

IACA - Articles

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Risk analysis of active membership in relation to death and disability risk coverage

Author(s): Ljudmila Bertschi (Member of Swiss Chamber of pension fund experts), Urs Barmettler (ETHZ), Mario Triulzi (ETHZ), Lionel Candaux (University of Lausanne / Swiss Chamber of pension fund experts (SKPE))

Abstract: Each pension fund board of trustees decides on type and amount of death and disability risk coverage. At first step in pension fund specific risk analysis, the full coverage of death and disability risks by the pension fund itself is analyzed. According to Swiss pension legislation an internal adequate provision to cover these risks in addition to risk contributions should be set up. In Switzerland this provision is denoted by pension funds as risk fluctuation reserve and in the classical risk theory it is called as initial wealth. The implementation of a recursive evaluation of the finite time ruin probability based on an equation of Seal gives a deep insight in a pension fund specific situation in relation to death and disability risks as well as their pricing. Unfortunately, this approach is still not used by Swiss pension funds. Detailed risk analysis based on Seal equation provides a strong basis for decisions regarding which kind of provision is most appropriate for a pension fund. In addition, the integration of pension fund claim experience helps to determine the optimal level of financing. Examples based on sample pension funds are provided.

The scourge of the indies : tropical depressions, storms, & hurricanes

Author(s): Marc Bagarry (Groupama), Arnaud Dalleau (Groupama)

Abstract: Climate change through its devastating effects is a concern for everyone and, more broadly, insurers are in the front line to understand this risk with statistical tools applied to physical phenomena, the data of which are becoming widely available thanks to the work of the IPCC. During this presentation we review recent developments in hurricane activity in the Caribbean, first by providing feedbacks on recent events in the area, quantifying the impacts related to activities protected by the market and finally by providing an own view of this risk assessed on the Cordex climate models to quantify the impacts of climate change in this region both in intensity and frequency by 2050.

La psychiatrie : un risque important en assurance santé ?

Author(s): Romain Gauchon (Addactis), Jean-Pascal Hermet (Addactis)

Abstract: The French Social Security has highlighted psychiatric diseases as a major risk. However, French private health insurance companies do not consider psychiatric care as an important topic. In this article is presented a study (based on four real health insurance databases) of the cost of a policyholder benefiting from a psychiatric follow-up care. It aims to provide a better understanding of this risk in an insurance context. It is shown that such a policyholder costs twice as much as an average policyholder, notably due to important expenses in hospitalization. Policyholders aged from 15 to 30 years, as well as the ones over 70 years old are the most concerned by this risk.

Underfunded Pension Plans : How did we get here and who is responsible?

Author(s): Adam Reese (PRM CONSULTING)

Abstract: Many public sector pension plans, including plans covering state employees, have seen their unfunded pension liabilities increase dramatically over the last 10-15 years. There are multiple stakeholders that have different responsibilities for sound governance of pension plans:

- Plan sponsor / legislatures who can enact benefit plan changes
- Employees who choose when they retire
- Retirees who seek ad-hoc pension increases
- Trustees who select investment managers and set investment policy
- Investment managers who manage fund assets
- Actuaries who advise or set actuarial assumptions and who determine funding requirements, and
- Employers / legislatures who choose how much to fund

This presentation will examine the causes of growth in unfunded liabilities and identify the principal causes of growth, and who was responsible for the change in unfunded liability using as a case study a State Retirement System and a County Retirement System. On the asset side of the ledger, the paper will study the investment performance and examine how well a benchmark return based on the plan's asset allocation policy compared to the valuation assumptions, and the plan specific performance compared to the benchmark. On the liability side, the presentation will examine changes in liability from pension improvements as well as strengthening of actuarial assumptions.

Pension Schemes do not deliver the amounts needed when they are needed. Can actuaries solve this problem?

Author(s): Nigel Sloam (Nigel Sloam)

Abstract: Retirement patterns are changing. Most working people are forced to postpone retirement - and retreat from employment slowly. Pension drawings are needed, initially, as top-ups to supplement employment income and then increase as retirement completes. In later life, higher income may be needed to cover extra costs of care for one or both partners in a relationship. Pension entitlements, public and private or in combination, usually don't provide sufficient resources. Other resources must supplement the costs of later life. Henceforth, only Governments will provide defined benefits. Individuals must provide for income shortfall on their own! The paper looks at situations in several developed economies. How much is needed? How can saving be encouraged or compelled in a tough world where children's and housing costs are additional "taxes"? How can risks such as longevity be shared? Can steps be taken to protect against perils such as incapacity and reduction of resources on divorce? Successful investment of savings is all important. Tax relief, recoverable through taxes on retirement income, will help secure provision. The paper considers how actuaries can help on these matters cost effectively and highlights their unique - but underutilised - skillset in assisting individuals to achieve adequate provision.

Problems and Prospects of Development of Uzbekistan's Insurance Market from an actuarial point of view

Author(s): Bakhodir Shamsuddinov (National University of Uzbekistan)

Abstract: Uzbekistan is making progress implementing wide-ranging social and economic reforms. However, the Insurance Market is developing more slowly than other sectors of the National Economy. The reasons are low incomes of the population, low confidence of the population and entrepreneurs to insurers, irrational behavior of the population regarding risks, imperfect insurance legislation. There are contradictions in various legislative acts regulating the insurance market. Legislative acts on reserving, on assessment and control of solvency of insurance companies are not based on modern actuarial methods and contain errors from an actuarial point of view. The article provides a brief analysis of the current state of the Insurance Market and Insurance Legislation of Uzbekistan. Proposals have been developed to improve the current legislative acts, applying modern actuarial technology. The problems of adaptation of Solvency II in Uzbekistan were also studied.

A Classical Framework For Managing Behavioural Risk

Author(s): Colm Fitzgerald (University of Dublin)

Abstract: The paper takes the classical distinction between the four principal character types in antiquity, namely, politēs, idiôtes, doulos and barbaros, updates them with more appropriate and modern language, and uses them to create a framework for the management of behavioural risk in an organisation. The methodology is multi-disciplinary fusing classical philology with modern risk management theory to create a narrative for managing behavioural risk - and in particular for the management of the behaviour of brutes. The paper aims to show actuaries how to make prudent assessments of character, making use of narrative analysis, rhetorical analysis and other techniques including quantitative techniques. It is likely to be of interest to actuaries concerned with behavioural risk, conduct risk and cultural risk.

The Ethical Perspectives of the Actuaries of the Future

Author(s): Colm Fitzgerald (University of Dublin)

Abstract: The submission would be 5-7 five minute plays enacting the interaction of classical character types in an actuarial or professional context highlighting ethical issues by young actuarial students in University College Dublin. One example of the plays would be an adaptation of the play “An Enemy of the People” by Henrik Ibsen applied to an actuarial environment.

An Introduction to Classical Ethics

Author(s): Colm Fitzgerald (University of Dublin)

Abstract: Practical classical ethics training for professionals. This will be an introductory course in classical ethics. Compared to mainstream religious ethics, classical ethics is less about moralizing and more about practical usefulness. The focus is on living a better life, achieving superior results and on how to best handle the challenging situations. The course is less of a tick box exercise and instead one that will give practical examples showing the usefulness of understanding and being able to apply classical ethical principles in the workplace. These principles are of particular importance to help actuaries best deal with difficult situations where an actuary might need to blow the whistle. When in such a position, and not knowing how best to handle it, an actuary could be damned if he does and damned if he doesn't. Can classical ethics help an actuary in such a difficult scenario? Come along to the course to find out and learn more about classical ethics.

On Character

Author(s): Colm Fitzgerald (University of Dublin)

Abstract: The presentation is based on an ethics article that the author has been invited to write for the ASTIN Bulletin by Prof. Mario Wuthrich and that the author has been invited to discuss at the Annual Convention of the Society of Actuaries in Ireland next year

Actuarial solutions of some problems of the Insurance Market of Uzbekistan

Author(s): Bakhodir Shamsuddinov (National University of Uzbekistan)

Abstract: Uzbekistan is making progress implementing wide-ranging social and economic reforms. However, the Insurance Market is developing more slowly than other sectors of the National Economy. The reasons are low incomes of the population, low confidence of the population and entrepreneurs to insurers, irrational behavior of the population regarding risks, imperfect insurance legislation. There are contradictions in various legislative acts regulating the insurance market. Legislative acts on reserving, on assessment and control of solvency of insurance companies are not based on modern actuarial methods and contain errors from an actuarial point of view. The article provides a brief analysis of the current state of the Insurance Market and Insurance Legislation of Uzbekistan. Proposals have been developed to improve the current legislative acts, applying modern actuarial technology. The problems of adaptation of Solvency II in Uzbekistan were also studied.

De-Risking Trends in US Corporate Pension Plans and the Implications on Plan Participants

Author(s): Michael Clark (River and Mercantile)

Abstract: For corporate US defined benefit plans, the last decade has been defined by large scale de-risking initiatives. These initiatives can be characterized in three major topics: investment strategies, liability reduction strategies, and plan design strategies. Some of these strategies have been around for many years but have recently picked up momentum for a variety of different economic and regulatory changes. The current state of affairs has also spurred innovation by way of new strategies that are beginning to be explored (some of which are already mainstream in other parts of the world). This paper looks at the background of the US defined benefit plan market and the various de-risking strategies that are currently popular among plan sponsors. We will also look at new strategies that are being discussed and beginning to be adopted.

Why Understanding People Is Imperative for Successful Consulting Actuaries

Author(s): Michael Clark (River and Mercantile)

Abstract: We all deal with people on a regular basis – colleagues, managers, clients, etc. In order for those relationships to be long-term successful we need to understand our own strengths and weaknesses as well as those of the people we interact with on a regular basis. There are studies and research on the importance of our own self-awareness. The understanding of our own behavioral tendencies can help us amplify our strengths and learn to compensate for our weaknesses. Furthermore, there are systems that exist to codify personalities to aid in our understanding of not only ourselves but also other people. Many corporations have gone as far as having licensed professionals administer personality tests to their employees to help aid in this understanding. This paper looks at the importance of self-awareness for consulting actuaries as well as some of the personality codification systems that can help us not only better understand ourselves but also understand the people we interact with every day. This knowledge will aid in the success of consulting actuaries (and actuaries in general) as they deal with internal and external colleagues and clients on a day-to-day basis.

Generative adversarial networks for actuarial use

Author(s): Kwanda Ngwenduna (ABSA)

Abstract: Generative Adversarial Networks (GANs) were invented in 2014 and have generated more interest since then. GANs are useful for learning the structure of the data without explicitly postulating the model. They are better than other generative models, used for data augmentation, boosting predictive models, attention prediction, anomaly detection, domain adaptation, privacy preservation, missing data imputation and discriminative modelling. GANs have been successful on images, music, text, speech and tabular data sets. However, GAN applications have been lacking in actuarial science. This work offers to provide practical applications of GANs in actuarial science. This presentation covers the following aims and objectives:

- Overview of generative models and why GANs are of better quality than other generative models
- An overview of the GAN architecture with practical insurance, banking and healthcare examples, trained using Python for:
- Data augmentation;
- Alleviating class imbalance; and
- Boost predictive models
- Cover some challenges with GANs, including recent advances and scope for the future and actuarial science.

Overall, we show a significant superiority of GANs for predictive models and stochastic simulations compared to current actuarial approaches. This work has recently been submitted for an MSc in Data Science at the University of the Witwatersrand in 2019.

Adoption of IFRS 17 in Emerging and Frontier Insurance Markets. An Actuarial Perspective

Author(s): Carlos Arocha (Arocha & Associates GmbH)

Abstract: The new rules set forth by IFRS 17 not only imply a fundamental overhaul of insurance accounting, but also, the reengineering of actuarial and accounting processes within an insurance company. In fact, a few insurers will opt to transform their operating model in its entirety, while smaller ones will set their objectives at minimal compliance. The objectives of the standard are to increase comparability between insurance companies and between insurance and other parts of the financial industry, such as banks and asset management. Other benefits include an increased consistency across companies in accounting for insurance contracts and a more theoretically valid measurement of revenue. These lofty goals come at a cost: the implementation carries a host of challenges that may result in many cases in the restructuring of an insurer's operating model. Non-advanced insurance markets are coping with a myriad of adaptations to their modus operandi, including overhauls of the IT infrastructure, redefinition of roles and functions, and understanding the financial impact of the standard. In this paper, the author explores how insurers from emerging and frontier insurance markets, can navigate through the technical aspects of the standard, and implement the IFRS 17 framework. There is an enormous gulf between emerging and advanced insurance markets, but actuaries can contribute to narrowing the gap.

Social inclusion in the world of modern predictive analytics

Author(s): Esko Kivisaari (Finance Finland)

Abstract: The volume of digital data is increasing by around 61 % annually. The rapidly developing techniques of predictive analytics make it possible to use this data in underwriting and pricing of insurers. These novel technologies present huge opportunities for societies to utilize pooling of risks better and better. For insurers better techniques help not only to cover risks more efficiently but also to better manage adverse selection and moral hazard, and also to combat insurance fraud. With these benefits we also have threats. Does increasingly exact risk-based underwriting lead to a decrease in the inherent solidarity, existing not only in mandatory or social insurance but also in voluntary insurance? Do we end up in a situation where lack of insurance leads to a larger part of the population being socially excluded (recognizing that modern techniques, when used responsibly, can also reduce exclusion)? The paper looks at the problem of avoiding social exclusion in the context of evolving techniques. It is connected to the thinking of the Consultative Expert Group on Digital Ethics set up by EIOPA, where the author is chairing one of the three workstreams.

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