

DIGITAL Actuaries



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Books that made me - Normal deviance

COMMENT

Is 'Part-Time' a Dirty Word?

EVENT REPORT

Young actuaries to workshop financial sustainability of Northern Australia

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IFRS 17 Taskforce Update - March 2018

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CareerView Podcast - Handling the Resignation

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The Critical Line - Volume 19

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IFRS 17 Taskforce Update - March 2018

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IMPORTANT INFORMATION FOR CONTRIBUTORS

Actuaries Digital welcomes both solicited and unsolicited submissions. The Editorial Committee reserves the right to accept, reject or request changes to all submissions as well as edit articles for length, basic syntax, grammar, spelling and punctuation via actuariesmag@actuaries.asn.au

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CareerView Podcast - Handling the Resignation

By Nick Cowdery and Angat Sandhu

The next instalment of the CareerView Podcast series explores the do's and don'ts of effectively resigning from a role.

In this podcast, Angat Sandhu (Chief Editor of Actuaries Digital) explores with Nick Cowdery (Director of InterAct Search) how to properly resign, including which conversation to have and which to avoid with your manager.

"I think taking the emotion out is the key. I always like to think a simple script for your resignation should just literally be "look, thanks for the time I've had here. I've really enjoyed working here and got lots of great experiences but it's time to move on and do something else..." - Nick Cowdery



Nick discusses the best professional method to resign including notifying your direct manager as soon as possible while taking into account your own transition period, especially if you are moving on to a new role. A perfect exit strategy will ensure you also take advantage of holiday leave so you can have down time in between an existing role and a new one.

[Listen to "CareerView - Handling the Resignation" on Spreaker.](#)

"...you do have to be slightly selfish, companies are very good at acting in their own best interest and because it's a personal relationship, sometimes you just have to think, in this instance, I do have to think about me, this is why I'm doing it" - Nick Cowdery

While notice periods needs to reflect your contract terms, you should aim to finish off and/or transfer ownership of existing projects and structure your transition in a flexible framework so you leave the company with a favourable view and excellent references.



Download Transcript [here](#).

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IFRS 17 Taskforce Update - March 2018

By Trang Duncanson (Trang.Duncanson@nab.com.au)

This article reports on the new AASB 17 Insurance Contracts Information Note, released on 8 March 2018, to support actuaries in Australia and NZ in the application of IFRS17.

The Institute released the new AASB 17 Insurance Contracts Information Note (AASB17 IN) on Thursday, 8 March 2018. AASB 17 IN produced by the IFRS17 Taskforce was released as a draft for discussion.

The IFRS17 taskforce was established in December 2016 with a core focus to produce an IN to help actuaries in Australia and NZ. The main purpose of this IN is to support its members in the application of IFRS17, ensure consistency in the interpretation of the Standard where possible at this time, identify issues in the Standard that affect the actuarial profession in Australia, and represent its members to ensure the relevant and significant issues are escalated to the right local and global forums.

The taskforce is chaired by Ian Laughlin and its core membership includes representative from General Insurance, Life Insurance and Health insurance practice areas. Members from the big four accounting firms, New Zealand Society of Actuaries, Australian Prudential Regulation Authority (APRA), the Accountant and Actuaries Liaison Committee (AALC), and the Australian Accounting Standards Board (AASB), Transition Resource Group (TRG). A full membership list of who is involved in the development of this IN is illustrated in the table below.

Member engagement and feedback

The AASB17 V1.0 is exposed to members for feedback. The feedback closing date is 28th of March 2018. Exposure draft, Explanatory Memorandum and some examples can be found [here](#). Please provide feedback and comments to Tony Burke at Tony.burke@actuaries.asn.au.

The Taskforce has organised a workshop in Sydney on the 3rd of April where interested members will have a chance to ask questions, provide their inputs for further improvement of the IN. If you are interested in attending the workshop, please register [here](#).

The Institute has also set up a webinar for members who are in other States and internationally.

AASB 17 Information Note structure

The AASB 17 IN is structured as a series of questions and answers (Q&A), in some cases, with a few simple examples for illustration. A limited but more detailed set of examples in Excel is available on the Institute website [here](#). The IASB also has published IFRS 17 Illustrative Examples.

We recognise that there is ongoing dialogue at the global level on a number of topics, and we expect that the IN will need to be updated over time for this.

The Institute would like to thank and congratulate the IFRS17 Taskforce for their dedication and commitment to get the first AASB17 IN finalised. The Taskforce, chaired by Ian Laughlin, and supported by many volunteers, has put in countless hours and enormous commitment to get the first draft finalised. The Institute is very appreciative of the incredible amount of work done by this Taskforce.

- Main Taskforce members and Coordinators with third parties and other professional bodies (APRA, ATO, AALC, AASB, IAA, the analyst community etc.)**
- Ian Laughlin (Taskforce Chair, Australian Prudential Regulation Authority (APRA), Australian Taxation office (ATO), Australian Securities & Investments Commission (ASIC) and Treasury),
 - Hoa Bui (Financial Services Council (FSC), Council and Cross Practice Committee)
 - Grant Robinson, Brett Pickett (Life Insurance & Wealth Management Practice Committee (LIWMP) representative),
 - Francis Beens (Insurance Council of Australia (ICA) and General Insurance Practice Committee Representative),
 - Brendan Counsell (International Actuarial Association (IAA) and the Accounting & Actuaries Liaison Committee AALC),
 - Trang Duncanson (Analyst Community and Actuaries Institute Communication Lead),
 - Anne Driver through Benoit Laganieri (Australian Accounting Standards Board (AASB));
 - Andrew Scott (Reserve Bank of NZ),
 - Ben Coulter (Reserve Bank of NZ and New Zealand Society of Actuaries),
 - Antony Claughton (Health Practice Committee (HPC) representative),
 - David Rush (Australian Securities and Investments Commission (ASIC)
 - Lisa Simpson
 - Martin Stollwitzer
 - Jun Oh (Australian Prudential and Regulation Authority (APRA)

Technical Work-streams	Coverage within work-stream	Taskforce Lead & Members
General Model/ building block approach (BBA)	<ul style="list-style-type: none"> • Onerous contracts • Current estimates (initial recognition and subsequent measurement) • Contract Service Margin (CSM) - initial recognition and subsequent measurement • Reinsurance • Contract modification /derecognition 	<ul style="list-style-type: none"> • Grant Robinson (BBA Lead) • Andrew Scott • Anna Byrne • Antony Claughton • Bob Buchanan • Brad Oldridge • Brett Pickett • Charl Jansen van Rensburg • Chris Scheuber • Dimity Gartizionis • Julian Braganza • Mari-Liz Hill • Michael Chae • Stuart Mainland
Variable fee approach (VFA)	<ul style="list-style-type: none"> • Eligibility for the VFA, and composition of the pool of underlying items • Treatment of participating contracts not eligible to use the VFA • Unit Linked with Insurance Riders in the same contract • Groupings that are required under the VFA (consideration of mutualisation) • Issues specific to the VFA relating to the Risk Adjustment, amortisation of the CSM, options under the contract, reinsurance, expenses and taxation • Issues specific to the use of the VFA by friendly societies • The treatment of asymmetry • The calculation of VFA starting amounts on transition 	<ul style="list-style-type: none"> • David Rush (VFA Lead) • Alison Nanson • David Liney • Grant Robinson • Jamie Kernot • Peter Corbett • Peter Erlandsen • Ray Bennett • Richard Land • Ross Culey
Premium allocation approach (PAA)	<ul style="list-style-type: none"> • Eligibility for the PAA • Liability for remaining coverage • Liability for incurred claims • Onerous contracts under PAA • Significant financing requirement • Issues specific to the PAA relating to reinsurance and expense acquisition costs • The calculation of PAA starting amounts on transition 	<ul style="list-style-type: none"> • Brendan Counsell (Workstream Lead) • Bob Buchanan • Chris Scheuber • Trang Duncanson • Brett Pickett • Antony Claughton • Evelyn Njoo • Nick Stolk • Philip Halverson • Ryan Druitt • Dean Hammond • Brett Pickett (RADR Workstream Lead) • Ben Coulter • Bob Buchanan • Bolin Li • Brad Oldridge • Brett Pickett

Technical Work-streams	Coverage within work-stream	Taskforce Lead & Members
Risk adjustments, discount rates	<ul style="list-style-type: none"> • Determining the discount rates and allowance for financial risk • Determining the risk adjustment 	<ul style="list-style-type: none"> • Danny Bechara • Lisa Simpson • Martin Stollwitzer • Michael Dermody • Nicholas Stolk • Ray Bennett • Stuart Mainland • Wayne Cannon • Benoit Laganiere (Workstream Lead) • Mari-Lize Hill • Ben Coulter • Trang Duncanson
Level of aggregation, definition of portfolios and groupings	<ul style="list-style-type: none"> • Defining insurance contract portfolios and boundaries • Dividing portfolios into groupings (onerous, no significant chance of becoming onerous, other, year of issue) • Issues specific to the level of aggregation and boundaries relating to reinsurance • The level of aggregation on transition 	<ul style="list-style-type: none"> • Chris Dolman • Chris Marston-Fergusson • Melissa S Yan • Michael Ramsay • Moy Yin Chow Fat Lun • Raewin Davies • Scott Reeves • Thomas McCutcheon • Hoa Bui (Workstream Lead) • Briallen Cummings • Brett Pickett • Bob Buchanan
Disclosures, OCI and strategic	<ul style="list-style-type: none"> • Other Comprehensive Income (OCI) • Disclosures / presentation • Strategic transition (e.g. tax and APRA). 	<ul style="list-style-type: none"> • Francis Beens • Grant Robinson • Shweta Krishna • Kevin Zhong • Trang Duncanson • Chris Scheuber • Jessica Chen • Evelyn Njoo

For general information about the Taskforce please contact Lily Meszaros at Lily.meszaros@actuaries.asn.au



I am an Actuary

By Martin Mulcare (martin@etiam.com.au)

In this particular instalment of 'I am an Actuary', our newly qualified members speak about how actuarial studies was their calling in life. Actuaries are not only well-trained in technical skills, but they are passionate individuals who love to give back to the community and see real value in their work.

Amy McDonald

I became interested in actuarial science when I was working as a superannuation consultant. I remember speaking to a customer who was terminally ill,



and he was so happy to be able to buy his wife a gift with his claim proceeds. It crystallised for me the difference that insurance makes in people's lives, and it prompted me to explore life insurance. I was soon hooked on the diversity of the work and the benefit the industry provides to society. The formal part of my actuarial journey started in 2010, when my son was three months old and I enrolled in a Masters of Actuarial Studies at UNSW.

My career so far has included working in product, pricing, individual product valuation and now, capital management.

I am motivated by learning new things, teaching others and solving challenging items whether they be at work or at home. This passion for learning applies to everything I do in my life, including my kids ("But mum, sometimes we don't want to learn. Sometimes we just want to talk about Pokémon").

I am grateful for the people who have helped me along the way – my incredible family, flexible lecturers, dedicated mentors, and work colleagues (both past and present). Now I have completed my formal study, I am really looking forward to giving back to this amazing community. I have started by coordinating 2B Life Insurance study sessions at work and I am volunteering with a fellowship of Christian actuaries.

I am passionate about the actuarial profession. I enjoy the diversity of work we get involved in, and I am proud to belong to a group that is required to act with integrity, honesty and due care, serving the public interest. When you enjoy mathematics, what better way to make a meaningful, positive impact!

Dimitri Lyulik

I can say with some confidence that my actuarial journey so far has been a little different to most. From moving to



Australia from the other side of the world, to being told I wouldn't make it into university, and now having the pleasure of being part of the 2018 Professionalism course –it most certainly feels something like a Black Swan event...

I was born in present day Odesa, Ukraine, and my mother and I immigrated to Australia when I was young. Approaching my final years of school my career advisor recommended that I “consider a trade...” because “university is not for you”. With that advice, a passion for art and mathematics, and limited knowledge of what the world had to offer, I enrolled in an architectural degree. In the last few weeks of architecture one of my colleagues elbowed me and asked “Why are we doing this? Why aren't we doing something like actuarial science?” to which my natural response was “What's that?” (A view that my parents seem to share to this very day!)

Needless to say, a profession focused on predicting and quantifying the unknowns was far too intriguing to pass by. I now hold an Architectural and Actuarial Bachelor's degree, an Actuarial Master's degree from UNSW, and I'm halfway through my Part III exams.

In 2016 I joined Finity Consulting working primarily in the general insurance space. My focus has recently expanded into more non-traditional work with big data and predictive analytics. Outside of Finity I'm a part time artist with several exhibitions already under my belt.

I wouldn't call myself the 'typical' actuary – I'm not certain anyone is - but I can say with certainty that I am extremely proud and privileged to be part of such a wonderful profession and community.

Evelyn Yong

Not many people knew my career started in the mailroom at Colonial



First State after completing my double degree with Macquarie University. With some luck*, I joined the CommInsure graduate program which restarted my pathway to qualifying as an Actuary. The graduate program was a great way to explore different parts of life insurance – I worked in Group Valuation, Direct Life Pricing & Analytics and finally, Capital.

I have been asked how I feel following the announcement that AIA Group purchased CommInsure. I think CommInsure is going through a phase that's quite rare in the industry, so there's a lot of interesting work we don't normally get to do. In fact, I am currently part of a project team working on the AIA/ CommInsure deal, and it is quite fast-paced and exciting!

At the Professionalism Course, I was glad to learn that it's increasingly common for actuaries to work in non-traditional areas like data analytics, government and not-for-profits. Right now, the idea of working in a non-traditional area appeals to me. I'd love to find out more about these areas (and at the same time 'give back' to the Institute), so I've expressed my interest in joining a few volunteering groups for non-traditional areas at the Institute.

*Speaking of luck, I've been very fortunate to be surrounded by amazing people – mentors, colleagues, managers, family, partner and study buddies – who gave me support, feedback and advice during my journey to qualifying. Without you, I wouldn't be able to say, 'I am an Actuary'. So here begins a new chapter of my actuarial journey!

Joyce Wang

After four years of studying Part III exams and been told multiple times that failing exams is part of character building, I can now finally call myself an Actuary (with strong character)!



My journey to become an Actuary has been fairly traditional. I studied Actuarial Studies at the University of Melbourne and started working as an Actuarial Analyst in the Life Insurance space. I have worked in various roles - valuation, risk management and, more recently, in pricing. Unlike other non-traditional

actuarial areas, life insurance is sometimes seen as boring. This is definitely not true! I am really excited about the difference new technology is making in traditional insurance, such as how big data provides insights in strategic decisions and how artificial intelligence can be used to improve efficiency.

I am currently organising a YAP event in Melbourne, inviting three industry experts to share insights on how machine learning can be applied in areas such as claims and underwriting. I am looking forward to hearing the speakers' views and whether they think actuaries can be replaced by machines in the future.

Without study occupying most of the weekend, I have found more time to fully enjoy life. Being a big foodie, I am spending most of my spare time on the weekends discovering new food gems in Melbourne. I have also recently started learning French, which will come in handy when I go on a food adventure in France.

Owen Tong

Some people are born to be pilots, some are born to be comedians, but I was born to be an actuary.



The actuarial profession and I are like a positive and negative charge.

Ever since primary school, I loved thinking about the future – I used to ponder how many marbles I could win if my winning streaks continued and conduct back tests whenever I'd come to the end of my streaks. This behaviour continued into high school where I began to build buffers (risk margins) into everything – whether it was allowing additional time when catching a bus, or saving additional money for a rainy day. I had no idea what an actuary was at the time, but I knew there must be a divine calling for my skillset. During the final year of high school, my math teacher recommended studying actuarial studies at university, and that's where my fun and adventures began.

In my current role, I am fortunate to have been selected to work on two major projects – interpreting and building models to assess the impact of IFRS17 and the implementation of a global actuarial reserving software. These projects involve significant conversations between Actuarial, Finance, Financial Planning & Analysis, IT, Claims, Underwriting, Executive teams as well as external consultants. As I sat through the Professionalism Course, I reflected on just how important effective communication is. As actuaries, if we cannot communicate effectively, poor decisions may be made which can taint the reputation of our profession.

Where will the future take me? I don't know but I will continue to uphold utmost integrity wherever I go. The actuarial skillset has prepared me for whatever challenges life might throw my way. Hence, I would like to say to the world – when the going gets tough, the tough get going, so bring it on!

Richard Dunn

In my teenage years I was set on a career in eSports – being paid to play video games 16 hours a day – what was not to love?



Unfortunately, my parents had other ideas and so, when I turned 16, I took a series of psychometric tests to establish if there was anything else to life. Shockingly – the tests were conclusive – actuarial science rather than video games was the clear favourite. In hindsight I think that the results must have been driven by my introversion, because at the time, I was failing maths.

I traded in late night gaming sessions for longer nights of maths homework to enrol in actuarial science at the University of New South Wales. Over the next few years it became clear that the tests had got it right – I loved translating the numbers that I had once struggled with into convincing and practical insights that fixed problems.

In 2015, half way through my final thesis, I was offered a job by Rice Warner supporting their research and consulting teams. This role has seen me focus on our superannuation and investments capabilities and culminated in developing and producing our analytics model for the Actuaries Summit in 2017.

Over the next few years I look forward to watching data analytics transform the actuarial playbook and elevate the quality of the insights that actuaries can provide. Looking back, I can confidently say that while eSports were exciting – being a Fellow of the Institute of Actuaries is what gets my heart pumping.

Sid Jain

Like many, in my final year of high school I had to decide what I wanted to become. Choosing something to do for the rest of your life isn't



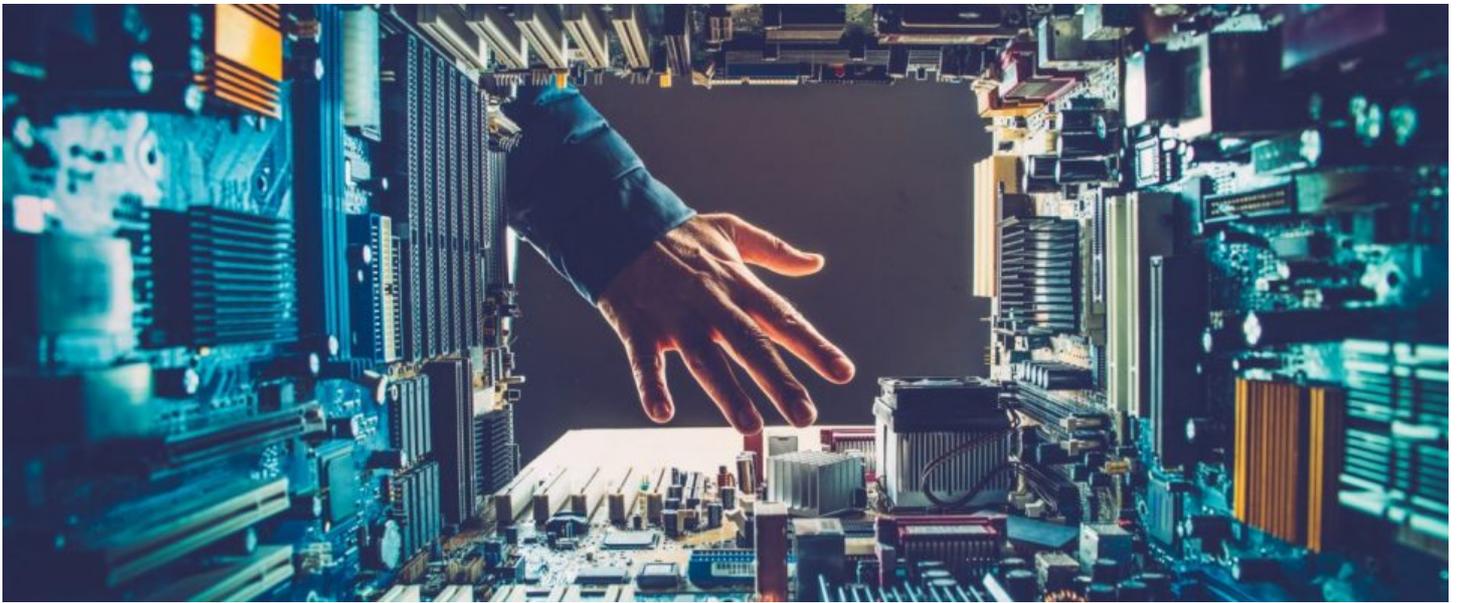
an easy decision. I knew I wouldn't enjoy being a doctor. I didn't really know too much about the daily life of an engineer. What I did know was numbers. Upon reading quite a few articles touting that being an Actuary was the best job (and a lot of research) - I would have been foolish to pursue anything else!

During university, I was lucky enough to work on a consulting project at Sun Life Financial in Hong Kong. Our team provided advice on how new regulations would impact Hong Kong's superannuation system. Following that, I spent some time at Medibank in Melbourne on a strategy based project, where we were tasked with formulating ways to differentiate Medibank's value proposition.

After a taste of some non-traditional work I thought it would be an injustice to the profession if I did not at least try a traditional role. After completing my degree, I decided to take up a role in the Long Tail team at Allianz in Sydney, where I've been for the last three years. The role is focused on the pricing of our Liability and Professional Indemnity portfolios, with a sea of ad hoc tasks along the way. I've found that the day to day tasks require complex thinking and a crucial overlay of expert judgement onto results.

I'm excited for the new opportunities which lie ahead as the profession evolves with machine learning, insurtech and big

data looming above it. I hope that in the future the word 'Actuary' will continue to carry the weight it currently does.



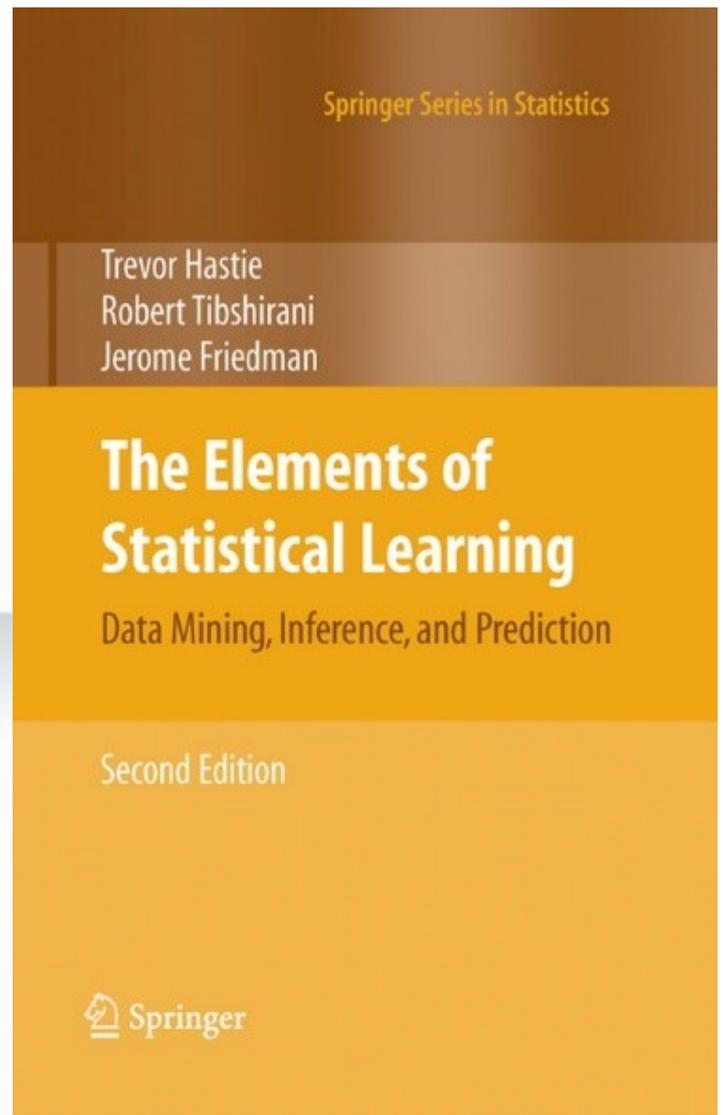
Books that made me - Normal deviance

By Hugh Miller

Regular columnist Hugh Miller reflects on the books that he's found most useful in his career so far.

If you're anything like me then you've got a long list of books that you'd like to read, but not found the time to do so. For this reason, it's incredibly rare to read a book multiple times. Here are three books that fit into that category; ones that I've found helpful enough that I've returned to them multiple times.

The Elements of Statistical Learning. Hastie, Tibshirani and Friedman.



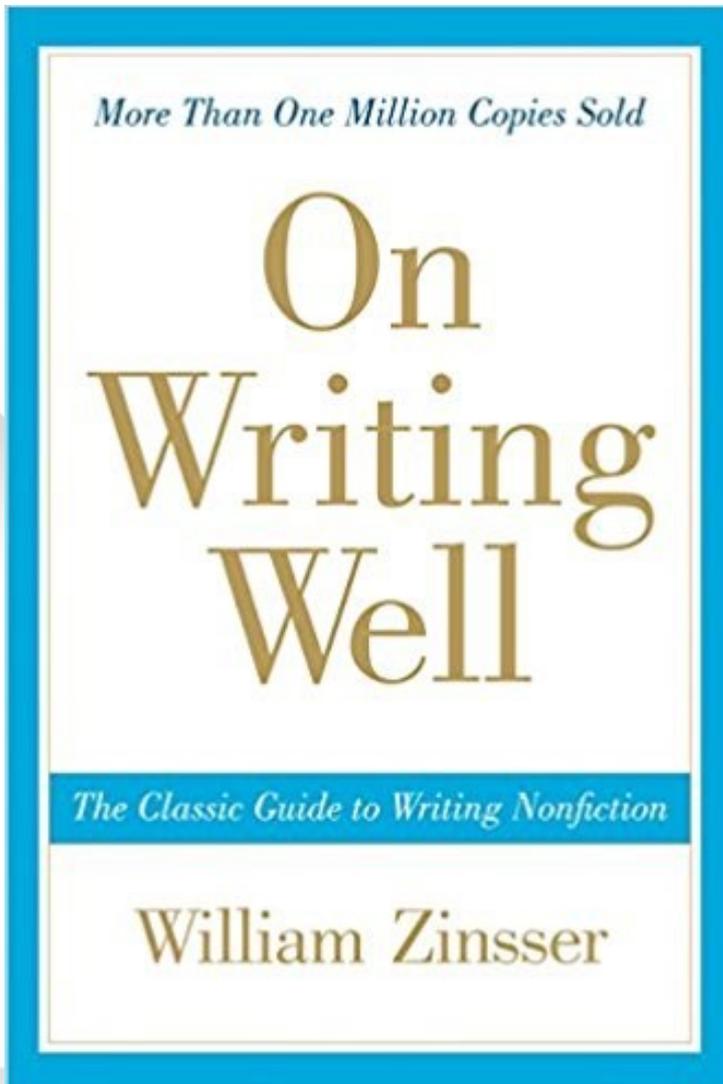
I read this book for the first time when preparing to start a PhD and it has defined how I've thought about predictive modelling ever since. Written by three genuine experts in the field, and with good charts and figures (a surprising rarity in statistics textbooks), this is a great way to learn a broad range of approaches for those comfortable with maths notation and statistical concepts.

It gets particularly good around chapter seven, where it gives useful general advice on overall model validation and assessment. In this way the book gives a sense of both general and specific principles for statistical learning.

In covering a broad range of techniques, the authors also draw links between various approaches. This is useful in gaining a better understanding of their differences and similarities, and a better feel for when some techniques will perform better than others.

And best of all, [it's free](#).

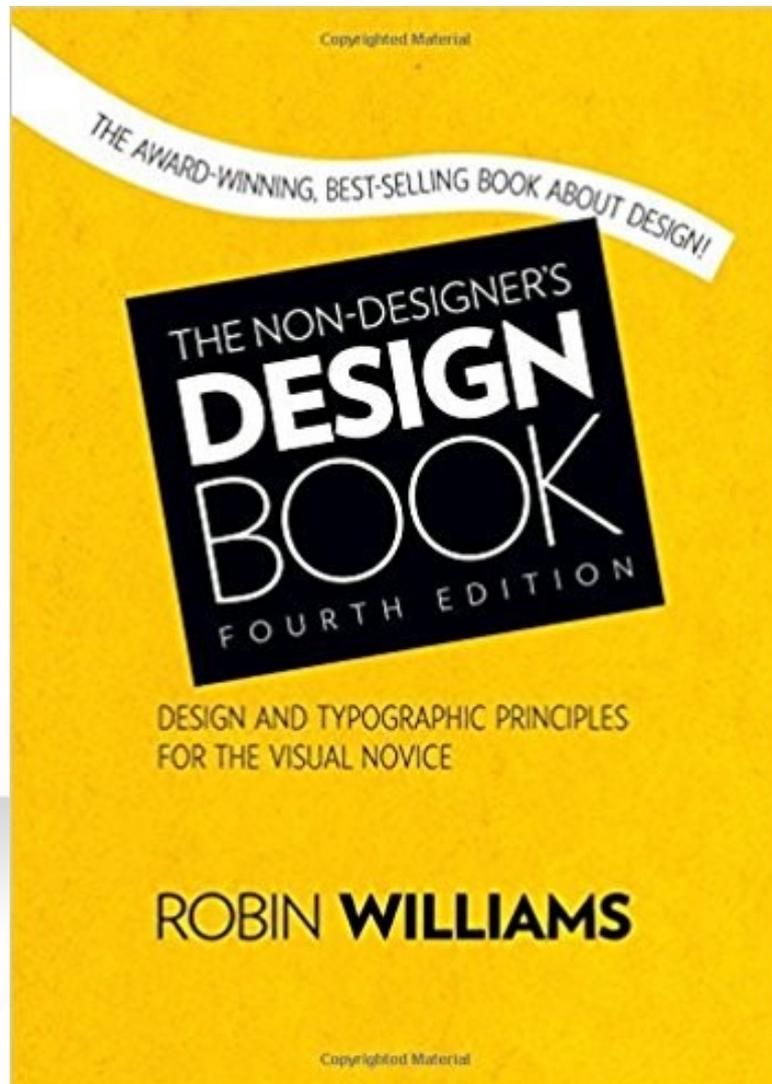
On Writing Well, William Zinsser.



This book, now over 40 years old, is timeless in encouraging better thought and technique in nonfiction writing. Zinsser himself writes with warmth and clarity. He encourages care in all stages of the writing process and pulls apart the key elements of writing in useful detail. While somewhat daunting, he makes the point that the only way to improve is to give yourself the time to review and edit multiple times.

It's also a good tonic for those uninspired with the vagaries of modern corporate writing; Zinsser has little time for corporate euphemisms or obfuscation. Instead he encourages simple and clear prose built with care.

The Non-Designer's Design Book, Robin Williams

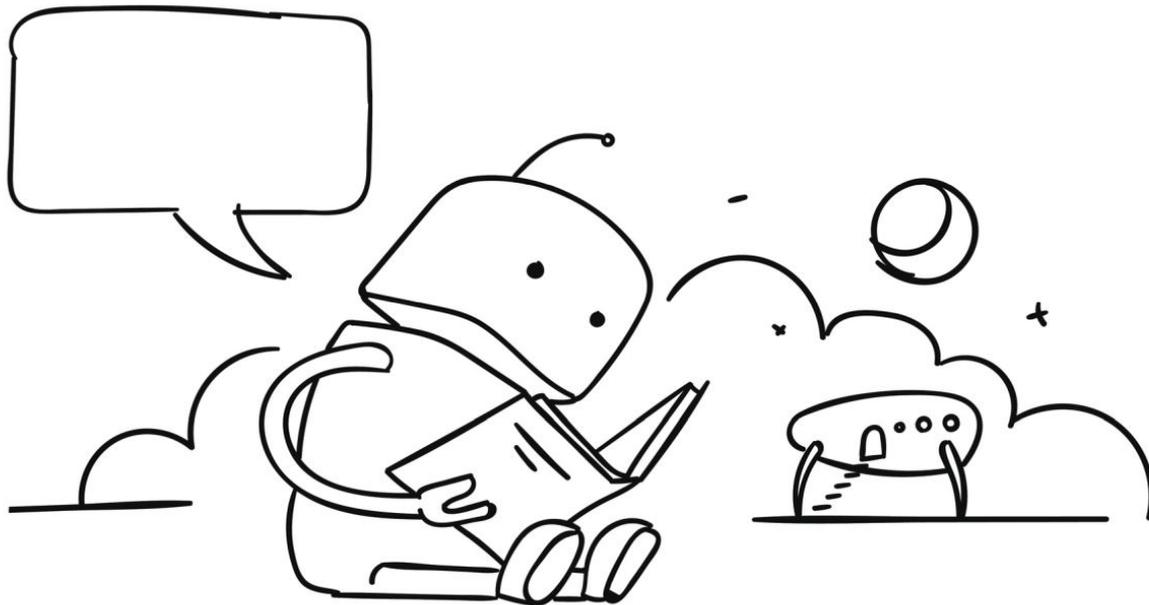


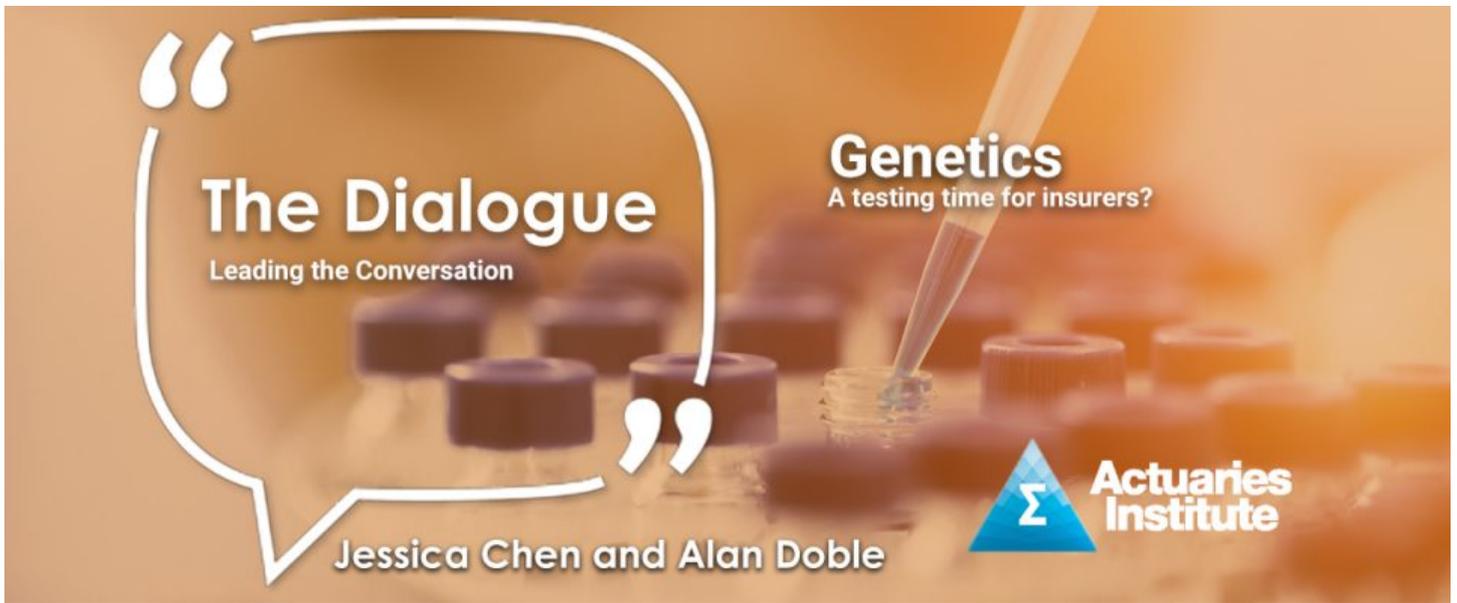
Another longstanding classic, this book is well described by its subtitle – design and typographic principles for the visual novice. People with a flair for design may not learn much, but it is written at a perfect level for people like me; those who don't know much about visual design but don't want to have to hire a designer every time they try a new font.

Much of the advice is simple and clear; design with strong lines, don't place anything without thought and don't be a wuss when it comes to font selection.

By knowing the basic principles of design, you can quickly apply them to your own work. You can be more discerning in figuring out why you like some designs and not others, which is the first step in being able to improve on it.

As an interesting sidenote, the book is good proof of how 'good design' is very much a societal construct; the visual look of the cover and included examples have changed significantly over the different editions of the book, reflecting that design does not stand still.





Genetics - The Dialogue Podcast

By Jessica Chen and Stephen Dixon

The next instalment of the Dialogue Podcast series explores the broader future implications of genetic testing for society, medical professionals and the insurance industry.

In the podcast, Stephen Dixon (Deputy Actuary at Munich Reinsurance Australia) questions Jessica Chen (Director of Insurance, Finance at BT Financial Group) on the research, potential impacts and considerations of modern genetic testing in the Dialogue thought leadership paper 'Genetics - a testing time for insurers?' - authored by Jessica and Alan Doble.

In the paper, Jessica looks at the far reaching implications for society and individuals of genetic testing. Factors such as rapidly decreasing test costs and greater understanding of genetic research results have increased the use of genetic testing:

"...the field of genetics has developed quite rapidly over the last couple of decades, so in the early 2000's it was the first time that the human genome was completely mapped." - Jessica Chen



Jessica notes that the genetics community in Australia sees a need to reduce barriers for people who want to understand their genetic make-up for health and/or family reasons. Increased genetic testing creates the potential for affected individuals to mitigate the risk of inherited disease that previously could not be identified through traditional blood and urine tests.

"...the genetic test used to focus on what we call monogenetic diseases so these are typically single gene mutations that 100% predict the onset of certain diseases. But since then the technology's moved and now we have what we call predictive genetic testing."

Currently predictive genetic testing uses technology called genome-wide Association studies whereby diseases that are caused by a number of gene mutations are researched and identified as polygenetic diseases. This technology is utilised to predict more common diseases such as cancer and heart disease and yet despite the advances, there are barriers that still present themselves to individuals including:

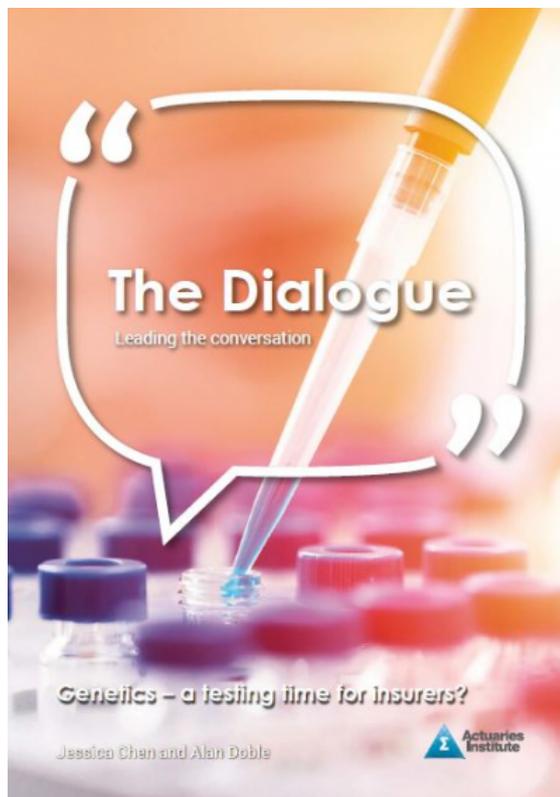
- Ethical considerations regarding pre-emptive consent for future interpretations from older genetic tests.
- Discovery of becoming high risk of a genetic disease
- Disclosure of genetic test results form an individual to medical and insurance professional

Jessica argues that while genetic testing is not regarded as a current threat to the insurance industry, should larger volumes of genetic tests be undertaken then individuals will start changing insurers based on the results. Insurers will need to redesign their policies, premiums and coverage to ensure the quality of life for their insureds remains high and their customer base continues to be loyal. Jessica notes however that it is up to the individual to make better informed decisions around their life and health insurance.

"...ultimately the aim of genetic tests is to improve people's lives so we do hope that people will use this information to better manage their health and improve the quality of their life."

Jessica recommends building a database where claim outcomes relate to high genetic information to track any new findings and similar patterns in a cluster of individuals. Jessica and Alan also encourage the FSC to publish information on how insurers make decisions on information provided to them through genetic tests to help individuals and the wider industries understand how they're tracking.

Overall Jessica makes a call to action for the medical profession, genetic research and insurance industry to come together and create a transparent solution that takes into account everybody's views.



Listen in to find out more on Jessica's research and further recommendations.

[Listen to "The Dialogue - Genetics - a testing time for insurers" on Spreaker.](#)

Download Transcript [here](#).

Access the Paper and Media Release [here](#).

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Five things we learned networking in London

By Li Mei

The London Australian Actuaries Network reports on its December mission to combine networking with one of the great institutions of British culture – pints at a pub.

The **London Australian Actuaries Network (“LAAN”)** was founded in late 2017 with the intention of organising quarterly networking drinks for Institute members living in the UK.

Typically based in the “square mile” area of London city (akin to the CBD in Australian cities, but for banks and insurers), we aim to combine networking with one of the great institutions of British culture – pints at a pub. Because let’s face it, where else would an actuary rather be in London’s notoriously gloomy weather?



Our December event took place in the Counting House, a traditional pub located between the Bank of England and the Lloyds building. We had an excellent diversity within our turnout of about a dozen, with Aussies from all areas of practice – industry, consulting, the PRA (Prudential Regulation Authority), and even academia. There were Aussies who’ve just arrived in London, some part way through a two year youth mobility visa, and others who have set down roots (with one veteran loving the country so much that he’s stayed for over 30 years).

We learned a few interesting facts over the course of the night:

1. Most Aussies who’ve settled down in the UK didn’t intend to do so in the first place. It is a place that grows on you. Falling in love with a local catalyses this process.
2. It is always good to meet the regulators who regulate you (the author of this article can testify there were no bribes of beer or other unprofessional conduct).
3. We all love the fact a three hour flight will get you to most places in Europe, whereas in Australia you’ll still be in the middle of nowhere.
4. Being allowed to vote in the UK as Australian citizens almost feels like we’re interfering in another country’s democracy, as in Australia we are so used to only being able to vote if we’re Australian citizens. But we all voted against Brexit anyway.
5. The weather doesn’t get better (it is snowing as I write this)



All in all, it was a wonderful night and we look forward to hosting future events in 2018. If you live in London, or are dropping by London for any period of time, do reach out to Lily Meszaros at the Institute who will let you know when the next event will be. If are you are living in London and have not yet updated your address to the UK, please update it so [Lily](#) will know where to send our event invites.



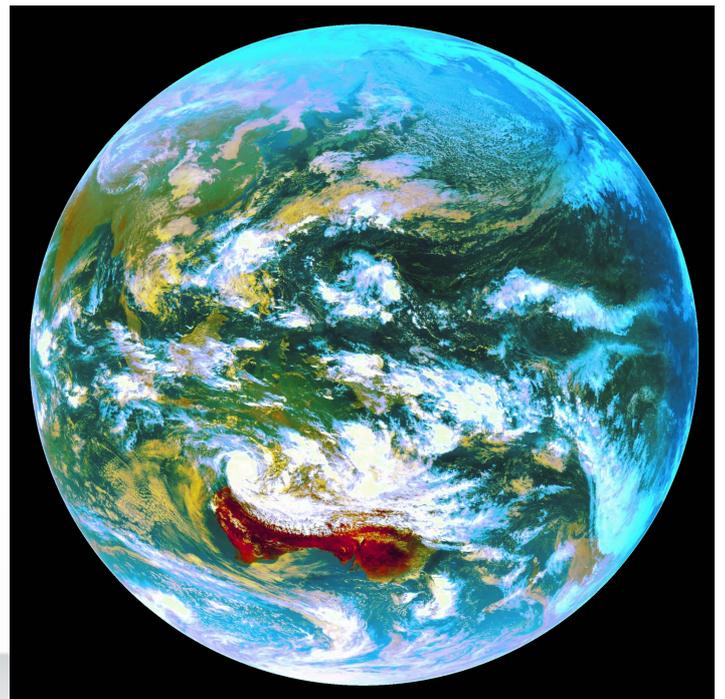
Young actuaries to workshop financial sustainability of Northern Australia

By Lisa Ye

Next Tuesday, members of Sydney's Young Actuaries Program (YAP) will workshop data with climate change scientists to help ensure the success and insurability of large scale redevelopments in the Kimberley region of Western Australia.

The Kimberley region is a land with many assets – Aboriginal culture, beautiful wilderness and rich in resources. Hence it is perhaps no surprise that the government of Western Australia has already invested over \$70 million into the revitalisation of West Kimberley and will have access to \$292 million over five years for further developments.^[1]

However, Northern Australia is prone to cyclones and other natural catastrophes. Home insurance premiums in this area are at an all-time high and unaffordable for much of the population, with some insurers refusing to write such high risks. Adding to the uncertainty is the impact of climate change. How can we guarantee the success of WA's re-development plans (which are expected to run over 20 years) when much of the new infrastructure will be uninsurable due to the substantial risk of catastrophes and the long-term uncertainty from climate change?



Tropical Cyclone Sam over the WA Coast on 08/12/2000.
Source: *Japan Meteorological Agency and Australian Bureau of Meteorology.*

The Actuaries Institute's Climate Change Working Group and the Earth Systems and Climate Change (ESCC) Hub of the National Environmental Science Program have engaged Sydney's Young Actuaries Program (YAP) to host a case study workshop to explore just this issue. The case study will be a detailed look at Derby, where \$8 million will be spent on redeveloping Derby Airport^[2], with plans for additional spending on other community projects such as improved infrastructure and facilities^[3].

We will be putting our actuarial skillset to use by exploring financial risk transfer solutions, whether it be changing up existing insurance and financial products or developing new products, to better protect the Derby community against the financial impacts of climate change.

Participants will:

- Get the latest information on climate change from some of Australia's leading research institutions;
- Explore why understanding climate change is important for your role in the industry;
- Work with climate change scientists from the ESCC Hub;
- Play with climate change data; and
- Come out of the workshop buzzing with new thoughts and ideas!

"I think the days of viewing climate change within a purely ethical, environmental or long-term frame have passed... we now have a much more sophisticated, granular, quantifiable understanding of the impacts, risks and probability distributions around climate change."

– Geoff Summerhayes, Executive Board Member, APRA, Speech to the Insurance Council of Australia, 17 February 2016

The workshop will be held on **Tuesday, 27th March 2018** at the Actuaries Institute, from 3:30pm to 7:30pm – this includes time for networking over wine and pizza.

No prior knowledge about climate change or natural catastrophe pricing is required, all you need to bring is a laptop and an eagerness to learn! Registrations are limited, so [book your spot today](#).

Look out for our post-event report to hear about our insights and findings from this day.

[1] Department of Primary Industries and Regional Developments, Government of Western Australia. 2017. *West Kimberley Revitalisation*. [ONLINE] Available at: <http://www.drd.wa.gov.au/projects/Economic-Development/Pages/West-Kimberley-Revitalisation.aspx>. [Accessed 18 March 2018].

[2] Cordingley, G. 2017. *Airport ushers in new era*. [ONLINE] Available at: <https://thewest.com.au/news/regional/airport-ushers-in-new-era-ng-b88491743z>. [Accessed 18 March 2018].

[3] Kimberley Development Commission. 2015. *2036 and Beyond: A Regional Blueprint for the Kimberley*. [ONLINE] Available at: <https://kdc.wa.gov.au/wp-content/uploads/2016/08/2036-and-Beyond-A-Regional-Investment-Blueprint-for-the-Kimberley.pdf>. [Accessed 18 March 2018].



Actuarial Education Team - new hires

By Daniel Smith (daniel.smith@taylorfry.com.au)

With a new education model approved for implementation beginning in 2019, Daniel Smith, Convenor of the Education Strategy Review Committee, outlines the background of three newly-hired actuarial educators at the Institute.

We have been investigating potential education models for over a year and have taken on board extensive feedback from members and other stakeholders on the initial design. Towards the end of last year Council approved a new education model to be implemented over a phased timeline commencing in 2019. Whilst there is much work to complete before a new program is finalised, we have moved to the implementation stage with the hiring of three experienced actuaries to fill the role of actuarial educators.

All three are passionate about education and we would like to introduce the new in-house actuarial education team.



Dr. Mike Callan FIAA: Lead Actuarial Educator (Melbourne based)

Mike has experience in many areas of life insurance and wealth management across Europe through his role as Head of Actuarial for the continental European division of a large UK bank. A challenging, yet rewarding, part of the role involved 'grandfathering' newly qualified actuaries into professional practice and helping them realise learning does not stop on qualification.

After a few years in one of the big four consultancy firms in Australia and a large life insurer, Mike moved to Monash University in 2014 to create their Part II program. Mike has found it an incredibly rewarding experience helping students transition from the well-defined mathematical subjects to the critical thinking skills required to provide advice to clients. Moving to the Institute to design and deliver Fellowship and

Associate material is a natural step and Mike is looking forward to assisting in creating a world-class education system that creates a valued educational experience for students.



Amanda Aitken FIAA: Actuarial Educator (Melbourne based)

Amanda is an actuary with a range of career experiences, including leading the actuarial team at WorkSafe, co-founding Actuarial Edge, a boutique actuarial consulting firm, and mentoring and tutoring at high school, university and graduate level. Amanda particularly enjoys using her actuarial skills in new and exciting ways, outside traditional areas of actuarial work.

As a teenager, Amanda had high hopes of becoming a primary school teacher, until her grandmother steered her onto the actuarial path. Yet throughout her actuarial career, her passion for teaching has drawn her to a number of education related opportunities, including running Actuarial 101 style workshops for non-actuarial colleagues and coordinating MOOC study groups through the Data Analytics Working Group. Amanda is excited about combining her love of teaching with her actuarial skillset in the Actuarial Educator role.



Steve Holstein FIAA: Actuarial Educator (Sydney based)

Steve Holstein brings over 25 years' experience as an actuary working in product pricing and development, capital management and consulting. He has worked at MLC, BT where he headed the product development team, EY and Suncorp. Steve was a member of the Institute's Risk Capital Taskforce whose recommendations provided valuable groundwork for APRA's capital review. More recently, Steve completed a Masters of Teaching at UNSW and has taught mathematics, from remedial to HSC extension classes, in public high schools. He has a passion for using technology to enhance learning.

Other HQ changes

Following moving her family to Melbourne last year, Sarah Tedesco has taken on a new role of Head of Strategic Projects and will oversee the new Actuarial Education Team and manage the implementation of the new Education Program and Continuing Professional Development Program Business Plan. Tony Burke (who job shared with Sarah in 2017) has commenced in a new role of Head of Member Service Operations and will be focused on overseeing the member services team and managing projects in professional standards, IT and data analytics.

Education Volunteers

An immense amount of work is completed by members of the profession on a volunteer or paid basis ranging from tutoring to the setting of exam questions and marking of exams. While some of these roles will be taken on by Staff Actuarial Educators over the next five years (with more roles planned to be recruited over the next three years), many member education roles will also remain. Sarah, Mike and the team will be working closely with the Education Faculties, to ensure the current high standards to qualify will not change in a new environment.



Private Health Insurance and Bill Shock - The Dialogue Podcast

By Ignatius Li (IgLi@deloitte.com.au), Dr Anthony Lowe (anthony@anthonylowe.com.au) and Jamie Reid (jamie.reid@finity.com.au)

The next instalment of the Dialogue Podcast series explores how a simple innovative addition to private health insurance (PHI) can alleviate 'bill shock' and reduce out-of-pocket costs for those diagnosed with cancer.

In the podcast, Ignatius Li (Partner at Deloitte) questions Anthony Lowe (former CEO of the Prostate Cancer Foundation of Australia) and Jamie Reid (Principal at Finity Consulting) on the recommendations and research in their Dialogue thought leadership paper 'Private Health insurance Bill Shock: What Can Insurers Do to Help?'.

In the paper, Anthony and Jamie extrapolate on the surprising and distressing impact of out-of-pocket costs for those with PHI facing a cancer diagnosis.

"...a recent study of men who had been diagnosed with prostate cancer showed median out of pocket expenses for those with PHI were \$6,000 compared to \$2,000 for those without. Although private cover does provide the benefits of choice of specialist, private rooms and generally lower waiting times, the cost differential is significant."



The pair argue that the knowledge gap on this issue between the public and industry insiders is wide. Anthony clarifies the varied reasons why this is so:

"...because it's called 'insurance' [many Australian's] they're sort of under the belief that they would cover everything so it's kind of like discovering that you've got you know buildings insurance, but your roof wasn't covered for example. I think most Australians just automatically assume that they won't face a bill of five or 10 thousand dollars if they get diagnosed with cancer, unfortunately that's not the case."

Currently PHI does not cover many of the factors that drive current treatment costs including:

- Medicare pricing
- New technology
- Bureaucratic hurdles
- Ancillary expenses (travel, medical costs)

Jamie and Anthony suggest additional innovation is needed, in the form of legislative change that would allow private health insurers to pay a \$5,000 lump sum to people diagnosed with cancer. The cost of providing the small lump sum benefit is around \$2.30 per person for month.



“Any rise in premiums requires considerable scrutiny,” said Jamie. “But providing additional benefits, particularly following a life-changing diagnosis, adds significant value to PHI.”



Listen in to find out more on Anthony and Jamie's research and innovative recommendation.

[Listen to "The Dialogue - Private Health Insurance Bill Shock" on Spreaker.](#)



Download Transcript [here](#).

Access the Paper and Media Release [here](#).

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Gender diversity at work - stories from actuaries

By Helena McGeorge

In celebration of International Women’s Day on Thursday 8 March, the Diversity and Inclusion Working Group ran an Insights session to look at gender diversity in the workplace and where to go from here as a profession and a society.

feminist battles being fought all over the world. Jenny noted that it was only six months ago when Saudi Arabia allowed women to drive, a daily activity for women in Australia that we could not imagine ever being prohibited. Taking advantage of the opportunities we do have in Australia, we need to be a profession that encourages equal opportunity to ensure that the Institute is relevant to the society it serves.



Facilitated by the Institute’s 2017 President, Jenny Lyon, attendees were enlightened by personal stories which told of the trends we are seeing in women joining the actuarial profession, the benefits of achieving gender diversity, how we can create leadership opportunities for women, and the role of male champions in promoting gender diversity. Presented by Adam Butt, Alice Huang, Jennifer Lang and Michael Rice, we were very lucky to hear from a range of different perspectives, and benefit from their past experiences and learning.

As an Associate Professor at ANU, Adam brought insights into the proportion of female enrolments in actuarial courses. For ANU, this proportion is consistently around:

- 35% for undergraduate domestic students; and
- 50% for undergraduate international and postgraduate students.

While the figure for undergraduate domestic enrolments may seem low, Adam highlighted that this aligns with the proportion of female enrolments in advanced mathematics in Year 12 in Australia (also 35%). With this context, we aren’t doing too badly as a profession in terms of attracting a gender diverse cohort.

"...we need to be a profession that encourages equal opportunity to ensure that the Institute is relevant to the society it serves" - Jenny Lyon

Kicking off the session, Jenny highlighted the notion that as individuals, we all bring a different frame of reference that we can harness to drive better outcomes – the ultimate benefit of achieving diversity. However, in a country such as Australia, the fight for gender diversity is quite trivial when compared with the



Following on, Alice shared her experiences and anecdotes from her education and professional working life. Alice's experience throughout school was one that encouraged women to be 'career women', however it was a slightly different story at university. While her experience was positive, she observed a 'boys club' culture that existed at college and was normalised among the students. This can permeate through to the workplace, as young men and women graduate and move into their careers. The discrimination may seem only slight, but it can be a result of unconscious bias of which we might not be aware of. As a result, it is important that we question our own actions and those of the people around us, and are part of the group instigating change.

"...single women living on the age pension in rental accommodation make up the largest poverty group in Australia" - Michael Rice



As a very successful female leader in the financial services industry, Jennifer spoke about how we can support more women into leadership roles, as individuals and as employers. There is a common misconception that women are poorly represented in leadership roles as a result of their choice to have children, go part time, and so on. However, it is not entirely down to this choice. We work in a society which doesn't support women in the same way it supports men. Therefore, it is important that we build a fairer workplace for everyone, which allows for the flexibility that is required in today's modern society. Jennifer highlighted the role of performance management systems in addressing unconscious bias and existing misconceptions. Employers and their recruitment staff need to think carefully about the behaviours and skills that they are looking for, developing specific role requirements which help to foster a fair and unbiased process. Despite this, Jennifer noted that while it is still difficult to achieve gender diversity in the profession, it is a lot better today that it has been historically.



Looking ahead to retirement outcomes, Michael shared his perspectives on how we can drive better retirement outcomes for women. Noting that single women living on the age pension in rental accommodation make up the largest poverty group in Australia, Michael talked through how the typical career path between men and women generally differs, with many women taking time off to have children and also tending to retire earlier than men. To address these differences and improve retirement outcomes, Rice Warner have developed a Valuing Females Policy which provides additional SG contributions to women, SG contributions while staff are on parental leave, paid parental leave, flexible working conditions and an education programme for staff. Michael commented that it is necessary for individuals, employers, the government and society as whole to address retirement adequacy and take action that will make a positive change.

Where to from here?

It's all good and well to talk about gender diversity and how it will drive better outcomes, but how are we going to get there? Some of the suggestions raised during the session include:

- Target all-girls schools to increase awareness of actuarial science and the career opportunities it presents.
- Represent the Institute and the profession as a gender equal community as perception is reality.
- Implement quotas to fast-track a shift in culture in the short-term.
- Create a plan and set goals, communicating this throughout the organisation.
- Amend recruitment practices to require men and women on every job shortlist and interviewing panel.
- Increase awareness and provide education on gender diversity.

Ultimately, a cultural change starts with each and every one of us, so we must be aware of our behaviour, be part of the group that instigates change and lead by example.





Climate Risk Fluency Series – Part One

By David Jenkins

David Jenkins reports on the highlights (including insights on Bureau of Meteorology climate data and CSIRO climate projections) from the Part One event focused on the financial implications of climate change.

“Now, now and now. The ability to answer some of the risk questions is here now today.” – Dr Nick Wood.

Climate risk is not just a future risk, it is already emerging. Some aspects of climate change and our response can be anticipated, avoided or mitigated now. Similarly the financial implications of climate change can occur well ahead of physical affects. This was a central theme of the [inaugural Climate Risk Fluency Series seminar](#), held on 24 October 2017, which saw a variety of expertise gathered for the half day session.

Emma Herd opened the seminar by asserting that business needs to act on climate change risks. The 2015 Paris Agreement signals to investors the need to limit greenhouse gas emissions, and the Taskforce on Climate Financial Disclosures (TCFD) process informs investors of potential climate risk exposures. There is a growing momentum with business playing a significant role in the developing the TCFD, which is consistent with the growing reaction within business to climate change risks. Business considering climate risk is now seen as being consistent with fiduciary duties, whereas in the past to do so was seen as a breach!



View presentations, video and audio from the first event on the [Program Snapshot page](#).

In the following session, Sharanjit Paddam, Dr Nick Wood and Serena Blanch, discussed climate risk disclosure in the financial sector, initially focusing on the TCFD. Many companies intend on adopting these disclosures, with some investors planning to vote against companies that don't adopt TCFD. The quality of early TCFDs may be questionable given the steep learning curve involved, however the panel agreed that TCFD will enable investors to make better-informed decisions regarding long-term investments.



Climate predictions from CSIRO

John Clarke introduced delegates to CSIRO's Australian climate projections. He presented www.climatechangeinaustralia.gov.au with its climate science 101, national climate projections and possible regional impacts and responses. While climate predictions are difficult with a range of possible outcomes, informed decisions can already be made, for example, analysis of regional risks faced by the wine industry, and risks to coastal assets from sea level rise. CSIRO ensures its analysis is robust by using 10th-90th percentiles outcomes from a variety of models.

Environmental impacts of current climate changes

Dr Nick Wood first established that everyone in the room understood that climate was already changing. For those in doubt, a recent heatwave in South Australia had unusually high overnight temperatures. This caused dairy cows to stop lactating, costing the industry \$70m in lost production. Such events can have significant implications for the local economy and financial institutions operating there. Dr Wood concluded that information doesn't need to be particularly detailed to identify trends and therefore inform sensible business decisions.

The second part of the seminar had more of a scientific rather than financial focus.

Dr Karl Braganza (Bureau of Meteorology) seeks to better understand climate risks using the BoM's wealth of historic data, however noted that only some of that data is digitised. The historic data was not collected with climate change in mind and so needs cleaning.



Climate system change and modelling

Professor Andy Pitman (University of NSW) closed the day by outlining climate modelling. He stressed that climate change is not simply a warming of the climate, rather it is wholesale change in the climate system which can cause complex outcomes, which needs to be addressed by climate models.

Global climate system models are based on physical laws applied to a 100km x 100km grid at the earth's surface. Regional models are nested within, and are dependent upon, the global models. Regional models enable a finer focus, however computing limitations mean that such regional models can only be run for short timeframes, and may understate extreme outcomes.

The reliability of forecasts can also vary – for example, there is high confidence in regional hail and heatwave projections, but less confidence in drought projections given the longer timeframes required to be forecasted.

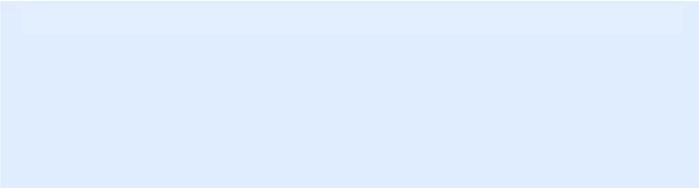


Dr Braganza also discussed the combination of climate trends overlaid with natural variability, which can lead to extreme outcomes not seen in the historic record; such outcomes are difficult to forecast. For example, in Tasmania in 2015 the trend for warmer springs coincided with reduced rainfall of El Nino, leading to very low soil moisture and record fire danger in old growth forests; by October, one thousand year old trees were burning. The reduced rainfall also impacted hydro-electric generation, which coupled with a failure of the Victorian interconnector resulted in an energy crisis. By May 2016, the sea-surface temperature was at a record high, causing extreme rainfall and flooding in Tasmania, and the well-publicised bleaching of the Great Barrier Reef in North Queensland.



Professor Pitman believes expert judgement along with scenario development, supported by models, is likely the best approach to assessing the likely physical risks associated with climate change. This seems like good advice for assessing the broader financial risks of climate change as well.

The seminar was well worth attending. I'd encourage any actuaries interested in financial risks to come along to future sessions.





Is 'Part-Time' a Dirty Word?

By Julia Lessing (julia.lessing@iinet.net.au)

With an increasingly part-time workforce and the impact of the 'gig economy', Julia Lessing discusses the true value of part-time workers and asks, *"what can organisations be doing to benefit from this growing talent pool?"*

People choose to work part time for many reasons, such as juggling caring responsibilities or study commitments. However, there are often negative perceptions relating to part-time workers. As one Senior Executive told me recently:

"It can sometimes feel hard to compete against full-time colleagues in the workplace when you're working part-time – the perception (sometimes correctly) that you're not available for that big interstate project, or don't have capacity for a new opportunity, is hard to overcome."

The 2016 Census shows that 30.4%^[1] of the Australian labour force works part time. This appears to be an increasing trend, rising steadily from about 10% in the 1960s. In fact, the Aussie labour force has the third highest proportion of part time workers in the world^[2], behind The Netherlands and Switzerland.

The "gig economy"^[3], made up of people working in temporary or casual jobs or part-time contracts, has been growing in Australia^[4], with one in five Aussie workers now employed casually. While older professionals may choose a "portfolio" type career, many Millennials are seeking greater flexibility in their working arrangements than a full time permanent job traditionally provides.

If this trend of increasing part time, casual and contract workers continues, employers will need to shift their mindset and adapt their workplace practices to accommodate and utilise these workers in order to attract and retain talent. In this article I will use the term "Part-Time" to describe all workers on casual, part-time or contract working arrangements.

How can the 'gig economy' help employers?

For the past three years I have managed a consulting business that has primarily utilised the skills and expertise of professionals who, for a range of reasons, are not willing to commit to a traditional full-time role. This operating model has allowed our business to access an incredible (and in my view, currently under-utilised) talent pool, while flexibly responding to meet the various needs of our clients.

Highly skilled and experienced Part-Time workers bring substantial value to any workplace, provided employers are focussed on objectives and outputs instead of the number of hours they want to see them each week. When these workers are effectively utilised, many relish the opportunity to work reduced hours, are highly effective and efficient, bringing great benefits to their employers. As [Amanda Aitken](#), co-founder of [Actuarial Edge](#) tells me:

"I've worked part-time as an Actuary for the last 14 years. I feel incredibly lucky to have had such supportive, accommodating managers, many of whom have gone out of their way to provide me with that flexibility. As a result, I've always given back 110%! I know from several of my friends working in other industries such as law that part-time work isn't always so readily available."

When Part-Time arrangements are well managed, they are mutually beneficial for employers and employees. I think that there are three key considerations to be addressed to make this approach successful.

1. Knowing the value of Part-Time workers in your organisation
2. Effectively integrating your Part-Time workers with your full-time workforce
3. Using flexibility of working conditions and remuneration as an advantage

These are considered in turn below.



Knowing the value of Part-Time workers in your organisation

I don't need convincing that Part-Time workers are valuable, because I've experienced the benefits first hand in my business. One key benefit is the flexibility to scale up or down the size of your workforce, or tap into specific skills or capabilities, depending on the workload and needs of your current clients and/or projects.

However, depending on your business model and operations, you should regularly review the mix of full time and Part-Time workers, to make sure the arrangements continue to meet your business needs. It can be tempting to maintain the status quo and rely primarily on the permanent full-time staff on board, but as the gig economy increases in momentum, many businesses will need to adapt to remain competitive.

Effectively integrating your Part-Time workers with your full-time workforce

Good team dynamics are critical for a productive workforce. In a team where all staff members work together on a regular daily basis, these team dynamics can be easily fostered. However, when Part-Time workers are included in the mix, the team dynamics may need some more structured support to help the teams build rapport. This is particularly the case if Part-Time workers are seen by management and colleagues as less committed or valuable than full time workers, even if this perception is unjustified.

In my experience working with Part-Time colleagues, good communication is key. Allowing time for people to get to introduce themselves and getting to know each other throughout the project is critical. Permanent full-time staff members might wonder why Part-Time workers have been included in their teams. Clearly explaining the purpose and value of your Part-Time workers will help with this integration. For example, "John worked in the UK for ten years, and so brings some valuable international experience." or "I know you guys have been working late regularly, these extra workers are here to relieve the pressure a bit so you can get home on time more regularly.". In addition, clear communication about the location and availability of your Part-Time workers is crucial for effective team management.

Using flexibility of working conditions and remuneration as an advantage

Thinking differently about employment arrangements involves consideration of working hours and location. Some work is best

suited to a face-to-face office environment during business hours, while other work can occur remotely at any time. It only needs a little extra thought about logistics and organisational procedures when work is being completed in different locations at different times.

A flexible temporary workforce also lends itself to new thinking around remuneration. While some workers will prefer an hourly rate for their time, others might prefer to work towards an outcome for a fixed fee. This agility creates opportunities to manage certain risks (such as salary budgets) within your business, while also encouraging innovation and efficiency from your workers.

In my experience, different staff members have different personal situations and their remuneration and working conditions can be adapted in a way that is beneficial for both the worker and the business. For example, one staff member living interstate preferred to work from home instead of commuting, which allowed us to access their specialised experience while also enjoying a saving in office space for our business. Further, while most workers preferred the security of being paid hourly, some preferred to work to a fixed fee based on an agreed outcome, which has given us flexibility in our pricing practices.

Conclusion

While Part-Time arrangements can require some progressive thinking to structure effectively, I strongly believe that Part-Time is NOT a dirty word

In fact, Part-Time workers represent a valuable talent pool that, if effectively engaged, can help employers attract and retain experienced professionals, while creating flexible, agile project teams to deliver value for their clients.

The changing nature of the Australian workforce, including the rise of the gig economy, will provide high performing staff with the opportunity to more effectively manage their work and non-work commitments. Employers will need to accommodate Part-Time workers to remain competitive.

How is your organisation changing to respond to an increasingly Part-Time workforce?



Using analytics to improve marketing - ADMA Data Day

By Aaron Cutter and Luke Cassar

Aaron Cutter and Luke Cassar share their impressions of the 2018 ADMA Data Day, including how marketing is getting more personal through better use of data and machine learning, and opportunities for actuaries to lead the way in developing smarter analytics.

The Association for Data-Driven Marketing & Advertising (ADMA) is the largest marketing and advertising association in Australia. On 23 February 2018 in Melbourne and 26 February 2018 in Sydney, ADMA hosted Data Day for the 14th year. ADMA advertises Data Day as the “largest, most comprehensive data-driven conference in Australia” and seeks to aid its members to connect data, technology and marketing. This year’s conference explored topics such as:

- customer experience;
- converging technology; and
- data and market strategy.

Themes of Data Day

ADMA's CEO Jodie Sangster gave the opening address and suggested that the key themes of this year’s conference would be:

- **Personalisation**
Businesses are now looking at offering an end-to-end customer experience
- **Artificial intelligence**
Including the application of machine learning and smarter data analytics to drive marketing strategy and improve customer experience
- **Peer-to-peer learning**
There may be a significant amount of up-skilling required for some organisations
- **Customer**
Firstly, in the sense that customer privacy is always an issue and that there is a risk of crossing “the creepy line” of knowing too much about the customer and secondly, ensuring that offering value to the customer is always at the centre.



ADMA Data Day 2018 had over 1,000 attendees across the two days in Melbourne and Sydney.

The word “data” has appeared six times in this article’s opening paragraph, so it’s perhaps no surprise that such an event was a golden opportunity for actuaries to enrich their understanding of how their data-based skills can be used in a world beyond traditional actuarial roles in the financial services industry.

This article will take you through the key messages of the day, which featured talks from the likes of online retailer The Iconic, ANZ, Woolworths Food Group, Ooh! Media and more.



ADMA CEO Jodie Sangster © Photographic Memory
Liz Moore of Telstra © Photographic Memory

Using machine learning to drive marketing outcomes

The speakers at Data Day were from a wide range of industries. Steve Lok from The Economist shared how data-driven marketing and automated customisation of The Economist's web portal based on an individual subscriber's demographics and topic preferences resulted in a flip of their main source of revenue from advertising to subscriptions.

We also heard talks on a range of different aspects of data analytics use in marketing. Liz Moore from Telstra convinced us of the power of Bayesian belief network models to determine causal relationships between marketing activities and business performance. This helps Telstra understand which marketing channels worked best where and for what kind of customer.

From the sessions touching on machine learning, two key messages emerged:

- *The more data, the better* – one presenter talked about testing as many as 5,000 explanatory variables in their models
- *Timeliness is paramount* – in some cases, analysis was automated and turned around almost instantly

Revealing the Truth

Willem Paling from IAG talked about how marketers can effectively engage with artificial intelligence (AI) and machine learning. One interesting insight is the confirmation of something many internet users have thought for a while – targeted digital advertising based on some previous interaction with a product (perhaps getting half way through an insurance quote) is more likely to turn away a customer than lure them back in. This was another example of how assumptions which may seem like common sense (that people who were looking at

a product online are more likely to purchase it) can be overturned by data and analytics.

Managing data-driven thinking

Patrick McQuaid from National Australia Bank talked about some of the challenges in leading a team in a large organisation to think away from a product-focus to a customer-focus.

Everard Hunder from Monash IVF talked about the importance of testing marketing strategies. Testing, in the sense of marketing, is probably not something us actuaries and data scientists working outside of marketing departments would be familiar with. For Monash IVF it involved running A/B tests on small marketing campaigns. For example, sending two different emails to two groups of test subjects and determining which style of email was more successful. Some example results were very unintuitive, highlighting the importance of A/B testing. Monash IVF allocate individuals budgets each year for staff to conduct such testing. Such an approach is an innovative way for staff to compete against each other (in a collegiate way) in order to find the most effective marketing strategies.



Considerations for actuaries

There are some clear parallels in data-driven marketing and advertising and the work that us actuaries have expertise in. Finding new customers for any organisation is a lot like finding good risks for an insurer. Our experience in building pricing models, incorporating high-level statistical modelling, sets us up perfectly for applying these skills to marketing and advertising. Actuaries working in or with insurers also require the ability to see the whole picture and understand how underwriting, claims management, reserves, profits and capital are all intertwined. This breadth is useful in a marketing context too. Having an ability to zoom out gives us an advantage in being able to understand how analytics can fit into improving the customer journey, from initial contact through to user experience.

"Our [actuaries] experience in building pricing models, incorporating high-level statistical modelling, sets us up perfectly for applying these skills to marketing and advertising."

We saw talks featuring a sophisticated use of machine learning techniques and AI, but at the same time talked to a lot of people who were there to see the forefront of data-driven marketing to inspire them to bring focus to data science and analytics in their own organisations. Clearly, there are opportunities for actuaries to lead the way in developing analytics in organisations outside of financial services.

So we'll see you there next year!





The reinsurance underwriting cycle: a simple supply and demand story

By Richard Hartigan

Richard Hartigan discusses the drivers of the reinsurance underwriting cycle and his theory on the next 'market turning event'.

Reinsurers' enthusiasm for a significant reversal in longstanding year-on-year rate decreases in the global catastrophe reinsurance market seems to be ebbing away. This is remarkable. By almost any metric 2017 was extraordinary.

The drivers of the reinsurance underwriting cycle are not well understood, but I hypothesise that it is one of the purest Supply / Demand stories ever written. A recent [report](#) by reinsurance broker JLT Re drove this home to me.

Demand for reinsurance is fairly static (rising only modestly year-on-year). Demand changes for reinsurance are usually modest, even after big events. Big events take capital out of the reinsurance market place (as losses are paid to insurers) leaving Supply of reinsurance temporarily constrained to the extent that new capital is not subsequently attracted by expected rate increases, but usually with modest change in Demand for reinsurance.

Absent a truly remarkable event (e.g. a colossal hurricane hitting the south east of the United States) Supply taken out of the reinsurance market place seems nowadays to only have a modest, and perhaps temporary, impact on rating. The most-likely reason is that Supply, attracted by expected rate increases, is 're-loaded' much more quickly and from a considerably more diverse pool of sources than previously.

So what of Demand?

I have already hypothesised that Demand changes for reinsurance are usually modest, even after big events. Has there been a time when this wasn't true? The terrorism events in September 2001 resulted in both severe Supply constraints and a Demand surge (for terrorism (re)insurance). Those

(re)insurers that held their nerve and responded actively to the significant resulting rate increases were rewarded handsomely.

Terrorism was, and is, a risk that is difficult to model and aggregate. Do any modern examples of similar classes of business exist? I suggest that cyber is quite similar. Sooner or later there will be a colossal global cyber event. Like with terrorism in 2001 I expect that this will result in Supply constraints and a Demand surge (for cyber (re)insurance).

I hypothesise that nowadays it is only an event destabilising both Supply and Demand simultaneously that would merit the title 'Market Turning Event'.

The ability of standard perils (earthquake, wind, fire) to significantly correct longstanding year-on-year rate decreases in the global catastrophe reinsurance market is perhaps lower now than it ever has been. The good news is that opportunities after a big event in non-standard perils / classes of business (e.g. cyber) likely still present future opportunities for handsome returns for reinsurers with steady nerves.



Can “traditional” actuarial methods be sexy?

By Ashish Ahluwalia (ashish.ahluwalia@finito.com.au)

Amongst much talk about data science and new analytics techniques, Ashish Ahluwalia challenges the profession to be bold in sticking to their roots and take their toolkit of ‘traditional’ actuarial methods into a broader applications such as industries outside of insurance. In his article, he shares his personal experience in doing just that as well as his views on the strengths of actuaries.

There’s plenty of discussion going on amongst the profession these days about machine learning, artificial intelligence and applying these methods and techniques for predictive analytics. It’s clearly an area of growth for data-driven professionals such as actuaries, and of course we all stand to benefit from adding these emerging capabilities into our technical toolkit.

I do sometimes feel though that implicit in this excitement is an “un-sexiness” associated with traditional actuarial methods. More importantly, I think that this runs the risk of missing opportunities for actuaries to be relevant in other ways. If I step back and consider what traditional actuarial methods are trying to do, I would say that broadly speaking they focus upon:

- Managing volatility - The methods are trying to take inherently volatile outcomes and analyse them in a way that allows for patterns to be identified that allows an outcome to be reliably projected in order to support management and strategic decision making
- Observation - The methods are constructed such that the key known and observable drivers of volatility are accounted for in the modelling, without a reliance upon highly granular data
- Cutting through the noise - The primary objective is to form a reliable view at an aggregate level (be it product, portfolio or claim segment), rather than an individual outcome. The need for and scope to apply judgment is explicit in the processes, recognising the inherent data limitations that need to be worked around.

These methods were developed to estimate a “present value” figure that would be expected to cover the anticipated costs of an uncertain set of cashflows expected to occur sometime in the future. They are intended to provide a stable basis by which to put a value on these uncertain outcomes. Specifically the methods have been developed with the following in mind:

- Costs and outcomes to emerge slowly over time
- A time bias in outcomes (e.g. smaller claims are settled first)
- High variability at the individual level
- Relatively limited “explanatory” data available for predictive modelling
- A need to provide a robust, evidence-based method for valuing assets and/or liabilities to management, Directors, Regulators and share markets to ensure decision makers adequately informed and confident in their decisions.

I think this helps to shed some light on why we’ve seen a divergence in techniques in the general insurance industry between personal lines pricing and other insurance actuarial work. As the availability of detailed risk data has increased, the industry has moved toward highly sophisticated predictive modelling, and away from aggregate techniques. The lack of access to such rich data in other insurance areas (commercial lines, life, etc.) perhaps explains why more traditional actuarial methods still play a large in those industry segments.

“There are plenty of business problems out there, where decisions have to be made an environment where causal data is extremely limited (so your GBM, neural network, etc. won’t help you), and outcomes are driven by multiple underlying real-world dynamics.”

Going back to those attributes I set out above, I’d argue that insurance isn’t the only business that exhibits these patterns. Indeed, we have seen some high profile work done by actuaries in Australia and New Zealand valuing Government Welfare liabilities. Overseas, there are examples of actuaries working with Oil & Gas valuations, helping companies understand the value relating to assets where future cashflows can be highly volatile. In these examples, I think actuaries can add as much by helping management understand not just the likely outcome, but also by helping quantify risks and assist the companies devise risk mitigation strategies.

A personal example that comes to mind is of an instance where I built state-transition models with movements between each state modelled using the equivalent of a claim finalisation triangle. What was it for? It was for a large scale construction project; the purpose was to assist the company understand its resourcing needs over the coming years. Each phase of the construction process had different skillsets required to support

it, and therefore the company needed to have a handle on how many “active” construction sites would be in any given phase of construction, so that staff resourcing could be accordingly managed in advance. Reliance on external parties, such as councils, sub-contractors, materials suppliers, engineers etc. meant that progress rates were subject to variability. In other words, the perfect set of circumstances to tackle with a finalisation triangle! By taking this tried and true approach to projecting outcomes, we were able to help the company understand:

- Expected timeframes for completion of the overall project
- The required resourcing needed to support the project in all future months
- The range of variability in that resourcing demand, which in turn informed strategies to manage the right level of flexibility in staffing levels
- The key risks to meeting targets (e.g. project phases that had a higher propensity for substantive delays)

As a result, this particular business has successfully navigated a stressful period of high growth, and subsequent slowdown, very well. Quality and timeframe KPIs were delivered very well, despite a previously unseen level of demand and growth in the market. The subsequent slowdown has seen a controlled and profitable reduction in the size of the organisation. If you think about boom and bust cycles the construction industry goes through, this is actually a rather impressive feat. By making long-term decisions based on an informed projection, rather than based simply on demand today, the business has been managed effectively and profitably. Things haven't been so easy for those players not making a more forward looking assessment.

Now, for me this opportunity to do an interesting project and work with a different industry altogether actually came out of my work with an insurer who happened to be working closely with the construction company. The issue came up in discussion and after some creative thinking was applied, we were soon working on trying to build a solution to the problem. In this case, simply by thinking carefully about the broader issues the insurer faced, we were able to identify an opportunity to help with something a bit left-field.

This is just one example, and the welfare valuation work being done by actuaries in Australia and New Zealand is a big endorsement of the profession's ability to make a broader contribution than insurance.

There are plenty of opportunities in the business world to help companies grapple with issues of uncertainty in a systematic way that links cause and effect, and allows management to understand the business implications of the uncertainty. We just need to open our minds up to these potential applications.

By all means, I encourage actuaries everywhere to increase their understanding of emerging modelling and analytical techniques. This is an important part of making sure our technical work remains relevant. However, don't lose sight of what it is that the profession offers – the ability to manage uncertainty through evidence-based decision making. There are plenty of business problems out there, where decisions have to be made in an environment where causal data is extremely limited (so your GBM, neural network, etc. won't help you), and outcomes are driven by multiple underlying real-world dynamics. Our training gives us the ability to tackle these problems systematically and to help stakeholders devise management strategies. So let's make sure that while we pursue greater technical knowledge, we also expand our horizons and help other sectors exploit the value that actuaries can readily add.



Social Risks for financial institutions - The Dialogue Podcast

By Rick Shaw and Ian Laughlin

The next instalment of the Dialogue Podcast series explores why conventional risk management may be failing Australia's financial institutions, which have been subjected to scorching community and government criticism, tougher regulations, and now a Royal Commission.

In the podcast, Rick Shaw (Partner at Deloitte) questions Ian Laughlin (Chairman at OnePath Life and ANZ Lenders Mortgage Insurance) on the ideas in his Dialogue thought leadership paper 'Social Risks - for a financial services business'.

In his paper, Ian says institutions do not seem to be effectively managing the risks that come from swiftly changing social norms and attitudes in the contemporary world.

“The new world includes access to huge amounts of information, [we] communicate in ways that [were] unheard of before ... Twitter, the use of facilities like Facebook to spread an opinion, capabilities like phones, everybody’s got a phone in their pocket and so things that might have escaped scrutiny in the past, don’t escape scrutiny anymore,” says Ian.



Acknowledging the changed 'risk profile', Rick asks:

“Do we have the existing frameworks and the existing institutional culture to allow us to respond to generational changing and attitudes towards government and large institutions or is something more radical needed?”

Rick and Ian discuss how institutions have failed in identifying new risks, such as social media, the spread of fake news and ‘reverse fake news’.

Ian highlights the importance of forward looking ‘risk sensing’ to manage social risk, rather than simply following “conventional risk management [where] the risks are monitored in arrears”.

To help provide insight into social risks Ian produced 14 labels for types of social risk that include:

- cynicism risk
- true values risk
- insight risk
- tolerance risk
- self awareness risk

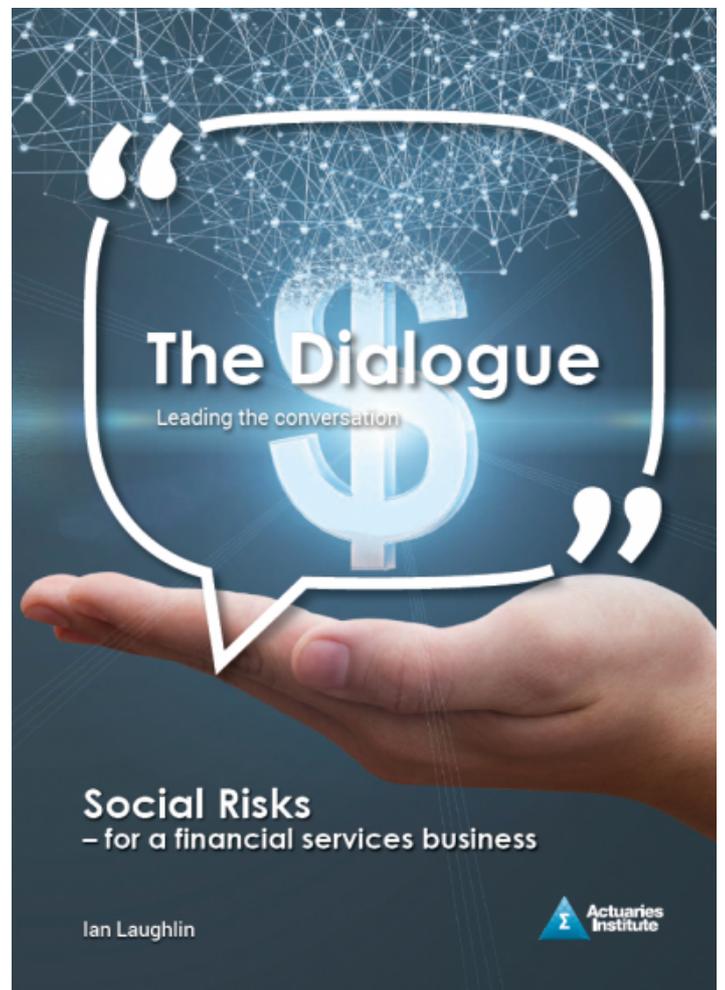
Ian debates in the podcast, various reasons why institutions could have failed in their current framework by not acknowledging all associated risks:

“I don't think organisations have those deep insights at the moment or even the capabilities to get those deep insights and it's not clear where you might get those capabilities so there you have a conundrum; how does the industry develop these capabilities that properly assess and manage these risks?”

Despite the current challenges, Ian is optimistic that with the correct resources and risk management framework, companies and institutions can repair their reputation.

Listen in to find out more on Ian's research and recommendations on how financial institutions can manage existing social risks and prepare themselves for the uncertainties of future risk management.

[Listen to 'The Dialogue - Social Risks' on Spreaker.](#)

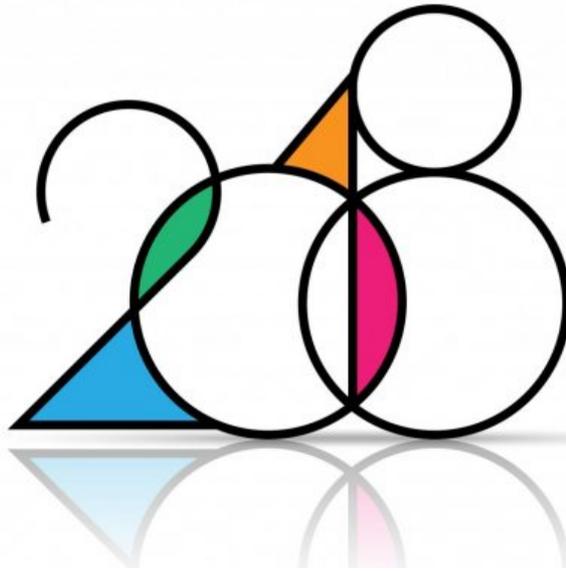


Download Transcript [here](#).

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2018 Agenda – Key themes for financial services players

By Angat Sandhu

Chief Editor Angat Sandhu's first Editorial focuses on key themes at play in our industry, from regulatory paradigm shift, to heightened customer expectations, technology disruption in financial services, and finding efficiency through technology and data analytics.

Everyone I have spoken with in a professional context, working in financial services, has had an unusually busy start to 2018.

The myriad issues surfacing are diverse; some new and internally driven within organisations; many externally initiated by regulators, policymakers and market forces.

Actuaries Digital has been inundated, with contributions flying through its [inbox](#). 30 articles, on everything from [AI in retail](#), to [PHI affordability](#) and of course [profiles of our actuaries around the globe](#) have been published already this year as I pen my first editorial as the new Chief Editor of this publication.

I thought it would be helpful to table some themes the [editorial team](#) expect to feature prominently for those working in, or just interested in, the financial services sector (which is still most Actuaries). Coincidentally, we also intend to share your views, the views of readers, on these themes over the course of the year.

So, in no particular order, here are my views on the:

Top four themes for 2018:

1.) Shift in regulatory paradigm: No surprises here given the onset of the Royal Commission. Those working in insurance and banking will be kept busy with the public trial the industry is undergoing. Developments over the last few months have made clear that regulators are expanding their focus beyond the traditional capital adequacy and conduct, to issues around culture and community expectations – which are harder to measure. This will force both banks and insurers to fundamentally re-assess what their purpose is and how to strike

a better balance in meeting the demands of shareholders, customers and regulators.

2.) Better meeting customer expectations: Most insurers and banks have been talking about becoming customer centric for years. Triggered partly by the regulatory debate and partly by the rise of technology giants who have been able to generate greater customer empathy. Insurers and banks will need to think harder about their customer proposition: how well are they upholding it, and importantly, what do they need to do differently to better meet customer expectations? I expect (and hope) that resulting actions will go beyond short-term TV campaigns that simply remind customers how important these sectors are to the broader economy. The recent scrutiny of 'medical definitions' in life insurance, the value of add-on insurance in general insurance (or lack of), and the surge in complaints in health insurance suggests there is plenty of room for improvement here.

3.) Changing nature of competition: Much has been written about technology giants starting to disintermediate traditional financial services globally. However, not much has actually changed in Australia. Incumbents have started investing and preparing for the above but barring a few exceptions, they have largely been in 'wait and watch' or 'small experimentation' mode. What is exciting (and a little scary depending on your vantage point) is that we are getting closer to seeing technology players play a greater part in financial services. Amazon has arrived in Australia, Apple has struck a partnership with ANZ and investments in Fintechs and InsurTechs continue to grow. Interestingly, the regulatory scrutiny on how financial services players have not met community expectations could accelerate the above trend.

4.) Renewed focus on efficiency and productivity: Each of the prior three themes will put pressure on the profitability of organisations, at least in the short-term. Organisations will try – and already are trying – to counter that by focusing on becoming more efficient through better use of technology and application of data analytics. Most large insurers and banks have made material investments in these areas but are yet to generate the desired impact. Relatedly, few have thought deeply enough

about the implications of the above trends on their workforce and importantly, what nature of workforce they will need 5-10 years from now.

Addressing each of these themes is challenging enough and trying to counter all at once is both daunting and exciting at the same time. For those working in the industry, there will be plenty to think about; for the avid readers of *Actuaries Digital*, we will ensure there is plenty to read about.

I look forward to helping bring you news relevant to the actuarial profession and the wider business and insurance community. Please email ActuariesMag@actuaries.asn.au with your feedback or ideas and contributions for articles. And, look out for these topics also being discussed on our fantastic .

Bring on (the rest of) 2018!



A new beginning, Year of the Dog

By Kitty Chan

The Year of the Dog began on 16 February 2018, celebrating family union, good fortune and prosperity. But do you know how fiercely competitive Chinese Zodiac animals can be?

There are many stories about the origin of the 12 Chinese Zodiac: Rat, Ox, Tiger, Rabbit, Dragon, Snake, Horse, Goat, Monkey, Rooster, Dog and Pig. Yes, the ordering is important. My favourite one is about a very competitive race between all these animals!

The story was set on the night before Chinese New Year, the Jade Emperor, ruler of the heavens, called for all animals in the entire universe to participate in a race on his birthday. The first 12 winners of the race would each win the honour of having a year named after them. The race would be a long one, passing through a densely wooded forest and a wide river.

Desperate to win, animals teamed up with each other and used different strategies and tricks.

- Cat and Rat vowed to race together and asked the strong Ox for a ride. But the cunning Rat pushed the Cat into the water, jumped ahead of the Ox and claimed the first place.
- Snake secretly hitched a ride on Horse's hoof.
- Goat, Monkey and Rooster helped each other along the race and worked as a great team. They crossed the river on a raft with lots of tugging and paddling.
- The strong runner and swimmer, Dog finished as number 11 because he couldn't resist playing in the river.

So, what happened to my favourite animal Cat? She nearly drowned after Rat pushed her into the water and missed the festivities when she made it to the finish line. She vowed to hate the Rat forever. Now you know why Cats and Rats are natural enemies!



What does the Year of the Dog mean to me?

Dogs represent obedient, loyal, faithful and playful beings they are mankind's best friend and companion. I believe they are talented and more competent than other animals in the Chinese Zodiac. Other than being an adorable pet at home, they have so many 'real jobs'. You will see them serving in the military, the police force, rescue teams, and customs and border protection. They also help the blind, act as security guards, and assist farmers and truffle hunters. Therefore, 'Year of Dog' means endurance, courage, hard work and devotion to me. Moreover, it also marks my second year at the institute and I look forward to the new challenges ahead of me.

"The 'Year of Dog' means endurance, courage, hard work and devotion to me"

Here is a short clip of the Lion dance, taken from the Chinese New Year ceremony at the Institute's Hong Kong Joint Office. I wish you all a prosperous and cheerful Year of the Dog ahead!

View the video here:

<https://youtu.be/bZw41WUErMY>

See you on the Asia Tour!

The Presidential Dinner in Hong Kong and Asia Tour networking dinners and cocktail party kicks-off next week. President John Evans, CEO Elayne Grace and I will be visiting Hong Kong together, then Elayne and I will continue onto Shanghai, Singapore and Kuala Lumpur where we are hosting several presentation and networking sessions with the support of the local societies. I look forward to catching up with the Asia-based members and meeting up with local stakeholders to learn about their views on Asia and their feedback for the Institute.

Register for an upcoming Presidential dinner with John Evans or Asia Tour dinner with CEO Elayne Grace and guests.

Dates for your city are below:

12 March 2018 - [Presidential Dinner and Presentation - Hong Kong](#)

14 March 2018 - [Presentation and Networking Dinner - Shanghai](#)

15 March 2018 - [Presentation and Cocktail Party - Singapore](#)

16 March 2018 - [Presentation and Networking Dinner - Kuala Lumpur](#)



Our profession today – CEO Column

By Elayne Grace (elayne.grace@actuaries.asn.au)

In her first column as CEO of the Actuaries Institute, Elayne Grace reflects on this fast-paced world and her vision for the profession and the Institute.

It is great to be writing my first column as CEO of the Actuaries Institute. It is a privilege to lead the organisation that represents the Australian Actuarial profession, which has origins tracing back to 1897. Thank you for all the supportive and 'best wishes' emails I have received since my appointment.

Like all of you, I want to ensure we build a strong actuarial profession that continues to remain in high demand; a modern, outward looking profession that is known for its cutting-edge data analytics, trusted insights and commercial strategy, extending past its thought leadership and historical regulatory roles. We need to stay relevant!

We live in an agile, competitive world with no expectation of any slow-down. In an era when machines can out-perform human beings at tasks, Richard and Daniel Susskind predict 'increasingly capable systems' will bring a fundamental change in the way that the 'practical expertise' of specialists is made available in society and argue that professions' opaqueness and affordability will be challenged (*The Future of the Professions*).

Business and society are undergoing significant changes. Common features include:

- Economies are seeing low growth and increased savings focus.
- Consumer expectations and distrust are increasing.
- Increased demand for strong STEM (Science, Technology, Engineering, Maths) skills but competition is also increasing.
- Consolidation of financial services and regulatory harmonisation.
- Continuing rise of Asia.

It seems that Australian actuaries are already adapting to these new forces, increasingly working in a diverse number of areas. Long known for their regulatory roles, Actuaries are moving into broader management roles in financial services. In a [recent survey](#) 47% of 777 responses said that <50% of their job

involved APRA regulatory considerations and 24% had none at all.

There is an ever-rising number of actuaries working in data analytics. 11% of all students compared to 5% of the total profession cite data analytics as their primary practice area and 20% when secondary practice area is included. We are also seeing increasing numbers of actuaries working with both Federal and State governments, whether it be through investment valuation work or the NDIS.

What makes a 'profession'?

What does it mean for the identity of our profession as we broaden our practice areas? The word 'profession' means different things to different people. It is derived from the notion of an occupation that one 'professes' to be skilled in, any type of work that needs special training or a particular skill, often one that is respected because it involves a high level of education. But at its core, it's meant to be an indicator of trust and expertise. Rachel Botsman* challenges us all in this new era to ask compelling questions about how trust is built, managed, lost and repaired, in an environment where the trust in governments, business, and other institutions is at an all-time low.

In order, for the Actuaries Institute to meet the challenge of best serving the profession, it is important that we:

- Position the Institute to anticipate future changes in the role of actuaries, the global actuarial profession and economic trends to better assess our delivery of services to members.
- Build our brand and community by developing and promoting the unique actuarial value proposition and our thought leadership status.
- Build more targeted life-long learning and a respected, education system that focuses on the capabilities required in the future.
- Improve our delivery of services by extending our relationships with employers of actuaries, universities and other actuarial associations.
- Drive value for members through a high performing culture, increased analysis of Institute activities, improved governance and effective resource targeting.

We are a small profession so scale is an issue but the contribution of our volunteers is immense. They are the backbone of the profession that keep our education, lifelong learning, practice excellence, professional standards, communication, events, public policy and thought leadership so strong.

I have been lucky over the last five years to have worked closely on public policy and thought leadership with some of the most highly respected senior Actuaries. I have also been greatly impressed by the quality of the younger members coming up through the profession through my interactions with the Commercial Actuarial Practice and Professionalism courses. Last week I got to experience the immense joy, pride and relief of our newest fellows at the Sydney Graduation Dinner.

The Actuarial profession is a great one. Yes, there are challenges but with challenges come great opportunities. And I have an unshakeable belief that the value of the Actuarial profession can only increase, in a world with increasing importance attributed to both conduct and extracting valuable insights from ever increasing information.

I look forward to continuing to work with you all. I am also keen to get your views on both the opportunities and challenges that lie ahead and I look forward to meeting you on the Presidential Tour throughout Australia and Asia or at the CEO luncheons.

Register for an upcoming Presidential dinner with John Evans or Asia Tour dinner with CEO Elayne Grace and guests.

Dates for your city are below:

[Presidential Dinner and Presentation - Hong Kong](#)

orking Dinner - [Shanghai](#)

[Presentation and Cocktail Party - Singapore](#)

*Rachel Botsman - *'Who can you trust?'*



The Critical Line – Volume 19

By Oliver Chambers

Oliver Chambers puts forward a puzzle that lies at the intersection of statistics and espionage.

Proposition: given only the audio of a person typing on their computer can you determine what they are writing?

Surprisingly the answer to this question is yes, and with some rather remarkable accuracy. Below is the abstract from the article *Keyboard Acoustic Emanations Revisited* which explains what can be recovered from only the sound of keystrokes

We present a novel attack taking as input a 10-minute sound recording of a user typing English text using a keyboard, and then recovering up to 96% of typed characters. There is no need for a labelled training recording. Moreover, the recognizer bootstrapped this way can even recognize random text such as passwords: In our experiments, 90% of 5-character random passwords using only letters can be generated in fewer than 20 attempts by an adversary; 80% of 10-character passwords can be generated in fewer than 75 attempts...

Perhaps the most surprising feature of this discovery is that the sound of individual keys being pressed are each distinct enough that they may be clustered into a sufficient number of groups that English words could be recovered. The authors of the article found that if the sound wave from each key press is decomposed into a vector of energy levels (Fourier coefficients) via a generalisation of a Fourier Transform call Mel-Frequency Cepstrum, then these vectors can be reliably clustered into similar groups using known statistical techniques. This is illustrated in the graph below:

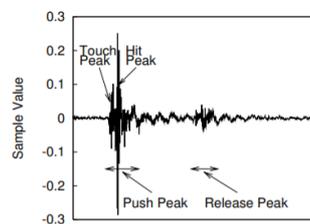


Figure 3: The audio signal of a keystroke.

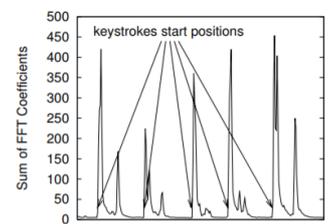


Figure 4: Energy levels over the duration of 5 keystrokes.

The clustering algorithm places the different key strokes into K different classes. They use slightly more classes than there are keys on the keyboard – so the K classes do not represent a one-to-one mapping from sound to key pressed, but rather K random variables each with a different distribution of which key was pressed. The benefit of this approach is that it allows them to consider the correlation between the classes. For instance, if one class could be the letter t or y with equal probability, and another class could be g or h, then whenever the first class precedes the other in text the combination “th” should be a much more likely outcome.

As of yet, the algorithm cannot handle special key combinations (e.g. shift key) or backspaces, which means we are probably safe from audio snooping for the immediate future. Nonetheless, it does hint at some scary possibilities in the future.

Further reading for those interested:

- https://people.eecs.berkeley.edu/~tygar/papers/Keyboard_Acoustic_Emanations_Revisited/ccs.pdf
- <https://arxiv.org/pdf/1609.09359.pdf>

Now for something completely unrelated: this month’s puzzle...

Weighing Stones

You have a N stones in a bag and you wish to calculate the weight of the heaviest stone. You do this by randomly pulling the stones from the bag one at a time (without replacement) and weighing it. Each time the weight of the stone is the heaviest so far you record its weight. Assuming that the weights of each stone is identically distributed, what is the expected number of times that you will record the weight of a stone?

For your chance to win \$50, send your solutions to ActuariesMag@actuaries.asn.au

The Critical Volume 18 - Solution and Winner

Here is the link to the [Volume 18 puzzle](#).

The prize goes to the first correct submission, Preetham Arvind.

And the solution is:

NEED A DRIVER REVIVER? FREE COFFEE ON SIDE ROAD IN FORTY KMS. YOU HAVE EARNED IT! KEEP YOUR EYE'S ON THE ROAD

Thanks to everyone who submitted solutions and apologies to everyone who pointed out that EYE'S should indeed be EYES.

Jevon.



Pricing tree structures with shifting parameters

By Greg Taylor (gregory.taylor@unsw.edu.au)

Greg Taylor from UNSW Business School gives a brief summary of his paper on pricing tree structures with shifting parameters, discussing motivation, hierarchical models, the Kalman filter and a numerical example.

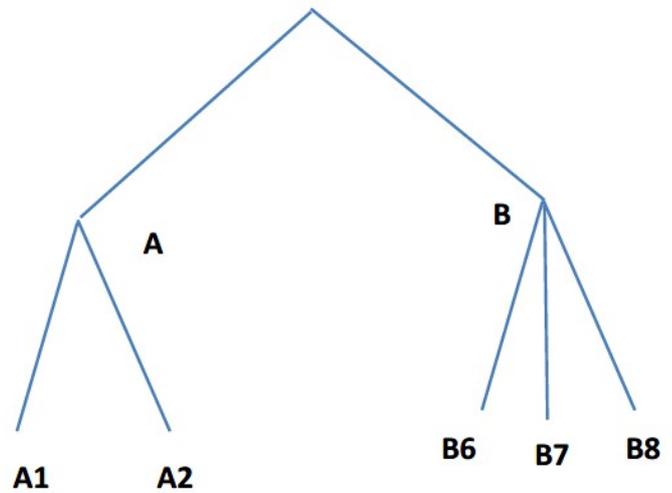
- Sample sizes of claims experience will often be small at the lower nodes of the tree;
- The parameters may shift over time.

This article is a very brief summary of a full paper published in the ASTIN Bulletin, and presented to an Insights session in November 2017. For reasons of copyright, the paper cannot be reproduced, but a pre-print can be found [here](#), and the presentation [here](#). Space limitations restrict the amount of detail in this article – see the full paper for further information.

Figure 1 ANZSIC hierarchy (excerpt)

Motivation

As a motivational example, consider the ANZSIC occupational classification. It follows a tree (equivalently, hierarchical) structure, a small excerpt of which appears in Figure 1. Here, A and B are the highest-level occupational groupings, and A1 to B8 are sub-groupings, as follows:



- A = Agriculture, Forestry and Fishing
 - A1 = Agriculture
 - A2 = Aquaculture
- B = Mining
 - B6 = Coal mining
 - B7 = Oil and gas extraction
 - B8 = Metal ore mining

Model

In fact, the ANZSIC classification is much more extensive. The highest level contains primary groupings $A-S$, and sub-groupings go to another four levels, e.g. $K6322$ = General insurance.

To establish a model of the risk parameters at the tree nodes, one thinks of any such parameter as a displacement from its parent's parameter (actually, the full paper makes a somewhat more general allowance). Thus, working down the General Insurance branch of the hierarchy, $\beta_{K6} = \beta_K + \zeta_{K6}$ where β_K is the parameter at node K , β_{K6} is the parameter at node $K6$, and ζ_{K6} is the displacement, assumed random with mean zero and normally distributed with known variance. Similarly, $\beta_{K63} = \beta_{K6} + \zeta_{K63} = \beta_K + \zeta_{K6} + \zeta_{K63}$.

Now suppose that each node of the tree carries a risk parameter. This could be one of any number of things but, in a pricing context, it might be expected claim cost per unit exposure. As an example, workers compensation is sometimes priced at the nodes.

Observations, e.g. claim frequencies per unit exposure, are made at the lowest-level nodes of the tree (leaves), such as

There are two difficulties in the estimation of the parameters:

K6322. Each of these observations is assumed to be a random variable with mean equal to the β parameter at its leaf (e.g. β_{K6322}). Again, the paper is more general.

This is a **hierarchical model**, and the problem of estimating its parameters was solved long ago (Taylor, 1979; Sundt, 1979,1980), provided that the parameters remained fixed over time. The solution made use of credibility theory, in which case the model was a **hierarchical credibility model**, strictly a **static** form of such a model.

In practice, there are often many reasons why these parameters do change over time, in which case inclusion of such variation in the model is necessary. Hence, the above model is converted to the following form, allowing the parameters to **evolve** over time:

$$\beta_{K6}^t = \beta_{K6}^{t-1} + \zeta_{K6}^t$$

where the superscript denotes time. Each parameter is now displaced from its parent's parameter value **at the preceding point of time**. The displacement is equivalent to the sum of two components, one equal to ζ_{K6} above, and another representing a further displacement due to the passage of time. This is an **evolutionary hierarchical credibility model**.

Pricing procedure

There is a ready-made statistical procedure for estimation of parameters in an evolutionary model of the type described. This is the **Kalman filter** (Harvey, 1989). This accommodates a model:

- whose parameters evolve stochastically over time in a linear manner;
- whose observations are random variables with means depending linearly on the parameters;
- all of whose random variables are normally distributed.

Parameter estimation follows a procedure that is well-defined and straightforward, though requiring a substantial amount of matrix manipulation. Variances and covariances of parameter estimates are also provided as part of the estimation process.

In the case of a large tree, such as that of ANZSIC codes, considerable organizational effort is required to ensure that the structure is correctly represented in the filter's matrices. The paper gives details of the book-keeping required to achieve this organization.

It is important to note that, since experience at each node is viewed as a displacement from its parent's experience, estimation at the node will be affected by estimation at the parent node, and therefore, to some extent by **all other nodes** in the hierarchy.

Example

The paper provides a toy example, involving a hierarchy consisting of just 3 levels, with a total of 10 leaves. Claim frequency per unit exposure is observed at each leaf. The hierarchy parameters are selected over three periods, some parameters remaining static and others following defined trends. Observations at the leaves are simulated according to the parameters there.

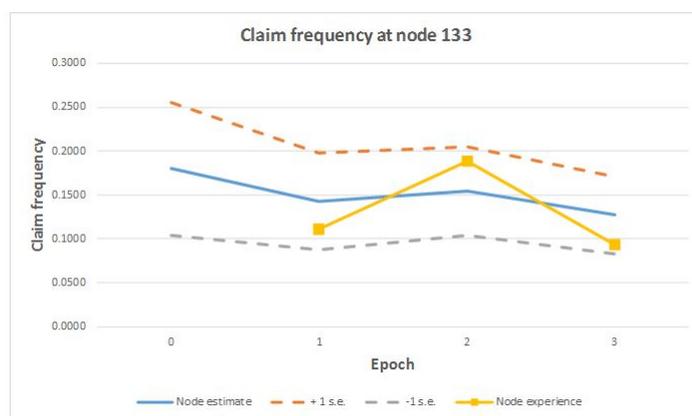
The Kalman filter is then applied to obtain parameter estimates, which can be compared with the known (but hidden) parameters. Figure 2 gives an example for one leaf of the hierarchy. The claims experience here is relatively small, and

therefore volatile. Its true claim frequency is flat over the three periods, at 0.18.

The figure plots the volatile experience for the three periods, and also the parameter estimates, together with a $\pm 1 \times$ standard error envelope. The observations are seen to lie within the confidence envelope.

The filter smooths the series of observations considerably. This demonstrates the filter pooling experience over time and nodes to improve estimation. Over the three periods, the estimated claim frequency falls from its initial value of 0.18 to about 0.13, even though the underlying frequency has remained constant at 0.18. This results mainly from reductions in experience at node 13.

Figure 2 Example of parameter estimation



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