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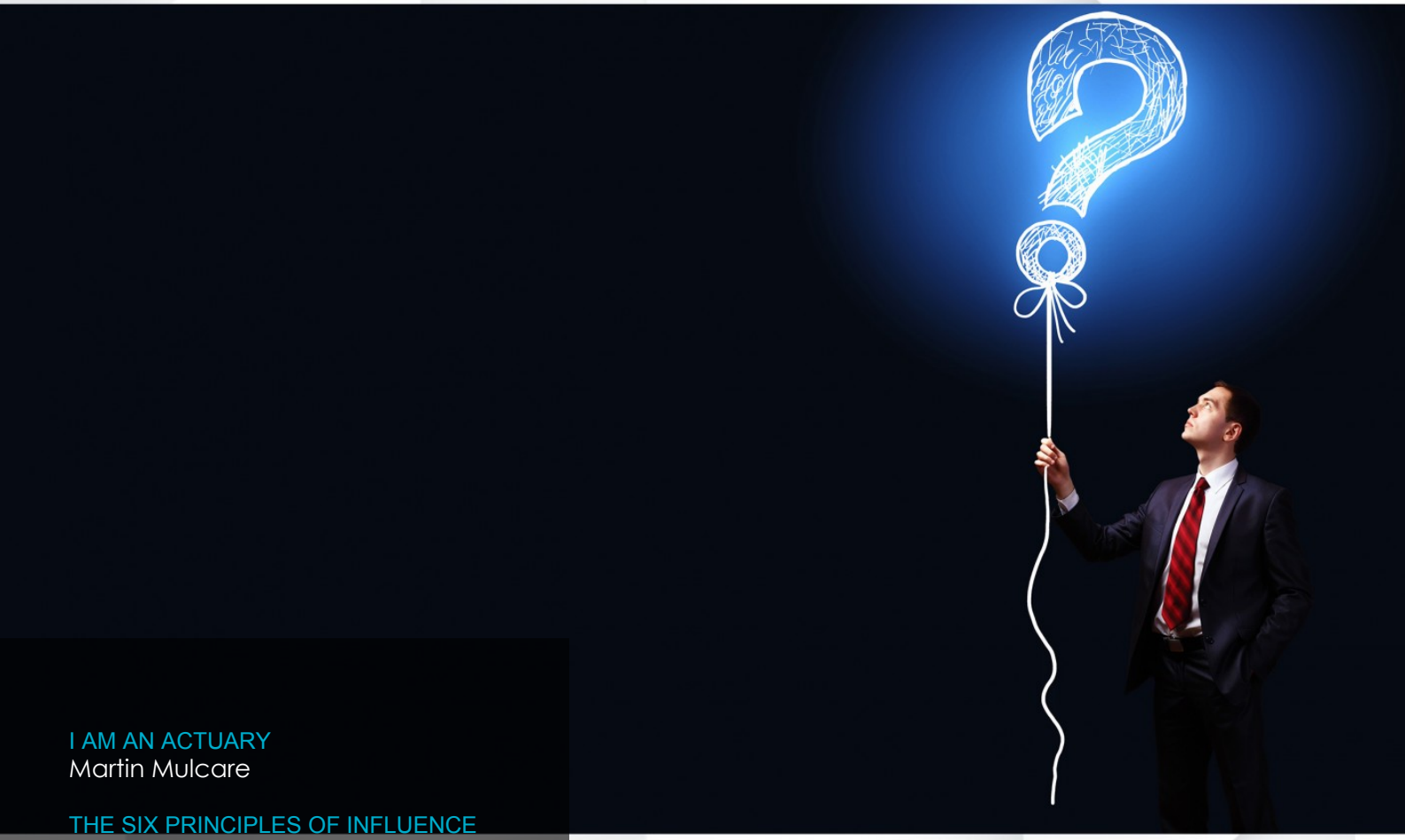

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IMPORTANT INFORMATION FOR CONTRIBUTORS
Actuaries welcomes both solicited and unsolicited submissions. The Editorial Committee reserves the right to accept, reject or request changes to all submissions as well as edit articles for length, basic syntax,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

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Reining in age pension spending

By Geoff Dunsford *(gandndunsford@optusnet.com.au)*

Reducing any dependence on the Age Pension is welcome news to a government which now spends in excess of $41 billion a year on this cost. Should the Age Pension be a "safety net" for a minority or a means-tested right for the majority? Actuary Geoff Dunsford gives his view.

In conjunction with Vanessa Ho, I wrote a paper in 2003 for the Biennial Convention – *The Future of Retirement Incomes*. In the paper, we noted:

"The ageing of the population will contribute to increasing government budget deficits unless current welfare rules are changed. This includes Age Pensions where some 85% of new retirees each year claim a least a part Age Pension and the associated "fringe benefits".

(The expression "Age Pensions" in this paper and the current article includes Service Pensions).

We suggested: ***"A possible scenario is for the Age Pension to become a "safety net" for a minority, instead of the current means-tested right for the majority".***

I remain of the same view – perhaps even more strongly in light of the latest annual cost of Age Pensions – some **$41 billion**. Figures in the latest *Intergenerational Report* (2015) project this, on a per capita of the population basis, to more than double (in 2015 dollars), due to the increasing proportion of the population living to advanced ages and the increasing average length of retirement.

"*There will be fewer people of traditional working age compared with the very young and the elderly. This trend is already visible, with the number of people aged between 15 and 64 for every person aged 65 and over having fallen from 7.3 people in 1974-75 to an estimated 4.5 people today. By 2054-55, this is projected to nearly halve again to 2.7 people*".

Safety Net Focus

There are (at least) two ways which the government could relatively easily (in the administrative sense, albeit not politically) impose a "safety net only" approach to the payment of Age Pensions.

1. As currently applies to unemployment benefits, retirees could be required to more or less exhaust their own resources before being granted an Age Pension.
2. The "50% deduction" of Age Pension benefit in respect of income from private sources, could be gradually increased to 100% over, say 25 years.

The first policy could encourage dissipation of assets. Not everyone would take this course, but continuing a pre-retirement lifestyle, without the discipline of a limiting regular income, would be almost inevitable for some. This would result in full Age Pensions payable from an earlier date than otherwise – perhaps costing the government more in the long run than the current policy!

The second approach does not heavily affect current retirees immediately, and those close to retirement should be able to plan appropriately. The impact on younger workers would be the greatest, but is deferred for many years. Being announced while they are focused on work and life experiences (and being told that retirement age will be receding into the future anyway!), they will have time to adjust any retirement expectations that they might have had.

In practice, both of these approaches could be considered rather heavy-handed. Accordingly we continued our paper with an alternative:

"This could be achieved by requiring the benefits from accumulated compulsory super contributions to be used to purchase a pension up to the full Age Pension".

Conference participants at the concurrent session to discuss the paper gave it a polite response, but there was little support for this theme.

Age Pension wrongly seen as Entitlement

The Financial System Inquiry (supported by the Institute) said that the objective of superannuation is "to provide income in retirement to substitute *or supplement* the Age Pension" (my emphasis).

As a payment made out of taxation rather than funded, the Age Pension should be seen as just another welfare payment, rather

than the first pillar of a three pillar retirement income system. By now, after 23 years of compulsory superannuation, **this** should be regarded as the prime method of providing retirement income. The principle contained in the widespread view that "I have paid my taxes, so I am entitled to the pension" is unsustainable. Unfortunately, with "Age Pension Entitlement" remaining well entrenched in the community, selling the concept of a "Safety Net only" approach would be difficult.

State Pensions and Compulsory Contributions

In the UK and other European countries, compulsory contributions are the main eligibility requirements for the State pension which represents the safety net for retirees.

The compulsory system was introduced in Australia in order to alleviate the cost to government of Age Pensions. For various reasons this is not likely to happen to any significant extent; the National Commission of Audit projects 80% of retirees still receiving at least a part Age Pension in 2050 when the system should have well and truly matured.

Arguably, we need to develop our compulsory super contribution system to become **part of** our Age Pension safety net for retirees, rather than a supplement to it. The 2003 paper continued:

Transitional Implementation

Introduction of the safety net concept along the above lines would clearly reduce *government expenditure. At the same time the outcome in $ terms would be significantly less than that currently expected by the working population.*

With such a negative impact on expectations, any move to the "safety net" concept would need to be phased in over a long period".

This article continues the theme

During the transitional period and ultimately, a form of integration of state and private benefits would apply. Accordingly a prerequisite will be a sensible restructure of the means test. For the purposes of pursuing this article further, a single test will be assumed.

Private assets (excluding the value of any defined benefit superannuation) will be aggregated. Then a "deemed income" will be determined with a "deemed interest rate" applied to this aggregate, and any defined benefit super income added, to arrive at the means tested Income.

A further desirable prerequisite would be for ***the Age Pension to be increased to a level which includes the average value of the current "fringe benefits***", e.g. car registration, telephone bill. This would leave pensioners to determine which ones they wished to avail themselves of. Apart from simplifying the integration process this would also save the government(s) the not insignificant costs of administration.

Build Compulsory Superannuation to offset Age Pension

From an "Appointed Day", establish a separate member superannuation account (or accounts) for future Superannuation Guarantee Contributions, referred to as say, their "Age Pension account(s)".

The balance in such "Age Pension" accounts would be used first to purchase a lifetime pension (which may be capital protected) at or after Age Pension age, up to an amount equal to the Age Pension, and indexed similarly.

An option would be for the account balance to be used to purchase from the government the part or full Age Pension. (The Actuaries Institute recent "For Richer, For Poorer" White Paper estimates the value of the full Age Pension for a single male at age 65 is $412,000; for a single female is $482,000, and for a joint life last survivor male/female couple is $816,000).

Any excess "Age Pension" account balance would be available for investment in other post retirement products permitted at that time, as would the member's other super account balances.

The Means Test would continue to apply to the remainder of a retiree's assets in respect of the balance of any Age Pension required.

Examples

The following are some simplified examples comparing retirement incomes (in 2015$) under the current (assuming the proposed Income Test) and proposed "Safety Net" rules:

For simplicity, the Age Pension is shown for a single person and is assumed to be $20,000 a year.

Also assumed is: the "Income before means test reduction" would continue to be allowed, i.e. approximately $4000 p.a.

	Current Age 60 (Retiring in 2020)		Current Age 30 (Retiring in 2050)		Current Age 30 (Retiring in 2050)	
Annual Income from	**Current $**	***Proposed $***	**Current $**	***Proposed $***	**Current $**	***Proposed $***
Future Compulsory Super (1)/ *"Age Pension account(s)" (1)*	2000	***2000***	16000	***16000***	22000	***22000***
Other Super and Savings (2)	12000	***12000***	4000	***4000***	6000	***6000***
Max potential (additional) Age Pension (3) **Current $20000** ***Proposed [$20000 – (1)]***	20000	***18000***	20000	***4000***	20000	***nil***
Age Pension deduction (4) (Max = (3)) **Current 50% [(1) + (2) - $4000]** ***Proposed 50%[(2) - $4000]***	(5000)	***(4000)***	(8000)	***nil***	(12000)	***nil***
Total Income = (1) + (2) +(3) – (4)	29000	***28000***	32000	***24000***	36000	***28000***
Government Saving		***1000***		***8000***		***8000***

Unpopular?

Politically, proposals of this nature are unpopular. However, the message should be that the current structure is unsustainable. This is readily demonstrated. Arguably, most people would not want the next generation to be saddled with repaying increasing budget deficits.

Under the proposals, it would only be the changes to the Means Test which will impact on existing pensioners. While the "losers" will be vocal (and the focus of the media), if the revised arrangements are clearly sensible, perhaps presented with highlighting current anomalies, they could be acceptable to the main seniors' representative groups.

There will be little (further) impact on those close to retirement: it will only be the benefits arising from their last few years' SG contributions which would become part of their Age Pension. Such people should be able to anticipate the impact and plan for it.

Many younger workers take little interest in retirement when it is many years away (particularly in the light of the planned extension of the Age Pension age). After all, the arrangements change almost every year, so there is little point in diverting

their attention from their more important current focus on jobs, relationships, children and enjoying life. Those who do take an interest can see broadly what the outcome would be for them. Hopefully the reaction would be 'I need to save more for retirement.'

Self-Employed/Non-Employed

It would seem unreasonable for the self-employed and non-employed taxpayers to be able to receive the Age Pension under the proposed measures paying no contributions, while the employed have done so. Equally it would be unfair if non SG contributions have been made by such people and the accumulated funds derived from all of these were not taken into account when determining their amount of Age Pension.

Consequently, it is proposed that self employed and non employed taxpayers be required to make "equivalent" SG contributions through the tax system. The relevant percentage of gross income would be included in their tax bill (which would be adjusted for tax relief on those contributions) and paid into the ATO's super fund. Transfer to a fund of the member's choice should be available.

Suitable arrangements would be needed for the non employed who are receiving little or no income – whether permanently or temporarily

The "Rich"

A complaint against the proposals could be that there would be no impact on "the rich" – i.e. those who do not currently have (or will not need) an Age Pension.

Arguably, the proposals are only targeting "middle class welfare" and so such a concern is irrelevant. If it is perceived that that "the rich" are not paying sufficient tax, that is another matter.

Start Date

These measures could be introduced more or less immediately as they only apply to future compulsory super contributions.

The start date would however, need to accommodate the necessary changes to administrative systems – government and private.

Sustainable?

The lesser cost to the government of Age Pensions under this structure seems likely to meet needs on a more sustainable basis. This should enable the country to grow economically, and ultimately, for both workers and retirees to benefit.

The proposed structure will only be fully effective when today's youngest workers retire: probably in 50 years' time. Sustainability would need to be tested over this period.

The future of retirement incomes?

Perhaps not immediately, but the need to rein in Age Pensions spending will be a trigger for action at some time in the future.

Where there are limited government funds available, the focus must be to look after the most disadvantaged. The current "middle class welfare" of most people receiving some Age Pension and the fringe benefits will need to be addressed.

Are correlations real or imagined?

By Benjamin Avanzi *(avanzi@dms.umontreal.ca)*, Greg Taylor *(gregory.taylor@unsw.edu.au)* and Bernard Wong *(bernard.wong@unsw.edu.au)*

Actuaries Benjamin Avanzi, Greg Taylor and Bernard Wong challenge preconceptions regarding the high level of dependence between general insurance claims from different classes. Using real life data, they show how more detailed analyses can often reveal systemic effects, such as weather events or seasonality, which can account for much of the observed correlation, leaving much lower levels of residual correlation.

Background

In August 2014, we outlined the main objectives of a research project carried out by us and our team of researchers, in collaboration with Allianz, Insurance Australia Group, and Suncorp[1]. The focus of the project is on claim dependencies, and one of the great outcomes of our collaboration with the industry is the setting up an extensive data base of real insurance claims at the single transaction level. This will be referred to as the **"AUSI" data set** (Allianz, UNSW, Suncorp and IAG).

In actuarial practice, correlations are widely used to represent dependencies. Furthermore, there seems to be a great deal of preconceptions on how dependent insurance claims should be. Often, the presence of dependence is taken as a given. Dependency is rarely discussed or challenged, perhaps because of the lack of an extensive public dataset and research on the actual dependencies shown in this dataset.

Australian actuaries working in the general insurance field would be familiar with the correlation matrices developed in Bateup and Reed (2001)[2] or Collings and White (2001)[3] for the purpose of assessing risk margins for insurers. The correlations contained there are based largely on the judgement of a small number of actuaries, with limited under-pinning in data (in one case none). A number of the correlations are of considerable magnitude, with little factual evidence to support them, and are possibly overstated, resulting in deliberately conservative risk margins.

Other references relevant to the construction of risk margins generally are O'Dowd et al. (2005)[4] and the Risk Margins Task Force (2008)[5].

Our recent work

In a recent paper (Avanzi, Taylor and Wong, 2015[6]), we develop a simple theoretical framework that enables us to explain rigorously how and why correlations can be illusory (and what we mean by that). In the present short article, we report on some of the pertinent results we obtained when analysing the AUSI data set. These have material implications on the estimation of diversification benefits (and hence adequate capitalisation), and the modelling of dependencies in general.

Correlations in the AUSI data set

How much correlation does the AUSI dataset actually display? We extracted from the AUSI data set six claim triangles. These span 40 quarters (2004 to 2013 inclusive) and originate from two insurers ("Insurers A and B). The Lines of Business ("LoB") we considered are Home, Private Motor, CTP, and Public liability (note that Home and Private Motor data were not available for Insurer B at the time of the analysis).

Simple chain ladder modelling was carried out, and cross-LoB correlation calculated for each within-insurer pair of LoBs. The results are shown in Table 1. It is remarkable that most correlations are very weak, with the notable exception of Home and Motor for Insurer A. Can we then conclude that Home and Motor are highly dependent?

		Correlation					
		Insurer A				Insurer B	
		Home	Motor	CTP	PL	CTP	PL
Insurer A	Home	1	0.59	+0.04	+0.09		
	Motor		1	+0.01	-0.02		
	CTP			1	-0.02		
	PL				1		
Insurer B	CTP					1	-0.09
	PL						1

Table 1: Correlations between residuals of simple chain ladder models in the AUSI data set

Illusory correlations and modelling

Jumping to this conclusion is very tempting. However, this would ignore one of the fundamental rules of modelling, which is to search for influential covariates that are missing from the model, and then include them. Such a routine has potential to wipe out some, if not all, of the observed correlation.

Time series should be de-trended before estimation of correlation between them. Otherwise, there is a risk of estimating high (or low) correlation simply because the series trend in the same direction or opposite directions.

For many applications, correlation between two variates relates to the **stochastic noise** contained in them. These are the components of the variates that are, by their nature, not capable of being modelled. In such cases, one should model all systematic (non-stochastic) effects that are identifiable in the observations, remove these effects, and correlate the remainders of the observations.

Case study: Home and Motor

The significant correlation displayed between Home and Motor for Insurer A provides an ideal case study.

The briefest examination of the data indicates substantial differences between accident periods in the total volume of claims. Figure 1 charts, for each of development quarters one to three, the time series across accident quarters, of the cumulative proportion paid of Home loss payments made in those quarters (relative to the total over the first eight development quarters). This chart also displays, by accident quarter, the total of Home claim payments made in the first eight development quarters . These plots are characterized by occasional very marked peaks, which can be confidently attributed to major weather events. Some peaks affect both LoBs (e.g. in accident quarters 16, 25 and 32). These will have generated large positive residuals in both LoBs, increasing measured correlation. They will also have created a tendency in both LoBs toward negative residuals in most of the other accident quarters, further increasing correlation.

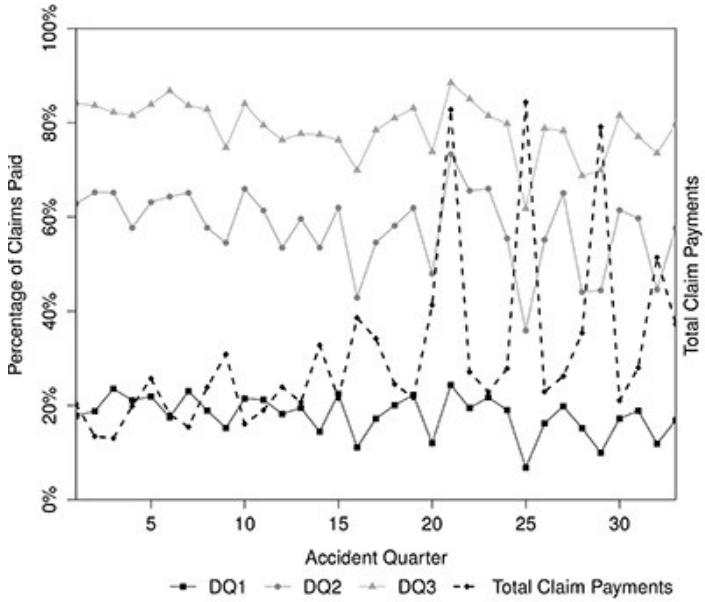


Figure 1: Volume of claims paid by accident quarter and effect on paid loss development

Figure 1 also suggests seasonal influences. There is a hint of slower payment of claims in every fourth accident quarter, specifically quarters numbered four, eight, etc. It is also noticeable that these accident quarters are marked by generally higher claim payments. This effect is somewhat confounded by

the occurrence of major events, whose accident quarters are marked by especially high claim payments and slow rates of claim payment. It is reasonable to suppose that the claims of any particular accident quarter are likely to be paid more slowly (or rapidly) according as the volume of claims impacting the accident quarter is high (or low). One might therefore infer a systematic effect according to which each fourth accident quarter (actually the fourth accident quarter of the calendar year, late spring and early summer) coincides with increased claims activity, probably weather related, and retarded processing of claims. In fact, a closer examination of the data indicates that a similar effect occurs in the first quarter of the calendar year (most of summer and early autumn).

When we included weather events in the modelling, by deleting accident quarters subject to extraordinarily heavy paid losses, correlation decreased from 0.59 to 0.11. Further recognition of the seasonal effects hypothesised above led to a residual correlation of -0.01. These results are compelling, and more dramatic than we had initially expected.

We should note that in Avanzi, Taylor and Wong (2015)[7] we performed a similar analysis on some Schedule P data from the United States, with similar results.

A word of caution

There is a fundamental difference in the required treatments of **past and future data**. While past data may be sufficient for the identification of specific effects contained within it—that is, sufficient for any apparent cross-LoB correlations to be modelled away—the same is not necessarily true of future (i.e. unobserved) data. Even if past observations are free of correlation, this may provide only a benchmark in relation to future data. Unobserved future errors (e.g. in superimposed inflation, or claim frequency induced by major events) may well be correlated as between LoBs, in which case it may be appropriate to allow for non-zero correlations.

Of the factors found in this article to generate apparent correlation, the first (seasonal effects), once modelled in past data, requires no further action. Any sympathetic trends in the cash flows of separate LoBs will be automatically contained in the model forecasts without resort to the use of correlation.

The treatment of the second factor (major events) would be different. The effects of these have been removed from the models discussed above, and so would be excluded from those models' forecasts. They would typically be restored by means of CAT model forecasts, applied simultaneously across LoBs, and so restoring dependency between them. Note, however, that the degree of dependency in forecasts may differ from that observed in the past if the modelled data set is atypical with respect to major events.

Conclusions

Two major conclusions are drawn:

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

There still is a lot to be done. We merely illustrate here that correlation levels are model-dependent. They mostly originate from unaccounted effects. The recognition of those, and their appropriate modelling, represent major challenges. Furthermore, in some cases correlations may not be an appropriate representation of dependencies (especially in the tails). We will be back.

Register now for the upcoming Insights session with Greg, Bernard and Benjamin at the Actuaries Institute in Sydney, or via webinar, on 23 October 2015.

[1]Avanzi, B., Taylor, G., Wong, B. (2014) Research into Claim Dependencies – an Industry and Academic Collaboration. The Actuaries Magazine, August 2014, pp 9-11. Available at http://www.actuaries.digital/2014/08/15/research-into-claim-dependencies-an-industry-and-academic-collaboration/.

[2]Bateup, R., Reed, I., 2001. Research and data analysis relevant to the development of standards and guidelines on liability valuation for general insurance. The Institute of Actuaries of Australia and Tilinghast – Towers Perrin.

[3]Collings, S., White, G., 2001. Apra risk margin analysis. In: Institute of Actuaries of Australia (Ed.), XIIIth General Insurance Seminar.

[4]O'Dowd, C., Smith, A., Hardy, P., 2005. A framework for estimating uncertainty in insurance claims cost. In: Institute of Actuaries of Australia (Ed.), XVth General Insurance Seminar.

[5]Risk Margins Task Force, 2008. A framework for assessing risk margins. In: Institute of Actuaries of Australia (Ed.), XVIth General Insurance Seminar.

[6]Avanzi, B., Taylor, G., Wong, B. (2015) Correlations between insurance lines of business: An illusion or a real phenomenon? Some methodological considerations. UNSW Business School Research Paper No. 2015ACTL11. Available at http://papers.ssrn.com/abstract=2597405.

[7]Note that the relevant axis for this series of data, in $, would normally appear on the right hand side of the plots. We had to redact it for confidentiality reasons.

Actuaries scoop industry awards

By Dimity Mannering *(dmannering@theinstitute.com.au)*

The 12th Annual Australian Insurance Industry Awards showcased the unique contribution of actuaries to the industry. ANZIIF's Dimity Mannering reports.

Numbers don't lie. It is a truth universally accepted (in the insurance industry at least. Those times you end up at a dinner debating with someone who declares a set of statistics irrelevant… they don't work in insurance).

This is why when actuarial firm Finity was announced the Professional Services Firm of the Year at the Australian Insurance Industry Awards in August, the crowd acknowledged the win with due reverence. It was undeniable: six times a trophy does an exceptional business make.

But it is a rare Industry Awards when actuaries are not recognised for their contribution to the industry. On this point the data, as usual, doesn't lie.

This is the sixth time Finity has won the Award (after five wins they were inducted into the Hall of Fame). Actuarial firm Taylor Fry took out the title in 2014. And while competition for the Professional Services category is fierce (consulting, accounting and law firms all vie for the same title – an extremely ambitious group), the actuaries so often emerge the victors.

This is, of course, due to the significant contribution that actuaries make to the insurance business. Their data and insights are key to innovation, decision-making and business success. It flows from this that there is a natural respect for numbers and those who work with them.

But Australia's actuaries don't only provide data; they also rack up their own impressive stats: they present at tens of events, write research papers by the ton, and provide generous financial support to industry projects. These are the numbers that prove their contribution, and they speak just as well of the figure-loving souls as the cold hard data that they gift to the industry.

'Evidence and data dictate everything the insurance industry does, and so it is natural that we respect those who work fluently with numbers. But we also recognises another side of it: that actuaries provide incredible thought leadership and support insurance businesses far beyond what might be expected – the industry sees this.' said Prue Willsford, CEO of ANZIIF, which co-hosts the Awards with the Asia Insurance Review.

This is a sentiment Estelle Pearson, Finity Managing Director, shares.

"As an independent firm of just over 100 staff Finity is incredibly proud to be awarded the title of Professional Services Firm of the year for 2015.

The award is recognition of not only the work we do, but it also recognises the valuable role actuaries play as professional advisors to the Insurance industry. The contribution made by actuaries these days goes well beyond the traditional roles of loss reserving and product pricing and takes actuaries into areas of advice including capital management, risk management, product development, corporate strategy and of course big data. Finity strives to deliver value to its clients across all of these areas while also sharing insights at an Industry level through our regular publications and forums. We have a real passion for insurance so winning this award is like winning an Oscar!"

The winners of the 2015 Australian Insurance Industry Awards are:

Small Broker of the Year

Consult Insurance Solutions Pty Ltd

Medium Broker of the Year

GSA Insurance Brokers

Large Broker of the Year

Marsh

Underwriting Agency of the Year

Brooklyn Underwriting

Small-Medium General Insurance Company of the Year

Hospitality Employers Mutual Limited

Large General Insurance Company of the Year

CGU

Life Insurance Company of the Year

AIA Australia

Innovation of the Year

Allianz Australia

Professional Services Firm of the Year

Finity

Service Provider to the Insurance Industry

recoveriescorp

Women's Employer of the Year

Insurance Australia Group

Youth Development Employer of the Year

BT Financial Group

Young Insurance Professional of the Year

Katherine Ashby – (BT Financial Group)

Insurance Leader of the Year

Mike Wilkins (IAG)

ANZIIF Lifetime Achievement Award
Steve Ball

Actuaries break into banking

By Peter Sinkis *(peter.sinkis@gmail.com)*

The inaugural 'Banking On Change' Seminar explored international and domestic market influences on the Australian banking landscape, as well as technological developments and mortgage market issues. A range of insightful presentations and influential speakers ensured its success. Peter Sinkis reports.

On Wednesday 16 September the Actuaries Institute and Banking Practice Committee launched the first major event focused entirely on the banking industry. 'Banking on Change' addressed the rapid change in regulation, technology and markets of the banking industry.

The day began with Institute President Estelle Pearson welcoming 90 delegates (Members and non-Members) before Institute CEO David Bell introduced our keynote speakers: Wayne Byres (Chairman, Australian Prudential Regulation Authority) and Guy Debelle (Assistant Governor (Financial Markets), Reserve Bank of Australia).

The audience, including representatives from the ABC, AFR and other media outlets, heard first hand of the major changes stemming from post-crisis regulatory reform, as well as a detailed overview of bond market liquidity, long-term rates and the influence of changes in China's public and private investment mix.

"There is no shortage of important issues where the analytical disciplines of the actuarial profession can make a significant contribution," – Wayne Byres, Chairman, APRA

Wayne Byres (pictured right), whose speech focused on the changes stemming from the post-crisis regulatory reforms in banking and the capital strength and resilience of the Australian banking sector, expressed his appreciation that the Actuaries Institute is taking a greater interest in banking-related matters.

"There is no shortage of important issues where the analytical disciplines of the actuarial profession can make a significant contribution," he said.

Guy Debelle's (pictured below) speech focused on bond market liquidity, long-term rates and China. He warned that Australia must ready itself for financial aftershocks of the coming interest rate rise in the US and also spoke on the effect of government bond yields on the discount rates used in actuarial calculations.

View more photos from 'Banking On Change' and download presentations.

There was a high level of media interest in the Seminar and the comments from both keynote speakers resulted in extensive media coverage.

The keynote presentations were followed by a plenary considering the role of technological change and it's influence on banking by Kelly Bayer Rosmarin (Group Executive for Institutional Banking and Markets, Commonwealth Bank of Australia) and Angat Sandhu (Principal, Oliver Wyman).

Following lunch, the afternoon began with James Hikey (Partner, Deloitte) and Sean Carmody (General Manager, Risk Analytics and Insights, Westpac Banking Corporation) providing us with a compelling overview of the Australian Mortgage market from both a top-down external perspective, and internal bank view.

The final session brought us full circle with perspectives from Paolo Tonucci (Group Treasurer, Commonwealth Bank of Australia) and Gordon Allison (Head of Treasury Development and Transformation, National Australia Bank) on how the banks have addressed regulation and how it has influenced their thinking.

Event Organising Committee

Keep an eye out for some more detailed articles in the coming weeks which will delve into the insights presented and discussions that took place on the day.

Thank you to the plenary chairs, organising committee, the Banking Practice Committee, and the hardworking Actuaries Institutes events team for making this a success. Also thank you to all our speakers and attendees, we hope you had a great day and made the most of the networking sessions that took place.

Contribute to Actuaries Digital

By Actuaries Institute *(Actuariesmag@actuaries.asn.au)*

Actuaries Digital is looking for writers and contributors to keep it rich in actuarial insights and proactively examining issues affecting the profession.

The success of Actuaries Digital depends on volunteer's generous and regular article contribution on a wide range of topics connected to the actuarial profession.

The Editorial Committee are eager to connect interested contributors to Actuaries Digital's now continuous online publishing cycle. The committee can provide editorial support and is available to assist with photo and video production to compliment articles.

Do you have an idea for an article, or would you like to report on an interesting presentation you've given or heard recently? Perhaps you're interested in a topic, but not sure what to write about. Take a look at the publication's themes below. If one or more interest you, please drop us an email ActuariesMag@actuaries.asn.au with your interest areas and we'll connect you to writing opportunities.

– Data Analytics

– Superannuation and Retirement Incomes

– Banking

– Health

– General Insurance

– Life Insurance

– Risk Management

– Wealth Management

– Leadership

– Public Policy

The committee's current map of article ideas and 'works-in-progress' for Actuaries Digital features a ream of potential interviewees for 'Leading Actuary' and 'Actuaries at Play' profiles and other – long and short – pieces that showcase the value of actuaries to Australian business, community and government.

Technical pieces are welcome, as well as well more general or 'human' stories; from essays to book reviews, to opinion pieces; laughable 'bad stats' or even a reflection on your career journey; defining moments as an actuary or tips on explaining what you do at a dinner party. Whatever your muse, we want to hear from you!

The editorial committee and HQ Communications team would like to sincerely thank all contributors to the site so far for enriching the profession through thoughtful reflection and analysis on current and interesting issues of relevance to actuaries and the industries they work in.

WIN! Each quarter, the Institute awards the top three most popular articles a $50 Dymocks voucher. Check out the most-read articles in Q1 and Q2.

The sweetest taboo

By Jean Eu ()

Sugar is everywhere. But, as actuaries, do we really understand the impact it has on our health, and how we can better allow for sugar intake in underwriting? Jean Eu investigates.

Let's start with sugar consumption. If asked to name sugary foods, you may think of sweets, chocolate, fizzy drinks, table sugar, and perhaps even fruit. But sugar can also appear in savoury foods such as ready meals, soups, salads and sauces; as well as 'healthy' foods such as breakfast cereals and yoghurt. Furthermore, starches such as bread, pasta, rice and potatoes also convert to sugar in our bloodstream, having the same impact on our bodies. These 'hidden sugars' can add a surprising amount to our daily intake.

Sugar also seems to be used by food manufacturers to increase the attraction of their foods. Large brands can have teams of reasearchers focusing on finding the 'bliss point' – the optimal level of sugar at which sensory pleasure is at its maximum – thus creating products that consumers will crave and return to buy.

It could also be argued that the 'low-fat' food industry has exploited the use of sugar. Researchers found that by removing fats from foods the taste deteriorated, so counter-balanced this by adding more sugar to make them more palatable.

According to the National Diet and Nutrition Survey, adults in the UK consume on average up to 58.8g, or 15 teaspoons, of sugar per day. Yet the World Health Organization recently published draft guidelines recommending that an average adult's sugar intake should be below 5% of total energy intake. This roughly equates to no more than 25g, or six teaspoons, per day. This means that the average UK adult is currently consuming nearly three times more sugar than is healthy.

The dangers within

To understand why sugar consumption is such a problem, we first need to understand how our bodies process sugar.

The sugars and starches we consume are digested in our intestines to form glucose, which is then transported around the body through our bloodstream. The glucose is absorbed by our body's cells for energy.

To regulate the amount of glucose in our blood, the pancreas releases hormones called insulin and glucagon. Both insulin and glucagon work together to regulate blood sugar levels. The more sugar in our bloodstream, the more insulin is released to help lower it. Equally, if blood sugar is low – say, between meals or during exercise – then glucagon is released by our pancreas to convert the stored sugar back into glucose and increase blood sugar levels.

Any excess sugar is stored first in the liver and muscles if glycogen levels are low. However, if glycogen levels in the liver or in the muscles do not need replenishing, the excess sugar is stored as triglycerides in fat cells around the body.

A problem occurs with the consumption of too much sugar. When we put a high level of sugar into our bodies too quickly, our body releases too much insulin in response to the sugar 'flood'. This causes our blood sugar to drop below normal levels, resulting in hypoglycaemia, or a sugar crash. There is a delay between this and when the body begins converting the stored sugars in our bodies back to glucose. This is when sugar cravings occur, in an attempt to replenish what our body thinks it has lost. So we take on even more sugar, and the process starts again.

A further complication is that the consumption of fructose or fruit sugars (the base of all table sugar) has been shown to increase the resistance of the brain to leptin, the protein which tells our body it is full and satiated.

Why we love sugar

It could be argued that human beings have evolved to crave sugar. If you consider the caveman, when humans had to hunt for or gather their food, sugar was hard to come by. Humans may have eaten fruit and recognised it as an instant energy source. As part of our evolution, we might then recognise sugar as a means of survival, and therefore naturally seek out sweet foods in times of need.

Sugar has also been shown by some to have a similar effect on our brains to any addictive substance.

Chemically speaking, dopamine is released when we consume drugs, nicotine or alcohol, giving individuals a 'high' that can lead to addiction. When eating food, dopamine is also released in the brain. However, after repeatedly eating the same food, dopamine levels begin to plateau, and we no longer find the same foods as satisfying. This is thought to be an evolutionary tactic, to ensure we eat a variety of food, so that our bodies receive the nutrition it requires.

Interestingly, no matter how much sugar a person consumes, dopamine levels never even out enough to discourage an individual from eating more sugar. Some of those who have tried to reduce their sugar intake have reported withdrawal symptoms akin to drug withdrawal symptoms; for example, dizziness, headaches, fatigue, irritability, shakes and mood swings.

Apart from the impact on fat storage and subsequent obesity, sugar also has many other implications for our health. It is also thought to lead to tooth decay, non-alcoholic fatty liver disease, metabolic syndrome, cardiovascular disease, type 2 diabetes and an increased risk of cancer.

Consumption as a rating factor

Given that sugar consumption appears to have a clear impact on health, it might therefore be appropriate to use sugar consumption as a rating factor in the underwriting process. In theory, if we could measure the level of a person's sugar consumption and quantify the relationship between consumption and health outcomes, we could calculate the risk of even a healthy individual developing a disease.

Current rating factors measure levels of cholesterol, blood glucose and abdominal obesity, however, these are measures of risks that have already occurred.

Chart 1 Average daily intake of non-milk extrinsic sugars (g)

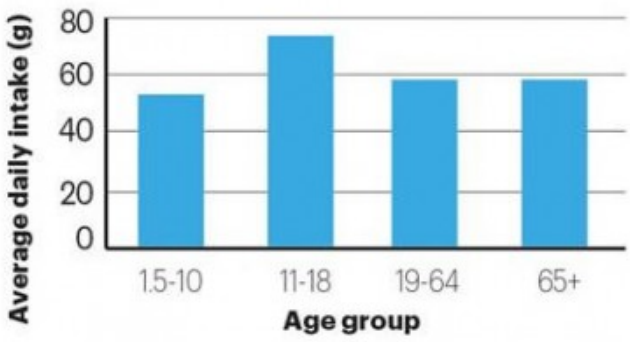
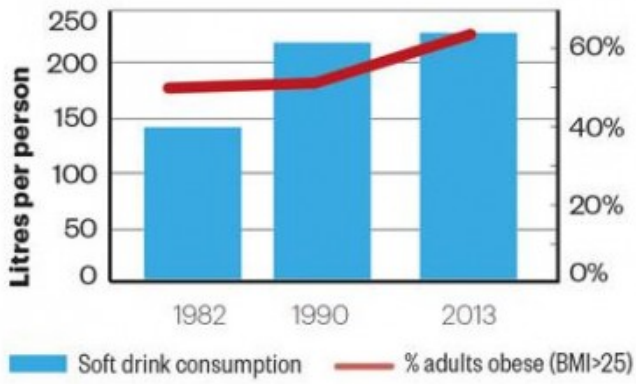


Chart 2 UK obesity versus soft drinks correlation



Source: National Diet and Nutrition Survey 2008/9-2011/12

Furthermore, measures of blood glucose only provide a snapshot view at a specific point in time, rather than a measure of someone's dietary habits. Individuals could answer questions about their food habits to indicate the amount of sugar they are consuming – but this is highly dependent on the individual's memory, and on the questions being answered accurately and truthfully. We need to measure the amount of glucose being consumed by an individual over a prolonged period of time. Such a test could be a good indicator of future health before a disease advances.

Measuring sugar consumption may not be a too distant possibility. Wearable technology used by diabetics to monitor blood glucose levels is already in use. For example, a continuous glucose monitor (CGM) uses a tiny sensor under the skin of an individual's stomach to measure blood glucose levels every five minutes, and sends a signal to a receiving device. The CGM sounds an alarm if blood sugar drops below a certain level, and can be connected to a number of smartphone apps.

There are also non-invasive methods of measuring blood glucose levels, such as GlucoWise, a device which measures blood sugar levels by squeezing the skin between the thumb and forefinger, or the earlobe, and connects wirelessly to a smartphone app, giving users a non-invasive and pain-free method of continuously measuring their blood sugar.

An article published in the *Journal of Nutrition* (June 2013) reported that researchers in the United States have recently identified a biomarker for dietary sugar, which would enable detection of habitual sugar intake from a hair or blood sample. The methodology is still being developed, but it would appear that the test may become available in the near future.

While it is becoming more commonplace to measure sugar consumption with the aid of wearable technology, there are other considerations to investigate before sugar intake can be used as a rating factor; for example, socio-economic factors. Traditionally the less wealthy have been associated with poorer health. However, these parts of the population may be more likely to live off the land and consume less processed foods and sugar than their more affluent counterparts. In this scenario the less wealthy may actually have better health in the long run.

Additional considerations include the impact of salt and fat consumption on an individual's future health in conjunction with sugar intake; how much exercise the individual does, and how this may negate the impact of excess sugar intake; and the quantification of the exact level of risk associated with excess sugar consumption.

This article was originally published in *The Actuary* on 3 September 2015.

Catastrophe modelling in a post Katrina world

By Edward Vukovic *()*

The reinsurance industry used catastrophe risk models long before Hurricane Katrina, but Katrina challenged the standards of these models. It called into question the quality of exposure data, how the models were used and their suitability for various business applications. ANZIIF's Edward Vukovic reports.

Ten years on from Hurricane Katrina, we can confidently say that quality of exposure data has improved dramatically. Companies across the world are taking a far more rational approach to model-based business decisions and many multinational reinsurance companies and intermediaries, have and continue to invest heavily in model research and evaluation.

But what was it like before Katrina wiped 'the Big Easy' out and how has that catastrophic event shaped cat modelling today?

Dr Jayanta Guin of Air Worldwide (AIR) says the risk associated with hurricanes, particularly in the US, was the best understood of all natural catastrophe perils. Given the wealth of data available, insurers had considerable insight into the behaviour and effect of hurricanes.

However, as with anything, there was always room for improvement and Katrina was a driver behind that.

"Katrina did not fundamentally change our approach to modelling the hurricane peril but there were still lessons to be learned. The main focus fell on the problem of exposure data quality which has led to significant improvements. Katrina also paved the way for enhancements in the way storm surge—and flooding in general—is modelled," says Dr Guin.

Dr Robert Muir-Wood, of Risk Management Solustions says that before Katrina, hurricane modelling remained strongly influenced by Hurricane Andrew, which was at the far end of the spectrum for having such a small proportion of storm surge losses.

"Katrina was the opposite of Andrew, creating more loss from flood than from wind. The flooding of New Orleans was itself a secondary consequence of the hurricane and became a catastrophe in its own right – what we now call a 'Super-Cat' when the secondary consequences become larger than the original catastrophe," he adds.

The impact of Katrina on how hurricane risk models are developed has been huge, most notably changing the way modellers make assumptions.

"The understanding at the time was that intense storms at low latitudes were relatively small. Katrina, however, was enormous. That led us to make revisions in some of our assumptions," says Dr Guin.

He adds that Katrina also revealed insights into the vulnerability of commercial structures.

"A good example is the large number of casinos built on barges along the Mississippi coast. Today, there is much better recognition of the wide array of buildings that companies are insuring and our view of the vulnerability of commercial assets has increased as a result. In fact, I would say that overall our view of hurricane risk along the Gulf coast has increased."

Dr Muir-Wood believes the biggest change in the modelling agenda relates to storm surge, with insurers recognising that it wasn't just some add-on to a hurricane loss model.

"Storm surge losses are also far more concentrated than the wind losses, which gives much more opportunity to employ modelling and in terms of ground up losses storm surge could be just as important as the wind," says Dr Muir-Wood. "This approach has been well validated in recent events such as Hurricane Ike and Superstorm Sandy, which further refined elements of our storm surge flood modelling capability, in particular around underground space."

Modelling post Katrina

The impact of Katrina went beyond the sheer physical devastation it caused, it was the driver behind an evolution in storm surge modelling, so commonplace today.

According to Dr Guin, storm surge modelling failed to get the attention it deserved because it wasn't thought to be a major driver of overall hurricane losses. Katrina, along with storms like Ike and Sandy have prompted a shift in thinking and helped develop more sophisticated models.

"At AIR we've brought to bear new science in terms of numerically-based hydrodynamic modelling, the computer power necessary to handle high-resolution elevation data, and exhaustive analysis of detailed claims data to ensure that the model, the localised nature of the hazard, and improved exposure data combine in such a way to validate well with datasets from multiple storms—not just one or two," says Dr Guin.

"As developers of models, we need to be cautious and avoid over-calibrating to a single headline event; doing so will result in a model that will not validate well across an entire 10,000-year (or larger) catalogue of events."

Dr Muir-Wood agrees, suggesting the old ways of modelling storm surges simply didn't work.

"In the Gulf of Mexico storm surges at landfall are commonly much higher than you would find by using the near-shore SLOSH model, because far more storms lose intensity in the two days leading up to landfall. To capture the storm surge at landfall one has to model the wind field and the surface currents and waves generated by the wind, over far more time in the life of the storm than just for the period before landfall," he says.

"There are really only two coupled ocean atmosphere hydrodynamic models up to the task of being good enough for generating storm surge hazard information along the US coastline: the ADCIRC model and MIKE21 developed by DHL."

While battered buildings and flooded homes seem relatively straightforward to model, Katrina raised the issue of certain components of non-modelled losses such as damage due to polluted water, mould, tree falls and riots — aspects that were never modelled previously.

Indeed, the experience of Katrina triggered a revolution in thinking about how additional factors that drive up loss. Dr Muir-Wood tells us that there are four factors that tend to push up loss beyond the simple hazard exposure loss equation of traditional Cat modelling.

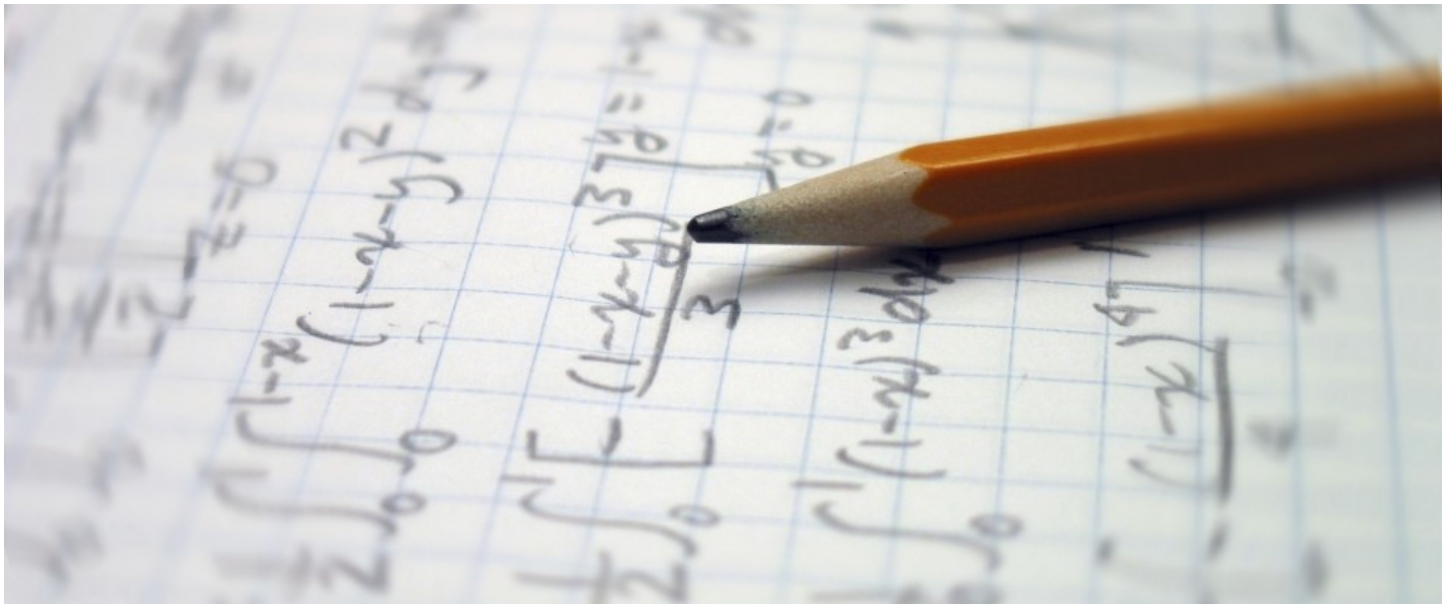
"First there is 'economic demand surge' – when excess demand leads to price increases in materials and labour. Second there is 'deterioration vulnerability' – as seen widely in houses abandoned in New Orleans after Katrina. Even where a property was not flooded, if it had a hole in the roof, after a few weeks the whole interior was contaminated with mould," he says.

Third comes the phenomenon of 'claims inflation', which comes to being when insurers are so overwhelmed with claims that they let through claims below thresholds without checking and finally, there is 'coverage expansion'.

"Coverage expansion occurs typically under political pressure forces insurers to pay beyond the terms of their policies – waiving deductibles, ignoring limits, and covering perils like flood. When the level of disruption is so high that urban areas are evacuated, so that BI losses simply run and run as seen in the Christchurch 2010 and 2011 earthquakes, we call this "super-Cat"," explains Dr Muir-Wood.

"In terms of our broader modelling agenda we focus on trying to capture economic demand surge and claims inflation and recommend stress tests or add defaults around coverage expansion. We also apply super-Cat factors to the largest loss events affecting cities that could be prone to local evacuations."

This article was originally published on ANZIIF on 10 September, 2015 here.



In the Margin: September 2015 - a-maze-ing stories

By Genevieve Hayes *(inthemargin@actuaries.asn.au)*

These days, when someone mentions the word 'labyrinth', the first thing that pops into the minds of many people is the 1986 cult movie featuring Jennifer Connelly and David Bowie as the magic pants-wearing Goblin King. However, labyrinths have actually been around for many thousands of years.

Originally, the intricate maze structures known as labyrinths were built for two main reasons: to keep prisoners in and to keep unwanted visitors out. Perhaps the most famous of all labyrinths throughout history, the Cretan Labyrinth, was, according to legend, built to hold the Minotaur, a hideous, half-man, half-bull creature that was ultimately killed by Theseus. However, Egyptian pharaohs also incorporated labyrinths into the design of their pyramids in order to protect the treasures contained within.

By the 16th Century, labyrinths had ceased to be used for security reasons and had become a type of entertainment, in the form of hedge mazes. In France, King Louis XIV had a hedge maze constructed in the Gardens of Versailles, while in England, hedge mazes arrived during the reign of King William III, with the most famous hedge maze, the maze at Hampton Court Palace, still surviving to this day.

Over 4000 years after the first labyrinth was believed to have been built, labyrinths continue to remain popular. They have become a standard component of video games and feature in countless artworks, books and movies, including the lithographs of M.C. Escher, Umberto Eco's *The Name of the Rose*, *The Shining* (1980) and *Inception* (2010). Last year, the labyrinth-centred dystopian adventure, *The Maze Runner*, hit cinemas and with the sequel just out, it seems that the long tradition of labyrinths in our culture will continue for many years to come.

Speaking Trivially

Awaking after a night of hard partying, you have found yourself in the middle of a maze with the following instructions on how to escape: Each room in the maze has four doors and a riddle painted on the floor. The answer to each riddle is a number. If you take the remainder of that number, modulo 4, this will tell you which door to choose – 0 indicates the north door, 1 indicates the east, 2 the south and 3 the west. Choose the wrong door and it will lead you to certain death.

You are currently in the room marked on the map below with a star. A list of all of the riddles found on the room floors is also given below:

A	B	C	D	E	F
G	H	I	J	K	L
M	N	O	P	Q	R
S	T	U	V	W	X
Y	Z	!	@	★	#
$	%	^	&	(	)

↑ N

A: Hydrogen atoms in a caffeine molecule.
B: Point value of the letter 'B' in Scrabble.
C: Gold medals won by Australia at the 2012 London Olympics.
D: The Year We Make Contact
E: Percentage of gold in 18K.
F: The Mystery of the Spiral Bridge.
G: Moons of Neptune.
H: Positive root of $x^3 + x^2 - 32x - 60$.
I: Degrees in each angle of a regular pentagon.
J: Kings of England named George
K: Wonders of the ancient world destroyed by earthquake.
L: 100 ÷ ½ + 11
M: Oscars won by Titanic.
N: Flavours of quarks.
O: Boiling point of water in Fahrenheit.
P: Year John F. Kennedy was assassinated.
Q: Members of the Three Stooges.
R: Ruby wedding anniversary.
S: Point value of the pink ball in snooker.
T: Players in a netball team.
U: Characters in the Hiragana alphabet.
V: Christopher Eccleston's Doctor.
W: Sides in an enneagon.
X: Faces on a Scattergories die.
Y: Stars on the flag of Singapore.
Z: Teams in the AFL.
!: Century in which the Mona Lisa was painted.
@: US states beginning with M.
★: 2015 in base 8.
#: Atomic number of Titanium.
$: Movies in which Roger Moore played James Bond.
%: Age at which Queen Elizabeth II ascended the throne.
^: Episodes of Breaking Bad.
&: (Distinct) Prime Ministers of Australia at 1 January 2015.
(: Greatest common divisor of 729 and 2646.
): Value of n such that the sum of the first n positive squares is 1240.

For your chance to win a $50 book voucher, determine a safe path through the maze and email your solution (with working) to: inthemargin@actuaries.asn.au.

What's Your Type? (*Actuaries* 200 Solution)

The four translations of the quotes given in *Actuaries* 200 (all lyrics from Weird Al Yankovic songs) and the transformations used to encode those quotes are as follows:

1. Quote: "Try to avoid any Virgos or Leos with the ebola virus."
   Transformation: Shift hands one key to the right with rightmost letter in each row wrapped around to map to the leftmost letter in that same row (i.e. Q = W, W = E, E = R, etc.).
2. Quote: "Well maple syrup and snow's what they export. They treat curling just like it's a real sport."
   Transformation: Letter keys on the keyboard mapped to the letters of the alphabet in alphabetical order (i.e. Q = A, W = B, E = C, etc.).
3. Quote: "Your eyes are even bluer than the water in my toilet."
   Transformation: Shift hands two keys to the left with leftmost letters in each row wrapped around to map to the rightmost letters in the same row (i.e. Q = O, W = P, E = Q, etc.).
4. Quote: "Yes, Virginia, now Santa's doing time in a Federal prison for his infamous crime."
   Transformation: Shift hands up one row on the keyboard (i.e. Q = 1, A = Q, Z = A, etc.).

Nine correct answers were submitted. The winner of this month's prize, selected randomly from among the correct entries, was **Maiyuran Arumugam**, who will receive a $50 book voucher.

A glimpse into today's general insurance market

By Justin Portelli ()

Justin Portelli reviews the recent half-day 'GI Glimpse' Seminar at the Actuaries Institute, packed with insights on cars of the future, pricing perils and the impact of climate change and cyber space on the general insurance industry.

On 8 September 2015 the Institute hosted the first ever GI Glimpse seminar. With a target audience of young general insurance actuaries, the half-day seminar sought to provide attendees with a glimpse into the multitude of opportunities, challenges and areas arising in the rapidly evolving general insurance industry.

The half-day seminar was jam-packed with thought-provoking and eye-opening content spanning eight presenters over three Plenary sessions and a riveting keynote address. The event was well attended, with the 100 delegates and presenters filling The Forum of the Institute's Sydney offices, reflecting the appeal of the event to the target audience.

Our very own president, Estelle Pearson, was the master of ceremonies for the event and welcomed the delegates and presenters before introducing the keynote address which was a highlight of the afternoon for many.

The keynote speaker, **Steve Cratchley** (pictured left), Advanced Technology Pricing Manager at Suncorp presented a fascinating address on **The Cars of the Future**. A specialist in future technologies, Steve highlighted the rapid technological advancements that have been occurring in the autonomous motor vehicle technology space. The address was fascinating and considered the wide-ranging impacts autonomous technology could have on the motor vehicle insurance industry, with initial estimates of possible reductions in claim frequencies of up to 60% and likely reductions on claims severity. Most interesting of all, perhaps, was just how close we are to being able to experience this technology, with suggestions that semi-automated cars could be on our roads in the next decade and that sometime in the not so far future, manually driven cars could become a relic of the past as did the horse and carriage of earlier years. The delegates were intrigued, if not positively frightened, as Steve described his experiences as a passenger in an experimental semi-automated vehicle in

Germany as he held tightly to his seatbelt, being transported at high speeds on a busy road by a car with no driver at the wheel.

"…sometime in the not so far future, manually driven cars could become a relic of the past as did the horse and carriage of earlier years."

The first Plenary focused on the general insurance landscape as well as the outlook for the future. **Andrew Cohen**, from Finity Consulting presented the delegates with a glimpse into the **Industry Outlook on Profit and Growth**, highlighting the strong currents that will be faced by some segments of the industry in the future. Continuing the theme of looking forward, **Warren Dresner** from Willis Re illustrated the **Emerging Risks, Emerging Opportunities** that have presented themselves in the General Insurance space. By learning from risks which have emerged in the past, Warren outlined how some of the possible emerging risks (Cyber Liability, Climate Change, the 'Internet of Things' and many others) could have broad ranging impacts on the industry. He also described how these risks might be addressed in the future and how the industry may be able to turn these risks into opportunities. **Mitch Prevett** from Quantium rounded out the first Plenary with an introduction to Big Data and highlighted how actuaries can harness their unique skills and the ever growing big data ecosystem to provide tailor made solutions to questions that have not been able to be answered before.

Plenary 1 Speakers

Andrew Cohen presents on GI Industry Outlook on Profit and Growth,


Deputy CEO Elayne Grace in conversation with Sharanjit Paddam who presented on 'Five things Insurers Can Do About Climate Change'

The second Plenary was focused on **Five things insurers can do about Climate Change**, presented by **Sharanjit Paddam** from Taylor Fry. Sharanjit provided a wealth of insights into the activities that that insurers can do in response to the concern of climate change. The Plenary highlighted a highly interesting topic area that could have broad ranging impacts on the general insurance industry in the future.

The third and final Plenary focused on the skills for tomorrow that will be required of today's young actuaries. The work involved in **Capital modelling and ICAAP** is an area of great interest to young actuaries and provides a holistic approach to consideration of the risks faced by general insurers. **Irene Yiu** from QBE shared some of her experiences and the various used of capital modelling and the ICAAP process in answering some of the difficult risk questions that insurers ponder.

Richard Gibbs from Tokio Millenium Re then shared his insight into the **Skills for Reinsurance** that are required of young professionals navigating the reinsurance market. **Justin Ho** from IAG rounded out the day with his talk on **The Perilous journey to Perils Pricing**. From Hailstorms to Earthquakes to Meteor showers, Justin emphasised the importance of "knowing your perils" and gave a glimpse into how the actuarial skill-set can be applied in the area of modelling perils in an environment of limited data and significant risk.

The afternoon concluded with vibrant discussion at the networking drinks as the delegates, presenters and industry representatives continued their conversations on the various topics discussed at the seminar.

On behalf of the organising committee, I'd like to specially thank all of the speakers for their stimulating presentations as well as Liz Gemmell and Emma Simonson from the Institute's events team who did an excellent job orchestrating the finer details and organisation of the event. It would be wonderful to see more events of such a high calibre being available to young actuaries in the profession in the future.

For more event photos and to download event presententaions, head to the GI Glimpse microsite.

The six principles of influence and how to make them work for you

By Edward Vukovic *()*

Whether you're trying to sell a product or, harder still, an idea, the ability to influence those you're speaking to cannot be underestimated.

Change is scary and people are naturally hesitant when asked to follow something or someone they're not sure of. This makes influencing others challenging, regardless of whether your product, process or concept is the best course of action.

Understanding the psychological principles behind the influencing process can help us better apply tactics to influence others, while also seeing through those trying to influence us.

In 1984 Robert Cialdini, Regents' Professor Emeritus of Psychology and Marketing at Arizona State University, published what he called the 'Six Principles of Influence' in his book *Influence: The Psychology of Persuasion*.

During his extensive studies, Cialdini spent time with skilled practitioners in the art of persuasion and influencing, such as brokers, salespeople, fundraisers, recruiters, advertisers and marketers, and found that there are six fundamental principles to influencing others. The six principles are outlined below.

1. Reciprocity

While there are always exceptions, most people tend to return favours given or pay debts, and try to treat others as they are treated. Cialdini found that the notion of reciprocity often makes us feel obliged to offer concessions, discounts or support to others if they have offered them to us. His research determined that we are uncomfortable feeling indebted to others.

For example, if a colleague helps you with a challenging project or task, you will probably feel obliged to support their ideas for implementing new risk management processes. Another example is a customer being more inclined to purchase a product if they have been offered an aggressive discount. Or you might be more inclined to go the 'extra mile' in helping someone if they have offered you a token gift or simply been pleasant to you.

Identify your objectives and think about what you want from the other person. Understanding your need will help you identify what you can give to them in exchange. It can be something as simple as reminding them that you've helped them in the past, or that a previous product was beneficial to them. Then follow up with further reciprocation — highlighting your willingness to assist them will go a long way toward them trusting and, in turn, helping you.

2. Commitment (and Consistency)

Cialdini says that we have an inherent need to be consistent and, consequently, once we commit to something we're inclined to see it through. This principle flows on from the idea of reciprocation, in that a colleague or manager would probably be more likely to support your proposal for process changes or product development if they had shown interest when you first mentioned the idea.

It is essential to get people's commitment early on, either verbally or in writing. If you're building support for process improvements or a new project, discuss your ideas early on with stakeholders, and make sure you take their views on board.

If you're selling a product, offer an incentive or make it easy for people to change their mind once they've bought it. Buying the product is the early commitment, even though they have the right to return it if they want.

3. Social proof

Otherwise known as 'safety in numbers', Cialdini suggests that people are more likely to do things if others are already doing them. For example, we're more likely support an idea if other team members are doing the same; buy a product if we know others have already bought it; or eat in a restaurant if it's busy. Humans, being communal creatures, are particularly susceptible to this principle. We're wired to believe that if a lot of people,

particularly those who are familiar or similar to us, are doing something then it must be OK, and if we're feeling uncertain our vulnerability to influence increases dramatically.

Social proofing in practice is the art of creating a buzz around your product or idea. If you need support for a project, gather support from influential people in your organisation before pitching it to the decision makers.

When selling a product or service, highlight the number of people using it, rather than the fear of not using it. Using relevant testimonials from people familiar to your potential customer, case studies or social media interaction will foster a different kind of fear in your client — the fear of missing out.

4. Liking

Reflect on your work relationships for a moment. If you're in a room with people you like and others you don't, who would you side with? The odds are you'd side with those you like, even if you don't necessarily agree with them.

Likability comes in many forms — people might be similar or familiar to us, they might give us compliments, support and encourage us, or we may just simply trust them. Cialdini tells us that we are naturally predisposed to be influenced by people we like, and that people will be more likely to buy from or follow people like themselves.

Developing your emotional intelligence and active listening skills are integral to building good relationships. Ensure you put in the time and effort required to build trust and remain consistent, and remember that every person is different and relates to people in different ways. Ultimately don't try too hard to be liked or you'll come across as disingenuous and this will do you more harm than good.

5. Authority

We are taught to respect authority from an early age, and as we grow into our careers we develop a sense of duty or obligation to people in positions above us. Authority can take many forms, and each of us views it differently. From job titles, uniforms, educational background, knowledge and experience, or even the things we own, authority, according to Cialdini, is an important factor in determining how likely people will be to respond to your ideas or requests.

Find which aspect of authority is most respected by your target audience and your ability to influence them will be greatly increased. If you're trying to get an idea off the ground, garner support from influential and powerful people and ask for their help in backing you.

When selling a product or service highlight well-known and respected customers, use research and statistics, and gather comments from industry experts or government sources. Also take care in how your information is presented – the more professional your material, the more authority people will place in both you and your product.

6. Scarcity

The sixth and final principle works on the notion that things are more attractive when their availability is limited, or the opportunity to get something at a good price is fleeting.

In practice, people will be more likely to buy a product if they're told it's the last one available or that a special offer will expire. Set a closing date for an offer or create customised products just for them.

The fear of missing out is a powerful motivator, even within organisations. People will be more likely to get behind an idea if they're told there's only a short window for success or if delays will come with dire consequences.

With Caldiani's principles in mind, it becomes easier to appreciate the value of understanding your customer or target audience and to use your newfound knowledge to influence them accordingly. However, be careful when following these principles, as it can be easy to use them to mislead or deceive people, or to appear calculating. Honesty is always the best policy.

NBA article slam-dunks 'most read' list

By Stephanie Quine *(stephanie.quine@actuaries.asn.au)*

What do Uber, Alan Joyce and Algo-advisors have in common? They all feature in the Top 10 most popular articles on Actuaries Digital since its launch.

A student who used actuarial modelling to correctly predict the outcome of the 2015 NBA Championship has taken out the top spot in the top 10 'most-read' articles on Actuaries Digital so far. UNSW actuarial student Murali Logendran's article, 'Predicting the 2015 NBA Championships' received 1,185 unique views, followed closely by Deloitte Partner Stephen Huppert's 'You can Call Me AI' yarn (1,090 views) on the value of 'robo-advisors', or as he deems them 'algo-advisors'.

Actuaries Digital celebrates its six-month birthday this week. The site officially launched on Friday 17 April when the first of its weekly e-newsletters was distributed to members.

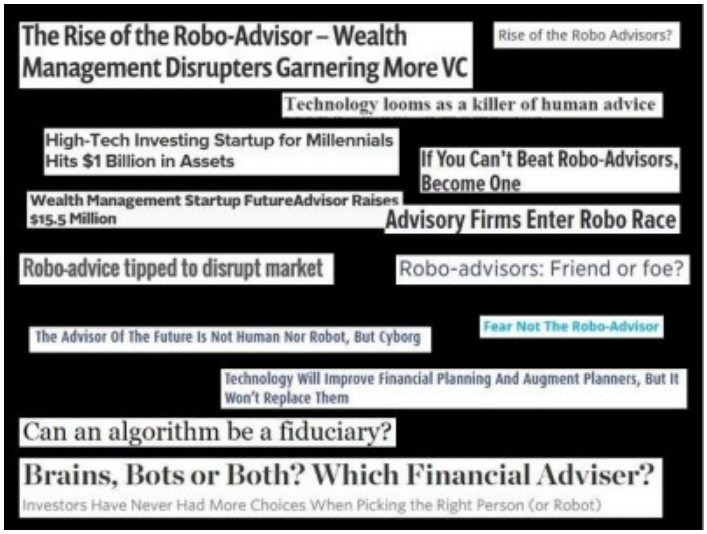
Since then it has garnered 52,479 'unique page views' or individual visitors altogether, who have spent an average of almost two and a half minutes on the site.

Top 10 'most read' since launch:

1. Predicting the 2015 NBA Champions – Murali Logendran
2. You Can Call Me AI – Stephen Huppert
3. On Clouds of Data – Alan Joyce on Steering Qantas – Alan Greenfield a Quine
4. Is There an Uber Future in Australia? – Catherine Weston
5. It's Official, Being an Actuary Is the Best Job – Estelle Pearson
6. Three Actuarial Success Stories – Rob Paton
7. 6 Exam Tips to Ace Actuarial Studies – Kirsten Flynn
8. From Big Bang To Data Transformations – Amanda Aitken and Yifan F
9. Disability Income: The Price Is Not Right, Nor Is The Product – Brad L
10. I am an Actuary – Angelika Fleer, Kelly Lee, Hao Qiu, Murray Staff, Da and Jeremiah Cheung

'WELL-READ COMPETITION': to celebrate Actuaries Digital's six-month birthday, the top three 'most read' article authors will each receive a $50 Dymocks voucher

"It's great to see that all the hard work of the committee, contributors, and HQ are paying off with a higher readership since our move to digital. Right now



we have a thriving platform for actuaries to demonstrate their thought-leadership and increase the influence of the profession both today and into the future." said Actuaries Digital Chief Editor, Sharanjit Paddam.

The third most read piece (1,044 views) since launch was Alan Greenfield's interview with Qantas CEO Alan Joyce. In collaboration with myself (behind the camera), Alan (G) visited Qantas HQ in Mascot in November last year to meet the approachable CEO, who openly shared thoughts on his personal career journey, as well as big data and disruption in airline industry; mathematics and business leadership; and work life balance and social influence of CEOs for an article and three part video series (now featuring on the Institute's YouTube Channel).

Coming in a hot fourth was Catherine Weston's piece on Uber and its unique implications for the insurance industry, followed by President Estelle Pearson's column on the coveted US survey that identified 'Actuary as the number 1 best career option for 2015', listing a good hiring outlook, excellent pay and decent job satisfaction as the key reasons for this ranking.

This site also showcases the quirky and fun side of actuarial skills used, for example, to predict the winner of the public glitter-fest phenomenon that is *Eurovision*; the best strategy for winning Tetris; or solving a Singapore maths problem that's "gone viral". We're also looking forward to covering the experience of actuaries running for parliament in the next election and others planning to set up online gambling sites.

The site features a wealth of leadership, study and career insights, tips and tricks from actuaries at all stages of their career. 'I am an Actuary' and 'Under the Spotlight' are regular features of the online magazine that attract strong readership for their uniquely personal insight. 'In the Margin', a puzzle competition compiled by Genevieve Hayes each month, also consistently features as a favourite read for the profession in Actuaries Digital.

Fancy yourself a writer? Contribute to Actuaries Digital

The editorial committee and Chief Editor remain instrumental in connecting internal Institute and external industry-related content to Actuaries Digital's now continuous online publishing cycle. But, they need YOU to keep the site rich in stories and proactive in examining issues affecting actuaries and the industries they work in. If you have an idea for an article or would like to report on an interesting presentation you've given yourself or heard from somebody else, or want to be on our list of potential writers, please get in touch with us at ActuariesMag@actuaries.asn.au. The editorial committee welcomes new members and is always keen to work with you to shape article ideas and help get your thoughts and ideas published.

Top 10 in Q1 (April 17 – July 17)

1. Predicting the 2015 NBA Champions – Murali Logendran
2. On Clouds of Data – Alan Joyce on Steering Qantas – Alan Greenfield
3. It's Official, Being an Actuary Is the Best Job – Estelle Pearson
4. You Can Call Me AI – Stephen Huppert
5. Is There an Uber Future in Australia? – Catherine Weston
6. 12 Things Good Bosses Believe – Trang Duncanson
7. From Big Bang to Data Transformations – Amanda Aitken and Yifan F
8. 6 Exam Tips to Ace Actuarial Studies – Kirsten Flynn
9. Viral Singapore Math Problem – Aaron Isaac
10. Appointed Actuary Role Review – Sharanjit Paddam

'WELL-READ COMPETITION': The top three 'most read' article's authors each quarter will receive a $50 Dymocks book voucher. Congratulations to the winners!

Top 10 in Q2 (July 17 – Oct 17)

1. Three Actuarial Success Stories – Rob Paton

2. 6 Exam Tips to Ace Actuarial Studies – Kirsten Flynn

3. Disability Income: The Price Is Not Right, Nor Is The Product – Brad Louis

4. I am an Actuary – Angelika Fleer, Kelly Lee, Hao Qiu, Murray Staff, Dan Wang and Jeremiah Cheung

5. Why future generations depend on us rethinking the old age pension – Stephanie Thompson

6. Talking bout' her generation – Stephanie Quine

7. Half time reflections on an actuary's contribution and his understanding of the social algorithm – Kitty Leung

8. Letter to the Editor – Chris White

9. Under The Spotlight – Ignatius Li

10. SKL actuarial salary survey 2015 – Jenny Lyon

The editorial committee, and HQ Communications and Marketing unit would like to sincerely thank all contributors to the site so far for enriching the profession through thoughtful reflection and analysis on current and interesting issues of relevance to actuaries and the industries they work in.

Missing persons, missing data

By David Jenkins *()*

Following on from Missing Persons Week last month, in this month's guest editorial, David Jenkins provides a personal view on missing persons in Australia.

How do I start writing on a topic that's intensely personal, that has affected my family for much of my life? An issue that is widespread yet is largely hidden from public view. Naturally as an actuary I start with the stats, or at least I try to.

Around 35,000 missing person reports are made in Australia each year. NSW Police defines a missing person as someone reported to police where fears exist for their safety or welfare. Thankfully 99.5% of missing persons are located, mostly within a week. However, there remain about 1,600 people in Australia who have been missing more than six months.

Data on Australian missing persons is patchy. Even a simple count of the number of people who go missing isn't actually simple: police data is inconsistent, some people go missing more than once, and some groups are prone to underreporting; particularly the young, homeless, intellectually impaired, Indigenous Australians and LGTBI people. Some missing person reports omit key details, particularly when child abuse or domestic violence is involved. The lack of quality data impedes research and analysis.

"More than a quarter of missing persons have mental health problems. Persons over the age of 65 are more likely to go missing after becoming lost, suggesting the involvement of an age-related impairment."

People go missing for a variety of reasons. Some people choose to go missing to escape or suicide. Others drift away. Yet others are involuntarily missing whether by abduction, accident, mental illness or homicide. In some countries, conflict and civil unrest is also a major driver.

Of those reported missing each year in Australia, around two thirds are young people. Teenagers aged 13-15 years are the highest risk group and girls consistently outnumber boys. Mostly they are runaways and are found at a friend's home. However some teens are told to leave by a parent. Other missing young people are abducted, usually by someone known to them. Risk factors identified for young people going missing include "domestic violence, family conflict, child abuse, neglect, school problems such as bullying, problems with peers/teachers, illicit drug/alcohol use, mental health issues, racism and poor coping skills."[i]

For missing adults, little statistical information is available. Mental health issues, alcohol, drugs, family dysfunction and gambling are key risk factors. Risk factors for missing adults who suicide include being male aged 41-65, married and/or with children, with stressors. Missing adult victims of foul play are typically female aged 18-25, single and without children, last seen in a public place, on a summer Saturday night, for whom being missing is out of character.

"The high number of reported missing persons makes it challenging for police to correctly identify those cases requiring a more urgent and intensive response."

More than a quarter of missing persons have mental health problems. Persons over the age of 65 are more likely to go missing after becoming lost, suggesting the involvement of an age-related impairment. This is growing area of concern given demographics shifts in Australia.

The high number of reported missing persons makes it challenging for police to correctly identify those cases requiring a more urgent and intensive response. In making their assessment, police consider the person's age, the likelihood they will harm themselves or others, and whether the behaviour is out of character.

Public awareness tends to focus on individual missing persons rather than the broader concept. Particular cases are highlighted by the Amber Alert system for abducted children at risk of harm, and police cooperation with television programs. Missing Persons Week, held in the first week of August, raises general community awareness, publicises recent cases and freshens the names and memories of the long-term missing. Some of those names were once high profile although most have since faded. Others never had much of a profile to begin with. They are all missed by those close to them.

How should you respond to a missing person? Remember that it's not a crime to go missing; indeed some may be victims. If you know the whereabouts of a missing person, tell police. Don't go directly to family or friends as the missing person may have

escaped circumstances of which you are unaware. If someone you know goes missing don't wait 24 hours to report it, particularly if disappearing is out of character.

For me, there is one particular missing person that personalises these various statistics and risk factors. Lynette Dawson was reported missing in 1982. Lyn lived on Sydney's Northern Beaches, was a nurse in a children's centre, a loving wife and devoted mother of two very young daughters when she vanished. She is also my mum's sister – my aunt. Lyn's disappearance has had ongoing deep effects on all those close to her, particularly her children, my cousins. Two coroners have declared Lyn dead, with a known person having committed an indictable offence. Lyn remains a missing person.

I hope none of you ever have someone you care for go missing. I hope you will keep your eyes open for the missing, and be a voice for those who can no longer speak for themselves.

If you have any information on a missing person call Crimestoppers on 1800 333 000 or your local Police.

Information sources:

Australian Federal Police: http://www.missingpersons.gov.au/

Australian Institute of Criminology http://www.aic.gov.au/crime_community/communitycrime/missingpersons.html

Biographical details of long-term missing: http://www.australianmissingpersonsregister.com/ and more recent missing https://www.facebook.com/austmissingpersons

[i] Henderson & Henderson 1998, quoted in "Trends and Issues in Criminal Justice No 353, Missing Persons in Australia" by Marianne James, Jessica Anderson and Judy Putt, Australian Institute of Criminology March 2008

Three Little Pigs lesson in Disaster Resilience

By Jon Harwood *()*

Jon Harwood reflects on winning the Guy Carpenter Prize with a 'Three Little Pigs' analogy highlighting the importance of a successful disaster resilience framework.

My adventure to the other side of the world started with writing up a 200 word response (see below) to the question **'What are the top 3 barriers to implementing a successful disaster resilience approach/framework and why?'**.

I was very chuffed to have won and I later asked how many entries there were. I was somewhat deflated to hear that there were only 12 entries! To be honest, there aren't too many competitions out there that give you a trip to the other side of the world, two weeks expenses paid accommodation, sightseeing and a reinsurance conference with such good odds!

The Guy Carpenter Asia Pacific Reinsurance Conference had everything you could ask for in a RI conference and more. It had the perfect mix of reinsurance theory and current practice, content and entertainment, and an eccentric RI broker with a wealth of experience thrown in for good measure! The conference ran for two weeks, with the first week set in Cambridge and the second week in London.

There were many highlights, such as presentations from experts in the UK RI industry, the Lloyds tour, networking with other professionals from across Asia, a punt ride along the river Cam, going out to the theatre in the West End and a dinner in front of the London Tower Bridge.

However what made the conference unforgettable for me was the first class service from the Guy Carpenter team. They made the conference special with their hospitality and great company throughout.

Some more novel learnings that I got from the course and tips for future winners include the following:

- Take a set of business cards with you! Nothing more awkward than starting a business card ritual with Asian business people only to say 'sorry, I'll email you instead'!
- Gampei! I believe that is Chinese for 'bottoms up'. On a related note, be mindful that accepting a Chinese rosè toast

means mixing a glass of red with a glass of white and sculling both. Maybe that was a consequence of the first learning…
- Don't poke fun at British actuaries, they might not get the joke.
- I'd like to thank Mark Kimberley, Alex Mendel, Jo Roman and rest of the committee from RDG for offering the scholarship and giving me the amazing opportunity. It was a special trip filled with many fond memories.
- Finally, I encourage everyone with who has an interest in RI to get involved in the next scholarship competition, the odds are great and it is definitely worth it!

Three Little Pigs, a Disaster Resilience Perspective.

The first pig cut corners and didn't bother purchasing a 'genie wish' to restore his straw house in a wolf catastrophe. He thought the 'wish' was a rip off as there hadn't been a wolf in 20 years. If anything did happen, there was always the fairy govtmother – she's given bailouts in other fairytale disasters.

The second pig believed his stick house would hold in a severe huffing and puffing, not realising that his property wasn't up to scratch with revised building codes. He purchased a 'genie wish', but didn't realise that his wish didn't cover flooding.

The third pig, a wolf engineer, understood the wolf loads properties should be designed to. He upgraded his pre-wolf code property to brick and even installed a cauldron in the fireplace to prevent wolf ingress. Unfortunately, the Genie couldn't give reduced premiums for his effort because he didn't have enough data or system capability to do so.

The morals are that improving the community and insurer understanding of risk, developing a coordinated effort across government, insurer and industry partners and putting incentives for behavioural change are needed to successfully implement a disaster resilience framework.

When you need clarity in a complex world, you need an Actuary

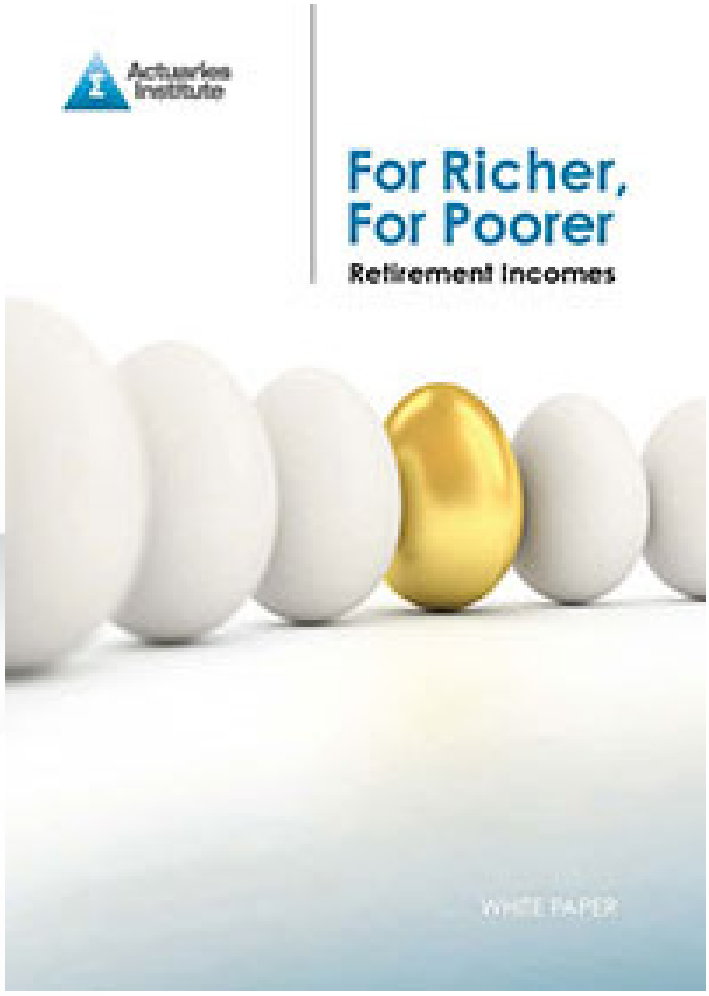
By Katrina McFadyen *(katrina.mcfadyen@actuaries.asn.au)*

The Actuaries Institute has launched the 2015 '*See what we see*' campaign to promote the profession across a range of targeted media channels, coinciding with the launch of a new White Paper 'For Richer, For Poorer'.

The 2015 *See what we see* campaign to promote the profession to C-Suite, senior HR professionals and recruiters launched on Friday 4 September and will run until Sunday 4 October.

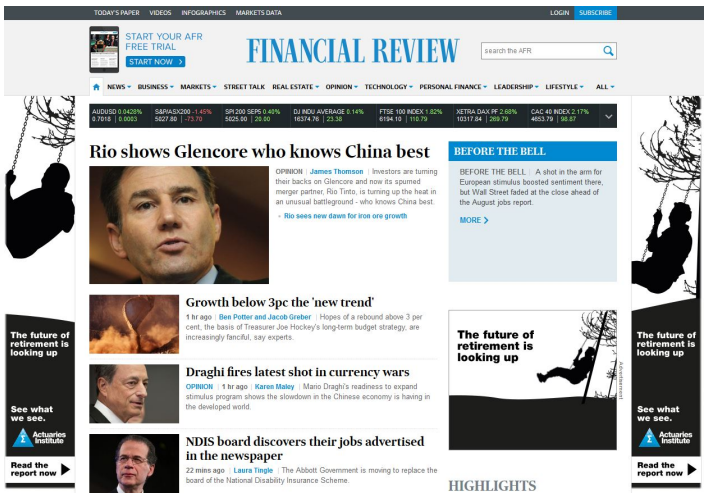
The campaign will continue to build on the concept of demonstrating the value actuaries bring to business, government and the community and will run across a range of digital media platforms.

The case study for this campaign leverages from the Institute's recently launched White Paper on retirement incomes 'For Richer, For Poorer'.



In preparation for this roll-out the campaign website has been enhanced to include the new case study, additional animation

and a series of videos featuring Actuaries Andrew Boal, Michael Rice, Elayne Grace and Nathan Bonarius.



The campaign kicked off with 'takeover' adverts on AFR online between 4 and 6 September.

A series of LinkedIn posts will also run for the duration of the campaign, targeting business executives.

For the remaining advertising inventory we are purchasing 'audience buys'.

This means that rather than buying advertisements on specific sites for a set duration, they will be purchased where people who fit our target audience are visiting. Therefore, our adverts will potentially appear on sites such as BBC, Fairfax, CIO, CFO, The Australian (and many more).

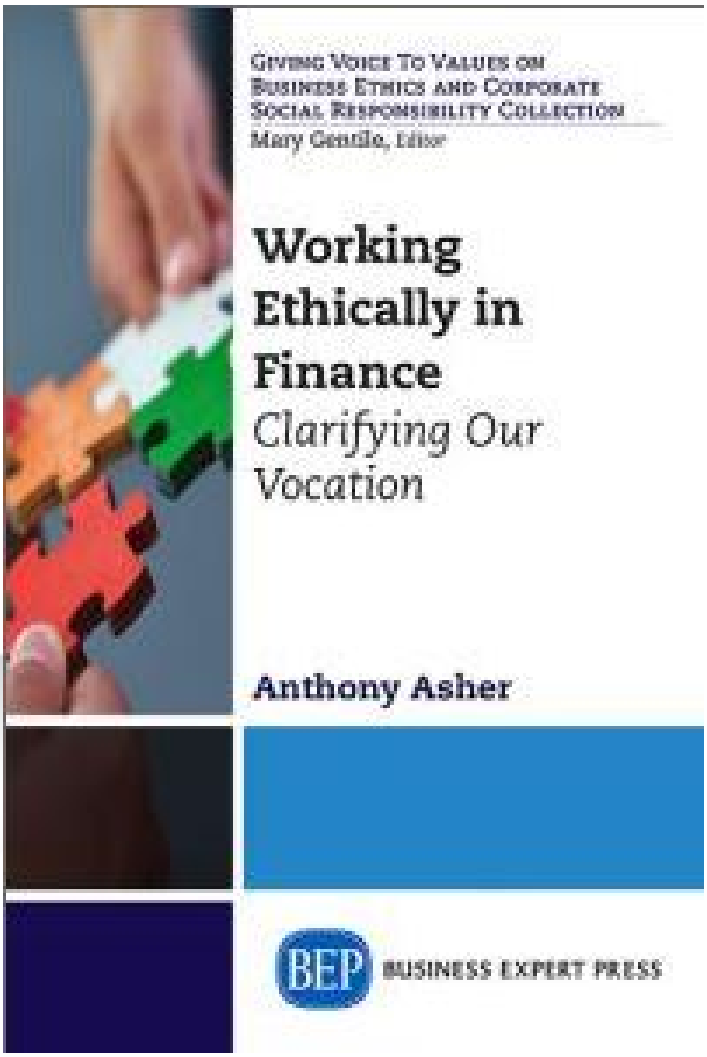
Members' feedback on the campaign is very welcome as always.

Book Review: 'Working Ethically in Finance: Clarifying Our Vocation'

By Chris White *(cjwhite46@yahoo.com.au)*

Anthony Asher's new book is a valuable read for actuaries and all those aspiring to cultivate wisdom, self-control, and courage. Chris White reviews 'Working Ethically in Finance: Clarifying Our Vocation'.

This is a wide-ranging book, demonstrating the breadth of both the author's reading in and beyond the finance sector and his active engagement with a range of the sector's important ethical issues. It is a book all actuaries should read and actively discuss as part of the profession's CPD program. It should be compulsory reading for new actuaries attending the Professionalism Course.



To give an overview and response, I can do no better than repeat Asher's chapter headings, which I follow with a few rather disparate comments.

PRELIMINARIES

1 Vocation and Virtues
I agree with Asher that the four classical virtues (self-control, justice, courage and wisdom), widely affirmed by faith traditions and secular humanism alike, are helpfully encapsulated in the notion of integrity, which should be the foundation of a profession and professional behaviour.

2 What is Not Covered
While wholeheartedly agreeing with Asher that virtues are developed in the context of practice, they need deep intellectual foundations to be sustained and promulgated. However his dismissal of both deontological (or duty-based) ethics and teleology (generally utilitarianism) is somewhat cavalier; the former is fundamental to most religious traditions (including his own), and the latter frequently underlies social ethical decisions (particularly in business and government) in secular (actually, pluralist) societies such as Australia. Virtue ethics needs both deontology and teleology, in varying degrees depending on the circumstances, to reinforce values with consistency and substance.

"'Physics envy' has persisted amongst economists since the eighteenth century: are actuaries also guilty of over-valuing mathematical models? "

3 An Overview of the Finance Sector
The fundamental purpose of the financial system as servant to the community's need to match assets/savings/income with liabilities/capital/housing indicates how far Wall Street's "masters of the universe" have been allowed to range beyond their proper roles and beyond what their expertise actually supports. Asher's endorsement of Braithwaite's case for a circle of mutual responsibility for regulating the system – the law, government regulators, professions, industry bodies, academics – is appealing, but how to implement?

CLARIFYING JUSTICE

4 My Personal Experience
Asher's recounting his experience in the South Africa, and some of the choices he made to engage with what he viewed as both social and financial sector equity issues (e.g. apartheid and black people's poverty, and inequitable vesting in defined benefit pension schemes, respectively) made me question my own choices as an Australian who has had a privileged life. Have I been as forthright as I could have in areas where my conscience troubled me? Asher discusses openly the role his faith has played in these choices, including those where he now questions what he did. I salute his openness and self-examination.

5 A Model of Justice
Asher mentions applying his justice model to a variety of actuarial issues (e.g. pension fund withdrawal benefit design, and differential insurance premium rating) as well as broader social questions (e.g. the provisions of the South African Constitution, and the remuneration of public representatives (including MPs)). The application of a consistent justice model across the range of one's interests in social ethical questions is appealing. (Space prevents my mentioning many other interesting issues he covers.)

6 Injustice in Finance and Economics
Asher cites Adam Smith to (rightly) debunk the idea of value-free economics.
"Physics envy" has persisted amongst economists since the eighteenth century: are actuaries also guilty of over-valuing mathematical models?
Asher's extended discussion of rent-seeking – in life insurance, investment banking, executive remuneration, etc – uncomfortably but validly challenge our professionalism.

THE PURPOSE OF FINANCIAL SERVICES

7 Investment Management
Asher appears to attribute to hard-nosed actuaries the questioning of over-optimistic estimates of equity risk premia by ivory tower academics. Actuaries are a small part of the financial sector and are not alone in this concern; see, for example, Copeland, who estimates an equity risk premium of between 3% and 4%. With the present market shake-out, no doubt there'll be plenty more asking hard questions.

On performance measurement, I agree with him that investment committees typically get more general economic commentary from investment managers than hard analysis of actual results – they should push back.

Finally, (and there's lots more of interest here) passive investment managers track markets at low cost, but need active managers focused on fundamental analysis, etc to help keep markets reasonably efficient, but with the downside of high management fees (which exploit the hope which springs eternal, despite at least half of active managers underperforming the market, especially after expenses!).

8 Insurance and Pensions
Mis-selling – or as Asher calls it, hard selling – seems to be often the result of poor product and sales remuneration design, as much as dysfunctional sales management and poorly trained salespeople. Efficient economic structures are those which produce desired results from enlightened self-interest (to use the famous phrase derived from Adam Smith), and managements (including actuaries) bear part of the responsibility for mis-selling.

It's interesting that in the last few decades life insurers have been replaced by superannuation funds as the main category of mutual financial institutions. If competition between superannuation funds becomes more intense, will we see the same capital needs arguments being advanced for their demutualization? If so, will it be without the subtext of enriching the current generation of managers, advisers, etc which Asher points out was a significant factor in the life insurance cases?

9 Banking
Among the many points which could be made on Asher's discussion and recommendations, I raise the question of how the excessive scope and influence of banks could be curbed without creating other problems. Should some limitations on the scope of banks be introduced: a modern version of the former US Glass-Steagall Act, for example separating "mum and dad" banking from riskier investment banking activities, thereby limiting the "too big to fail" problem?

"…seeing vocation and career as more than making money…also helps in the transition into an engaged life post full-time work."

10 Regulation

I make just two points on Asher's generally insightful comments on regulation:

- There is a strong human tendency for those injured in a catastrophe to want disproportionate punishment of those perceived to be to blame, and while his reintegrative shaming (prompt recognition and correction of shortcomings, and prompt forgiveness of offenders) may be appealing in some circumstances, it requires strong structures with a measure of independence from immediate public pressures to sustain it;
- His reference to "the rogue nature of the Arthur Andersen culture, worldwide" (in the context of a particular ethical failure within Andersen) seems too general – while there were significant ethical problems within parts of Andersen, there were also individuals and areas within the firm behaving to high ethical standards (see 2003 Harvard Business School

case study 9-103-061). The point of the Andersen case is that even a broadly ethical organization can be brought undone if the internal control mechanisms are inadequate to stop rogues doing irreparable damage.

11 The Poor

While I take Asher's point that sometimes micro-finance can help keep poor people (mostly men) out of the formal economic system with its advantages of division of labour and economies of scale, the MFIs which focus on women's small enterprises in countries with under-developed economies, and which use community pressure to keep defaults low, are performing a very useful service in alleviating poverty and providing meaningful engagement.

PREPARING YOURSELF: FINDING A VOCATION

12 Passions and Virtues

I welcome Asher's discussion of the important issue of how young people in the critical developing years (during tertiary education and early professional life) can have the courage to stand apart from destructive cultures (such as binge drinking). From experience, seeing vocation and career as more than making money, as well as providing deeper meaning during one's working life, also helps in the transition into an engaged life post full-time work.

13 Developing Our Strengths

It is refreshing in a book such as this to read discussion of such practical issues as handling supervisors and managers who are bullies, and coping with the occasional failures encountered when stepping outside one's comfort zone. Asher also mentions the role the reflective aspects of the religious traditions, as well as secular counselling and advice services, can help anyone in gaining deeper self-understanding as well as dealing with difficult issues in one's working life.

14 Serving Society's Needs

The extent of observed relative commitment and service in Asher's three communities (family (broadly defined), political, and work) varies culturally – for example, in some cultures family tends to trump the others; in others work tends to dominate. Finding an appropriate balance, and applying a consistent ethical outlook across all three provides the path to the goal of a life well lived.

As will be clear to the reader who has persisted this far with this review, Anthony Asher's book is a very broad-ranging discussion of issues of interest to anyone wanting to engage thoughtfully and ethically with the financial sector. It is of particular interest to actuaries, to whom I warmly commend it.

Survivorship Bias

By Ben Trollip *(ben.trollip@towerswatson.com)*

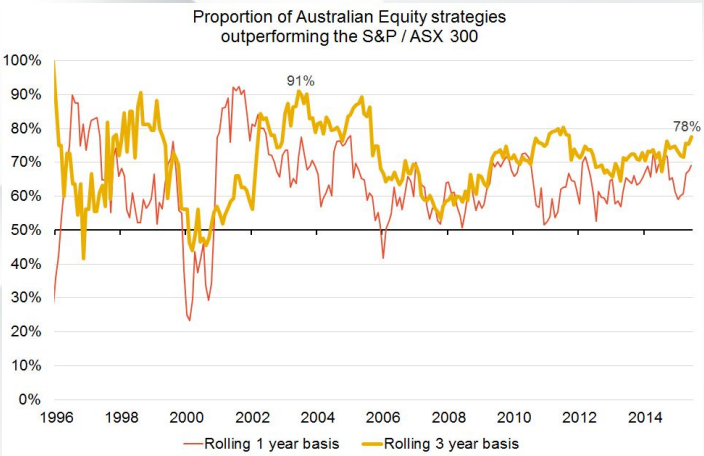
How accurately do performance databases reflect competing investment strategies? Ben Trollip looks at the bias towards strategies that have, by luck or skill, successfully navigated past crises.

Here's a question to test your knowledge of the Australian equity market; what proportion of investment strategies have outperformed the index over the last three years?

If you guessed a number close to 50%, you're on solid theoretical ground. It is generally accepted that about half of all active strategies will outperform, while the other half will underperform. After all, in a closed system, for every winner there is a corresponding loser[1]. However in this instance, you would be far away from the actual answer.

If we look at the universe of active Australian equity strategies according to eVestment[2] over the three years to 30 June 2015, a whopping 78% have outperformed the S&P/ASX 300 index. Moreover, this is not extraordinarily high for this statistic. In the three years ending 30 June 2003 the figure peaked at 91%. In other words, nine out of ten strategies were ahead of the index!

As can be seen from the following chart, it is rare for this statistic to drop below the theoretically pure 50% mark. Taken at face value, this chart would argue that most strategies outperform the index most of the time.



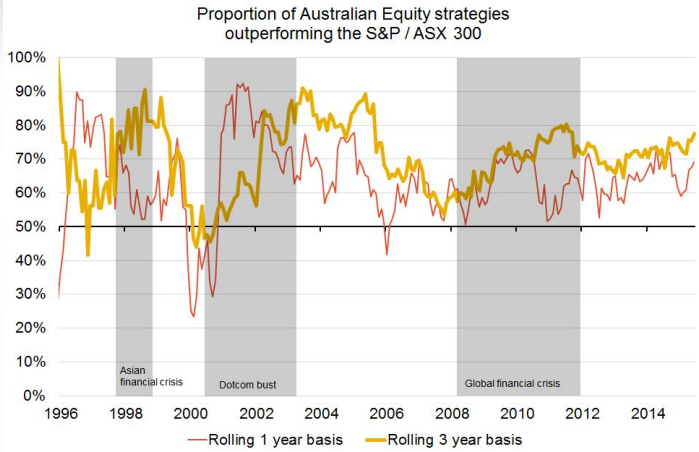
This is clearly nonsense.

What this chart is actually telling us is that of the strategies still submitting performance data to this database today, most have outperformed the index over most time periods. This makes much more sense. It is the successful strategies that have "survived" to today and therefore continue to add to their performance histories.

This characteristic is often described as **survivorship bias** – a type of selection bias that is especially pernicious in the investment management arena. After all, it is hard to market a strategy that has persistently lost money and therefore these underperforming strategies are more often than not the ones that close down and drop out of performance surveys. Put another way, performance surveys often do not accurately reflect the entire universe of competing strategies through history.[3]

Arguably it is even more interesting is to note the peaks and troughs in the chart. There seem to be distinct periods where the majority of the universe has performed well. For example, from mid-2009 to mid-2011 roughly 70-80% of the universe consistently outperforms on a rolling three year basis.

If we highlight periods of market stress[4] some patterns begin to emerge.



Allowing for the trailing nature of the data[5] it is not hard to argue that the highest peaks tend to coincide with the periods of market stress. In particular, as noted above, the gold line stays elevated through the GFC, indicating that the majority of strategies that are still around today are those that consistently outperformed the market in this period. Many of these strategies will have been run by highly skilled investment managers but a subset will have simply been those that "got lucky".[6]

This analysis partly explains why it pays to be wary about using past performance to assess investment manager skill. It is fairly well-known that performance databases can be subject to survivorship bias, but the analysis above seems to suggest that over and above this there is also a bias towards those strategies that have, by luck or skill, navigated previous crises successfully.

Whether as many will survive the next crisis remains to be seen.

[1] Although we are making a number of assumptions in this theoretically pure world, including the fact that the benchmark captures the entire investible universe. This is not necessarily true because off-benchmark positions can be held by many strategies. This would include stocks outside the index and cash.

[2] The universe has been sourced from eVestment and comprises all strategies classified in the "All Australian Equity" category.

[3] eVestment, like other performance databases, combats survivorship bias by retaining the performance of strategies that have stopped submitting performance data. In this analysis we have included strategies within eVestment's database that are marked as "inactive", so our sample incorporates some strategies that have not survived to present day.

[4] We have picked out the approximate dates covering three periods of "pain": (1) July 1997 to August 1998: Asian financial crisis and Russian financial crisis, (2) March 2000 to March 2003: Dotcom bust and September 11th attacks, (3) January 2008 to January 2012: Global financial crisis and aftermath.

[5] That is, that performance through the period of stress will take some time to be expressed in the rolling one and three year figures.

[6] It is also worth remembering that there is a natural boost to relative performance in "bear" markets for strategies that can hold cash. In practice, most managers will have at least a small portion of liquidity in their portfolios.

I am an Actuary

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

Deciding which direction to take your career path in can be tricky, especially when faced with the mysterious intersection of mathematics, insurance and actuarial studies. We asked six qualified practitioners how they came to be actuaries and why they love their work.

Angelika Fleer

My pathway to become an actuary is far from the traditional way. After completing a mathematics degree in my home town in Germany (with a one year break in Melbourne to write my thesis), I worked as an IT Consultant traveling Europe. As good as it sounded at the time, I realised that I needed a bit more stability in my life and started working for the German Finance Department as an auditor for corporate superannuation liabilities.

"But after two years of intense study doing Part 1 and Part 2 exams, I am really excited to finally call myself an actuary."

After four years the travel bug hit again and I moved to Australia determined to travel the whole country. After a few month I found an actuarial analyst role with AMP and scrapped my travel plans to grab this once in a lifetime opportunity. Not only did I finally find an answer to the question "what does an actuary actually do?" I also got the opportunity to stay in Australia indefinitely.

I quickly understood that becoming an actuary means sacrificing your private life to study. But after two years of intense study doing Part 1 and Part 2 exams, I am really excited to finally call myself an actuary.

Going forward I will continue my rather non-traditional path, working as a pricing specialist for Telstra. This role is halfway between a technical data analytics function, dealing with complex pricing model and big data, and a strategic function communicating results and ideas to various stakeholders across the marketing and product area. I am very excited about my new role and am truly looking forward to enjoy an Australian summer without studying.

Kelly Lee

Fear. That was the driving force for me becoming an actuary. It certainly isn't something that you hear often. Growing up, I had every intention of becoming a surgeon until a fateful night watching the Texas Chainsaw Massacre. The blood was the all-telling sign that I should reconsider my career options.*

Fast forward some years and here I am calling myself an actuary – a job which is intellectually stimulating, involves constant problem solving and no blood! I am currently working at PwC and have been lucky enough to do so for the last three years. I graduated from the ANU with my honours in Actuarial Studies, and landed my first job with WorkCover SA (now known as ReturnToWorkSA). It provided me with a glimpse into the Accident Compensation industry in which I now specialise in, and of course a break from the awful Canberra winters!

During my three years with WorkCover SA, I learnt about the workings of a Workers Compensation scheme, from the time a claim is lodged up to the settlement of a claim. This provided me with a strong basis in the next step of my career with PwC, providing consulting advice on Accident Compensation.

Fast forward some years and here I am calling myself an actuary – a job which is intellectually stimulating, involves constant problem solving and no blood!

I really enjoy working in this industry as I feel like I am making a difference (albeit indirectly) to people who have been unfortunate to get injured whether at work or otherwise.

It's been a great ride. In my downtime, I enjoy baking. There's nothing like having a blood orange flavoured cake, or using beetroots to make intensely coloured Red Velvet cakes. I'd like to think I've conquered my fear. I still have not finished watching the *Texas Chainsaw Massacre*, though.

**Some parts of this article are about as real as Fargo's claim to be a true story.*

Hao Qiu

Gordon Coventry's AFL record of 1299 career goals stood for 62 years until it was finally broken by Tony Lockett in 1999.

My family and I moved to Melbourne while I was still in primary school. At the time, I was a shy and chubby kid faced with the daunting task of trying to make a whole bunch of new friends. Naturally to try and fit in with my new school buddies, I tried to learn about their interests – this happened to be AFL football. They started by teaching me the rules and letting me join the school footy team. This was all it took to ignite a passion in me for both football and funnily enough, numbers. Soon I was regularly visiting the library to read about all the famous players and their records, including the wonderfully useless stat above.

This was all it took to ignite a passion in me for both football and funnily enough, numbers.

Since then, I have completed an Actuarial & Information Systems degree and worked briefly at IBM before joining PwC's Actuarial team in Melbourne. At PwC my main focus has been the different aspects of accident compensation. This has involved working with general insurers to assess their claim liabilities and building performance monitoring tools to help them understand the key drivers behind their business.

Meanwhile I've also found time for football, recently competing with the China AFL team in the International Cup. When I'm not playing footy, I'll either be watching it or poring over my next fantasy footy trade.

So I can now finally call myself an actuary. Maybe this is a sign that I should put all my focus into becoming the best actuary I can be. Then again, maybe it's not too late to make the AFL…

Murray Staff

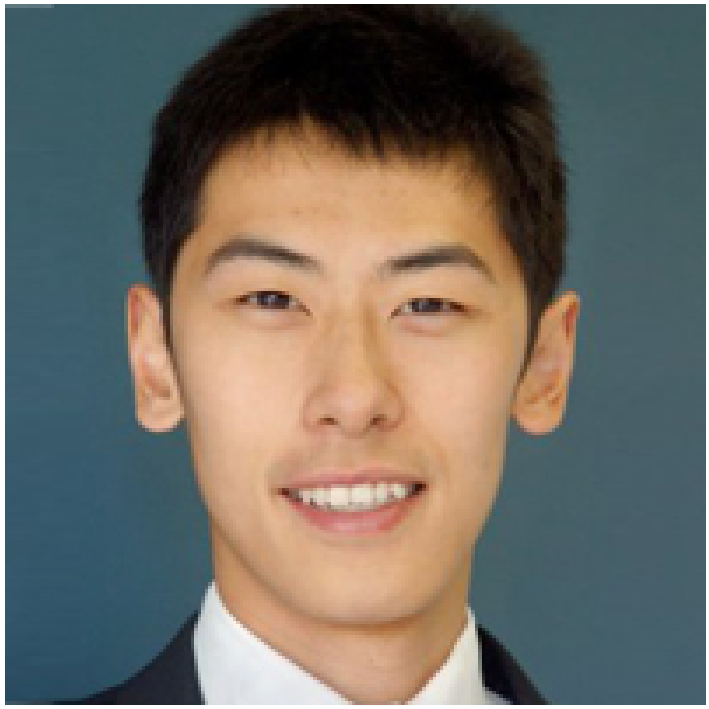
I've taken a long non-traditional journey to become an actuary working in a non-traditional area. I studied civil engineering at the University of Queensland because people (who had no business giving me career advice) said that if I studied maths I could only become a maths teacher. My undergraduate thesis measured the effects of El Nino on storm waves in Queensland. Around this time I was looking into the actuarial world and realised that, given my thesis topic, the move to the insurance world wasn't such a big leap. Once I started working in the engineering industry I realised that it wasn't very mathematically challenging so I started my Part I exams.

Youi is data driven and looks to the actuarial department to provide insights in all parts of the business.

My first actuarial role was at Suncorp in the home insurance team. A few years later I got a job at Youi on Queensland's Sunshine Coast. It's been amazing to see the growth of the business over the last few years and the actuarial team has played a pivotal role in this. Youi is data driven and looks to the actuarial department to provide insights in all parts of the business.

I've recently moved into the Youi's marketing department which I guess is a non-traditional sector for actuaries. My main interest is the world of statistical modelling and data mining and how it can be applied to any problem where data is available. Maybe one day I'll enter a Kaggle data mining competition just to tick it off the bucket list!

Dan Wang



I always enjoy explaining to my colleagues what actuaries do. People even ask me: Do you do archery? My career so far has involved telling stories from numbers. It was a great experience to attend the Professionalism Course. Finally I can call myself an actuary (AIAA). Yes!

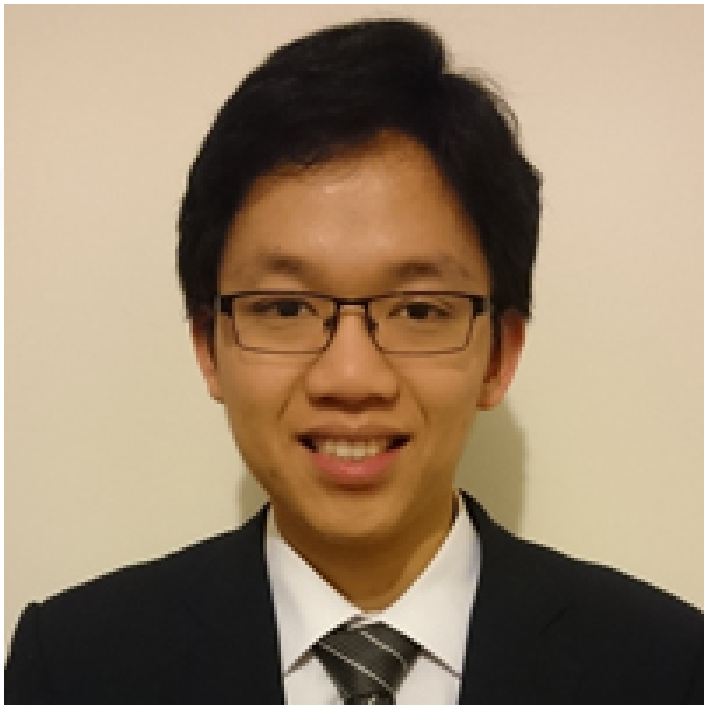
I started my career as a financial planner in Canberra. I was lucky enough to serve 92 sophisticated investors. I utilised the control cycle to project and review clients' holistic financial position. This important skill I learned from Part 2 and it has helped my clients understand the big picture and make optimal long term investment decisions. I also learned about life insurance and investment products from a sales perspective.

I always enjoy explaining to my colleagues what actuaries do. People even ask me: Do you do archery?

I have been working as an actuarial analyst at Australian Unity Investments since LAGIC was introduced. Getting this actuarial job was one of the happiest moments in my life. It has been a great learning experience to work closely with the experienced actuaries and investment managers in a small team environment. My main responsibilities involve monitoring and reporting on the financial positions of funds specifically in relation to their target capital levels. I also contribute to the asset and liability investment management of these funds. I enjoy working collaborative with a variety of teams, and communicating key results to all levels of management. It has become clear to me that the actuarial skills I have acquired can make a significant impact on business decisions.

I continue to study towards the Fellowship. There is no doubt that attending the Fellowship and Graduation Dinner will be my next happiest moment.

Jeremiah Cheung



I started my journey towards becoming an actuary back in 2009 in the University of Melbourne due to my curiosity for numbers. When I graduated in 2013, the job market was bleak. I was fortunate to secure a contract Actuarial Analyst in The Warranty Group. I then realised that an actuary deals with more than numbers – understanding the implications of the analysis and devising follow-up actions are also important.

I am blessed to work in a team which encourages all round development.

Having worked in the small niche insurer, I had the privilege of grasping the full range of issues faced by the business. It also enabled me to see the whole change process: From making claims cost analysis and projections; recommending on utilising a particular settlement option; seeing it discussed in committee meetings; and finally effectively implemented. This certainly helped lay a good foundation of building my skills in an actuarial reserving role.

One year later, I joined the IAG Reserving Team in Melbourne. I am responsible for Workers Comp reserving, short tail valuations and actuarial data integrity processes. These led me to understand and develop the differing skills required for valuing uncertain cash flows with diverse natures. I am blessed to work in a team which encourages all round development.

Beside work, I am actively involved in church, such as playing piano in praise and worship and leading Bible study. Church life is important to me, not only because of religious beliefs but also being part of a community where everyone comes together and contributes for mutual benefit. With the same spirit, I look forward to serving the wider actuarial community once I complete my final examination.

Life Insurance Checklist Launched to Support Australian Women

By Dimity Mannering *(dmannering@theinstitute.com.au)*

Australian women are being encouraged to have tough conversations and use a life insurance checklist, in a bid to address a $1.8 trillion gap in insurance cover for death or permanent disability.

Not for profit risk and insurance network Know Risk says the ($1.8 trillion) figure, reported by Rice Warner, reveals that if an individual or family member were to die or be permanently disabled, thousands of Australians would not have adequate life insurance cover to support themselves or their families to endure the loss of income and care costs.

With women now making the bulk of financial decisions in Australian households, Know Risk says providing information and supporting women to make decisions about whether they need life insurance and how much of it they need are vital to addressing the shortfall.

"This is a really shocking statistic but it's really one that we hope will encourage people to start talking about the financial reality of death and disability," said Know Risk spokesperson Prue Willsford.

"Insurance is complicated and this in combination with a lack of awareness and a reluctance to have uncomfortable conversations may be to blame for the gap. Right now, many Australian families rely on cover from their superannuation funds and this leaves many people underinsured."

To start to address the gap, Know Risk launched a Life Insurance checklist on 2 September, aimed at supporting women to assess their needs and their families' needs. The complete checklist and other resources on life insurance are available from knowrisk.com.au.

According to Know Risk, the steps for ensuring individuals and families are fully covered are:

1. Decide if you need life insurance.
2. Do your research on insurance providers.
3. Decide what type of life cover you need.
4. Decide what level of cover you need.
5. Buy your insurance.
6. Review your policy each year prior to renewal.

Know Risk is an independent, non-profit practical risk and insurance information initiative developed by the Australian and New Zealand Institute of Insurance and Finance with the support of community and emergency groups, insurers and risk experts.

Murray highlights value of actuaries' rigour

By Stephanie Quine *(stephanie.quine@actuaries.asn.au)*

David Murray gave a sound nod to the rigour and value of actuarial work as he launched *For Richer, For Poorer* in Sydney on Wednesday 2 September.

Murray addressed a press conference at the Actuaries Institute for the launch of the Institute's new White Paper on Retirement Incomes and commented that "for the Institute to take on this work on the back of our inquiry to add value to what is going on in the superannuation system is really very valuable."

"[The Actuaries Institute] is a very important body of people… it is an important pillar of our commercial system," he said, adding that the "extraordinarily demanding" rigour required to get actuarial qualifications is important.

"One consequence of this is that the Actuaries Institute becomes a go-to place not just for work like this, but in many commercial contracts for dealing with arbitration, disputes, and valuations."

For Richer, For Poorer analyses a cross-section of age, gender, income and marital status to build an intergenerational profile outlining the financial risks facing future retirees.

The Financial System Inquiry (FSI), which included two actuaries in its Secretariat, called for an agreed set of superannuation objectives to guide the sustainable financing of our ageing population and recommendations for the development of comprehensive income products for retirement.

Since the FSI there's been very significant renewed debate in the superannuation system… and for those of us in the Secretariat and Committee, this is extremely pleasing. We have called out this problem of politics and superannuation which is, for the longer-term, very healthy," said Murray.

View the video here:
https://youtu.be/fXWExprywPg

Murray thanked the Institute for adding value to the debate on Australia's retirement income system and reaffirmed the Institute's calls for an overarching approach to designing a sustainable and equitable system.

"The system needs to be non-distortionary…in dealing with super, we should not use it as an instrument to deal with other issues," he said.

"The FSI made it clear that we do not get enough value from the superannuation system, given what we invest in it, and that needs to be fixed … [Australians] have to believe in it."

Institute CEO David Bell, David Murray and President Estelle Pearson, at Institute HQ before the launch.

Download and listen to David Murray's full address (7.38 minutes).

Data research will help avoid 'do-not-do' treatments

By Sophie Dyson *()*

The study of extensive healthcare data sets will help tackle the problem of identifying and tracking 'do-not-do' health treatments across Australia, writes actuary Sophie Dyson.

The Grattan Institute report released last week *Questionable care: avoiding ineffective treatments* identifies five treatments that should not be given to certain types of patients (do-not-do treatments) and three do-not-do-routinely treatments. The do-not-do list includes treating osteoarthritis of the knee with an arthroscope, filling vertebrae with cement to treat fractures and hyperbaric oxygen therapy. In addition to diverting resources away from effective patient care, these treatments represent unnecessary cost and inconvenience at best, and at worst, can cause serious harm to patients.

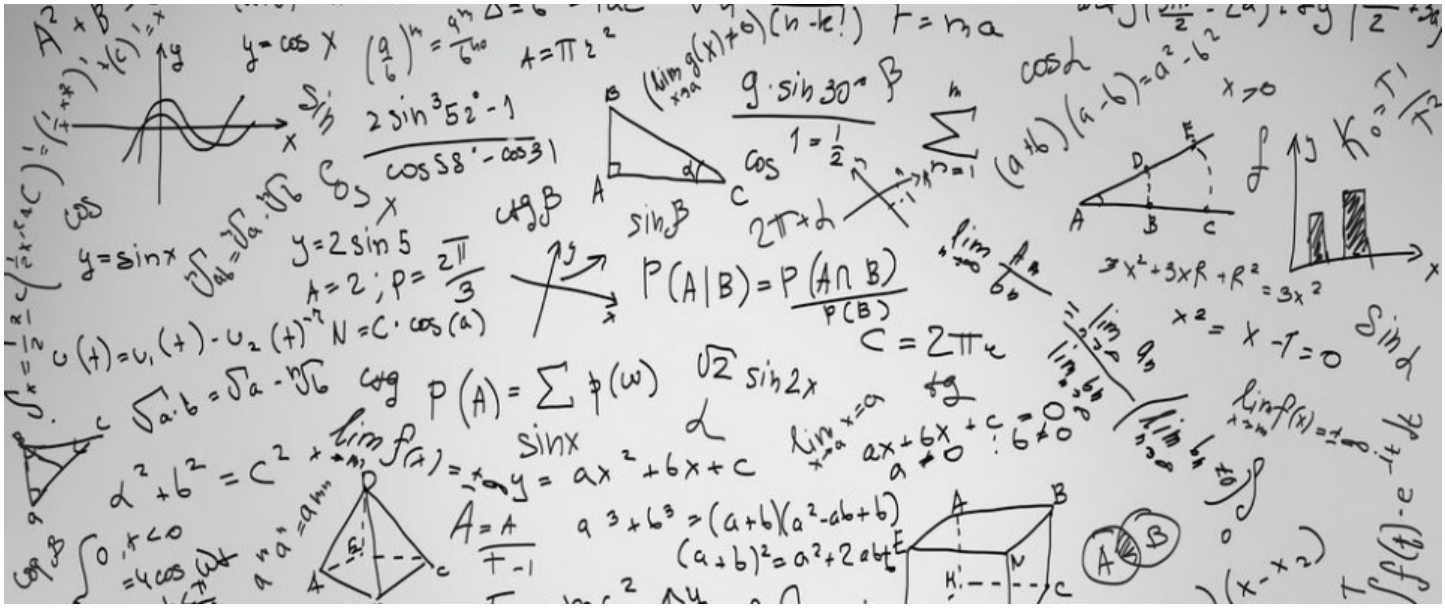
"Australia has extensive (but siloed) healthcare data sets and these could be put to better use."

The five do-not-do treatments totalled 6,000 procedures in 2010-11. While a tiny proportion of the many millions of procedures delivered annually, among the patient group getting these procedures, the do-not-dos represented 4.5% of activity. There is enormous variation between States, public vs private and individual hospitals in the rates of do-not-do procedures, with some hospitals delivering up to 10 to 20 times the average rate.

The report looks at only eight treatments, but there is a much longer list of do-not-do or do-not-do-routinely procedures to be addressed. To tackle the broader problem, the report recommends publishing clear guidance and lists of do-not-do treatments, tracking treatments and reporting on where they happen and using targeted interventions to reduce rates of ineffective care.

The use of healthcare data is a large component of the proposed solution. Australia has extensive (but siloed) healthcare data sets and these could be put to better use. Historically, access to healthcare data for research has been more highly restricted in Australia than some other countries, but the situation is improving.

The Capital Markets Cooperative Research Centre has over 35 PhD students in their health research stream (some of them actuaries), working on a range of data-related projects including effective care. The recently-launched Centre for Big Data Research in Health at University of New South Wales has over 20 PhD students.



Asset Allocation Competition Update

By Ben Trollip *(ben.trollip@towerswatson.com)*

Into its fourth month now, the Actuaries Institute's Asset Allocation Competition, might be causing some (hypothetical) headaches. Time will tell if its would-be CIO's can turn the tide, writes Ben Trollip.

In April this year, the Wealth Management Sub-Committee launched its Asset Allocation Competition. This contest allowed entrants to manage a hypothetical superannuation fund allocating across asset classes ranging from Australian shares and bonds to global infrastructure, hedge funds and commodities. Prizes will be determined based on the results to 31 March 2016 and awarded to:

1) The highest total return.

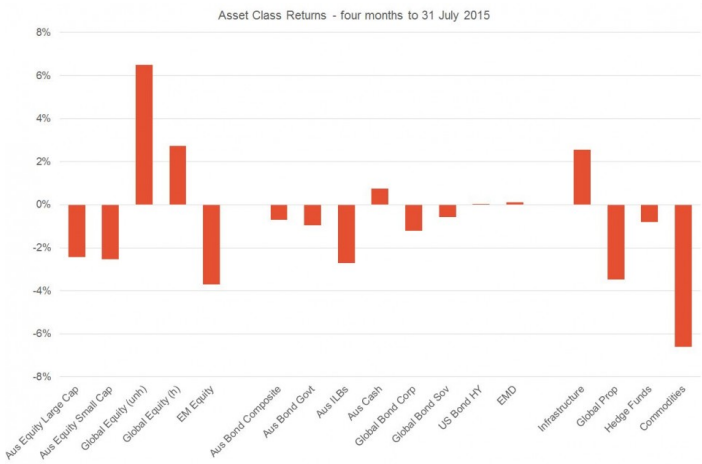
2) The best risk-adjusted return (excess return over cash divided by volatility).

3) The closest return to CPI + 5%.

With four completed months in the books, we thought we'd take a quick look at the results as at 31 July. Notwithstanding the very short-term nature of this analysis, across the 62 entrants there is a wide range of returns (from +6.5% to -8.9%), showing the entrants were not shy with the discretion afforded to them. Interestingly, first place is currently a three-way tie* amongst entrants that chose to put 100% of their members' funds in unhedged global equities. The fall in the Australian dollar has provided a welcome kick to these portfolios, despite some mixed numbers from equity markets. Presumably these results will not be looking quite so rosy come the end of August!

Illustrating the generally tough time in markets (outside of those exposed to the weakening Australian dollar), the average return across all entrants is a disappointing -0.15% compared to cash which is up 0.74% over the period. Clearly there will be quite a few (hypothetical) members that are dissatisfied with the recent performance of their funds. Time will tell if our would-be CIO's can turn the tide.

The chart below shows the returns for various sectors over the four-month time period.



* In the event of a tie at the completion of the 12 months, a random draw will be made amongst the winning entries.

Membership Subscriptions 2015-2016

By Actuaries Institute *(Actuariesmag@actuaries.asn.au)*

The new Strategic Plan for 2015-17 has focused the Institute's activity on five key goals centred around:

- providing services to Members (in Australia and overseas) and opportunities for professional growth;
- continuing to advance the profession into new practice areas as well as increasing awareness of the profession; and
- ensuring that the Institute continues to be in a strong position to respond to the changing needs of Members and the profession.

To keep you informed of what's been achieved and what's coming up please take a look at the brochure Broadening our Horizons.

The Institute thanks Members for their ongoing support of the profession and invites them to continue their membership for 2015-16.

e-Subscriptions were sent out this week and hard copy subscriptions are on their way to Members. Subscription fees can be paid online or by direct deposit, credit card or cheque.

Details of each of these payment methods can be found on the reverse side of the tax invoice. Please note that the deadline for payment of annual subscription fees is 30 September 2015.

Institute HQ is very much looking forward to continuing to work with Members. Please contact the Member Services Team regarding any membership queries, they'll be pleased to help.

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