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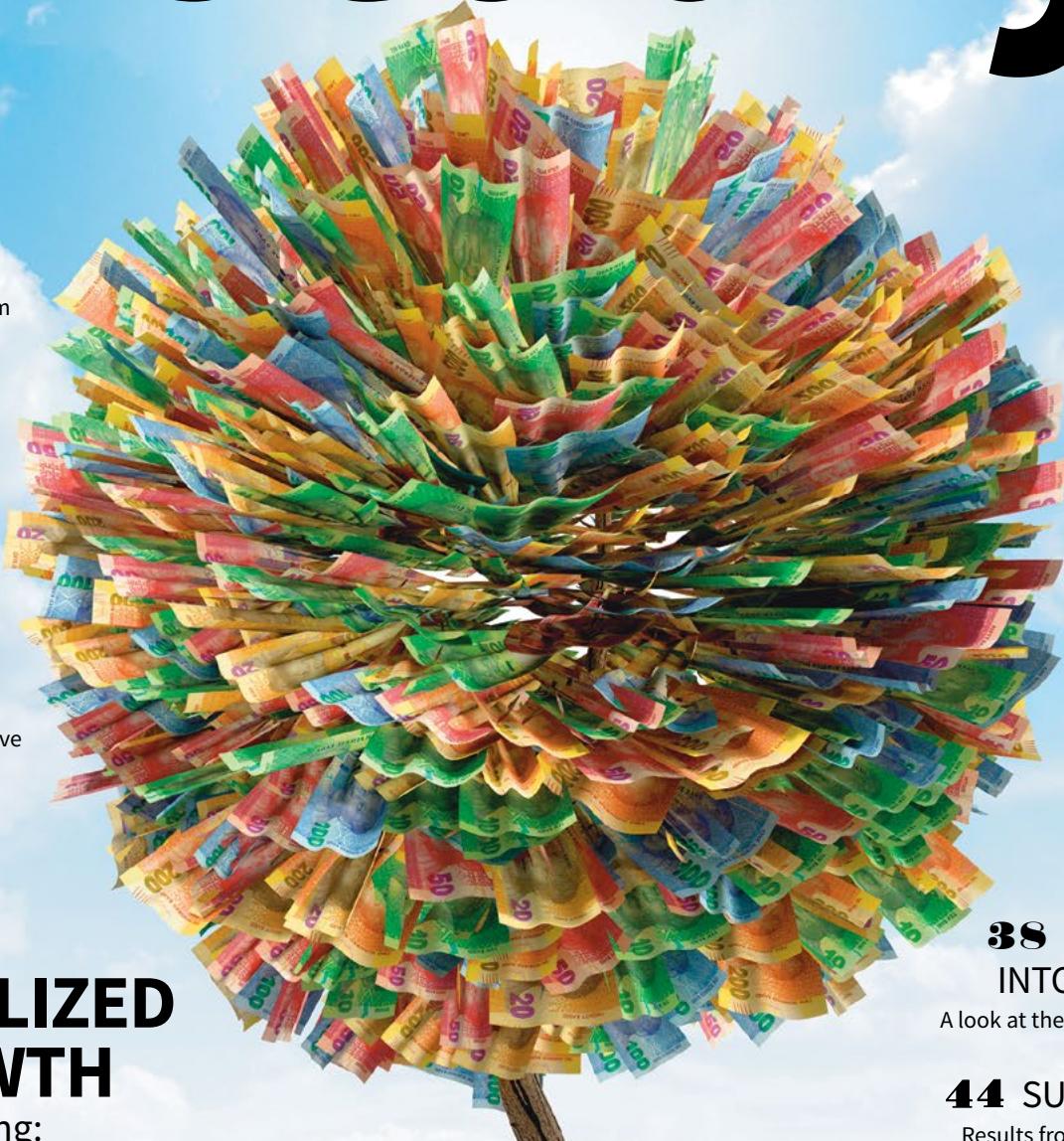
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Actuaries in banking

BY ROBERT L. BROWN



As I booked my flight for Cape Town last May, little did I know that there would be two purposes to my trip.

At that time, I had a single focus: to attend the semi-annual meetings of the International Actuarial Association (IAA). It was soon thereafter that I was asked to join the board of contributing editors of *The Actuary*. At our board meeting in July, we mapped out six general topics upon which our six 2017 issues would focus, and divided the responsibility for each issue to a member of the board. I was chosen to head up an issue that would focus on actuaries in banking.

My brain tweaked (a rare event indeed). I remembered that the Actuarial Society of South Africa was planning a seminar on actuaries in banking the day after the IAA meetings. What a wonderful coincidence! After extending my stay for the extra day, I registered for the banking seminar. I spent my time at the seminar lining up the authors who wrote the feature articles in this issue. As you will see, they are from all over the world: South Africa, Australia, the United Kingdom, Canada and the United States.

If you get a chance to read all six feature articles, you will discover that Canada and the United States lag behind their counterparts in South Africa and Australia in this practice specialty. It actually took a fair bit of work to find four actuaries truly working in banking for our article on

the United States and Canada. But, given the advanced evolution of actuaries in banking in South Africa and Australia, and given that the professions there have created solid educational material, it would be relatively easy for the rest of us to catch up once a decision to do so is made.

In fact, as indicated in the article about banking in the United Kingdom, it is not necessary for us to create our own tuition material. The United Kingdom is also looking at the possibility of tying in with existing banking bodies such as the Chartered Institute of Bankers, which already has developed a range of educational materials for banking. Thus, it might be possible for the SOA to find an existing credential that meets our needs and standards, and then consider giving the attainment of that parallel credential some appropriate level of credit in a possible future FSA track.

There are myriad possibilities, as described in this issue. Read, learn and enjoy. ■

Robert L. Brown, FSA, ACAS, FCIA, HONFIA, is a contributing editor for *The Actuary* and a past president of the Society of Actuaries.

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Big data (and opportunities)

Big Data—aka predictive analytics—is a term we have all heard, learned or used. There's a growing need for actionable information from predictive data, tapping into the available data and building models upon it. As actuaries, we know data and models well, and we have great potential and expertise in this arena. Over a relatively short time, we have seen considerable interest and opportunities for actuaries around the world in working with predictive analytics. For example, actuaries are working with data analytics in the life, health care, and property and casualty sectors, as well as in risk management, investment and areas outside of insurance. Here's an update on the Society of Actuaries' (SOA's) predictive modeling developments.

CURRICULUM CHANGES

Among the curriculum changes for associates, we will incorporate predictive analytics topics to prepare SOA-trained actuaries for future opportunities. Employers noted the need for this emphasis as we developed the curriculum updates. The learning objectives for associate-level topics on predictive analytics cover the model building process, exploratory data analysis, model selection, model validation and communication of results. These curriculum changes will warrant the exploration of new technologies applied to the assessment approach, with more details available in 2018.

PILOT CERTIFICATE PROGRAM

Recently we announced the predictive analytics pilot certificate program for fellows. This pilot program is part of our organization's commitment to help actuaries stay on the forefront of new methods and knowledge. This five-month program has six eLearning modules and a two-day, in-person seminar. We selected 30 individuals out of nearly 100 applicants for this pilot program.

BY JEREMY J. BROWN

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from the PRESIDENT

These individuals represent a variety of practice areas and actuarial expertise. Those that applied for this pilot program needed to be fellows in good standing, receive employer approval to join the program, and have at least five years of experience with models and basic analytics techniques. Participants who successfully complete this pilot program will receive a certificate of completion. Their involvement will help shape future offerings in predictive analytics from the SOA.

DATA SCIENCE CONTEST

As an organization, we continue to explore new ideas and opportunities for actuaries. For instance, we designed a new SOA contest for fellows and associates through Kaggle, an innovative platform for data science competitions. The SOA contest encourages actuaries to develop models and showcase their data skills. I'm glad to see our organization tap into different ideas and find ways to highlight actuaries' abilities in this space.

As part of this SOA contest, which is expected to run through Dec. 31, there are prizes for individuals or teams that place in the top 25 percent of Kaggle's private



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leaderboard, or place in the top 10 percent. There is also a prize for individuals who become Kaggle Competitions Masters. See “Related Links” for where you can read the contest rules and fill out the notification form.

PREDICTIVE ANALYTICS SYMPOSIUM

In addition to our existing professional development opportunities, such as webcasts, podcasts and concurrent sessions at SOA meetings, I also want to mention a new upcoming event. The SOA will host a predictive analytics symposium this September in Chicago. It is another opportunity for actuaries to build upon their skills and insights within predictive analytics and modeling. Stay tuned for more information on this upcoming symposium.

Additionally, I encourage you to check out the SOA resources on this subject matter, including the Predictive Analytics and Futurism Section and the SOA’s predictive modeling research.

In closing, it is great to see your continued interest in predictive analytics, and we’ll explore new opportunities and provide further updates on our efforts involving predictive analytics. ■

RELATED LINKS

Curriculum Changes

SOA.org/curriculumchanges

Predictive Analytics and Futurism Section

bit.ly/SOAPASection

Predictive Analytics Research

bit.ly/SOAResearchPA

SOA Resources on Predictive Analytics

SOA.org/predictive

SOA.org/pacertificate

SOA Contest on Kaggle Data Science

SOA.org/predictive-analytics/kaggle-contest

Kaggle Contest Rules

bit.ly/KaggleContestRules

Kaggle Involvement Program Notification Form

bit.ly/KaggleInvolve

Idea exchange

A ROUNDUP OF NEWS FROM THE GLOBAL COMMUNITY

PACIFIC RIM ACTUARIAL DINNER

Society of Actuaries (SOA) President-Elect Mike Lombardi, FSA, FCIA, CERA, MAAA; SOA board member August Chow, FSA, FCIA, CERA; and SOA staff fellow for Canadian membership Ben Marshall, FSA, FCIA, CERA, MAAA; attended the 24th Annual Chinese New Year Meeting, which was held during the dinner hosted by the Pacific Rim Actuaries Club of Toronto on Feb. 22 in Toronto.

During the live panels, Marshall spoke about SOA initiatives in the Pacific Rim regions, lessons learned and plans for 2017. His speech was titled “What’s Up in the Pacific Rim—SOA in 2017 and Beyond,” and it was prepared by Ann Henstrand, SOA senior director, Asia and Latin America. Chow provided a presentation titled “The China Insurance Market,” which was prepared by Jessie Li, FSA, SOA lead China representative. Chow examined various aspects of the China insurance market, including market growth, regulatory development, key players, product development and distribution channels in China.



(From left to right) Hubert Yan; Sheng Tseng, FSA, FCIA; Fiana Kwok, FSA, FCIA (current secretary of PRACT); and Mercy Yan, FSA, FCIA, MAAA (former president of PRACT); enjoyed time together at the Pacific Rim Actuarial dinner.



Attendees from the first exchange program, held last year in the United States, gained a global perspective on managing risk.



For more information, please contact Ann Henstrand, SOA senior director, Asia and Latin America, at ahenstrand@soa.org.

2017 SOA/CAA EXECUTIVE EDUCATION EXCHANGE PROGRAM

The Society of Actuaries (SOA) and the China Association of Actuaries (CAA) held the second Executive Education Exchange program, March 25–April 2, in China.

In April 2016, the SOA hosted chief actuaries and actuarial department heads from China during the first SOA/CAA Executive Education Exchange program. The program was designed to facilitate information exchange, strengthen the profession in both countries, and solidify relationships between the SOA, the CAA, and actuaries and employers in both countries.

Attendees at the 2017 SOA/CAA Executive Education Exchange program experienced small group and one-on-one meetings with actuarial leaders in China and gained a global perspective on managing risk. The program was designed to provide attendees with a deep understanding of the Chinese insurance market, including growth drivers and development, and it included meetings with insurance regulators, university representatives and insurance companies.



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SOPHISTICATED SOLUT

Here's your source for industry briefings and SOA news. Important headline information, section highlights and current stories—in short, news to note.



HEALTH CARE AND ARTIFICIAL INTELLIGENCE

In a recent *Venture Beat* article, it was reported that dozens of venture capitalists see the most potential for applied artificial intelligence (AI) in the health care field. They noted that the ultimate dream is to eradicate disease entirely, but innovation is challenged by risk aversion and digitization. Read how humanity stands to benefit from the application of AI.

RELATED LINK

Venture Beat Article
bit.ly/Venture-AI



PREDICTIVE ANALYTICS USED IN PREVENTING ACCIDENTAL DEATHS

Forbes reports that overdose from the misuse of prescription or illegal opioids overtook road accidents as the most common cause of accident death in the United States in 2016. In Canada, the situation has been called a “national health crisis.” Scientists at Blue Cross Blue Shield of Tennessee are working with big data analytics architects at Fuzzy Logix to develop and provide solutions to this growing problem.

RELATED LINK

Forbes Article
bit.ly/BCBS-FuzzyLogix



METRICS MASTERS

Read how CFOs can take charge of nonfinancial performance measures without alienating the rest of the organization. See how the proliferation of data analytics plays a significant role.

RELATED LINK

CFO.com Article
bit.ly/Master-Metrics

PREDICTIVE ANALYTICS AND FUTURISM SECTION UPDATE

BY RICKY TRACHTMAN

The Predictive Analytics and Futurism (PAF) Section of the Society of Actuaries (SOA) has always been at the forefront of innovation. It is a place actuaries can go to find new techniques to apply in their work. Recently, we changed the section name from Forecasting and Futurism to Predictive Analytics and Futurism to reflect the innovative work we have already been doing.

In the spirit of futuristic techniques implied by our name, we conducted a Delphi study to choose our new one. A Delphi study eliminates the biasing influence of hierarchy and involves rounds of anonymized responses that form the input for the successive rounds until study participants stop changing their minds. Our new name not only better reflects our focus, but it also has attracted new members to our section. This goes to show the profession's interest in predictive analytics.

Section membership has increased by about 65 percent in the past year. We currently have 1,182 members, the majority of whom are located in the United States and Canada. We do, however, have some members from Europe and China as well. Our membership is represented most heavily by the life and health practice areas.

The work we do at PAF is vast and interesting. Our membership benefits from our work in many ways. Our council, friends of the council, members of PAF and others work hard to provide interesting and applicable content. A good example of this work is our newsletter, which we produce semi-annually. (See "Related Links.")

Our one-day seminar after the Life & Annuity Symposium in Nashville last year was a big step for us. The goal of this seminar was to apply predictive analytics in the life and annuity space. It was a major success. Industry leaders presented hands-on demonstrations, and a data scientist spoke for part of the day. We will repeat this event after the Life & Annuity Symposium in Seattle this year.

As a section, we sponsor many SOA sessions throughout the year at various meetings, including the Life & Annuity Symposium, the Valuation Actuary Symposium, the Health Meeting and the SOA Annual Meeting & Exhibit. We also sponsor—by ourselves or with other sections—webcasts throughout the year. Please be on the lookout for some of these great opportunities.

Recently, we also started to produce podcasts that are posted on the SOA website. You can find many podcasts on predictive

analytics, including subjects such as machine learning and the bias-variance tradeoff. We expect to produce a number of new podcasts on predictive analytics topics in the near future.

At PAF, we not only focus on providing content, but we also encourage discussion and community building. That is why we have a forum on LinkedIn that facilitates online discussion and sharing of links. We also recently started a Virtual Open Forum that is free for our members. This forum is held online, typically during lunchtime. It is a great way to have lunch, learn and fulfill some educational credits. On this forum, a group of experts continues discussions about their articles and presentations, where questions and interactions from the audience are much appreciated and key to its success.

We are always looking for opportunities to help spread knowledge on predictive analytics and help actuaries showcase their work. Please contact us with any ideas on research, presentations and articles.

I would like to take this opportunity to say thank you to the members of PAF. If you are not yet a member, please consider PAF when you renew your SOA membership. We are more than just a section. We are a community.

RELATED LINKS

PAF Section Newsletter

bit.ly/SOA-PAF-News

PAF Podcasts

bit.ly/SOA-PA-Podcasts

PAF LinkedIn Page

LinkedIn.com/groups/5118314

Ricky Trachtman, FSA, MAAA, is a principal and consulting actuary at Milliman, where he specializes in pricing and development of life and annuity products. He is currently the chairperson of the SOA Predictive Analytics and Futurism Section Council.

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FEATURE

BANKING IN SOUTH AFRICA



SPECIALIZED growth

TAKEAWAYS FROM THE SOUTH AFRICAN EXPERIENCE IN BANKING

BY MICHAEL T. TICHAREVA

Actuaries are increasingly looking at banking as a new area of work. Around the world, the various actuarial associations and banking jurisdictions are at different stages in recognizing the value of actuaries in banking. We anticipate that the trend will persist and banking will continue to grow as a new practice area for actuaries globally.

REGULATORY DEVELOPMENTS

Involving actuaries in traditional banking business is a new trend sparked by regulatory reform initiatives, such as the introduction of the Basel II banking regulations. These international regulatory developments introduced aspects of work that actuaries are well equipped to handle. In South Africa, we had foresight and saw the opportunity many years ago—a number of our actuaries already were employed in banking roles before the introduction of Basel II in 2008. Subsequently, when Basel II was introduced, the value of actuaries became even more pronounced.

International Financial Reporting Standard 9 (IFRS 9) on provisioning for bad debts is another area where we believe actuaries are well placed to perform the work that requires a lot of assumptions and judgment in estimating expected credit losses. However, we need to remain proactive and continue driving forward, as we should be shaping the future regulatory landscape through our input as the actuarial profession matures in the banking area.

Actuaries have played a critical role in developing and reviewing banking models required by the regulator in the implementation of Basel II by South African banks. It is quite possible that actuaries could oversee the implementation of capital solvency regulations by banks on an ongoing basis in the future. As the regulatory landscape continues to change, this could even involve the introduction of a statutory actuarial function within banks in South Africa. But, obviously, this would need to be driven by the banking regulator. Currently, only life companies and short-term insurers are legally obliged to employ a statutory actuary who is tasked with ensuring proper financial management by long- and short-term insurers to protect policyholders. Although the South African banking industry did not suffer any casualties as a result of the global credit crunch, appointing statutory actuaries to ensure proper financial risk management by banks could greatly assist in mitigating risks on an ongoing and sustainable basis.

TYPICAL AREAS OF WORK

While the majority of actuaries are employed in the areas of long- and short-term insurance, health care, investments and retirement benefits, banks are increasingly recognizing the value of using actuaries for their unique modeling, projection and risk management skills. These actuarial skills are especially valuable for banks as they develop and implement economic capital management and risk-adjusted performance measurement frameworks.

As already indicated, there are many opportunities for actuaries in banking in South Africa. These opportunities are increasing in jurisdictions like Australia, the United Kingdom and North America, and are driven largely by regulatory changes over the past few years, such as Basel II and III. Most recently, changes in international accounting rules that now require a forward-looking expected loss approach to credit loss provisioning (as opposed to incurred loss-based historic approach) also provide more opportunities for actuaries in banking.

The roles actuaries in banking typically hold relate to risk management. This ranges from credit risk, market risk, liquidity risk, operational risk and other business

risks. Each of these risks can be broken down further into a breadth of topics. For example, credit risk is a major area of work and can be broken down into loan origination and pricing strategies, monitoring of portfolio trends, provision of capital and reporting. Given actuaries' quantitative abilities and understanding of the financial world, they are able to play a key role in each of these areas. These roles are not confined to banks. They apply to consulting firms as well. Consultants are able to act in advisory or audit roles. While audit roles often lead to validation of a bank's model, advisory roles allow actuaries to build up strategies and models with clients (the banks) across the breadth of risk types and topics.

Actuaries working in the banking sector in South Africa are largely employed in the following areas:

- ⇒ Credit scorecard development
- ⇒ Credit risk management and reporting
- ⇒ Design and pricing of all banking products (credit and noncredit related)
- ⇒ Provision model development
- ⇒ Balance sheet management (i.e., asset-liability mismatching, risk management and liquidity risk management)
- ⇒ Pricing and trading of derivative products

Actuaries employed in the risk-consulting field provide risk-consulting services to banks in the following areas:

- ⇒ Capital modeling
- ⇒ Credit, operational and market risk modeling
- ⇒ Balance sheet management

The relevant skills and knowledge for actuaries in these areas include:

- ⇒ Quantitative and modeling skills, including asset-liability modeling
- ⇒ Knowledge of nature and pricing of financial and derivative products
- ⇒ Business and regulatory awareness in the banking sector

Given worldwide regulatory pressures in the banking space, actuaries, among other professionals, are sought after to build cutting-edge models to optimize the risk environment and to work on the forefront of policy development.

BANKING FELLOWSHIP SUBJECT

Tasked with developing and promoting the actuarial profession in the banking sector, the Actuarial Society of



“Actuarial skills are especially valuable for banks as they develop and implement economic capital management and risk-adjusted performance measurement frameworks.”

South Africa Banking Committee, which I chair, introduced a banking fellowship subject in 2015 for South African actuaries. We saw major benefits in introducing it, given the rapidly changing banking landscape that requires new and improved risk management skills.

The new banking exam places a strong focus on the management of banking-specific risks, such as credit risk, market and interest rate risk, liquidity risk and operational risk. Balance sheet and capital management, as well as corporate governance and strategy setting in the banking environment, are additional key focus areas. Other important issues, such as banking product design and pricing, also are covered. The banking subject focuses on the application of actuarial concepts learned in foundational and intermediate actuarial subjects to solve complex problems within banking institutions.

The first sitting for the banking subject was in October 2015, when eight students wrote but none passed the exam. At the second sitting in May 2016, 12 students wrote and four passed. The third sitting was in October 2016, where 11 students wrote and two passed. There will be two sittings annually as we move forward. The number writing is not yet a true reflection of the maturity of the actual banking practice area, where we have close to 300 actuarial professionals (about 10 percent of our membership), and this area of practice is growing rapidly. As more students get to this level of the examination process, we expect the number taking the banking fellowship subject to also increase significantly.

This is a major strategic shift for the actuarial profession. Historically, the Actuarial Society's fellowship subjects focused on the more traditional actuarial practice areas of

long- and short-term insurance, health care, retirement benefits and investments. South Africa can now have actuaries who qualify specializing in banking as a practice area, a first in the world. The introduction of a banking fellowship subject also complements the Chartered Enterprise Risk Actuary (CERA) qualification introduced by the Actuarial Society in 2011. Actuaries with this internationally recognized qualification have sought-after skills enabling them to devise and implement effective risk management strategies across organizations.

“Banks are recognizing that gaining a deep understanding of their customers will not only help mitigate risk, but also provide them with the edge in a highly competitive environment.”

—Lee Bromfield, former deputy chairperson, Actuarial Society of South Africa Banking Committee

THE NEED FOR IMPROVED RISK MANAGEMENT

Banking bailouts in recent years have cost taxpayers around the world trillions of dollars, highlighting the need for much improved risk management at banks. A sound banking system is one of the cornerstones of a stable economy and a country's financial markets. South Africa discovered that its own banking system was not infallible when, in August 2014, the South Africa Reserve Bank (SARB) and the other major banks had to step in to rescue African Bank, an unsecured loan lender in the lower-income segment that went under business rescue due to increasing credit losses that had not been adequately provided for. This bank needed fresh capital to survive.

It can be argued that with the new accounting standard, IFRS 9, which has a forward-looking approach to credit loss provisioning, this problem could have been anticipated and provided for well in advance. This also could have led the bank's executives to change their lending strategies and to increase their loan collection efforts. African Bank has since appointed one of the most senior South African actuaries and business leaders, a former president of the Actuarial Society, to its board in early 2016. This is not to say that this will prevent all problems because there is now an actuary on the board, but it will certainly introduce fresh eyes and thinking on how risks are managed at the bank.

Because risk management is a key component of an actuary's skills set, banks increasingly have been looking to the actuarial profession to provide the resources needed to accurately assess risk and implement the necessary controls. As noted by Lee Bromfield, former deputy chairperson of the Actuarial Society Banking Committee and former segment head of credit at one of South Africa's big four banks, “Increasingly banks are recognizing that gaining a deep understanding of their customers will not only help mitigate risk, but also provide them with the edge in a highly competitive environment.”

Bromfield recognizes that part of an actuary's job is to make financial sense of the future. This means that as part

of risk management in banking, those who best model the customer will own the profit streams. For this reason, the bank for which Bromfield works has been proactively hiring actuaries for a while. The bank currently employs at least 20 qualified actuaries and more than 130 student actuaries. There are a number of actuaries in CEO positions, as heads of credit and in other executive committee positions ranging from pricing to analytics. Bromfield notes that considering the average retail bank has more than 5 million customers, the number-crunching potential for actuaries is unlimited. He imagines the richness of information available on the transactional history of a client. As an analyst, one would want to work where there is a lot of data, as this allows one to apply almost any quantitative skill imaginable.

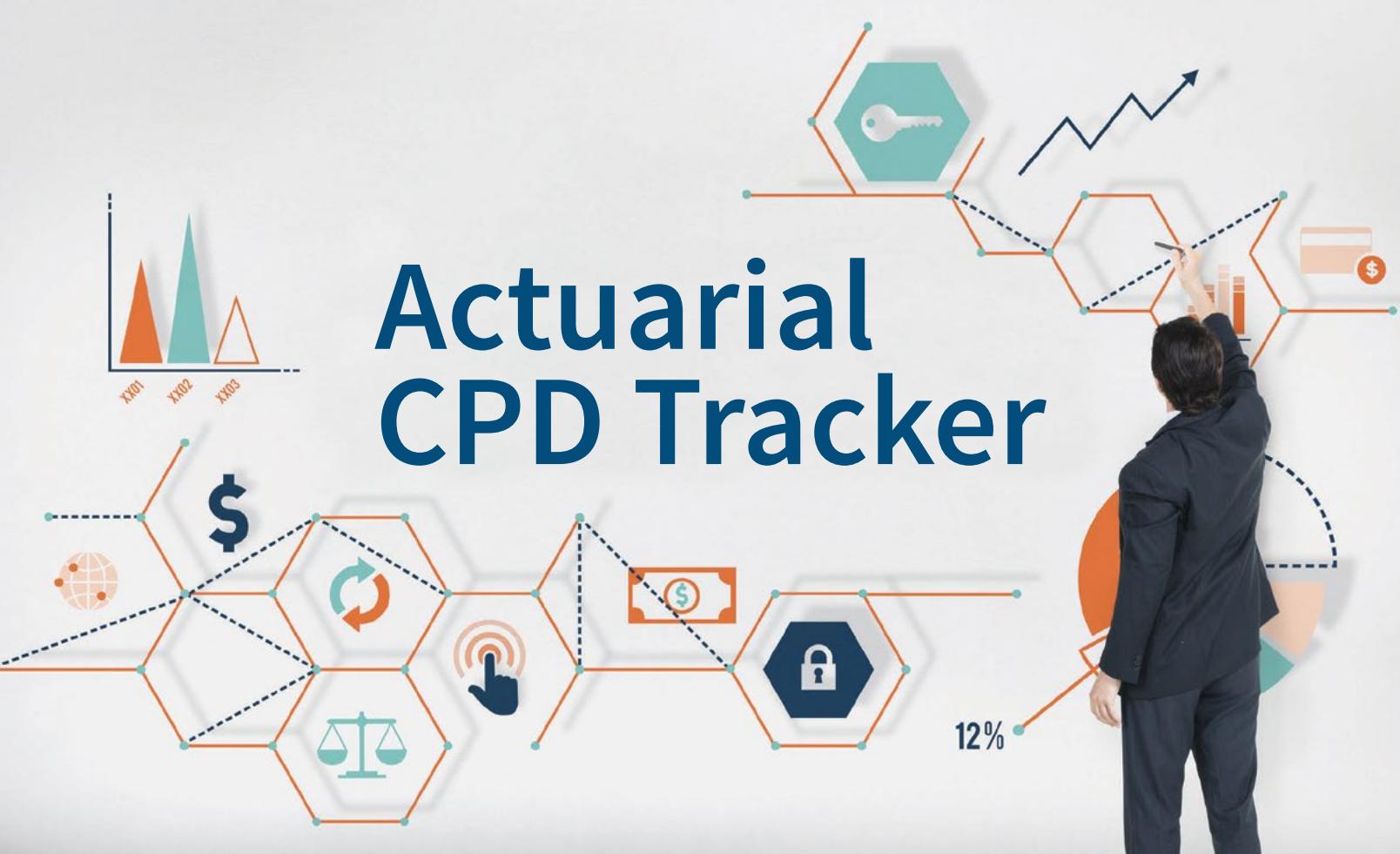
There also are endless behavioral patterns to model, and because this is a growing field, there are few set guidelines to follow. Actuaries can innovate in this space.

UNIQUE SKILLS

What may distinguish actuaries from other qualifications in managing banking institutions is their strong technical skills in risk management coupled with a deep understanding of business in the financial services sector, as is already incorporated in the actuarial syllabus as a whole. Banking is certainly no different from other financial services organizations in which actuaries have long played a critical role. We believe that, with our unique skills, we have a major role to play in managing banking institutions alongside other professionals and experts. ■

Michael T. Tichareva, BCom (Hons), FASSA, MBA, is managing director of the Johannesburg-based National Standard Finance Africa, an affiliate of the U.S.-based National Standard Finance LLC that he founded in 2014 to develop and finance social and economic infrastructure projects in Africa. He is also chair of the Banking Committee for the Actuarial Society of South Africa and chair of the Banking Working Group for the International Actuarial Association.

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SOCIETY OF
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FEATURE

A BANKING ACTUARY'S JOURNEY

FROM MY



PERSPECTIVE

A PERSONAL NARRATIVE OF ONE
SOUTH AFRICAN ACTUARY'S JOURNEY
IN THE BANKING PRACTICE AREA

BY ROLF VAN DEN HEEVER

INTRODUCTION BY ROBERT L. BROWN

In researching the articles in this issue of *The Actuary*, I was pleasantly surprised to find that the country with the longest history of actuaries in banking was South Africa. So, after some debate, I decided to track down the local industry experts to find out more about these industry architects. I was referred to Michael Tichareva, who works in infrastructure project finance, and Rolf Van Den Heever, who works in the treasury department of one of the regional banks, Barclays Africa Bank Limited. Michael had already agreed to write the article "Specialized Growth" found on page 14 of this issue, so I turned to Rolf to get his story. Luckily, he obliged, and his story goes like this:

A number of key events and experiences have led to my development and contribution to the local profession. I've chosen to highlight a few in this article.

THE EARLY YEARS

My mom was a mathematics lecturer and my dad was a computer science professor. They introduced me to mathematics, and this interest prompted me to study actuarial science.

I completed my master's degree at the University of Pretoria. The actuarial school is very good. The accounting, finance, mathematics and statistics subjects applied in a forward-looking control cycle provide a toolbox that can be applied in many different disciplines. This toolbox paved the way for me to work in different industries. One tool in particular, collective risk models, allowed me to explain portfolio frictions and areas of optimization to my clients. (Basically, I could use the tools to quantify risks in the portfolio, such as credit, market and operational risk, and then identify the cost of the risk versus the return provided by the portfolio. Areas with higher levels of returns and lower levels of risk were clear winners, but often risk management techniques also helped to reduce the level of risk, thereby increasing the economic profit.)

I took a gap year after completing my studies and then returned to the university as a lecturer. Consulting in my spare time, I performed reserving exercises and was offered an analytics role by one of my clients, Hannover Reinsurance. While at that company, I qualified as a general insurance fellow of the Institute of Actuaries. At the reinsurance firm, we developed value-add opportunities for our underwriting agencies and did a lot of pricing support work. I then moved to London, England, and joined the consulting firm Deloitte and worked as a London market reserving actuary. My time with the Deloitte teams that consulted with and provided risk assessments to banks, building societies and housing associations led to my transition from general insurance to banking, with a focus on quantitative risk and finance.

ENTERING THE BANKING WORLD

Next, a headhunter recruited me to lead the capital management team for a new investment banking startup back home—Absa Capital, a division of Absa Bank Limited and my current employer today. It has been five years since I joined the group treasury function, and what a time it has been. I still do a substantial amount of board and senior management training, so my lecturing experience is useful, as well as my experience in risk-based pricing, application of the collective risk models in economic capital and application of the control cycle. Currently, I have two areas of focus.

① | Balance sheet optimization: This is the portfolio optimization discussion mentioned earlier, focusing on the balance sheet of the bank.

② | Capital markets execution: These are the activities performed to source the long-term funding and capital base available to the bank, as well as tackling ever-changing market environments.

In addition, I am the principal examiner for the new banking fellowship provided by the Actuarial Society of South Africa. Through this initiative, we aim to establish a strong actuarial complement for the industry.

While my role is no longer purely actuarial, the actuarial tools I've honed are applicable throughout. Many actuaries work in risk departments, and I've witnessed the transition of skills into business areas as well. I believe the next step for our profession is to leverage this trend.

THINKING STRATEGICALLY

As a profession, we need to take great care in the way we communicate to other stakeholders within the banking industry. The traditional actuarial worlds are different from those of banks. For example, insurance actuaries are very comfortable with the uncertainties residing in liabilities;



how to identify, quantify and manage the risk inherent in liabilities; and how to match liabilities to appropriate asset profiles to mitigate these risks. From a banking perspective, bankers are very comfortable with the uncertainties residing in assets and how to secure funding, including capital to mitigate the risks. When I moved into banking, I initially struggled to understand this view, having previously focused on liability quantification. As a consequence, I did not appreciate the major concern from a funding perspective: funding running out! The financial crisis changed that lack of knowledge quite quickly.

In addition, strategic discussions, such as ones about capital demand, easily can become very technical. For example, the discussions could detail the methods used to quantify the risks that drive capital demand, but the output of these discussions are not necessarily implemented into business processes, like pricing models. These are areas where I feel actuarial contributions can make a significant difference, provided the actuaries understand where the bankers are coming from, and vice versa.

The transition underway in the profession to a qualification specialty in banking is not perfectly clear-cut. One of our peer banks has had deep actuarial penetration for a number of years now. In addition, the previous chairman of my current employer was exposed to my actuarial peers when the bank started an insurance company, and actuarial involvement grew from there. Actuarial students' frustration about a clear career path in a bank led to the development of the new "banking" study material, given that the market demand already existed.

A DEVELOPING MARKET

Banking is an important work sector and opportunity for South African actuaries today. But there is still a lot to do, especially as a result of the scrutiny regulators worldwide place on banks.

- Risk and provision assessment requirements are increasing. For example, International Financial Reporting Standard 9 (IFRS 9) requires new methods for the assessment of provisions for impaired assets. The implementation and management of IFRS 9 programs provide significant opportunities for actuaries.
- Capital adequacy assessments and forecasts also are increasingly onerous (similar to Solvency II). The Basel Accord's second pillar is concerned with statutory review of banks' Internal Capital Adequacy Assessment Process (ICAAP). This process and its U.S. equivalent, the Comprehensive Capital Analysis and Review (CCAR),

provide challenges for banks where actuaries can play a significant role. For example, I was responsible for the generation of the ICAAP document as well as the coordination with the local regulator, the South African Reserve Bank, which conducted the statutory review and evaluation process.

- Pricing tools need to keep up-to-date, especially customer pricing (including whole of life, cross product and marketing spend optimization). Pricing is going through a transformation. The time horizon, customer view, credit quality of the provider, collateral management processes, credit quality of the client and product detail all can be incorporated into pricing. The level of incorporation depends on the elasticity of demand, the level of liquidity in the market and market norms. As these change, the need for actuaries increases. Regulatory changes also may force banks to discontinue certain products, which reduces the need for actuarial input.
- Optimal balance sheet structuring is key in order to manage the regulatory load. In its simplest form, this involves identifying the products and segments that generate value and growing those areas of the portfolio, while managing those areas that destroy value.
- Treasury teams constantly are improving their views of interest rate risk, funding profiles, liquidity risk management as well as capital management.
- I suspect that as actuarial involvement in banking gains traction, actuaries also will be able to branch into the industries served by banks.

My journey in the banking industry reminds me of the early days in general insurance, when actuaries were also foreign commodities. The general insurance market for actuaries has developed significantly since those early days. History might repeat itself. ■

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FEATURE

CREDIT RISK AND BANKING IN NORTH AMERICA





BUSINESS

MODERATED BY ROBERT L. BROWN

ACTUARIES FROM CANADA AND THE UNITED STATES DISCUSS THEIR ROLES IN THE BANKING INDUSTRY

Expanding opportunities for actuaries is a key priority for the Society of Actuaries (SOA). One potentially promising area of expanded practice is in banking and credit risk. This article explores the experiences and perspectives of several actuaries with significant experience in banking and credit risk in Canada and the United States.

- **Mark Austin, FCIA, FSA**, spent 18 years with the Royal Bank of Canada and is now CRO with Brookfield Annuity.
- **June Meimban, FRM, ASA, MAAA**, has worked for PNC Bank and now Citizens Bank, where he is currently vice president of strategy and analytics.
- **Mike Schmitz, FCAS, MAAA**, is with Milliman and consults with banks, mortgage companies, monoline mortgage insurers, financial guaranty insurers, insurers on credit related asset risk, government insurers (including the Federal Housing Administration) and others.
- **Erik von Schilling, FCIA, FSA**, has worked for Toronto-Dominion Bank in Toronto and is now with the Canadian Imperial Bank of Commerce.

This is what I discovered in my interviews with these individuals.

Q:

How did your work background prepare you for where you are today?

VON SCHILLING

I've had two major phases in my career. The first part covered 10 years with Mercer Consulting in Toronto with its Risk, Finance and Insurance practice. I had the opportunity to work with a number of industry-leading actuaries in a flat and dynamic environment that covered a very broad section of traditional and emerging actuarial practice areas. This experience developed my skill sets around understanding cash flows, valuation, assumptions, scenario testing and loss distributions, as well as managing projects and effective communication of complex topics.

The second phase of my career (the past 13 years) has been working in the treasury and risk areas within the banking industry. I was introduced to the Toronto-Dominion (TD) Treasury during one of my Mercer assignments and leveraged this relationship later to join TD Bank in a retail credit risk and economic capital management role. Retail credit has characteristics analogous to insurance, where pooling concepts over large numbers of individuals can be used to estimate credit losses. Key to my successful transition was understanding the unique differences in industry practice and the nature of the risk and accounting, which creates a different environment and a different solution than some of the insurance-based actuarial techniques. I didn't try to fit retail credit into a traditional insurance framework, but rather I effectively applied many actuarial principles in a more generalized sense to this different application.



Erik von Schilling
FCIA, FSA

AUSTIN

After a few years of traditional pension work, I sought out nontraditional assignments to supplement my regular pension consulting. I eventually took a keen interest in asset-liability management (ALM) modeling for pension plans to better understand the asset side of the balance sheet. This, in turn, led me to apply for a position at RBC in its risk management function in 1998. There, my mandate was to evaluate and calibrate third-party credit risk capital models that the bank intended to use in qualifying for Basel II regulatory capital reform.



Mark Austin
FCIA, FSA

MEIMBAN

I started my career as an actuarial student at a life insurance company. Later, there was a push for cash-flow testing. I had the opportunity to help model various assets and liabilities and test the company's performance under various economic scenarios. This allowed me to have a firsthand experience in modeling various financial instruments.



June Meimban
FRM, ASA, MAAA

From there, I moved to Merrill Lynch to work on mortgage securitization. That job allowed me to set foot outside of insurance and into the broader financial services industry.

I later moved on to working in analytics and building prepayment and default models, price optimization models, marketing models and scorecards. One of the firms for which I worked was a startup that collected mortgage data and built prepayment and default models. I even worked as an independent consultant and built a loan-level risk projection system for Toyota Financial, one of the largest auto-finance companies in the world.

I also had a job at a boutique consulting firm specializing in modeling complex derivatives, catering to banks, hedge funds and investment firms. Finally, I worked for a consulting firm that developed price optimization systems for banks, insurers and lenders.

SCHMITZ

I began consulting on credit risk by doing assignments for monoline mortgage guaranty insurers. These companies take residential mortgage credit risk through an insurance contract. Working for these companies gave me a deep appreciation for the tail risk associated with credit risk generally and mortgage credit risk in particular. The original industry completely folded during the Great Depression, and the modern industry lost several companies following the South Central Oil crisis of the 1980s. That instilled in me an appreciation for the tail risk that mortgage credit has. As we headed into the recent global financial crisis, I had already been consulting companies about the unsustainable bubble that we were experiencing and had authored a public article on it in 2006 before the bubble burst.



Mike Schmitz
FCAS, MAAA

managing these risks, but in setting the internal pricing and allocation of these costs through a central capital allocation and funds transfer price system. My actuarial background has been an asset for understanding the complex multidimensional constraints and risk drivers affecting the balance sheet economics and establishing disciplined frameworks and management processes to optimize and drive value creation.

AUSTIN

In my role as an actuary in banking, I reconciled actuarial and capital market views on risk-taking, highlighting the opportunity cost of renewing mispriced bank lines to corporate clients; established early-warning signals for credit deterioration; and led the deployment of a proprietary loan mark-to-market model. In a subsequent role, I managed a team of 20 employees responsible for Basel-compliant credit risk parameter estimation and stress-testing for the wholesale portfolio; implementation of best-practice economic capital methodologies for credit, operational and business risks across the enterprise; and the development of policy credit limits that aligned with the organization's risk appetite. Overseeing the bank's inaugural enterprise-wide stress testing exercise in 2007 and adapting this program in response to the global financial crisis that followed was an unforgettable experience. Throughout my career at the bank, I certainly drew upon and was grateful for my actuarial skill set, but this was never a prerequisite for the roles I had.

MEIMBAN

I am responsible for identifying and evaluating opportunities to improve pre- and post-default performance on several consumer portfolios and deposit products, including mortgages, home equity lines of credit (HELOCs), auto loans, student loans, credit cards and checking accounts. I analyze historical data and apply integrative and critical thinking to identify trends and make business recommendations. I build predictive models to optimize our collection activities to mitigate risks that arise from loan defaults and overdrawn accounts. Credit and operational risks are my primary concerns. Transition models are used extensively in banking to project a loan's migration from one status (current, 30 days past due, etc.) to another (current, delinquent, prepaid or default). Building such models utilizes logistic regression, which is based in probability theory.

SCHMITZ

We consult to banks, mortgage companies, monoline mortgage insurers, financial guaranty insurers (bond

Q:

What is the nature of your work and where do your actuarial skills fit into this work?

VON SCHILLING

I have worked in the bank treasury space for the past 10 years and have held roles in capital management and planning, asset-liability management strategy and execution, as well as being involved with liquidity and funding management for the bank. The recent Basel developments for both capital and liquidity have had a profound impact around managing the bank's balance sheet, and the treasury function plays a central role in not only measuring and



RISK MANAGEMENT AND MODELING, PREDICTIVE ANALYTICS, CUSTOMER SEGMENTATION, WORKFORCE ANALYTICS, PRODUCT DESIGN AND PRICING ARE AREAS IN WHICH A QUALIFIED AND ENGAGED ACTUARY COULD CONTRIBUTE AND ENJOY A FRUITFUL CAREER IN BANKING.

insurers), insurers (both life and property and casualty [P&C]), government insurers (including the FHA) and other financial institutions on credit-related asset risk. I also was hired by one of the rating agencies to build a stochastic economic capital model for financial guaranty risks. The actuarial roots are a clear foundation in this work; the diligence, healthy skepticism, ingenuity and standards of practice are integral. It's truly a multidisciplinary team effort involving actuaries, economists, data scientists and programmers.

Q:

Was being an actuary a definite help?

VON SCHILLING

Yes. There are not many actuaries working in banks, so describing myself as an actuary is a differentiator and usually commands a base amount of respect that I must be smart. That's at least a good start! I often describe myself as having a foot in two worlds. I am not a Ph.D. quant or "rocket scientist"; however, I understand models and assumptions enough that I can communicate, challenge and understand effectively how to use the models.

AUSTIN

Yes. I was fortunate to work with a large number of colleagues who had varied educational backgrounds and experiences. Many had graduate degrees—master's or Ph.D.s in the natural sciences or financial engineering—and were very adept in a broad range of numerical methods and estimation techniques that could be applied to building closed and open-form solutions for the capital requirements of a bank portfolio, or modeling operational loss distributions by fitting frequency and severity distributions to loss event data. More than anything, I think I benefited from being a "lone actuary" immersed in this rich, intellectual environment in which the contributions of the whole were so much more than the sum of individuals. It was helpful in the initial years of my transition to banking to make the connection that default risk and mortality risk share a lot in how they can be modeled mathematically.

MEIMBAN

Yes. Having worked previously as an actuary in insurance has exposed me to similar concepts and techniques that are portable to the banking industry. For example, loan default probabilities vary by characteristics, such as credit scores, loan-to-value ratios, loan age and so on. Probability models are built around these covariates. In actuarial science, there

are survival models and hazard rates. Such models and concepts also are used in prepayment and default models in banking. Techniques and concepts are very similar.

Also, a lot of people in banking are aware of how difficult actuarial exams are, that our mathematical abilities are top-notch and that we are a bunch of very smart individuals.

SCHMITZ

Yes. I believe the key to our success is the actuarial foundation on which the practice is built, along with the multidisciplinary, collaborative teamwork.

Q:

What does the future hold for actuaries in banking?

VON SCHILLING

It definitely has the potential to be another important work sector for actuaries. The regulatory environment continues to evolve, introducing more competing and conflicting constraints around capital, liquidity and funding that need to be managed. All of that change will present a lot of opportunity for developing treasury balance sheet solutions.

Actuaries would need to think outside the box. The banking applications will not use all of the traditional actuarial techniques and “standards” found in insurance, pension and P&C business management. However, if one can generalize the skill sets a bit, there are plenty of potential applications, such as:

- ➔ Treasury ALM, capital and liquidity management
- ➔ Enterprisewide stress testing for risk and capital management
- ➔ Retail credit risk management—scoring models, lifetime profitability, provisioning, credit capital models
- ➔ Commercial and corporate credit risk management—ratings models, expected loss, portfolio credit management, credit capital management
- ➔ Enterprise risk management for banks

AUSTIN

It can be an important area of practice for actuaries. Banks are typically large institutions with so much embedded complexity and sophistication in their operations. They play an important role in financing our economy and providing

liquidity to the capital markets. Risk management and modeling, predictive analytics, customer segmentation, workforce analytics, product design and pricing are areas in which a qualified and engaged actuary could contribute and enjoy a fruitful career.

MEIMBAN

I have no doubt that actuaries are qualified to do analytical work in banking. However, actuaries are not viewed as such. We are viewed as experts in insurance and pensions “only.” We all know that our skills are portable. But, unfortunately, outside of insurance and pension fields, our skills are underutilized.

One positive move is that the SOA is now including exams/courses covering predictive analytics. I think this is going in the right direction.

Being an actuary working in traditional jobs is somewhat “comfortable.” You have a secure job. Banking and investments, on the other hand, have more ups and downs. And, once an actuary gets out of insurance, he or she no longer enjoys that “reserved right” to do certain things. In banking, there is no such reserved right. Anybody can become a risk manager or risk analyst, although there is a growing trend now for certifications—such as FRM and CFA—being required or highly recommended for certain jobs in risk management and portfolio management.

SCHMITZ

I think that the Financial Accounting Standards Board’s (FASB’s) Current Expected Credit Loss (CECL) initiative and the tandem International Financial Reporting Standard 9 (IFRS 9) spell much greater demand for this work, and I think we are well placed to compete for that work with our strong analytics, multidisciplinary approach and the standards of practice.

Q:

There's currently no “gathering place” for actuaries in banking. How do you connect with your peers?

VON SCHILLING

I recently joined the newly formed Banking Working Group of the International Actuarial Association (IAA). Developing communication and forums for actuaries who work in the banking field is one of the discussion items.



WITH THE RESOURCES OF SOUTH AFRICA AND AUSTRALIA AVAILABLE TO THE REST OF US, WE CAN MOVE AHEAD QUICKLY AND BE CAUGHT UP IN A VERY SHORT PERIOD OF TIME.

AUSTIN

There are also a number of industry associations—such as the International Association of Credit Portfolio Managers (IACPM), Risk Management Association (RMA), Global Credit Data and Operational Riskdata eXchange Association (ORX)—that are well represented by banks and provide great opportunities for discussion, research and problem-solving across many topics.

SCHMITZ

I've tried to organize such a section within the Casualty Actuarial Society (CAS) called the Credit Risk Special Interest Section, but it's not easy to get more than a handful of actuaries excited about this work. A joint group between the CAS and SOA would seem to make a lot of sense since some casualty actuaries are involved in the liability side of credit risk (mortgage insurers, surety, etc.) and some life actuaries are involved on the asset side. But how do we do it?

CONCLUSION

Once you have had the chance to read this entire issue of *The Actuary*, you will see that Canada and the United

States are at about the same level of evolution with respect to actuaries in banking as South Africa and Australia were about a half dozen years ago. While this may seem to be bad news, the good news is that South Africa and Australia have taken huge steps forward and are now offering education materials to their students for a fellowship specialty that will provide them with a credential for working in banks on risk analysis that is truly "banking." So, with those resources available to us, we can move ahead quickly and be caught up in a very short period of time.

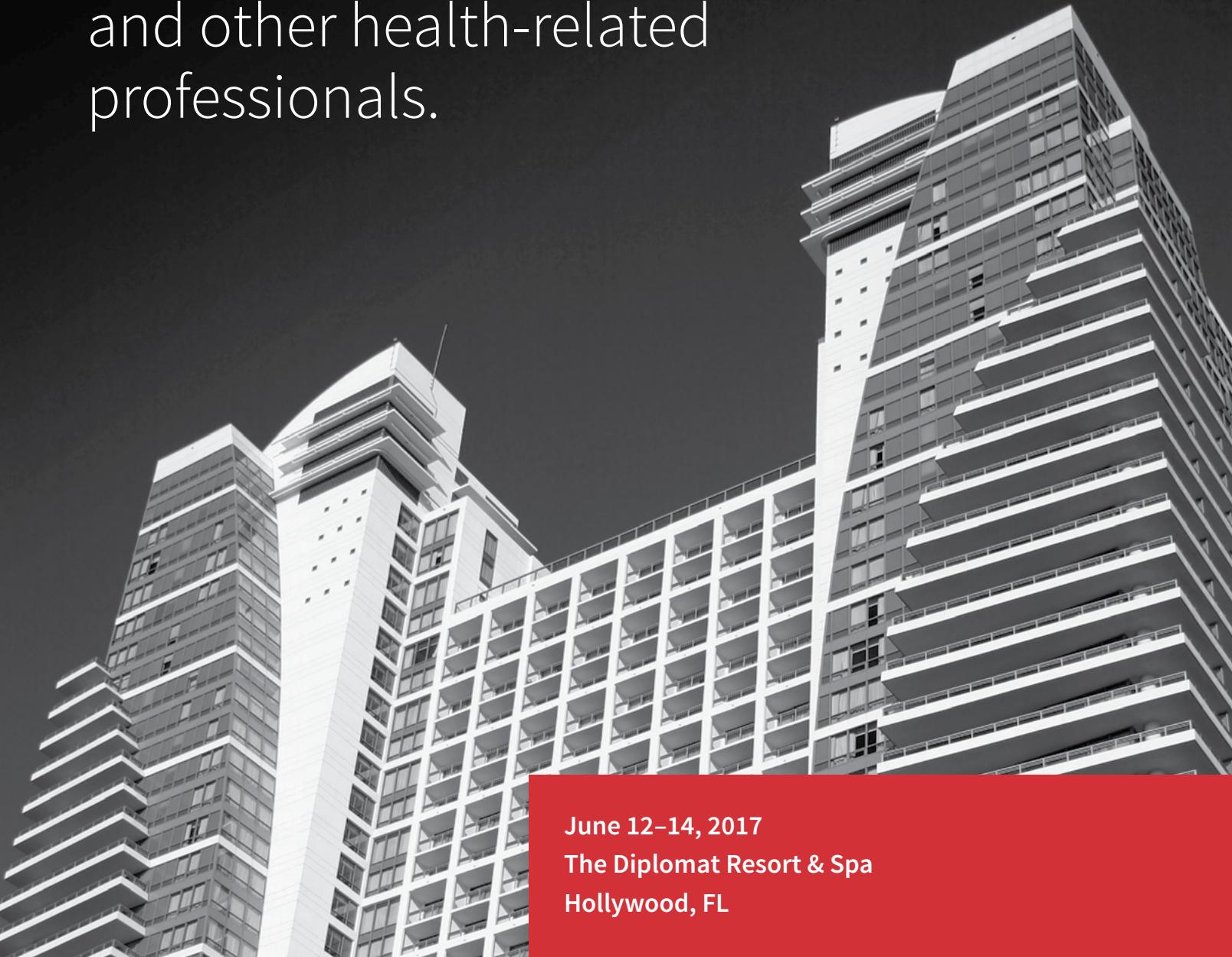
Further, our friends in the United Kingdom have offered us another alternative. That is to find an independent credential that an actuarial candidate could attain that would then be added to his or her basic actuarial education and result in a fellowship designation (FSA) in banking. ■

Robert L. Brown, FSA, ACAS, FCIA, HONFIA, is a contributing editor for *The Actuary* and a past president of the Society of Actuaries.

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FEATURE

AUSTRALIAN ACTUARIES IN BANKING

BANKING



ON RISK MANAGEMENT

BY NICK SCOTT

HOW ACTUARIES IN AUSTRALIA BECAME AN INTEGRAL PART OF THE BANKING INDUSTRY

There are about 300 members of the actuarial profession in Australia who select “banking” as their primary interest area, which is just more than 7 percent of the local membership.

The early days of actuaries in banking were very ad hoc, with individual actuaries making their own way. There was no single point of entry. Some carved out a role in the finance function, having worked in capital management for insurers and transferring those skills to banking. Some worked in corporate finance, which has always been a home for a range of quantitative professionals. With the introduction of Basel II, there was a big opportunity for actuaries to help build credit risk models to help banks become accredited as “advanced banks.” Actuaries in both industry and professional services jumped at this opportunity.

The Basel requirements¹ and the regulatory bias for internal models from 2005 to just after the 2008–2009 financial crisis opened a path for actuaries in credit and operational risk modeling. The recent focus on stress testing also has provided work for actuaries across risk classes. The “Basel IV”² move to introduce capital floors and the tilt back to standardized approaches may dampen growth in this space. Banking risk management is still a highly technical area, and even standardized approaches are complex.

Regulation could, of course, be another game-changer in the future. A statutory role may emerge, given the focus by both the government and local regulators on bank pricing and how banks balance the demands of shareholders and customers.



Many of the risk management practices of banks in Australia have been ahead of those for insurers. For example, banks had Basel II before they had Life and General Insurance Capital (LAGIC) requirements, which are local risk-based capital requirements for insurers that are equivalent to Solvency II. Banks also had the Internal Capital Adequacy Assessment Process (ICAAP), as required under the Basel rules and local regulatory standards, before insurers did. Banks were well ahead in terms of stress testing, so in a lot of ways the regulators created the opportunities for the smart numerical risk professionals like actuaries.

As for the near future, alongside risk and capital management, a significant growth area in banking is analytics—customer, behavioral and predictive analytics—that can be used to sharpen up pricing and portfolio optimization. This is the world of big data, and actuaries are very big in this space locally. One large consulting firm has combined its actuaries and its analytics team, and we know that actuaries work in this space at banks—in both mortgage analytics and deposit analytics.

In 10 years, it is possible to imagine that actuaries will be seen as the gold standard professional for prudent bank risk management and the go-to profession for explaining the economics of banking activity and financial strength. As disruption continues across the industry, the core economic function of banking—credit intermediation (the function of connecting savers to borrowers) and maturity transformation (the function of borrowing short-term money like deposits to lend long-term money like home loans)—will be examined by nontraditional players and made more transparent to the market. This should continue to drive demand for banking actuaries.

A SURVEY OF AUSTRALIAN ACTUARIES IN BANKING

In 2014, the Australian Institute of Actuaries (the Institute) surveyed actuaries working in the banking sector and followed up with several in-depth interviews. The survey examines backgrounds and pathways into banking, current roles and perceptions, areas of development and future opportunities. Its purpose was to provide a snapshot of actuaries working in the banking sector.

What follows is a presentation and discussion of the survey results. Our objective is to better understand how the profession is faring in the sector and provide a platform for further discussion. The Institute's Banking Practice Committee (BPC) was established in 2013 as a vehicle for supporting the growth of actuaries in banking, and these results are a small contribution to that effort. (See the "Findings" sidebar for a high-level summary of the survey.)

The survey targeted the 293 members of the Institute (2014) who self-identified as working primarily in banking and make up about 7 percent of all Institute members. Overall, there were 47 respondents, representing 16 percent of the potential member universe, although not all respondents answered all questions.

The first question established the distribution of the number of years worked in the banking sector. We found an even allocation across the experience brackets, indicating a good mix for the survey results and inferences. More important, it may also imply a healthy distribution of new entrants and seasoned professionals across the sector.

Question 2 focused on the typical practice areas of survey respondents prior to their movement into banking. Overall, it showed a broad mix of backgrounds from traditional (predominately life and general insurance) and nontraditional areas.

Almost half of the respondents with a general insurance background currently are in a credit risk role. Further discussion in interviews revealed that general insurance experience could provide the technical training for the application of statistical and programming techniques in credit risk modeling. Within consulting firms especially, actuaries can move naturally from general insurance projects to bank projects and banking-focused teams.

Overlaying the result with time spent in the banking sector highlights that beginning a career in banking is a relatively new development, with two-thirds of respondents in this category having worked in banking for five years or fewer.

The work categories reported have a high percentage of roles that are management level.

The high combined percentage working in Investment Banking and Markets (29 percent) shows actuaries are active in "front-office" roles as well as the more habitual group service and middle-office roles. At this level, there are a pleasing variety of roles across the highly diverse segments of credit risk and treasury.

The large percentage of members in credit risk roles was expected based on the anecdotal recognition of this area as the more natural crossover point from statistical modeling roles in general insurance.

During our interviews and discussion with banking colleagues, we learned that credit risk modeling is still a relatively nascent field, and actuaries are prominent in thought leadership, framework and process development within banks. The complexity and variety of banking risk exposures and the weight and urgency of regulatory requirements has created a large space for actuaries to

findings

build out and develop their careers. The number of actuaries working within treasury is both noteworthy and encouraging. Treasury roles have been more closely aligned with the accounting profession, with its traditional location within Group Finance. Through further discussion, a number of factors were revealed to have driven this development:

- ➡ Since the 2008–2009 financial crisis, treasury management at banks has increasingly focused on liquidity risk modeling, management and pricing, which is a relatively underdeveloped area.
- ➡ Accounting techniques that have a “balance sheet focus” are perhaps less suited to the challenges of stress tests, sensitivity analysis and other quantitative risk measurement techniques applied to liquidity risk and other asset-liability modeling.
- ➡ Recent regulations, such as Basel III, have increased the need to understand liquidity characteristics, and the requirement to hold liquid assets for uncertain future events has increased.

The dominant skills that are applied on a day-to-day basis are the traditional skills of statistical analysis, cash flow and financial modeling, combined with the ability to apply complex judgment.

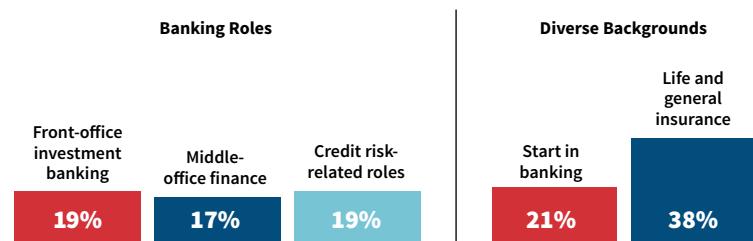
Overlaying this view with data on “current role” shows a significant number of managers, not unsurprising, using complex judgment within their current roles.

PERCEPTIONS

Actuaries are regarded positively within banks, and there is no evidence of any perception issues that are limiting the opportunities of actuaries within banking. Within credit risk, there is some indication that actuaries are perceived as “modelers” as opposed to managers using skills “across the control-cycle.” There is a significant group of actuaries who do not believe their actuarial background is relevant to their colleagues’ perception of their skill sets. This is notwithstanding that actuaries themselves certainly feel particular aspects of their skill sets are relevant on a day-to-day basis. Although strong quantitative skills are seen as a key feature of the actuarial profession,

A SURVEY OF AUSTRALIAN ACTUARIES IN BANKING: KEY TAKEAWAYS

Actuaries are working in a range of banking roles: front-office investment banking (19 percent), middle-office finance (17 percent) and credit risk-related roles (19 percent). Banking actuaries come from a diverse range of backgrounds—mainly life and general insurance (38 percent)—and a strong emerging segment of actuaries with careers starting in banking (21 percent).



The main attractions to a banking career are broader career opportunities (31 percent) and variety of work compared to traditional areas (26 percent). This is reflected in the extremely wide range of current roles of our survey respondents.

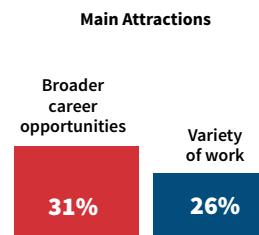
Credit risk modeling roles are a natural bridge for actuaries with modeling and programming skills acquired in general insurance practice, though technical product pricing (as led by actuaries in the insurance sector) is emerging for certain banking products.

Risk-based capital and internal credit risk models are still very much a “work-in-progress,” and some actuaries are emerging as thought leaders in these fields.

Regulatory changes, in particular the Basel III liquidity requirements, are opening up opportunities for actuaries for the technical challenges of liquidity risk measurement and modeling—a largely “green-field” specialist area.

More training in banking-specific techniques and regulatory requirements is required to seize the current opportunities open to actuaries.

Regulatory changes and the evolving challenges of banking risk management since the 2008–2009 financial crisis are seen as the key drivers for the future opportunities of actuaries in banking.



it was noted by some respondents that actuaries were not necessarily “top-of-mind” for quantitative roles.

CURRENT APPLICATIONS

As a bridging question to future opportunities, we asked what areas of banking are best suited for actuaries. This question allowed multiple responses, so it was broken down into percentage terms of those who actually responded.

Treasury and Product Management and Pricing both scored higher than 10 percent and indicate strong interest in these areas. We suggest treasury is a reflection of the increased regulatory and market focus on funding and

liquidity as discussed earlier. Typically an accounting and balance sheet focused role, the demands of a treasury role in banking have clearly changed since the 2008–2009 financial crisis, as indicated by the raft of new regulation by global regulators to improve the liquidity risk measurement and management, controls and systems of large banking groups.

Actuaries have an established role in product pricing in the insurance sector, as that market has seen a significant increase in disciplined pricing techniques over the last decade. Actuaries emerged out of reserving roles to apply statistical techniques to traditional and innovative rating factors to help underwriters manage renewal and new business pricing.



IN 10 YEARS, IT IS POSSIBLE TO IMAGINE THAT ACTUARIES WILL BE SEEN AS THE GOLD STANDARD PROFESSIONAL FOR PRUDENT BANK RISK MANAGEMENT.

In a similar way, actuaries clearly believe there is scope to apply a similar skill set to banking product pricing. In post-survey interviews, we discussed the application for more high-frequency products in the retail sector and the uses of quality data available in this sector for certain products, such as credit cards, loans and deposits.

AREAS FOR DEVELOPMENT

As is often seen in questionnaires and debates on this topic, communication and influencing skills were seen as the top area for development. We judge this to be no different than outcomes observed for traditional practice areas.

Another clear theme was the need for development of specific quantitative skills for banking. Although actuaries are well trained and drilled in financial modeling in the early years of work experience, more banking-specific modeling techniques are lacking from the syllabus. This is an obvious area for improvement in education and continuing professional development (CPD). Like general insurance, inexperienced actuaries can be taught by practicing actuaries at consultancies.

Bank regulation is also a standout area for improvement. There has been significant regulatory change since the 2008–2009 financial crisis, and there is no better time for actuaries to acquire this knowledge and experience. Alongside modeling techniques, it is perhaps the most readily accessible by self-learning and attendance at industry seminars.

Developments related to accounting standards revisions requiring forward-looking credit provisions is another developing area. Challenges of this nature are essentially actuaries' "bread and butter," and it is no surprise that actuaries both within consultancies and banks are gaining ground in this area.

FUTURE OPPORTUNITIES

The final question in the survey was: "Which current issues and challenges faced by the banking sector are best suited for actuaries to respond to?" Though an open-ended question, the results gravitated around two topics: risk management and the Basel capital standards.

Specific topics included stress testing, sovereign and large financial institutions' credit risk models, and credit provisioning. The results are correlated strongly with the number of actuaries working in these areas and are seen as a response to the weaknesses revealed during the 2008–2009 financial crisis.

Outside of capital management, one interviewee said no profession has stepped forward to "claim the liquidity risk space," which dominates the Basel III standard.

This area could make up a new and distinct branch of the profession, as it requires a deep understanding of the data, products, systems and processes behind all bank products and services.

Some expressed a concern in relation to "overregulation," balance and reliance on rating agencies, which speaks to the historical challenges between internal disciplines and frameworks and less risk-sensitive regulatory constraints in the insurance sector.

In other areas, several members highlighted the opportunity to apply quantitative pricing models to banking products for the first time. This coincides with the availability of rich data sets across some banking groups and an emerging ambition to leverage the data for competitive purposes.

CONCLUSION

The survey results in many ways support our own intuitive and basic assumption that actuaries would be working in a range of banking roles, with a slight bias toward credit risk modeling. In the absence of a banking-specific qualification and the wide range of banking roles, no one profession or qualification suite dominates the banking sector in Australia—with the possible exception of the ubiquitous accountant. As there are fewer actuaries generally, there are naturally fewer actuaries working in the banking sector today. Nevertheless, an average participation rate of 7 percent of Institute members in a sector vastly larger than insurance (in people and capital resources) is something that should be the subject of further research and discussion.

The diversity of banking roles occupied by actuaries is healthy and a sign of the wide applicability of the actuarial skill set, experience and ambition of its members. Actuaries are active in client-facing investment banking roles, as well as the wide array of risk and product management roles. The continuous increase in levels of both modeling sophistication and regulatory oversight across banking activities can only be a bullish sign for the profession. ■

References

¹ International minimum capital requirements set by the Basel Committee of Banking Supervision (BCBS).

² The name now typically adopted to describe the latest wave of reforms proposed by the Basel Committee of Banking Supervision (BCBS).

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FEATURE

BANKING OPPORTUNITIES IN THE UNITED KINGDOM



CROSSING INTO



A LOOK AT ACTUARIES AND BANKING IN THE UNITED KINGDOM

When it comes to actuaries and banking, the United Kingdom lags behind South Africa and Australia, whose professional bodies are seeking employment opportunities for their members in wider fields like banking.

In the United Kingdom, there has always been a trickle of actuaries crossing into investment banking, where they use their skills and knowledge to find roles. By contrast, few actuaries have worked in the traditional areas of commercial and retail banking.

Despite the importance of banks and the large pool of jobs available, the U.K. actuarial profession has not developed a strategy to help actuaries move into banking. This seems reasonable, since the traditional banks have not experienced a “road to Damascus” moment—where they comprehend how actuaries could help them make better, more joined-up, longer-term decisions. This creates a chicken-and-egg situation. Without any clear demand for actuaries in banking, the wider profession has not invested in equipping actuaries to make their own journeys.

The main link between U.K. actuaries and banking has been through a voluntary Banking Member's Interest Group (MIG), which sits under the investment and risk board. The MIG has been active periodically over a 20-year period, and it has produced an interesting range of papers. However, it has not managed to create the critical mass required to sustain activity, let alone create a new and wider field area for banking, as general insurance achieved in the 1970s.

BY JOHN YOUNG

BANKING

GROWTH OPPORTUNITIES

As the current chair of the MIG, I am fortunate to be able to draw on the experiences of its founder, Iain Allan, who recruited me into the banking field. Our combined experiences have determined our proposed approach to educate and encourage actuaries to pursue a career in banking. We are basing our approach on four premises.

Our starting premise is opportunities for actuaries in banking will continue to grow as change sweeps the traditional providers. Traditional banking models are under threat everywhere. Data is being transformed by adaptive learning and driven forward by new technologies, such as self-driving cars. Regulators are moving away from “tick box” compliance to judgment-based decisions and improved risk management and planning through more demanding and realistic stress tests. New entrants no longer will be excluded by a lack of data, thanks to proposed initiatives such as open APIs,¹ which will facilitate aggregation of personal financial management across financial providers. The old banking skills needed to manage the practical complexity of a branch network will reduce as banking moves away from the high street. However, operational complexity will continue to differentiate banking and insurance, especially as long as cash continues to be used in the economy. I estimate that the 2.8 billion ATM withdrawals a year in the United Kingdom dispense notes with a weight equivalent to 15,000 Mini Coopers. This represents a stack of £20 notes that is 1,200 km long—a greater distance than the length of the United Kingdom. Managing this volume of cash and other transactions is a costly and complex business operationally.

Our second premise is that the entry of actuaries into banking will be a long-term process. It will take time to build a critical mass of actuaries working in banking who will then value the skills of other actuaries. These “pioneers” are necessary to open the door to others. Thus, the MIG’s educational focus is to help these intrepid pioneers make the journey into banking. We also hope that relevant continuing professional development (CPD) might attract the interest of banking actuaries who have “gone astray.”

Our third premise is that actuaries who have made this journey into banking are well positioned to help educate other actuaries. Only actuaries know how to leverage the traditional knowledge and skills actuaries already know. Banking actuaries can highlight the remarkable overlap between core banking concepts and core insurance concepts. Banking is not, and should not be thought of as a completely separate field. Many actuaries already know

enough to be successful in a bank. They just don’t know how to explain this to management.

My final premise is that the U.K. actuarial profession is standing on a weakening platform. I believe traditional jobs will become increasingly scarce, as defined benefits pension schemes decline and life offices continue to merge and focus on simpler investment products. This will create a demand for new sources of actuarial jobs during the next 10 to 20 years. The MIG is looking to banking as a solution in the longer-term, rather than today.

PREPARING FOR THE LONG TERM

Given there is little immediate demand to train actuaries in banking from either the actuarial profession or the U.K. banks—but rather a long-term opportunity exists for both—the MIG is looking for some easy educational “wins” in 2017. Our proposal is to create a coherent block of online CPD that will be accessible and immediately useful to actuaries interested in working in banking. Our aim is to be realistic about what can be achieved.

STRIKING SIMILARITIES

In an ideal world, there would be three sets of materials. One set of materials would focus on stories of how actuaries have already made the journey into banking. How did they find a role? What concepts did they rely on? What challenges did they face?

Another set of materials would explain the key concepts of banking. What do banks do for customers? What are the key risks facing a bank, and how do banks manage them?

These first two sets of materials, developed by actuaries for actuaries, would focus on how to re-use existing knowledge and concepts rather than learning banking from scratch. For example, underwriting for life and general insurance is very similar to credit risk scoring for bank lending. Both approaches use past data to estimate the risk of future losses. Both approaches separate the loss calculation into frequency and severity calculations.

In banking, the probability of default is analogous to claims frequency in insurance. The banks split the calculation of claim severity into two parts. They first estimate the exposure at default (how much the bank is on the hook for, which matters for lines of credit, such as a credit card, when someone who has not borrowed may borrow £5,000 when he or she loses his or her job) and the loss given default (how much of this exposure the bank will not get back).

Even the general insurance concepts of nonhomogeneity and selection of risk carry over to banking. The probability of default is influenced by the rate the bank charges when



CHANGE

“Knowing how to translate technical ideas from insurance to banking is not enough. Actuaries interested in a career in banking need to understand how banks are organized.”

it offers a customer a loan. These are all familiar concepts for most actuaries. What are necessary are context and a bank jargon buster (there is a joke that banks need a “TAM,” a three-letter acronym manager).

The same type of analogy is true of capital management. There are significant overlaps between Basel III and Solvency II. In addition, the role of bank capital is best understood using the concept of probability of ruin, which I learned from general insurance. Even the most bank-centric activities in the Treasury Department overlap strongly with insurance ideas for asset-liability management.

LEARNING BY EXAMPLE

The third set of materials proposed by the MIG for 2017 will cover current topics in banking and examples of work done by actuaries in banking. Current topics in banking will offer links and commentary on proposals for new U.K. banking regulations, such as Bank of England and Financial Conduct Authority (FCA) macroprudential and conduct regulatory papers.

The banking examples will describe work actuaries have successfully done in a bank. My own experience, for example, covers the development of net present value (NPV) pricing models for loans, mortgages and credit cards. However, we should not take our skills for granted. It is interesting that Jamie Dimon, the CEO of JP Morgan Chase, observed that no one could really claim to be a

banker unless they understand credit cards. Actuaries who have been involved in life insurance or general pricing can pick this up pretty quickly.

I also have been involved in the development of customer value (economic value) metrics across retail, business and private banks. This type of model requires an understanding of how to calculate and allocate income (including treasury), costs, losses and capital at an account level. This is a natural approach for actuaries who have been exposed to model office concepts and understand the need to separate different tranches of business. It is harder for bankers who have been trained to think of a bank in terms of a total balance sheet.

In addition, our intention is to create a pool of material that acts as a dictionary to translate banking jargon into the equivalent insurance concept. The approach should help those actuaries adventurous enough to make the leap into banking.

CROSSING BOUNDARIES

However, knowing how to translate technical ideas from insurance to banking is not enough. Actuaries interested in a career in banking need to understand how banks are organized.

Banks are organized in vertical silos. For example, they have specialists in credit risk, treasury, finance and product management. These experts are generally taught on the job. This structure and approach make it hard for a



THERE IS A NEED TO REACH OUT TO OTHER ACTUARIAL BODIES TO TRY AND SHARE THE LIMITED KNOWLEDGE THAT EXISTS IN BANKING. WE NEED TO POOL OUR LIMITED RESOURCES IN A MANNER THAT MAKES IT POSSIBLE TO CREATE A NEW AREA OF ACTIVITY.

credit expert to move into other areas of the bank, such as treasury. As a result, people in these silos often find it difficult to communicate effectively across boundaries. This is made harder by the way silos are normally tasked with their own, often mutually-exclusive, targets. For example, credit risk may set a target to minimize losses, while products and finance may be tasked to maximize income. This creates an immediate conflict, as maximizing income could be done by writing riskier loans and mortgages.

This is where actuaries offer a unique skill. Our training allows us to communicate across silos. This bridging across profit and loss (P&L) lines is often left to the CEO and finance director, meaning the natural supporters of actuaries in banking are at a relatively senior level. Actuaries may face problems when they work at levels lower than this. If actuaries sit within a silo, their natural desire to optimize a solution (e.g., trade off credit risk and income) might be seen as making life more difficult. This can make it hard to “get into a bank.” However, since I joined the bank, I have had the opportunity to set up different teams that continue to recruit actuaries whose value is recognized by the business. Of six actuaries brought in, two have moved into product roles, and this is the sort of organic growth that the MIG wishes to support with its simple approach to education.

The MIG hopes its approach to CPD might help open the door to actuaries in bancassurance to try and cross over into banking, or it may help actuaries in consultancies to team up with their banking colleagues to pitch for business. It might also encourage some actuaries to head into

banking on their own. It’s a modest aim, but one that might be achievable.

While this is the focus for 2017, there is a need to reach out to other actuarial bodies to try and share the limited knowledge that exists in banking. The hope is that initiatives, such as this issue of *The Actuary*, will make this possible. What is needed is a pooling of limited resources in a manner that makes it possible to create a new area of activity.

The U.K. MIG will also look to tie in with existing banking bodies, such as the Chartered Institute of Bankers (CIOB), which already has developed a range of education materials for banking. The minimum engagement would be to make actuaries aware of CIOB’s affiliate membership, which allows access to *Chartered Banker* magazine. Beyond this, we would look to share ideas on CPD and see if the actuarial profession’s code of professional standards might be helpful in the banking arena. ■

Reference

¹ An open API is an open “application programming interface.” It’s a way to allow a wider group of application developers to create new solutions on a platform. It’s significant for U.K. banking because the open banking initiative is seeking to encourage innovation by allowing developers to create new apps that can better use customers’ transaction data.

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FEATURE

BANKING AROUND THE WORLD



SURVEY SAYS

THE IAA BANKING EDUCATION INTEREST GROUP SURVEYS ITS MEMBERS TO LEARN MORE ABOUT ACTUARIES WORKING IN BANKING GLOBALLY

BY ANDREW GLADWIN



At the Saint Petersburg Education Committee meeting in May 2016, there was a discussion around banking as a potential emerging area for actuarial education. It was agreed to establish an interest group that would report back to the International Actuarial Association (IAA) Cape Town committee meetings. The members of the interest group are Andrew Gladwin (South Africa, chair), Louis Doiron (Canada), Khadija Gasimova (Azerbaijan) and Phillip Everett (Australia).

The IAA also has recently established a Banking Working Group that reports to the Scientific Committee—a further indication of the recognition of banking as a practice area.

PROCESS

The interest group members held an initial discussion about the roles actuaries can play in banking. It was then agreed to send out a short survey to the Education Committee, organized by the IAA office. The responses of the survey were then collated and are discussed in this article.

ROLES ACTUARIES CAN PLAY IN BANKING

In discussing the roles actuaries can play in banking, the following high-level points were noted by the interest group.

- ⇒ The nature of the actuarial training, in terms of understanding economics, finance, asset-liability management, modeling and credit risk, should provide a skill set that can be very useful to banks.
- ⇒ In addition, the professional skills of an actuary may be very useful in an industry that does not always have the best public reputation.
- ⇒ On the other hand, the actuarial profession does not have a monopoly on the quantitative skills needed in banking, and other professions/courses may provide a stronger background. Actuaries will need to “prove themselves” in this field.
- ⇒ Data analytics will be an important skill for actuaries in banking.

It was noted that a number of actuaries were employed by banks around the world, but often for the insurance sections of a bank, in traditional insurance roles. However, there were actuaries and actuarial students employed by banks in specific bank roles, especially in South Africa and Australia. These roles include:

- ⇒ Capital management and Basel-related returns
- ⇒ Broader balance sheet management
- ⇒ Risk management, including credit risk and operational risks
- ⇒ Asset-liability management—especially the mismatch between asset and liability terms
- ⇒ Credit scoring of applicants
- ⇒ Data analytics—especially for up-sell planning
- ⇒ Work around mergers and acquisition, including risks and pricing (for investment and merchant banks)
- ⇒ Any work that requires both financial acumen and the assessment and valuation of long-term risks
- ⇒ Treasury
- ⇒ Product development and pricing

SURVEY QUESTIONS AND RESPONSES

A short survey was set up with the following questions.

- ① How many fully qualified actuaries in your association work in banking? (Please provide approximate ranges if you do not have the exact details. Note this would include actuaries working in specific banking roles, as opposed to an insurance subsidiary of a bank.)
- ② How many students (studying to become fully qualified actuaries) in your association work in banking? (Please provide approximate ranges if you do not have the exact details. Note this would include actuaries working in specific banking roles, as opposed to an insurance subsidiary of a bank.)
- ③ Do you have a working group, task force or interest group in banking as part of your actuarial association? If so, please provide brief details of this group.
- ④ Have you provided any education opportunities in banking, including CPD events? If so, please provide brief details around these educational opportunities.
- ⑤ What would your association's view be on the following statements?
 - ⇒ Actuaries can add value to banking institutions.
 - ⇒ Banking is a potential future practice area that a significant number of actuaries could be involved in.

There were 27 responses to the survey, including most but not all of the larger full member associations, and with reasonable representation from the major regions. The main conclusions from the responses are:

- ⇒ There are significant numbers of fully qualified actuaries working in banking (in specific banking roles) in

the United Kingdom, Spain, South Africa, Australia, Germany, Mexico and France. For other countries, there were very few or no actuaries in this field, although some countries indicated difficulty in tracking where their members work.

- ⇒ The previous point also applies to students studying to qualify as actuaries, although it was indicated that it was often even harder to track where students work.
- ⇒ In the United Kingdom and Italy, the profession is in the process of setting up interest groups/working groups in banking.
- ⇒ South Africa and Australia have established banking practice committees.
- ⇒ In Canada and Ireland, there is no separate banking committee, but banking is discussed as part of emerging practices and wider fields groups.
- ⇒ In Germany, the investment practice committee has links to banking.
- ⇒ Aside from the associations already mentioned, none had specific structures looking at banking.
- ⇒ In South Africa, a banking course has been part of the actuarial syllabus as an optional route to qualification since 2015. The annual daylong seminar in banking is now established.
- ⇒ Australia has held two banking seminars in the last two years. The Australian Institute of Actuaries is looking to introduce a banking course as part of its qualification.
- ⇒ Germany and Ireland have held a few banking seminars.
- ⇒ Otherwise, there seem to be a limited number of education/continuing professional development (CPD) opportunities in banking among other actuarial societies.
- ⇒ As a response to the proposition that actuaries can add value to banking institutions, 25 associations agreed with the statement, and many indicated strong agreement. There was one response of maybe, and one indicated that banking was not a focus area.
- ⇒ As a response to the proposition that banking is a future potential practice area for actuaries, 22 agreed, again with many indicating strong agreement, and South Africa noting that it was already a current practice area. Five of the responses were less sure, with the time needed to establish the profession in the area cited by one as a possible constraint.

CONCLUSION AND NEXT STEPS

The results of the survey indicate that banking is an important future practice area in which actuaries can add value. In Australia and South Africa, it is already an



THE RESULTS OF THE SURVEY INDICATE THAT BANKING IS AN IMPORTANT FUTURE PRACTICE AREA IN WHICH ACTUARIES CAN ADD VALUE.

established practice area, while some other countries have set up CPD opportunities and structures looking at banking. The new IAA syllabus has been set up in a way that should facilitate more basic knowledge around banking and the roles of banks in the economy. This could encourage more actuaries and student actuaries to practice in this area.

It may be useful for countries with more established practice, such as South Africa and Australia, to share educational and CPD resources, and to look into setting up a formal or informal global practicing group. ■

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Q&A WITH TECHNOLOGY EVANGELIST DAVE SNELL

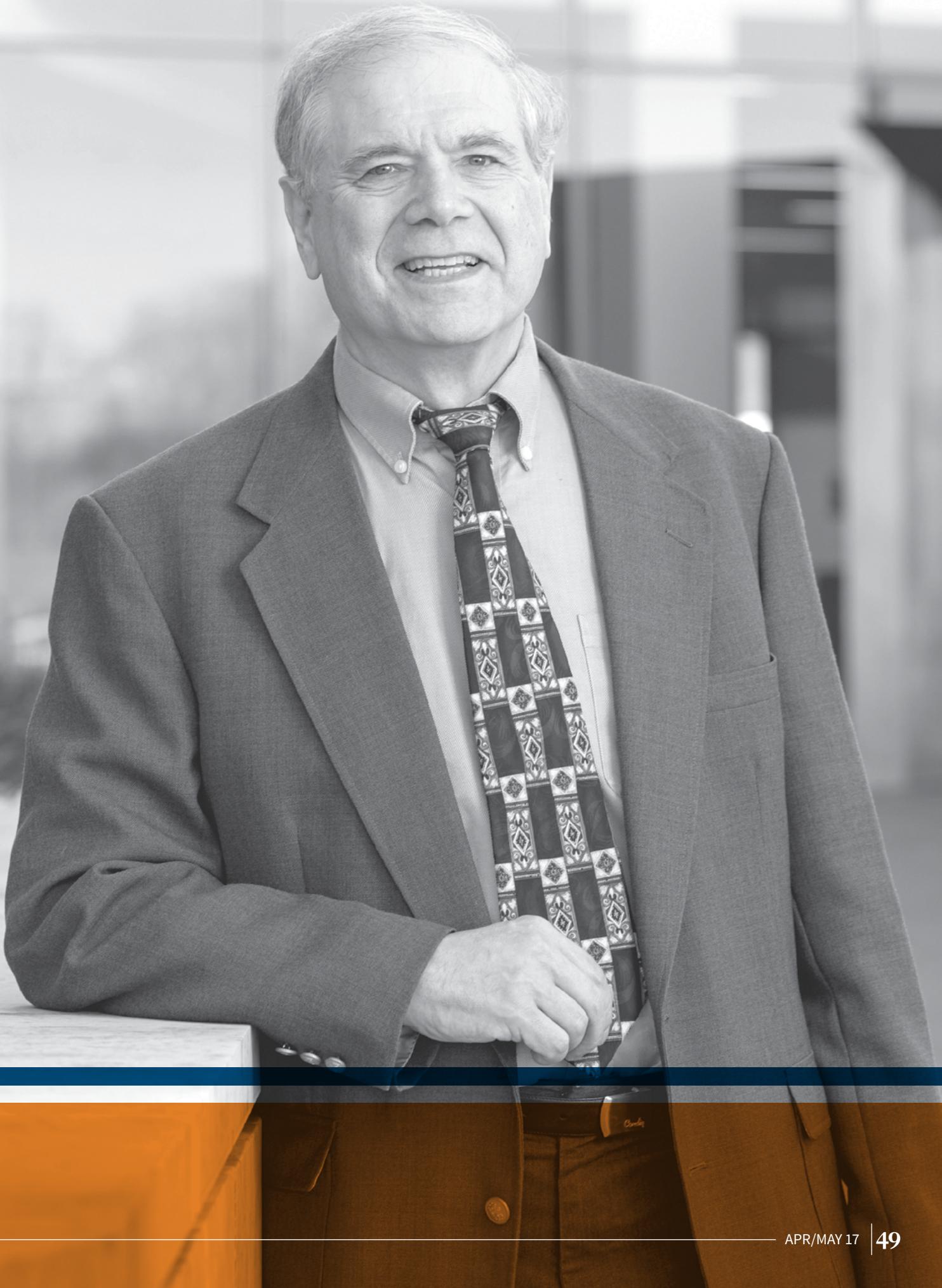
Q: Why did you become an actuary?

A: I was an engineer in a research lab. One Thursday morning, I came to work and discovered that due to a defense cutback, our team was being laid off. At the time, I was young and still marketable. However, my colleague in the next office, despite being a world expert in fuel injection technology with 23 years of experience, had very limited options. There were only two firms in the world that could employ him in that capacity—and one had just laid him off. I witnessed the personal devastation of a very competent career engineer and decided never to become that person. That weekend, I accompanied my wife, who worked at an insurance company, to a work party. She introduced me to an actuary, who said, “If you like math, and you like money, this is a great career.” Mathematics had always been a passion for me, and with a two-month-old son, money sounded like a really good idea.

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Q: Why did the actuarial profession attract you?

A: The actuarial profession offered the opportunity to work in a nontoxic, nonhazardous, not-politically-dependent environment with extremely bright colleagues and get paid very well for it. It satisfied my idealistic desires to help humanity by designing affordable and dependable products to protect families from dire financial need after the loss of a loved one. It also appealed to me that the exam process was so oblivious to gender and race. Career progress was highly related to exam progress, and it is really difficult to discriminate unfairly against a candidate number. Also, there appeared to be no ceiling for professional growth.

At the time I started working in this field, actuaries headed most life insurance companies in the country. The actuary was the only person able to master commutation functions to do the complicated mathematical forecasting needed for pricing, valuation and other “quant” tasks. But the actuary also was able to cross over into other business functions. He or she could converse with an underwriter about the longevity significance of a complicated disease, meet with the investment department about the beta of a stock or bond, talk to the information technology team about storage bytes, and chat with the marketing folks about consumer needs and preferences. Only the actuary spoke all of these languages and had empathy for the many areas of an insurance company. Strategic leadership was a natural outgrowth of that ability to understand both numbers and people—and to convey goals and results in a lucid manner.

Unfortunately, I fear we have lost much ground since the ubiquity of electronic spreadsheets that eliminated the need for commutation functions and the invasion by other quants (MBAs, CFA, CPAs, etc.) with similar computing tools but better communication skills. There is an old Chinese saying—“I wish my enemy 50 years of prosperity”—that seems to apply here. The idea behind the saying is that a long period of prosperity can erode our initiative and our willingness to adapt to changing times. Actuaries, as a profession, got complacent. Now, on some fronts, such as predictive analytics, we must play catch-up.

Q: How did your professional experience lead you to a career that is somewhat less traditional?

A: Back in the late 1980s, I had the unusual (for an actuary) opportunity to move into the sales field. I lived for

three years on commissions from managing 1,200 brokers in the San Francisco area. My initial assumption was that my vast product knowledge would make me a brokerage magnet. Unbeknownst to me, the term “actuary” was synonymous with “deal killer” in the sales environment. I had to become a chartered life underwriter (CLU) and chartered financial consultant (ChFC) to get some street cred. I also started teaching agents how to pass their life underwriter training council (LUTC) exams.

By the third year, they elected me president of the Life Underwriters Association—but by then I realized my strengths were not in direct sales. Often, I would convince clients to stay with their own plans rather than buy the one the broker and I were selling. I returned to a home office environment as a “respectable failure,” but I was far savvier than when I had left it. The education was expensive, but it served me well afterward because I had learned empathy for the sales process that I could not have gained in a comfortable salaried position. In a sense, this was my introduction to behavioral economics, which play an important role in effective predictive analytics.

Q: How did you segue into work in predictive analytics?

A: In 1982, a good friend (who later became our CEO) gave me a copy of *Gödel, Escher, Bach: An Eternal Golden Braid*, by Douglas Hofstadter. I became fascinated by this new area called artificial intelligence (AI). Later, he had me develop an AI expert system for life insurance underwriting. RGA was a pioneer in the development of underwriting expert systems. It has been translated into several languages, including Chinese, and currently is being used in many countries. More recently, I was co-inventor on a patent to combine machine intelligence with human intelligence.

Q: What brings you the most joy in your current position?

A: I love working with, inspiring and learning from the bright young minds around me. We have a lot of Ph.D.s in our group. Relative to any of them, I am academically challenged; but we seem to have a synergy that produces amazing results. I’ve been blessed to have the pleasure and pride of teaching individuals to do something (or to try something) and then watch them do it better than I could have ever imagined myself.



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“We have a professional responsibility to detect, change and, where possible, prevent the misuses of predictive analytics.”

Q: With regard to predictive analytics, what skills positioned you for work in this area?

A: I had a nonstandard experience set for the predictive analytics area. Fortunately, our company recognizes that a wide mix of people with complementary skills is needed to make predictive analytics projects successful. My strong computer programming background, which spans four decades and 30 programming languages, was a big asset because so much of predictive analytics involves harvesting and preparing the “tidy data” before you can use it. The actuarial studies provided me with a decent background in statistics, and I strengthened my knowledge where necessary through books, online courses and interactions with kindred spirits. The Society of Actuaries (SOA) Predictive Analytics and Futurism (PAF) Section is an excellent place to shortcut this process.

Q: What skills do actuaries bring to analytics that other professionals may not?

A: In addition to the stats and IT knowledge, a data scientist for financial risk needs subject-matter expertise. Other quants may actually be stronger than actuaries on the first two items, but we shine on this third one. Our PAF newsletter has several articles with examples of how important subject-matter expertise is to the successful creation and use of predictive models.

One glaring example of how important it is to understand the assumptions of the algorithms utilized is the “dead salmon syndrome.” Thousands of functional magnetic resonance imaging (fMRI) studies have been used to validate new medications and medical procedures, and a few years ago it was discovered that the underlying algorithm to interpret these fMRI results had a flaw that gave a lot of false positives. It was confirmed after a researcher hooked the electrical leads to a dead salmon and got results supporting the efficacy of an experimental procedure. Keep in mind that the subject was a salmon—not a human brain—and it was dead! The actuary brings a strong background of experience and knowledge that permits a more informed judgment of results from these models, or of the validity and applicability of underlying assumptions.

Q: What kinds of challenges are you solving using data analytics? How are they different from the issues you would address in a more mainstream role?

A: Many data scientists would say that getting enough (and relevant) data is most important. I think that is very important, but critically looking at your data and your algorithms from a more holistic perspective also is a huge challenge.

In our company, we like to say that we seek data that is REAL: relevant, ethical, affordable and legal. It is obvious that relevancy is important. If you throw a bunch of

confetti up into the air and then look at where it lands on the sidewalk, you will likely discover that you can neatly draw a chalk line around some clusters. These represent correlation but probably no meaningful causation. Lots of cross validation techniques exist, but I think external validation is also important. This is especially true when using techniques such as deep neural networks, where it is difficult, at best, to trace an answer back to the assumptions and rules employed.

We owe our internal decision makers (such as senior management) and the public the due diligence required to justify their trust in us. A more mainstream role might utilize a known formula where you offer others the opportunity to see all the steps involved to the level of detail they wish. Again, the opaqueness of some predictive analytics techniques is a challenge, but it is also an opportunity for actuaries to show the value they add through their subject-matter expertise.

Another challenge is that sophisticated models can obscure assumptions or rules that are not ethical or legal. If a multivariate model turns out to incorporate ZIP codes or a proxy for them, it may be guilty of racial profiling. We need to be the watchdogs of our own industry so others do not feel the need to impose those controls upon us.

Q: Where do you see opportunities for actuaries in the predictive analytics arena?

A: The obvious areas are in our own industry: life and health insurance, general insurance, valuations and so on. But those are just the tip of the iceberg. The SOA Cultivate Opportunities Team is promoting actuaries in predictive analytics roles for investments, enterprise risk management, manufacturing, software development and many other business areas. Some actuaries might be the ones building these models, others may be using them, and still others may be managing the associated risk departments.

Q: How do you see the role of predictive analytics changing in the next five to 10 years? Where will actuaries fit into the equation?

A: Many companies are jumping into predictive analytics. As data becomes more readily available and computers become more powerful, it is creating a near-term boom

in the demand for predictive analytics and those who can use it. My personal feeling is that this will lead to some very good implementations and some that will be more challenging. Actuaries can help ensure that the good results are based upon REAL data and REAL algorithms. We have a professional responsibility to detect, change and, where possible, prevent the misuses of predictive analytics.

Q: What are some of your best professional experiences/memories as an actuary that may inspire others to explore different actuarial paths?

A: Several years ago, while installing some actuarial software in one of our offices in Asia, I was alone all night in the office and found myself unable to properly use the telephone, copier, fax machine and even the PCs (I made some PCs inoperable by misunderstanding the Chinese character error messages). I felt so angry at my own ignorance that when I returned to the United States, I began learning Mandarin Chinese. This was a personal hobby, but a few years later, when we needed someone to build and head an Asia-Pacific Technology team, I was chosen partly for my (admittedly poor) Chinese character fluency. My family and I had the pleasure of residing in Sydney for three years and of traveling throughout much of Asia. It was a mind-opening experience that gave us an appreciation for cultures far different (yet amazing!) from our own. You never know when some optional learning beyond the SOA study notes will pay large dividends!

Q: What is your dream job?

A: My dream job is one where I feel needed, challenged and appreciated. **Almost every job I have ever had has become my dream job.** Too many people think that they are not empowered to enhance their own jobs. That's a very narrow-minded viewpoint. If you find that you do not like the job you are in, I offer three choices:

- ① | Learn to like it.
- ② | Change it to your liking.
- ③ | Leave it for one you can like or change to your liking.

Nobody should waste precious years in a job that is not his or her dream job. ■

TOOL

READY-TO-GO KIT ON PROFESSIONALISM

Earn continuing education credits and learn about professionalism with the 2016 Professionalism Ready-to-Go Kit from the Society of Actuaries (SOA). This program is designed so an actuary from your company or an experienced facilitator can use the material to lead a session wherever it suits your company's needs.

This Ready-to-Go Kit uses a case study to illustrate professionalism scenarios and to promote small and large group discussions.

SOA.org/ReadyToGoKit

3 VIDEO

SOA SECTIONS

Share your opinions with your industry peers. Join a section to express your opinion, work with other actuaries in helping lead the profession and make your voice count. Watch the video on SOA Sections and learn how sections can help open doors, provide networking and advance your career.

SOA.org/sections/join-section
bit.ly/SectionVideo

ADVANCE YOUR CAREER

Looking to be a leader in your workplace or in your profession? Here are some resources that can help you in that quest.

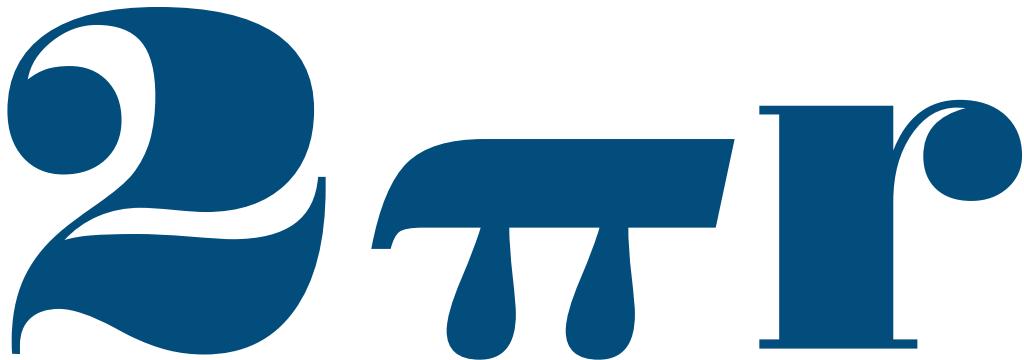


MULTIEMPLOYER PLAN METRICS CALCULATOR

Quickly calculate and output metrics on more than 1,200 U.S. multiemployer pension plans. The MPM Calculator uses data from the U.S. Department of Labor Form 5500. The MPM Calculator can output the previous benefit cost (PBC), previous benefit cost ratio (PBCR) and other defined metrics.

bit.ly/MPMCalc





(AKA FULL CIRCLE)

VOLUNTEERING PROVIDES OPPORTUNITIES FOR HELPING OTHERS, NETWORKING AND PERSONAL GROWTH

BY LORNE SCHINBEIN

I experienced a moment of déjà vu while serving as a volunteer facilitator at the 116th Fellowship Admission Course (FAC) at Miami Beach in December 2016. The sessions I attended and the fellowship candidates I met re-instilled in me the excitement for obtaining my own fellowship designation at the second FAC.

After completing the grueling exams, everyone deserves the reward of the newfound freedom to reconnect with family, friends and favorite pastimes. When these connections are once again strengthened, there also lies ahead another rewarding stage of fellowship designation—being a volunteer in the Society of Actuaries (SOA) Education system.

During the 25 years that have elapsed since obtaining my FSA, I have been participating in this second stage. Over these years, I progressed through many volunteer roles within the SOA Education system. While completing the various tasks within each volunteer role, I never lost sight

of the recipients of my efforts—the candidates. By attending the 116th FAC and discussing my volunteer roles with our new crop of FSAs, I further reaped the rewards of volunteering. There I was, among those who had just successfully completed the fellowship requirements, requirements I helped to develop.

I have presented at several colleges in my home state of Florida about the experiences of working in the actuarial profession, but those experiences were often more about the profession rather than the potential candidates in the audience and the education process they would experience. Thus, such presentations were in contrast to what I experienced at the FAC, which was entirely about the candidates and the SOA Education system. These individuals were enthusiastic about this stage of their accomplishments and eager to demonstrate their abilities and motivation.

The enthusiasm of these new graduates validated the contributions I had

made to their professional development as a volunteer. Moreover, thanks to their enthusiasm, I could not help but feel like a new candidate as well. It was like I had come full circle.

MY VOLUNTEER YEARS

One of my first actions as a fellow was to recruit proctors and register my worksite as an exam test center, thereby making it more convenient for the candidates in the area. Since then, my volunteer contributions have spanned much of the breadth of available volunteer positions. This includes the entry-level position of a volunteer item writer (exam question writer) and my current position of Past General Chair of the Education Executive.

I remember being excited when the first question I developed was included on an exam. As an item writer volunteer, you have the opportunity to apply your knowledge to the exam source material and to share in that excitement of having your question appear on an exam. I have met

many great item writers, and I assure current candidates that, contrary to a popular belief among veteran fellows, the exams are not any easier than they used to be.

Other volunteer roles I held were Curriculum Committee member and Curriculum General Officer for the Individual Life and Annuities Fellowship track. This involved the fulfillment of the learning objectives for exams, authority over the exam study material choices and working collaboratively with the exam committees. From there, I became the Curriculum General Chairperson, and following that, the General Chairperson of the SOA Education Executive. The responsibilities of being a member of the Education Executive are significant and include ensuring all elements of the SOA's designation pathway remain relevant in the long term, overseeing the volunteer personnel and their training, ensuring high standards for fairness and equity, and being responsible to the SOA board for implementing its requested strategy. The most recently requested strategy is the ASA Curriculum revisions that include new content around predictive analytics.

THE VOLUNTEER YEARS OF OTHERS

One could consider my current position to be both the highest level to attain within the volunteer system as well as the end-of-the-road position. I take pride in holding this role, but perhaps more important, I appreciate the personal growth and networking opportunities I have had during these past 25 years of volunteering.

Through all this time, it is unlikely I have thanked other volunteers and members of the SOA staff often enough for their contributions. Through this article, I hope to let them know I saw firsthand the positive impact each of them has had on the lives of the graduates of the 116th FAC.

You can surmise that there are many roles available to members, each with its own unique responsibilities and rewards. I would encourage all SOA members to volunteer in some fashion, whether it be within the Education system, as a section member or in your community as a tutor of high school mathematics, which I have also enjoyed doing.

For myself, I intend to always serve as a proponent for volunteering, encouraging others to do so in as many different ways as I can imagine. ■

“You make a living by what you get, but you make a life by what you give.”

—Winston Churchill

action

VOLUNTEER OPPORTUNITIES DATABASE

Members can now access the Society of Actuaries (SOA) volunteer opportunities database to identify and apply for volunteer roles. This real-time database helps you find projects that fit your availability and expertise area. You can also update your volunteer profile. See the list of volunteer opportunities and make your move now!

bit.ly/SOAVolunteer

Lorne Schinbein, FSA, MAAA, is vice president and consulting actuary at Actuarial Resources Corporation in Clearwater, Florida. He is also the Education consultant for *The Actuary*.

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ANALYZING EXTREME

Several actuarial organizations, including the Society of Actuaries (SOA), released new updates for the Actuaries Climate Index. This index provides objective, quarterly measures of changes in extreme weather frequency and sea level.

While the index officially launched in November 2016, we now have data updated through spring and summer 2016. In fact, the Actuaries Climate Index value for the United States and Canada for summer 2016 was 1.72, the third-highest seasonal level recorded.

By way of background, the Actuaries Climate Index was developed by the Climate Change Committee, formed from a partnership among the American Academy of Actuaries (the Academy), the Canadian Institute of Actuaries (CIA), the Casualty Actuarial Society (CAS) and the SOA. The index is designed to provide actuaries, public policymakers and the general public with objective data about changes in the frequency of extreme climate events over recent decades.

I encourage you to visit the website and examine the data analysis available. You can look at specific regions within North America and a variety of time frames by adjusting the parameters. For example, you can investigate high and low temperatures, find out the data on extreme wind power, and dive deeper into heavy precipitation and drought. Aside from the separate regional data analysis, we provide an overall Actuaries Climate Index average using the six different index components with data from 1961 to summer 2016. The current five-year moving average of the index is 1.03, which continues a trend of exceeding observations from the 30-year reference period from 1961–1990.

The current highest five-year average values by region are in:

- ➔ Northwest Pacific (British Columbia and Yukon Territory)
- ➔ Northeast Atlantic (New Brunswick, Newfoundland and Labrador, Nova Scotia and Prince Edward Island)
- ➔ Southern Plains (Kansas, Montana, North Dakota, Nebraska, Oklahoma, South Dakota, Texas and Wyoming)

High temperatures and rising sea levels primarily drive the high values in these regions. We will continue to provide quarterly updates, using data for each meteorological season when available.

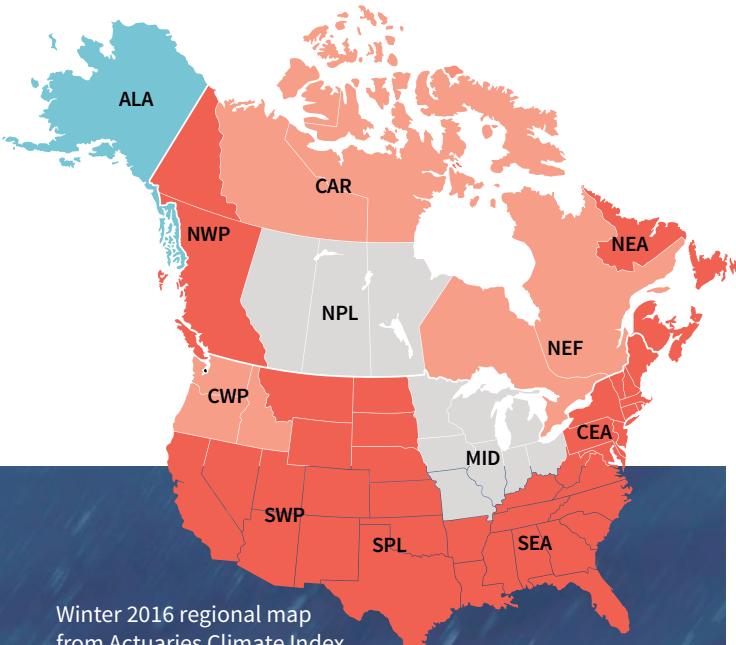
The next phase of this project will build on the initial climate variable research and develop the Actuaries Climate Risk Index. This second index will measure correlations between changes in the frequency of extreme events as measured by the index and insurance variables, such as economic losses, mortality and injuries. Stay tuned for more updates from the sponsoring actuarial organizations.

Don't forget to visit *SOA.org* for more updates on SOA research. ■



WEATHER

BY R. DALE HALL



Winter 2016 regional map
from Actuaries Climate Index

Standard Deviations
2 or more
1.5 to 1.99
1 to 1.49
0.5 to 0.99
.25 to .49
-.24 to .24
-.25 to -.49
-.5 to -.99
-1 to -1.49
-1.5 to -1.99
-2 or more

action

GOOD RESEARCH READS

SIGHTLINES PROJECT ON LONGER LIVES

The Society of Actuaries (SOA) helped fund research for the Stanford Center on Longevity's Sightlines Project, an effort focusing on healthy living, financial security and social engagement. Access highlights of the report and recent media coverage.

bit.ly/CenterOnLongevity

PROPOSED CANCER CLAIM COST VALUATION TABLES

The joint American Academy of Actuaries (the Academy) and SOA Cancer Claims Cost Tables Work Group released a report of proposed new cancer valuation tables for cancer policies. Access the proposed tables, report and experience information.

bit.ly/2016CancerClaimCost

NEW REPORT ON ACTUARIAL MODELING GOVERNANCE

The SOA Modeling Section and Financial Reporting Section released a report on actuarial modeling governance, updating a previous study on modeling controls for U.S. and Canadian life insurance companies. The report provides an industry assessment and proposes considerations for enhancing the current state toward a well-controlled governance framework.

bit.ly/ModelGovernance

RELATED LINKS

Actuaries Climate Index
ActuariesClimateIndex.org

Research Emerging Topics
bit.ly/SOAClimateResearch

R. Dale Hall, FSA, CERA,
MAAA, is managing
director of Research at
the Society of Actuaries.

dhall@soa.org

TAKE CHARGE

MEETING

Health Meeting

June 12–14, Hollywood, Florida

Stay ahead of health industry trends and changes at this premier event for actuaries working in the health industry. Learn from expert presenters while gaining up-to-date information on the most relevant issues facing health care. Session highlights include antibiotics, superbugs and the health care delivery system; risk-industry primary care; and how new technologies are disrupting health care. Register now.

HealthMeeting.SOA.org

E-COURSES

Social Insurance

Learn about current issues that social insurance programs are facing. Most of the content reflects Social Security and Medicare

Continue the cycle of continuous improvement and identify new experiences to pursue. Attend a meeting or seminar. Tune in to a podcast. Take an e-course. These are great ways to take charge of professional development and can help you:

- ❶ | Develop leadership skills.
- ❷ | Stay up-to-date with current business trends.
- ❸ | Expand your network base.
- ❹ | Make meaningful contributions to your company, your team and the profession.

operations in the United States and Canada. This course also covers similar demographic and economic pressures in other countries.

bit.ly/SOA-SI

Straight Talk: Effectively Communicating with a Nontechnical Audience

Access videos, tips, guidelines and activities that help you communicate with professionals across all disciplines. In today's business environment, professionals in a variety of industries turn to actuaries to clarify risk-related issues.

bit.ly/StraightTalkSOA



Visit SOA.org/calendar for the full complement of professional development opportunities.



SAVE
the
DATE

A graphic featuring the words "SAVE the DATE" in large white letters. The background is a dark blue gradient with a faint image of a city skyline. To the left of the text, there are several yellow diamond shapes of varying sizes, some containing smaller text.

SOA China Annual Symposium

29-30 June 2017
Shanghai, China



SOA Professionalism Ready-to-Go Kit

Host a Top-Notch Professionalism Workshop for Your Employees Without Leaving the Office

Check out the Professionalism Ready-to-Go Kit:

- Includes a facilitator guide, logistics guide, slide presentation and participant guide
- Participants may attain Continuing Professional Development credits
- Uses real-life scenarios and provides opportunities for group discussion
- Ideal for 20–30 employees of any level
- At \$500, it is an excellent value

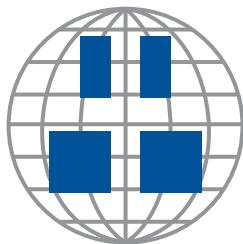
Learn more at SOA.org/ReadyToGoKit.





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