset from Australia). We develop a simple theoretical framework that enables us to explain how and why correlations can be illusory (and what we mean by that). We show with some real examples that, sometimes, most (if not all) of the correlation can be 'explained' by an appropriate methodology. Two major conclusions stem from our analysis:

- In any attempt to measure cross-LoB correlations, careful modelling of the data needs to be the order of the day. The exercise will not be well served by rough modelling, such as the use of simple chain ladders, and may indeed result in the prescription of excessive risk margins and/or capital margins.
- Such empirical evidence as examined in the paper reveals cross-LoB correlations that vary only in the range zero to very modest. There is little evidence in favour of the high correlation assumed in some jurisdictions. The evidence suggests that these assumptions derived from either poor modelling or a misconception of the cross-LoB dependencies relevant to the purpose to which they are applied.

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Note: If you are not presenting a paper for this Colloquium, please include as much detail as possible in your Abstract (maximum three pages) to enable delegates to prepare for your session.