SOCIETY OF ACTUARIES
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This newsletter is free to section members. Current issues are available on the SOA website (www.soa.org).

To join the section, SOA members and non-members can locate a membership form on the Reinsurance Section Web page at http://www.soa.org/reinsurance.

Call for articles for next issue of *Reinsurance News*.

While all articles are welcome, we would especially like to receive articles on topics that would be of particular interest to Reinsurance Section members.

Please email your articles to Ronald Poon-Affat (rpoonaffat@rgare.com) or Dirk Nieder (nieder@genre.com). Some articles may be edited or reduced in length for publication purposes.

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Chairperson's Corner

By Mike Kaster

Winter turns to spring, spring turns to summer. The weather changes, and so, too, does the world of reinsurance. The Reinsurance Section Council was put in place to help all of us keep tabs on a changing and evolving reinsurance world. We are just nine council members (and some very good friends of the council). And while we do a lot to support the education and research needs of the reinsurance world, we could always do more, and we would welcome your contributions and volunteer time to help us with our goals.

Earlier this year we identified some "hot topics" which we felt deserved additional attention, and so far we have spent extra time exploring and understanding three of those topics. And throughout the remainder of 2018 we will be working on several initiatives to address these topics. You can look forward to additional coverage on the topics of PBR (for reinsurance), tax reform and accelerated underwriting as the year progresses.

How do we all connect as a section of members interested in reinsurance? That is something we discuss often during our monthly Section Council meetings. Generally, those of us involved in reinsurance are fairly outgoing and social, so we tend to love networking opportunities. So we will keep searching for more and creative ways to offer these opportunities to our members. With upcoming meetings in Washington (Val Act) and Nashville (Annual Meeting), we expect to offer networking opportunities at both meetings. Please look for those opportunities to come.

Speaking of Washington, we are very excited about the upcoming sixth edition of the Reinsurance Section-sponsored reinsurance seminar. This year's edition is called the "Life and Annuity Reinsurance Seminar" (creative name, huh?), and it will be held on the Wednesday (Aug. 29) right after the Valuation Actuary Symposium, at the same hotel, the Marriott Marquis Washington. We have an all-star line-up of speakers planned, so I hope that you will take this opportunity to get some in-depth continuing education on U.S. reinsurance topics.

As winter was ending (in some parts of the country), I had the great joy of attending ReFocus in Las Vegas. This year's event was the 12th annual conference, and the attendance was as strong as ever. While no longer a reinsurance-focused conference, the content is very good, but the networking is even better … perfect for those of us who work in reinsurance. The theme was around longevity and life expectancy, certainly a hot industry topic. And while I definitely enjoyed the conference personally, it turned into a very large speed-dating event for me. But that's OK, I love meeting with and talking to as many of my industry colleagues as possible.

For the first time (for myself personally), I attended the Canadian Reinsurance Conference, hosted every year in Toronto. This year's event in April was (unbelievably) the 62nd year of this event. Yes, that is not a typo, 62 years! That's incredible. And my hat's off to the conference organizers who ran an outstanding event. While this was my first time joining my Canadian reinsurance brethren, it will certainly not be my last.

I'd like to wrap up this edition of the Chairperson's Corner with a very special thank you to two individuals who have given countless hours to the Reinsurance Section, most recently through their efforts to support our LEARN program. For those of you who don't know what LEARN is, this is the Reinsurance Section's outreach program to provide free education around reinsurance topics, primarily for regulatory personnel. This program has been on-going for many years now, and over the past few years, two individuals have gone to numerous state insurance departments, voluntarily, to provide this educational program to the state insurance department personnel. This not only is of benefit to the regulators, who struggle to obtain educational opportunities, it is also a great program for our profession, as we show the regulatory community that actuaries are not only knowledgeable, but are also outstanding teachers. Two of the best have been Michael Frank and Larry Stern. Both have participated in several state department presentations. After several years, both have decided to step down from this volunteer activity and pass the reigns to some new presenters. Michael and Larry, the profession, and the reinsurance community, owe you a huge amount of gratitude, and I'd like to personally thank both of you for your outstanding contributions to our profession and the reinsurance section. **THANK YOU!**

And so we are nearly mid-way through 2018, and my time as chair is over half completed. I look forward to my last chairperson's corner, where I will share with you all that we've been able to accomplish this year. ■

Mike Kaster, FSA, MAAA, is EVP—Life Solutions Group, Willis Re. He can be contacted at *mike.kaster@willistowerswatson.com.*

Editorial: There has Never Been a Better Time to be a Minimalist...

By Ronald Poon-Affat

I can still remember how disoriented I felt when I first came across the concept of minimalism in 2003. While reading a financial newspaper in my Rio de Janeiro office, I came across an article describing the lifestyle of Andrew Hyde, a successful *serial startup entrepreneur* who had deliberately whittled his worldly goods down to 15 items.

I read the article and then I read it again, certain that either my eyes or my rudimentary Portuguese were deceiving me. Such a philosophy went against the then-current core belief that more is better and better is certainly the road to happiness, right? The luxury car, the bigger house, the lavish vacations … the carrots that kept us burning the midnight oil in search of success and mega year-end bonuses.

My minimalist moment was akin to Neo taking the red pill in the Matrix.

THE LESS YOU OWN, THE LESS OWNS YOU

Minimalists believe the pursuit and acquisition of physical possessions will never fully satisfy the desire for happiness. In the minimalist way of thinking, "retail therapy," or finding temporary fulfillment in buying a new item, is anathema; and oniomania, or compulsive buying, something to be pitied. By clearing clutter from our homes and our lives, we can make room for life's most important aspects: health, relationships, passion, growth and contribution.

In 2003, being a minimalist, especially in an urban city, could be as challenging as being a teetotaler in New Orleans or a vegan in Dallas. There was Netflix and Audible, but neither was a streaming service. There was no Uber, no Spotify, no Kindle, and no Hulu. Today, however, thanks to smartphones and apps, ownership of things has never been less necessary. Car-sharing companies such as Zipcar have lessened the need for a second car, and e-books and streaming services for movies and music might either eliminate or at least halt the hoarding of books, DVDs and CDs (many still in their plastic wrapping).

There has never been a better time to be a minimalist. Indeed, from time to time, without even realizing it, we are all minimalists. When we take vacations or travel on business, most of us travel happily with a small fraction of our worldly possessions. Frequent flyer road warriors who mastered the skill of traveling for a week with only carry-on luggage were early adopters of minimalism.

In my own journey towards minimalism I reflected on what is needed to do the work I do as a reinsurance actuary, as opposed to other careers such as my sister's, who is an optometrist. Her office is filled with things, from a visual field perimeter machine, a pachymeter, and an optical coherence tomography machine to an extensive inventory of spectacle frames and contact lenses. All of which, of course, is necessary for a successful optometry practice.

I, on the other hand, have lived in nine cities in seven countries, and I can attest to the fact that actuaries don't really need a lot of equipment to be up and running. These days, armed with a high-end laptop and access to unlimited cloud-based storage, an actuary can hang up his or her shingle literally anywhere in the world with access to reliable wi-fi (and good coffee).

WHEN IN DOUBT, GOOGLE IT OUT

Interestingly, the actuarial profession would appear to be one of the ultimate minimalist careers. But don't take my word for it: when I Googled the query "*What is a minimalist profession?*" my first hit was a blog listing "*the 10 most lucrative minimalist*

careers." Clicking over to the blog, I saw that the second career listed was "Actuary Consultant." I kid you not!

According to the blog, the two main characteristics of these minimalist careers are:

- Flexibility: You should be able to create your own schedule to a certain degree. Hours need to be pliable: a job demanding 50+ hours every week with no exceptions will not make the list.
- Lucrativeness: The point of work is to make money. The point of a minimalist career is to make money as efficiently as possible; that is, needing the least time and effort for the most gain.

THE FUTURE ` S SO BRIGHT (I GOTTA WEAR SHADES)

As we prepare for the next generation of young actuaries to enter our ranks, let us consider some millennial preferences. They embrace:

- **Technology and mobility.** Millennials are the first generation born after the technological revolution. For them, mobility is the new stability. It is difficult to live a mobile lifestyle with a house full of stuff.
- **The Sharing Economy.** Technology has provided a platform on which access can take precedence of ownership.
- **Living preferences.** Millennials migrate toward smaller dwellings in walkable neighborhoods with access to shared amenities.
- **Experiences.** Millennials spend less on possessions but more on wellness, food, drink and experiences.
- **Environmental concerns.** Millennials are the most socio-civic conscious of all age groups, leaning more heavily towards environmental initiatives than ever before.

Based on this list, it would appear millennials are hard-wired for minimalism.

SMILE, BREATHE AND GO SLOWLY

While I am still nowhere near to having a 15-item inventory, I consider myself to be an aspiring minimalist. I certainly make an effort to donate household and clothing items almost every weekend.

I vividly recall a scene in "About Schmidt" (2002), Hollywood's most famous movie about an actuary. On his last day, Warren Schmidt leaves the building with a small box. Turning around, he sees his life's work packed away in a few boxes in the building's garage, waiting for the garbage truck. He walks off forlornly in a post-career funk, thinking how little his professional life truly meant in the great scheme of things.

Let's fast forward to the hit Netflix series, "Unbreakable Kimmy Schmidt." Ms. Schmidt (no relation to Warren) would not pull a long face. Rather, she would smile from ear to ear (a.k.a "Kim-mying"), reflecting that she made a significant contribution to the long-term sustainability of a leading financial institution while generating very little packaging waste and thus had an ecologically-friendly career.

The Society of Actuaries' 2017–2021 Strategic Plan includes the goal of encouraging talented students with diverse backgrounds to pursue actuarial science. Could actuarial science be marketed to millennials as a minimalist career? Indeed, could actuarial science become the next "cool" profession? Something to think about when you are packing for your next holiday. ■

Ronald Poon-Affat, FSA, CFA, FIA, MAAA, is co-editor of the Society of Actuaries' *Reinsurance News* newsletter. He can be contacted at *rpoonaffat@rgare.com*.

Interview: Dr. Winfried Heinen

Chairman of the Board of Executive Directors, General Reinsurance AG, Cologne

By Ronald Poon-Affat

Dr. Winfried Heinen joined Gen Re in 1988. Having serviced Gen Re's Latin American Life/Health business from the Cologne office for three years, he was transferred to Mexico City as regional manager for Latin America. In 1996 he returned to Cologne, taking responsibility for Gen Re's German Life/Health business. He later assumed the position of chief actuary Life/Health. In 2007 he was appointed to General Reinsurance AG's board of executive directors, of which he became chairman in July 2016. In April 2008 he was also appointed to General Re's board of executive directors. He holds a Ph.D. in mathematics and is a member of the German actuarial association.

Gen Re is a strong player in the global life and health reinsurance business: Which markets do you operate in?

Gen Re is active in North America and internationally. We offer life and health reinsurance protection for critical illness and disability income insurance portfolios as well as group and individual life. We've developed a full range of solutions and services in all areas of risk assessment for biometric insurance risk. We have proportional and non-proportional coverages for all kinds of biometric risks, and our life/health experts are equipped to specially tailor programs to meet individual carrier's needs.

The global life and health markets we operate in include emerging markets and mature markets and they all have their own characteristics.

In high growth economies like China and India the primary life and health markets are growing strongly, compared with the mature economies of North America and Western Europe, for example. There is still a big protection gap in emerging markets that needs to be closed, but nevertheless as such economies grow, their mortality and health, and disability insurance sectors grow as well. Gen Re will expand in those growth markets alongside our primary insurer clients.

It's not the same picture in developed markets. Here, a more recent trend influencing reinsurance purchasing is the wish of some primary companies to de-risk their balance sheet. It's an imperative that's driven by a combination of the capital markets, and also regulatory compliance to do with Solvency II or equivalent regimes. At Gen Re we are seeing more and more opportunities to acquire existing books of business, rather than the primary companies retaining them.

Digitization is a big topic across the global financial services sector: Is the life insurance industry embracing the digital age, in mature and emerging markets?

A digital evolution is happening in both mature and emerging markets, albeit at a different pace in each, as life insurers respond to changing consumer habits. It's interesting that consumers are frequently more open to digital channels in emerging markets. In China, for example, people are obsessed with technological developments and they have embraced digitalization enthusiastically.

But that said, consumers in the mature markets are also opening up more to digital channels.

So digitization is a topic around the world—and not necessarily the preserve of either emerging or mature markets.

But emerging markets are ahead of mature markets in the take up of digital channels?

It just depends on the level of infrastructure in particular markets. Emerging markets have demonstrated fast take up because they have no legacy "infrastructure" in the way. It means that they have been able to jump several steps at a time.

There are also demographic and cultural aspects. Older consumers in mature markets are used to doing things in a certain way. They believe that the status quo has worked well for them and that makes them more cautious, resistant to change, when it comes to adopting new ways of doing things.

There's also a big difference in attitude among insurance carriers in the different markets, in my experience. For example, when I talk with insurers in Asia about new technology they see opportunity. When talking to European insurers, risk is their main preoccupation. They are worried about defending their market position on the one side and about data privacy, regulation and such on the other.

But digitization is radically changing the face of the life and health insurance markets—even disrupting them—to use that buzzword?

Sometimes I think the language used around the topic of digitization is rather inflammatory. The term disruption is particularly alarming. As an industry, we have faced technological changes in the past and we have mastered them. The life and health industry continues to do what it has always done: pooling funds from many to pay for the losses of some, thus giving those individuals—and society as a whole—financial stability. That role is not changing so much. What is changing is how we do it. That's where the new technology comes in.

So how should insurers think about digitization, in the context of evolving their strategies?

The consultant Interbrand invented the term "Mecosystem." It's an interesting concept that explains a lot of what is happening in our industry. According to them, if an ecosystem is an interconnected system in which devices interact, the Mecosystem puts you at the center of those interactions.

In the good old days when you needed to buy something, you had to leave your home and go out into the world to shop. With new technologies, the world comes to you.

To quote Interbrand, "Within the Mecosystem paradigm, you are at the nexus of the system."

How do you relate the Mecosystem to life and health insurers' proposition?

The Mecosystem is characterized by three things: easy access, transparency and customer-centric offerings.

I put a question mark over transparency; it's a proxy for something else in my opinion. OK, so you know the price of a product. That's not the real value though; the real value is having trust, being confident in getting a fair deal in a complex world. It's about transparency, but it's mostly about building trust. People don't necessarily want the best deal, they want a fair deal.

Customer-centricity is another fuzzy area. Often, what people buy is the perception of a customer centric product. The product is not usually tailored to you in reality; what's offered is an off-the-shelf product presented as if it were made for you. In reality, it's a product that's available that suits you.

Is the insurance industry close to developing a Mecosystem?

Is there easy access to life and health insurance products? No. In fact, we are one of the few industries that reserves the right to choose its customers. When you go into a shop, you can buy whatever you want if you have enough money. When you want to buy insurance the insurer says, "Thanks for contacting us,

but first we want to check if you are good enough for us." We don't give easy access.

Then there is transparency and trust. On trust, let's face it, no one understands the wording of insurance products. It is opaque legalese. Then there is trust. The way to gain your client's trust is by getting to know them. With life insurance, the customer buys the policy once and then they never hear from the provider again. This low frequency of contact makes it impossible to build trust.

Lastly, there is the question of customer-centric products. Insurance products are bought off the shelf and they don't change for years—so it's quite unlike the Mecosystem.

How can life and health insurers change to adapt to the Mecosystem?

On the question of easy access, clearly we still need to select clients for the good of the portfolio and other policyholders. But we can make the process easier than it is today. You can achieve that through product design or through process. Insurers can reserve the right to select their customers, but it doesn't need to be so difficult for them.

Instead of using lengthy questionnaires, for example, maybe consider other data that could make the process smoother or easier. Underwriting "machines" that make use of Big Data can ease the onboarding of customers in this way.

Some insurers are already working on the trust issue. In a number of countries, most notably the U.K. and South Africa, the life and health insurer Vitality incentivizes its insureds to keep in touch. They operate something like a loyalty program by giving rewards and discounts for policyholders that demonstrate they have a healthy lifestyle. You can obtain discounts on premium and also rebates on cinema tickets, like a typical loyalty program. They ask for information like how many steps you walk, sports activity, nutrition, etc., in exchange for a better premium. This approach feeds into the "customer centric" bucket. But importantly, it's an approach that establishes constant contact with the customer.

In a sense, it's an old idea that makes use of new technology.

What role can a reinsurance company like Gen Re play in this changing environment?

Going back to those three buckets I mentioned earlier, Gen Re can help insurers improve the prospective client's access to products and can also contribute to designing customer centric offerings.

Both of these challenges are data driven and at Gen Re we have accrued substantial actuarial, underwriting and medical data resources. It's a trove of diverse data that's derived from many products, different companies and in different markets around the world.

Is it fair to say that insurance companies have no choice but to go down the digitization route, to stay competitive?

It is not necessary to panic. In a lot of countries, in Europe for example, most customers are happy with the particular insurance company they use. There is a general dissatisfaction with insurance per se among consumers—after all no one actively enjoys buying insurance.

But, if you ask people if they are satisfied with their particular insurer the answer is usually yes. So, individually, insurers are doing some things right!

Insurers have to react to the changes taking place, but not over react. As a society, we are not completely replacing our analog lifestyle with a digital lifestyle. And at the same time, even older people use new technology in addition to the old ways.

It means insurers have to be "digital" as an additional channel. But don't throw away what has worked well in the past. My advice is react but don't over react. As the expression goes: "Don't throw the baby out with the bath water."

You haven't mentioned disruption and the potential for big non-insurance corporations like Google or Amazon to move into the life and health insurance business. After all, they are already well adapted to the Mecosystem.

They do have a lot of data and of course we do talk to them. But they know surprisingly little about insurance. Also they are quite hesitant about entering a heavily regulated market like insurance. I have my doubts that Google or Amazon will come up with a risk carrier of their own. They might show up in the intermediary field as an alternative sales channel, however.

Finally, what's your message to actuaries? What impact will digitization have on the actuarial profession?

The angle for actuaries is that a lot of what's happening is data driven. Managing data and, closely related to that, recognizing structures are core competencies of actuaries. Actuaries' skill in manipulating and managing data will continue to be the keystone of the insurance business. The insurance world will become even more quantitative as a result of digitization and analytical thinking is a typical strength of the actuary. So, digitization is good news for actuaries; it is a really good time for actuaries. ■

Ronald Poon-Affat, FSA, CFA, FIA, MAAA, is co-editor of the Society of Actuaries' *Reinsurance News* newsletter. He can be contacted at *rpoonaffat@rgare.com*.

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Don't be Naive About Social Media

By Mairi Mallon

Do you know what access social media companies have to your personal data? Use your smarts to continue using this useful tool, while keeping your information safe.

I'm assuming if you are reading this publication that you are smart, that you have at least one degree and have had to use those brain cells a lot. So, let's assume none of you are at the bottom of the class (and never have been).

So why is it that when it comes to social media, so many clever people lose their smarts? They not only post away, allowing people to know when they are abroad, (it really is silly advertising that your house is lying empty), but on a much more sinister level they give away information that you wouldn't pass on to family members.

Those Facebook tests? The ones that say, "post your favorite albums of all time," or "what your Game of Thrones character would be called?" These are blatant phishing exercises designed to get you to tell them valuable pieces of personal information such as your first pet's name, your middle name or your mother's maiden name, your first street name and mix them up to come up with some meaningless name. While taking these tests, you very often also have to give the app access to not only your photos, data, posts, but also those of your Facebook friends.

Would you do this in any other situation? If you need it explained, many of these apps are simply finding out the answers to your security questions. I actually saw one quiz last week that not only asked for your mother's maiden name, your date of birth (in various stages), the first street you lived on, and, wait for it … the last four digits of your credit card. If I could print the emoji with wide open eyes, I would. The crooks no longer have to go through your bins looking for your details, they create apps that gamify data harvesting, and we happily walk into these traps.

To be honest, the recent scandal with Facebook sharing data should come as no surprise. Social media sites make money by collecting data and selling it, usually to advertisers.

Just to jog your memory on the Facebook story, the Cambridge Analytica privacy scandal erupted on March 16, prompting the hashtag #deletefacebook. Reports in newspapers from *The Observer* to *The New York Times* said Cambridge Analytica, which is a political data-mining and consulting firm, collected and accessed over 50 million Facebook users' private information without their knowledge.

The data, originally claimed to have been collected for academic purposes, reportedly was later used to target Facebook users for crafted ads and messages for President Donald Trump's 2016 election campaign.

Facebook CEO Mark Zuckerberg spent two days testifying before Congress because of the outrage at what the legislators saw as the irresponsible use of personal data. Cambridge Analytica has since shut down.

What makes this story so different from many other breaches is that Cambridge Analytica didn't steal this information, instead it was given to the company.

And we willingly gave it to Facebook. One good thing to come out of the scandal is that, finally, the general public has woken up to the facts that a) Facebook (and other social media) make money from selling your data; and b) that whirly tab at the top right for settings should be looked at and access restricted.

I recently helped a friend from the U.S. look at her settings on Facebook. What was amazing was how hard it was to get to the granular information they had stored—and then how detailed it really was! It had a list of her interests, from mommy groups, to age ranges, to the kinds of houses she likes. It even had an analysis of what political party she voted for (she is quite political in her posts, so in fairness, not that difficult to tell). What was interesting is that she had left the door open for apps that had access to her friends' accounts, as well as finding that her friends had unwittingly allowing apps to access all her data as security doors had been left open.

So, it is really important to go through your Facebook settings, particularly the apps that others use, and switch off everything you can, unless you want to give away all your personal data when a friend plays one of those quizzes. They take everything you ever posted and everything your friends posted unless you've gone deep into your settings and switched it all off.

And it is not just Facebook. Have you checked your LinkedIn settings recently? I train people in LinkedIn, and more often than I would care to admit, when I have a look at what LinkedIn is now accessing on my account there are several new buttons, each one set to its most open setting by default. It is the way they get around you shutting it all down. While it can be great to be able to spy on rivals, bosses and work colleagues (and who

has not done this, to be honest), remember that, generally, if you can find out that stuff about someone else, they can find it out about you.

If you look at the detailed analytics available on Twitter about your followers, you know they have the access to a great deal of your data. Settings can also be set to restrict this access. They have lists of your interests, what you buy, estimate how much you earn and can find out exactly where you have been. Have a good look, and check you are happy to share this information.

So, just how dangerous is it to not have closed everything down? I'm not a person to be overly-worried about being found. I've not been stalked or harassed and work in the rather tame world of insurance and reinsurance where I actually want people to know who I am. That is why I am on social media, to promote myself and my company.

In today's inter-connected world, there is so much data being harvested about us, most of which I could not care less about. What I do object to, however, is social media companies taking this data without me realizing I may have given permission by mistake, or it has been assumed.

There is more damaging data that can be harvested, however. Health data—this comes from apps accessed from gyms, or from smart watches which monitor our heart rate, exercise … even our breathing. We have our banking apps on our smart phones.

Below I've listed top tips on how to keep safe on social media. Remember that you need to, on all your social media platforms, go in and play around with your settings—and take the time to delve deep.

Reuters recently said that Facebook executives "have apologized for the data-harvesting, pledged to investigate others who collected Facebook user data and reduced the amount of data available to similar app developers now."

The power to really restrict access, however, lies in our hands. If we learn how to make our data more secure, then we can prevent it from being harvested in this way.

Just use your smarts. You have plenty of them.

TOP FIVE TIPS ON KEEPING SAFE

1. **Don't panic.** The world will not fall on your head because of social media. Go to your settings and take your time to shut down the access they have to your information and how they share it with third parties. It is not hard and there are many, many articles on this on the internet. Set your settings to a level that is comfortable to you. Really think about it and give it some time. For an example, see here: https://www.zdnet.com/article/facebook-private-data-settings/

2. **Secure the most important stuff.** I would not bother with a two-step verification on sites like LinkedIn, but you should use two-step verification for your most important sites, like banking and health apps. These should have a code or fingerprint after the pass codes. Facial recognition is really useful as a way to secure your device against unwanted access.

> What you put on the web can last a lifetime. You can delete a tweet or picture, but there is always a record of it somewhere.

3. **Ask questions.** Ask why you're giving certain information. If you're taking an online quiz, it doesn't need to know your address and phone number. Be careful if you feel uncomfortable disclosing information. Scammers can be putting together a profile on you based on the info you give. That whirly little cog at the top right is where you look to see what access apps have to your data and your friends' data.

4. **Share with care.** What you put on the web can last a lifetime. You can delete a tweet or a picture, but there is always a record of it somewhere. It does not disappear completely. Before putting up a post about yourself or yourself with friends, think about how it will look. Tequila shots may be OK at college, but may not be taken to too kindly in our sober working environment.

5. **Spring clean.** Look at all your apps often and have a look at what they are trying to find out about you. Get rid of the apps you aren't using and question free apps that seem to want to know too much. Watch what access they have to your social media and other data.

HOW I BECAME @reinsurancegirl

Ten years ago, I set up a public relations firm, rein4ce, with Stephen Breen to service the global insurance and reinsurance market.

What we understood from the get-go was that in order to be a communications firm of the future, we had to master social media. At the time, there were hundreds of self-appointed "social media gurus" and I spent a lot of time reading up on what they were saying. A lot of it was based on business-to-consumer promotion or self-promotion. Almost nothing had anything to do with business-to-business communications, let alone our small, rarefied world of insurance and reinsurance. I spent a lot of my time almost giving up, sitting with my head on my keyboard.

To say I'm not a digital native is an understatement. I was born in 1968, and have just turned 50. I read real newspapers, and prefer real books over my Kindle. I'd still rather pick up the phone or meet in person than send an instant message.

So, this new way of communicating did not come easy. But I had to master it, and master it I did. I remember picking @reinsurancegirl as a handle as I thought it was funny, getting my 50th Twitter follower and being super excited.

I remember connecting with others who were trying all of this new-fangled media out in our world. Stand-outs were Alicia Montoya at Swiss Re and Tom Johansmeyer at Guy Carpenter (he's now at Versik, and both are now doing very different jobs). Conversations with other communicators with many more years' experience than myself were key to learning—James Peavey at A.M. Best was a great sounding board and then willing Guinea pig. Friends such as Alayna Francis, then Swiss Re, now Marsh Group, and Harvey Smith, who is doing something super-clever and InsureTechy now, have helped me wrap my old head around new communications ideas.

But the biggest revelation is that there is nothing really new about this kind of communications revolution. Yes, it is much faster. Yes, it is much more public. But good communication is still the same. Work out what you want to say, and who you want to say it to, and you will win every time. Know your audience. Know your subject. Know how to write. The rest is just really learning new technical skills, which is about the same as moving from a Blackberry to an iPhone, a fax to an email, telex to a fax, a telegram to a phone call. Maybe once I wrap my old brain around Snapchat, that will be the next thing I will find a use for and will have to show clients how to use. What I do know is that technology never stands still, and to stay relevant we all have to keep up. ■

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IFRS 17: Implications for Reinsurance Contracts Held

By Tze Ping Chng, Steve Cheung and Alexander Aeberli

Editor's note: The references marked by [ ] represent the text or extraction from the IFRS 17 Standard and Basis for Conclusions.

After a very long journey, the International Accounting Standards Board (IASB) issued IFRS 17 "Insurance Contracts" (IFRS 17).[1] IFRS 17 replaces IFRS 4 that was issued in 2004. The overall objective is to provide a more useful and consistent accounting model for insurance contracts among entities issuing insurance contracts globally.

UNDERLYING INSURANCE CONTRACTS AND REINSURANCE CONTRACTS HELD

An entity shall also apply IFRS 17 to reinsurance contracts it holds (i.e., as cedant). All references in IFRS 17 to "insurance contracts" also apply to "reinsurance contracts held," except for references to "insurance contracts issued" and some specific modifications related to recognition and measurement (as noted in paragraph 60 to 70). In order to give a faithful representation of the entity's rights and obligations and the related income and expenses from both underlying insurance contracts and related reinsurance contracts held, IFRS 17 requires a reinsurance contract held to be accounted for separately from the underlying insurance contract to which it relates. This is because an entity that holds a reinsurance contract does not normally have a right to reduce the amounts it owes to the underlying policyholder by amounts it expects to receive from the reinsurer.

This article summarizes the main IFRS 17 requirements of the accounting for reinsurance contracts held, focusing on how these differ with the requirements for the underlying direct insurance contracts.

HOW DOES IFRS 17 APPLY TO REINSURANCE CONTRACTS HELD

(1) What are the level of aggregation requirements for reinsurance contracts held?

The same grouping requirements apply for the reinsurance contracts held, except the onerous contract grouping requirements. IFRS 17 replaces the "onerous contracts" by "contracts in which there is a net gain on initial recognition." The level of aggregation is assessed with reference to reinsurance contracts held. The grouping requirements suggested in IFRS 17 may result in a group that comprises of a single contract. These can cause differences in grouping between reinsurance contracts held and the related underlying insurance contracts.

(2) Does the onerous contract testing apply to reinsurance contracts held?

Reinsurance contracts held cannot be onerous [IFRS17.68], hence the onerous contract test is not required accordingly. Instead of profitable or onerous contracts, IFRS 17 views them as the net cost or gain on purchasing the reinsurance contracts. Both positive and negative contractual service margin (CSM) are allowed for reinsurance contracts held, except if the reinsurance coverage relates to events that occurred before the purchase of the reinsurance (retroactive cover). This may cause a mismatch in profit or loss, if the underlying contracts are onerous at inception. In such cases, the loss recognized immediately from the underlying contracts is not dampened by the expected recovery from related reinsurance contracts held. Please refer to question 10 on the subsequent measurement logic.

Table 1
CSM (as reinsurance asset) at Initial Recognition for Reinsurance Contracts Held

Fulfilment cash flows are …	Cover relates to future events	Cover relates to past events
… negative (cost on purchasing reinsurance)	• Accounted for as positive CSM • CSM is amortized in P/L over coverage period	• Recognized immediately in P/L
… positive (gain on purchasing reinsurance)	• Accounted for as negative CSM • CSM is amortized in P/L over coverage period	• Accounted for as negative CSM • CSM is amortized in P/L over coverage period

(3) When shall a group of reinsurance contracts held be recognized?

[IFRS17.62] A group of reinsurance contracts held shall be recognized:

(a) If the reinsurance contracts held provide proportionate coverage—at the beginning of the coverage period of the group of reinsurance contracts held or at the initial

recognition of any underlying contract, whichever is the later; and

(b) in all other cases — from the beginning of the coverage period of the group of reinsurance contracts held.

(4) Can the VFA be applied to reinsurance contracts held?

No. Reinsurance contracts held (or issued) cannot be insurance contracts with direct participation features for the purposes of IFRS 17 [IFRS17.B109]. Hence, the VFA cannot be applied. This may result in a mismatch of the measurement model with the related underlying insurance contracts.

(5) How is the contract boundary being defined according to paragraph 34?

There have been ongoing discussions on the contract boundary definition for reinsurance contracts held, given its operational challenges and implications. According to the IASB Transition Resource Group (TRG) 2018 February meeting summary, cash flows are within reinsurance contracts held boundary if they arise from substantive rights and obligations that exist during the reporting period. This would be the case if the entity is compelled to pay amounts to the reinsurer, or if the entity has a substantive right to receive services from the reinsurer. Hence, it is possible that the contract boundary of reinsurance contracts held include cash flows from related underlying contracts that are expected to be issued by the cedant in the future. This is a change from existing practices where the cash flows of related future underlying insurance contracts are generally not required to be estimated.

(6) What assumptions should be used for measurement of reinsurance contracts held?

IFRS 17 requires the use of consistent assumptions to estimate the present value of future cash flows for both reinsurance contracts held and the related underlying insurance contracts. In addition, the entity shall reflect the effect of non-performance risk by the issuer of the reinsurance contract, including the effect of collateral and losses from disputes.

(7) Should the entity use the identical discount rate for both reinsurance contracts held and the related underlying insurance contracts?

This question was raised by the industry for the February 2018 IASB TRG discussion. The IASB staff replied that "consistent" as mentioned in question 6 above does not necessarily mean "identical." The extent of the dependency between the cash flows of the reinsurance contracts held and the related underlying insurance contracts should be evaluated.

(8) How is the change in non-performance risk of reinsurers being treated?

IFRS 17 prohibits changes in expected credit losses adjusting the contractual service margin [IFRS17.BC309]. Changes in expected credit losses are economic events that do not relate to future service. Hence the impact should be reflected as gains and losses in profit or loss when they occur.

(9) What is the risk adjustment for the reinsurance contracts held?

The risk adjustment for non-financial risks represents the risk being transferred by the holder of the reinsurance contracts held to the issuer of those contracts.

(10) How is the CSM for the reinsurance contracts held being calculated in subsequent measurement?

The CSM roll forward of the reinsurance contracts held is similar to the general model logic, but an entity should also consider its linkage with the related underlying contracts. Changes in the fulfilment cash flows that relate to future service are adjusted to reinsurance contracts CSM, unless they are stemming from changes that do not adjust the CSM of the related underlying contracts. This means that, when the underlying contracts issued becomes onerous during subsequent measurement, the expected recovery from the reinsurance contracts held can be recognized and only the net amount will impact profit or loss. This is different from the treatment of onerous contracts at initial recognition as explained in question 2.

(11) Are there any specific presentation requirements for the reinsurance contracts held?

In the statement of financial position, reinsurance contracts held and insurance contracts issued are presented separately. An entity shall also present separately the carrying amount of the reinsurance contracts held that are assets; and reinsurance contracts held that are liabilities.

In the statement of comprehensive income, an entity shall present income or expenses from the reinsurance contracts held separately from the expenses or income from insurance contracts issued. An entity may present the income of expenses from a group of reinsurance contracts held, other than insurance finance income or expenses, as a single net amount; or the entity may present separately the reinsurance recovery received and reinsurance premium paid.

(12) What are the key disclosure requirements for the reinsurance contracts held?

Separate reconciliations (of liabilities or assets) shall be disclosed for insurance contracts issued and reinsurance contracts held [IFRS17.98]. Also, the entity is required to disclose certain risks for reinsurance contracts held and insurance contracts issued separately.

CONCLUSION

IFRS 17 states that all references to insurance contracts also apply to reinsurance contracts held with some exceptions as noted in IFRS17.4. There are a number of areas where judgment will be needed and there are certain mismatches possible between the IFRS 17 treatment of the reinsurance contracts held and the related underlying insurance contracts, such as the CSM recognition at inception, contract boundaries and the applications of different measurement models.

Similar to the Solvency II experience, it is generally expected that certain market consensus will converge for these application areas. The related methodology and considerations should be properly documented and approved within the entity's governance structure, and agreed with by the entity's auditor. It is also important for individual entities to understand both the financial and operational impacts of the reinsurance contracts held at the beginning of the implementation journey.

The views reflected in this article are the views of the authors and do not necessarily reflect the views of the global EY organization or its member firms. ■

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ENDNOTE

1 Please refer to EY's "Applying IFRS 17" for an IFRS 17 overview; *http://www.ey.com/Publication/vwLUAssets/ey-Applying-IFRS-17-Guidelines/$File/ey-Applying-IFRS-17-Guidelines.pdf.*

Is Level Funding on the Level?

By Mark Troutman

Editor's note: This article compares and contrasts the various forms of employee benefits funding available to smaller employer groups.

The Affordable Care Act (ACA) was designed with several desired outcomes: to increase the number of people covered by insurance to spread health care risk over a greater base of individuals, to make insurance more affordable and to modify or eliminate certain underwriting and pricing practices for individual and group policies. One of the outcomes of ACA health care reform is an increased interest by employer groups of all sizes to consider self-funding their benefit programs. Although self-funding has been a common approach for many larger employer groups, smaller employers are also now increasingly considering self-funding. This article focuses on small group employer stop-loss market product design issues (defined here as 15–100 employee lives).

> ACA rating and underwriting requirements produce incentives for groups to consider moving from insurance to self-funding.

Potential advantages of self-funding (regardless of group size) include improved cash flow from employer responsibility for funding and favorable experience thereon, flexibility in benefit design, elimination of most premium tax and lower cost of operation due to elimination of most insurance carrier risk and profit margin. Potential disadvantages of self-funding include assumption of risk due to adverse claim fluctuation and more time spent overseeing the benefit plan and not on the core purpose of the business. The increased risk can be partially mitigated by purchase of employer stop-loss "specific and aggregate" coverage.

These advantages and disadvantages for self-funding exist regardless of the ACA. However, the ACA provides additional incentives to consider self-funding as ACA rating and underwriting requirements produce incentives for groups to consider moving from insurance to self-funding. Prior to ACA reform, modified community rating allowed a variety of demographic factors to be considered in setting appropriate rates for small employer groups. These include age-sex factors, family size, occupation, duration of coverage, geographic location, tobacco use and even credit-worthiness. Proposed ACA reforms limit these types of features to age, geography, tobacco and family size. In addition, the result of the age banding limitation is that younger, healthier groups are subsidizing older/less healthy groups under such mandated rating requirements. These subsidization requirements are eliminated when a group is self-funded and ACA insurance laws and regulations do not apply.

Smaller employer groups interested in self-funding currently have two different employer stop-loss product design approaches for consideration. The first, often called level funding or aggregate only, provides a maximum aggregate liability to the employer group while incorporating no specific deductible per member. In that regard, it looks and feels more like a fully-insured employee benefits plan with a different maximum benefit limitation. In contrast, a traditional employer stop-loss policy provides both a specific deductible per covered member (above which all claims per member are covered by the employer stop-loss carrier) as well as an aggregate claim limit protection for all claims not subject to the specific individual deductible. This aggregate protection is often set at 125 percent of expected non-pooled claims, but this limit is often reduced to 115–120 percent for small groups and related to all claims if there is no specific individual deductible involved.

Most employer stop-loss carriers prefer issuing policies to larger groups (200+ employees) for several reasons. These groups typically have claims experience from a current insurance carrier or may be currently self-insured and more likely to have steady employee enrollment than smaller groups. Given the possibility of availability of experience from the incumbent insurance carrier, this facilitates rating the specific individual deductible coverage via a pricing manual and the aggregate coverage utilizing group experience.

Level funding costs are typically made up of several components—Administrative Services Only/Third Party Administrator (ASO/TPA) fees, stop-loss coverage and claim funds (paid claims plus reserves). The ASO/TPA fees will cover administrative costs for administering the self-funded benefit plan and broker commissions. Stop-loss provides a risk protection for specific individual catastrophic claims and/or claims in excess of an aggregate expected amount. The claims fund is typically the largest component of the level funding premium payment amount. Amounts not utilized to pay claims may be refunded to the group or provided as a credit for following year's costs or settlement at termination.

Level funding is designed to maintain the advantages of stability and efficiency of the fully insured coverage while providing the flexibility and advantages described above for self-funded plans. Level funding is a stop-loss product designed to facilitate an existing fully insured plan to transition to self-funding. Here's how it works:

Funding—The TPA sets up an employer benefit plan account for each employer at the bank of its choosing. The carrier sets up a funding account that can transfer funds via Automated Clearing House (ACH) to the employer's benefit plan account. At the beginning of each month, the employer deposits its monthly funding (based on the group's rating factors) into its employer benefit plan account. The TPA cannot process any claims until the employer has made this monthly deposit. The employer's monthly funding is used to pay any eligible medical claims. At any time during the month, if the cumulative paid claims amount exceeds the employer's account balance, the Third Party Administrator (TPA) calculates the excess amount and sends a request to the carrier. The funds are then sent by ACH transfer to the employer's benefit plan account. The TPA then releases any pended claim payments. At any time during the month, if the employer's cumulative paid claims exceed its cumulative funding balance, all claim payments for the remainder of the month would be reimbursed by the carrier.

Premium—The employer's premium payments and the funding factors must be submitted by the first of each month. The funding factors would be deposited into the employer benefit plan account and the premium will be sent to the insurance carrier. If the employer's premium is not received, the TPA must hold all claim payments until it is received.

Accounting—Each month, the employer deposits its funding factor amount into its employer benefit plan account. Both the plan's attachment point and paid claim amounts accrue on an aggregate basis. During any month, if the employer benefit plan account reaches $0.00, the TPA will hold all checks and request funds from the carrier. At any time during the policy year, if the employer benefit plan account has a large balance and the carrier had previously issued prior reimbursements, a refund may be requested prior to plan year-end final settlement. For every group, a full accounting of the employer's attachment point, funding and paid claims must be done at plan year end. If the carrier **did not** reimburse any claims throughout the year and the year-end total paid claims amount is less than the year-end attachment point, the outstanding balance in the employer benefit plan account remains in the employer benefit plan account. If the carrier **did** issue reimbursements throughout the

year, any amount remaining in the employer benefit plan account must be refunded to the carrier. The amount of the refund would be limited to the amount(s) reimbursed by the carrier. If the year-end total paid claims amount exceeds the employer's year-end attachment point and the employer benefit plan account has a balance of $0.00, the carrier would have reimbursed all eligible excess amounts and no refunds would be due.

In some situations, carrier reimbursement is via a "sweep" account. The employer's bank account is attached to the carrier's account and when the employer's bank account becomes negative, the carrier account automatically funds the difference.

Claims—Notification of potential large claims mirrors a traditional specific and aggregate stop-loss policy approach. Notification typically occurs for individuals that exceed some dollar threshold in total paid claims, claims with a potentially catastrophic diagnosis, inpatient admissions, outpatient surgeries, and individuals in a catastrophic case management setting.

Table 1 provides a brief comparison of a fully-insured employer benefit plan to the level funding and traditional employer stop-loss alternatives for a smaller employer group.

The underwriting of risk for smaller groups typically involves usage of a short form medical questionnaire or risk assessment tool to predict future high claimant claim costs. Health plans may already have existing individual underwriters and small group rating capabilities to utilize in this regard.

In 2016, the senate passed the Protecting Affordable Coverage for Employees (PACE) Act. The PACE act stopped the ACA small group definition from expanding from 50 to 100 subscribers and lessened the immediate demand for small group self-funding. However, incentives remain for the better risk small groups to consider level funding products or traditional employer stop-loss.

Programs will also need to consider NAIC model stop-loss laws which have been adopted in many states and require minimum

Table 1
Program Features

	Fully Insured	Aggregate Only Level Funding	Traditional Specific & Aggregate
Specific deductible per member	No	No	Yes
Cash funding calls to employer	No	No	Yes
Fully funded liability	Yes	Yes	No
Level monthly budget	Yes	Yes	No
Maximum cost	Lowest	Medium	Highest
Flexible plan design	No	Yes	Yes
Participation in favorable experience	No	Yes	Yes
Individual medical underwriting	No	Usually	Sometimes
Added risk for poor experience relative to fully insured	No	Yes	Yes

Both self-funding programs have advantages and disadvantages and Table 2 summarizes these.

Table 2
Pros Versus Cons

	Aggregate Only Level Funding	Traditional Specific and Aggregate
Advantages	1. Feels more like a traditional insured program 2. Simpler administration 3. Lower maximum aggregate corridor 4. Participation in favorable experience	1. Specific deductible protection specifically provided 2. Participation in favorable experience
Disadvantages	1. Higher portion of total cost paid in fixed costs 2. Higher risk assumed by employer	1. Higher risk assumed by employer for adverse experience

specific deductibles (e.g., $30,000–$40,000) and aggregate stop loss corridors (e.g., 120 percent).

HMOs and other managed care organizations (i.e., health plans) are increasingly developing small employer group self-funding products. This is a natural fit for their marketplace given that health plans have knowledge of the current employer group risk profile (if currently a fully-insured group), and health plans often have experienced individual medical underwriters on staff. Health plans also have a rating model which takes into account their service area, preferred provider arrangements and managed care programs.

Health plans' considering offering small group self-funding have decision points:

- Traditional or level-funding type small group self-funded product,
- minimum group size,
- lowest specific stop-loss deductible available,
- available aggregate corridor (e.g., 115–125%),
- use of individual medical applications and small group medical underwriter,
- health plan filed policy or use an external stop-loss carrier fronting arrangement,
- level of risk assumed by health plan either directly or via reinsurance, and
- small group rating model and medical underwriting capabilities at the health plan.

In conclusion, regardless of size, employers simply want health care benefits that provide peace of mind, control, flexibility and value. These remain interesting and challenging times for those who purchase and provide health care coverage to their employees and the health plans that provide them on a fully insured or self-funded basis. Traditional specific and aggregate coverage and level-funding are increasingly becoming attractive value propositions for smaller employer groups due to ACA requirements. Employee benefits plans which include both properly managed care and self-funding have a winning formula for success. ■

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ReFocus 2018—A "Predictable Surprise"

By Ronnie Klein

Life expectancies are increasing in most, if not all, mature markets and fertility rates are dropping below population replacement values. The combination of these two facts is causing an increase in the old-age dependency ratio (number of people aged 65 and older divided by the number of people aged 15–64) to unsustainable levels. Life insurers are the only companies with the knowledge, tools and risk appetite to assist in mitigating this worldwide issue.

This was the theme of Dirk Kempthorne's final ReFocus "State of the Industry" address at the most successful ReFocus Conference ever with over 720 attendees. Kempthorne, president and CEO of the American Council of Life Insurers (ACLI) and former governor of Idaho, will be leaving prior to next year's meeting. The ACLI, along with the Society of Actuaries (SOA), have been co-hosts of ReFocus since 2007, the initial year of the conference, 12 years ago. During these 12 years, ReFocus has grown from 290 attendees at an 8 percent average annual growth rate (yes, I am an actuary).

Directly after Kempthorne's address, he led a panel of CEOs in a discussion about "The Future of Longevity." This session fit nicely into the 2018 Theme—"Life Expectancy and Longevity: Beyond the Numbers." During this session, Carolyn Johnson described some of the unique products that Voya has to help combat the well documented gap in retirement savings. Barry Stowe showed his passion for financial literacy, explaining how Jackson National produces a cartoon and video games to help teach children in Asia about financial literacy.

However, the best line of ReFocus 2018 came from Phil Waldeck, president of Prudential Retirement, when he said that the impending retirement crisis was a "predictable surprise." This term became the most used phrase at the conference. Demographers saw the increasing old-age dependency ratio coming and knew that this would put stress on social retirement systems around the world. Governments have been too slow to react. This session also highlighted some important steps that individuals must take now to provide for themselves in their retirement years.

No insurance conference is complete without a few sessions on InsurTech and ReFocus 2018 had its share. Nico van Zyl led a team of experts in a discussion about how genetics and new devices can help in-force policyholders live longer. There is a lot

of discussion in the industry about the anti-selection that can be caused by direct-to-consumer genetic testing, but Tom Wamberg and Mark Winham showed how genetics can be used to increase interaction with clients, improve life expectancies and increase new business. Connor Landgraf, a 27-year-old CEO of a start-up company, described one of the devices that his company is marketing which monitors heart and lung sounds remotely and already has FDA approval. Think of the uses this device could have for in-force policyholders.

Clara Shih had some interesting observations in her keynote address. She said that younger agents don't know what they are doing and millennials do not want to buy insurance from their parents' insurance agents. She went on to say that the insurance industry is way behind the times with technology.

Countering Shih's arguments was Sy Sternberg, former CEO of New York Life, who said flat sales in the insurance industry are due to fewer agents being trained. The industry is keen on InsurTech, but Sternberg is old school and still thinks we need more agents. Who can argue as sales are flat and there are fewer life insurance agents being trained? Sternberg was part of a retired CEO panel which also included John Coomber (Swiss Re) and Rob Henrikson (MetLife). I was honored to moderate this panel.

There were other very interesting sessions and keynote addresses at ReFocus 2018, but the real value in this conference are the networking opportunities. Many attendees call ReFocus their most important marketing meeting of the year. With over 720 senior executives roaming the halls, no wonder attendance has been steadily increasing. Add to this the expert conference moderating by Bill Press, senior CNN political analyst and former host of Crossfire, and you have a not-to-be-missed event.

The success of this conference is mainly due to the amazingly dedicated programming committee—my co-chair, John Laughlin, and committee members Pete Schaefer, Kent Sluyter and Dawn Trautmen. Of course, the conference could not exist without the support of the ACLI and SOA, especially Elizabeth Carden, Jay Semla and Tatiana Tolentino. In addition, the event could not occur without the support of our sponsors, especially our Diamond Sponsor, Milliman. Please contact the ACLI, SOA or me for sponsoring opportunities.

ReFocus 2019 will be held at the Cosmopolitan Hotel in Las Vegas from March 10–13. Please mark your calendars now and watch for alerts from the SOA and ACLI. Be sure to register early so that you do not miss out on rooms in the main venue as they sell out fast. I look forward to seeing you next year! ■

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The P&C Reinsurance Landscape

By Dave Ingram

Reinsurance for property and casualty insurance follows the same general principles as life and annuity reinsurance. But all of the terminology and most of the details are totally different. I started to learn this 10 years ago, when I left the life insurance sector after over 30 years and joined a property and casualty reinsurance broker as an advisor on enterprise risk management. The following represents my very brief summary of the P&C reinsurance landscape that I have picked up by association over the past 10 years.

AUTOMATIC AND FACULTATIVE REINSURANCE

As with Life reinsurance, P&C reinsurance can be written on an automatic or facultative basis. Automatic reinsurance is also called Treaty reinsurance. Facultative reinsurance follows the same general choices for structure as Treaty reinsurance.

PROPORTIONAL TREATY REINSURANCE

Proportional reinsurance is called so because both premium and losses are shared between the cedant and the reinsurers based on the cession percentage. As example, if the cession percentage is 60 percent and premium is $1,000 and losses are $10,000, the reinsurer receives $600 in reinsurance premium and pays $6,000 in loss.

Property & Casualty insurers use two forms of proportional reinsurance: quota share (there is also a variant to this called variable quota share) and surplus share.

Quota Share: With quota share reinsurance, the cedant and reinsurer agree upon a fixed cession percentage for all risks, so that the reinsurer will receive a fixed percentage of premium and loss for all risks ceded to the quota share treaty. In its variant, the variable quota share and several fixed percentages can be set based on risk characteristics (which could include limit, geography or type of risk).

Surplus Share: Surplus share treaties are a form of proportional treaty that allows the cedant to vary the quota share percentage and determine the proportion ceded at the time of underwriting each and every risk. The cedant is allowed to cede the "surplus" amount of exposure over and above their retained line subject to a maximum ceded percentage and limit. As an example, the surplus share treaty might allow the cedant to share between 50 percent and 80 percent of a risk subject to a maximum ceded line of $10 million. In this example, the cedant could have a $2M risk, retain $1M and cede $1M to reinsurers, a 50/50 sharing of risk. Another risk, could have a $5M line and the cedant could decide to have the same 50/50 sharing of risk or could cede 80 percent of the risk, retaining $1M and ceding $4M. In each of these examples, the cedant and reinsurer share in the premium based upon the cession percentage determined by the cedant at the time the risk is underwritten. Due to the fact that this form of proportional reinsurance could theoretically involve adverse selection against the reinsurer, surplus share treaties are less common. Uncertainty surrounding loss development, exposures and timing of loss payments in casualty lines lead to surplus share being used less frequently for casualty business.

Pricing: Pricing for proportional reinsurance generally follows the original policy pricing. However, these treaties generally pay ceding commissions:

P&C INDUSTRY BACKGROUND

Most P&C policies are written with one-year durations. Policies are not binary and the amount of loss paid by the policy (if any) is uncertain, even after a loss becomes known. Pricing and reserve risk are therefore significant.

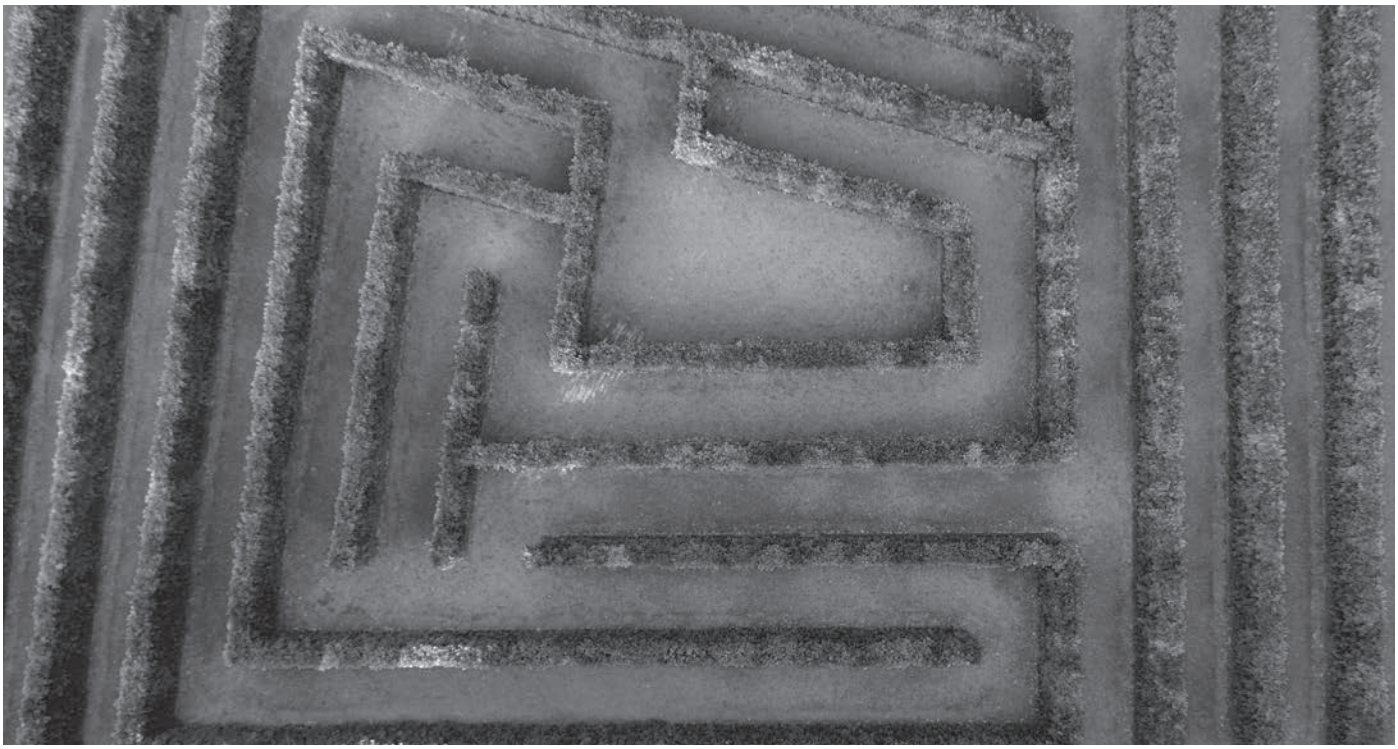
On the average, over the entire industry, P&C insurance runs at a modest underwriting profit to break-even over time. The industry's genuine profits emerge from interest earned on assets backing reserves.

Reserves reflect amounts held for future claims payments on covered losses that were incurred during prior one-year coverage periods.

Claims from different P&C lines of business pay out over vastly different timeframes; property business over a shorter period and casualty business over a generally longer period.

For some lines, like personal auto and homeowners, almost all claims are settled within two or three years after the coverage period. Others, like workers' compensation, take decades to settle.

For various historical reasons, P&C reserves are not generally discounted for interest, which is one major driver in the low or negative excesses of premiums over claims.



- A ceding commission should cover the expenses of the ceding company, but it can be reduced if the expected profitability of the business is questionable.
- In some cases, ceding commissions are on a sliding scale, trending downwards as claims are higher and higher as claims are reduced.
- A Loss Corridor can be introduced that will have the cedant retain 100 percent of losses above a given loss ratio and revert to the original quota share percentage after another higher loss ratio. This mechanism can allow for improved ceding commission terms and bridge a gap between the cedant's and reinsurers' loss expectations.

Proportional reinsurance is generally used to support a cedant's need to write larger risks than they are typically comfortable with; of the two, surplus share does this most effectively. As well, the ceding commissions and ceding of large amounts of unearned premium reserves provide some measure of expense and surplus relief. Depending on the percentage of business ceded to the proportional treaty and the exposure to event or catastrophic risk, proportional treaties can provide substantial catastrophe protection.

PER RISK EXCESS TREATY REINSURANCE

Losses in the property and casualty world are generally not binary and usually fall short of the full policy limit. If there is a fire in a 100-story office tower, the loss is generally contained to one or a handful of floors, not the entire building. As a result, reinsurers are willing to consider reinsurance structures that will allow the cedant to retain the first portion of loss as a retention and, above the retention reinsurers, would pay losses. This is per risk excess reinsurance, sometimes referred to as excess of loss or XOL reinsurance.

Because the cedant is retaining the first dollars of loss, there is also a disproportionate sharing of premium. As an illustration, an XOL treaty may provide protection for $5 million per risk, per loss excess of $5 million per risk, per loss. In this example, reinsurers would receive less than 50 percent of the premium due to the fact that more losses are expected to fall within the first $5 million of loss than in the second. As the retention relative to overall exposure increases, per risk excess pricing reduces.

Per risk excess reinsurance is utilized to protect both property and casualty exposures.

WHAT IS CASUALTY INSURANCE?

Casualty coverages include all forms of liability coverages, from individual liabilities resulting from auto accidents, to corporate liability and professional liability of lawyers, doctors, and directors and officers. Workers' compensation insurance is also considered to be a casualty coverage.

As with quota share, per risk excess reinsurance enables cedants to write larger risks. And the structure allows a cedant to cap-off peak risks within her or his portfolio. These treaties sometimes have ceding commissions, but, since the premium volumes are generally lesser than proportional reinsurance, the expense and surplus relief are lesser too. Due to the first loss retention of per risk excess treaties, they generally provide lesser protection against catastrophic risk than do proportional reinsurance treaties.

PER OCCURRENCE EXCESS TREATIES

Per occurrence excess treaties protect cedants against an accumulation of risk to a single occurrence or event. Insurance regulators and rating agencies are particularly concerned with a property and casualty company's ability to withstand exposure to natural catastrophes; and, increasingly, they are concerned with possible exposure to systemic casualty risk.

Per occurrence excess treaties are similar to per risk excess treaties in that the cedant retains the first portion of loss and reinsurers respond excess of that retention.

Property occurrence excess treaties are often referred to as "Cat" treaties because most of the protection afforded is against natural perils like earthquakes, hurricanes and floods; these treaties still provide protection against man-made disasters like 9-11 or the Phillips Petroleum disaster (1989 for $1.4 billion).

Casualty excess occurrence treaties are often referred to as "clash" treaties since the treaties respond to a clash of losses from either or both multiple policies for the same insured (think Enron) or multiple insureds involved in the same event (the MGM Grand Fire as example, where the building owners, architects, construction companies, local government and others were defendants). The definition of "occurrence" or "event" has always been one of the major hurdles in negotiating a casualty occurrence excess treaty.

WHAT IS A CASUALTY EVENT?

In casualty insurance, an occurrence is an event that results in one or more claims. In most casualty per occurrence excess treaties, an event requires multiple claims against multiple policies.

As is the case with per risk excess treaties, pricing for per occurrence excess treaties reduces as the retention increases. For property Cat treaties, reinsurers utilize catastrophe models to develop expected annual aggregate losses exposing the treaty and price accordingly. For casualty clash treaties, there are no industry-standard models for pricing and pricing generally follows benchmarks relative to other similar treaties, attachment relative to the maximum per risk exposure or to industry concentrations.

INSURANCE-LINKED SECURITIES

Since the early 1990s, the capital markets have played an increasing role in supplying capacity for catastrophic risk. As investments, they are popular with pension plans and other investment funds that are looking for extra returns from uncorrelated investments.

The most common form for these instruments is a bond that is purchased by the investor; the bond pays a regular coupon and at maturity repays the principal, unless there is a pre-specified catastrophic event. This bond is held by a special purpose vehicle (SPV) reinsurer which enters into a reinsurance agreement with

the insurer; if there is a catastrophe, the principle is not repaid and coupon payments cease. Initially, the definition of a triggering catastrophe was based upon industry-wide losses from a single event. As the market gained experience with this form of catastrophe protection, the definition has shifted to more company-specific definitions of catastrophes. ILS, unlike traditional reinsurance treaties, will often run for multiple years, offering insurers stability of both capacity and of pricing. With the large storms in 2017, several existing ILS were called upon to pay insurers.

Other forms of ILS included industry loss warranties which are parametric derivative contracts that pay their full amount to the extent that the industry loss (as determined by some recognized supplier of such information) exceeds a specified dollar amount.

ILS vehicles have been commonly used to protect against exposure to natural catastrophes. More rarely, they have been used to provide casualty catastrophe protection; fewer than a handful of casualty ILS structures have been placed to date; this is due to the lack of any standards for measuring and modeling casualty catastrophe risk.

AGGREGATE STOP LOSS

This form of reinsurance provides insurers with a comprehensive guarantee that their claims will not exceed a predetermined level, specified as either a percent of the premium base or a fixed dollar amount after satisfaction of a deductible (or retention). In many cases, this is the form of reinsurance that most closely aligns with what the insurer wants in terms of claims variability management. However, aggregate stop-loss is not always available; and, when it is available, it may be priced at a level that makes it less attractive compared to a bundle of other reinsurance treaties that provide piecemeal coverage that can add up to something very close to the protection afforded under an aggregate stop-loss.

LOSS PORTFOLIO TRANSFERS

Even though most P&C insurance is written via one-year contracts, claims may pay out over multiple years. An insurer may end up with a large amount of loss reserves that are held to pay future claims on previous business. In some cases, insurers want to be relieved of the uncertainty of the actual amount of claims that will be paid as well as the capital that must be held to provide for that uncertainty. A loss portfolio transfer (LPT) is a form of reinsurance that transfers all or a portion of the liability for future claims payments to the reinsurer. Depending upon the type of business, the amount of claims already paid and a host of other factors, the amount transferred to the reinsurer may be the reserves held, something less or in some cases, a larger amount. The reinsurer may also take over management of the claims so that they can seek to achieve the best possible result.

ADVERSE DEVELOPMENT COVER

An alternative to the LPT is an adverse development cover (ADC) under which an insurer gets reimbursement from the reinsurer for claims from any claims in excess of a pre-agreed retention level. Usually this level will be either at the level of the reserves held or at some level higher than the reserves.

MULTIPLE EXCESS LAYER AND REINSTATEMENTS

Because most losses are partial, cedants can reduce rates depending on the retention of any given excess cover. In order to appeal to varying risk assumption appetites of reinsurers and to appeal to their own risk retention appetite, cedants will often structure their per risk, per occurrence, and adverse development covers in layers in order to appeal to these fluctuating appetites.

Excess reinsurance treaties often have limitations on the number of times they will respond for the duration of the contract. Each time the contract pays an additional limit, is considered a reinstatement of the original limit. Per risk excess reinsurance contracts that have a high premium volume and predictable results (sometimes called "working" reinsurance layers) are generally provided with unlimited reinstatements. Whereas, those with limited premium volumes and substantial volatility are given only limited reinstatements; sometimes these reinstatements come with an additional premium referred to as a paid reinstatement. Cat and Clash reinsurance contracts generally have limited and paid reinstatement features.

COMBINATIONS OF TREATIES

For P&C insurers, it is quite common to purchase a variety of reinsurance covers for different "layers" of their exposure in order to address different needs: capacity, financing, stabilization and catastrophe protection. Each of the forms of reinsurance fulfill, to some extent one or all of these functions.

CONCLUSION

In writing this brief tour of P&C reinsurance, I realize that I have learned quite a bit about what was once a totally foreign land. But in gaining that familiarity, I realize that I may have lost some of my Life Insurance perspective. I hope that I retained enough to make this a helpful starting point for anyone who wants to learn about this fascinating sector. ■

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Digital Insurance—Key to Unlocking Africa's Life Insurance Potential?

By Jason Cooper-Williams

Much has been written about the African insurance market, both with regards to the inherent potential as well as the many obstacles that prevent the market from naturally flourishing.

The combination of one of the lowest life insurance penetration ratios, combined with an expanding population that can be categorized as young, are just two factors that provide a glimpse into the potential for the life insurance market. The current population is largely underserved from a general financial services perspective and this includes banking and insurance. Slowly increasing levels of education, increasing urbanization and a growing middle class with disposable income will accelerate the need for financial services in general which will include life insurance products and services.

The main hurdle to an expanding life insurance industry is still affordability on the demand side. This relates to insufficient poverty reduction and the high levels of unemployment that are prevalent on the continent. When food and shelter are still a primary concern, insurance purchases are not likely. A lack of financial education and awareness also plays a large role. On the supply side, poor regulation and governance, and a lack of local expertise make it difficult to easily invest in and enter various markets within Africa.

These examples of potential and obstacles are by no means exhaustive.

At this point it is worth mentioning that South Africa is an outlier as far as the rest of Africa is concerned. For example, South Africa has one of the highest life insurance penetration ratios in the world. If you exclude South Africa from Africa the penetration ratio drops to the lowest in the world. South Africa has a mature and innovative insurance industry. It is also from South Africa that much of the investment into the life insurance markets in Africa is made as local insurers look for growth outside of the established local market.

MOBILE POWER

Simpler practical issues also stifle development within the African life insurance market. In Africa this often manifests as a simple premium collection and reach issue. Given a willing buyer and seller, can the buyer purchase a life insurance contract if they don't have a bank account? And can an insurer sell a policy if they don't have a branch or agent near the potential customer, which is often the case given the spread of populations over rural areas?

It is estimated that half of the African population of 1.2 billion people has access to mobile services, and continues to grow. This provides a powerful tool to any industry that is struggling with issues around payment and reaching customers. Much of the technological innovation in Africa has been around mobile money and is centred around Kenya and the rest of East Africa.

Mobile money adoption in Africa has outpaced growth in the rest of the world. In 2016 the number of registered mobile money accounts surpassed half a billion across the world; 277 million of these were in sub-Saharan Africa. MTN Mobile Money and M-Pesa (M is for "mobile" and pesa is Swahili for "money") are two of the largest providers of these services. These advancements have done much to advance financial inclusion in Africa.

In developed nations people tend to access their bank accounts through a smart phone. In mobile money markets people use the phone as a bank account. The cost of smart phones is still prohibitive to many in Africa, but basic mobile phones (feature phones) can be used for mobile money transactions. This is done using a frequently used service called unstructured supplementary service data, or USSD. This is available to all GSM mobile phones.

However, smart phone adoption in Africa is rapidly increasing as low-cost smart phones become available. This is largely through the introduction of cheaper Chinese android devices. Smartphone adoption in Africa is already over 40 percent and smart phone usage has doubled over the last four years.

Financial service providers that can harness these developments can place their brands, products and services in potential customer's hands through mobile phones and collect premiums through mobile money technology. Education and awareness can also be addressed through this medium.

Affordability of life insurance products is still a key issue, and traditional insurance products that require stable monthly premiums are often not practical. Products any more complex than simple funeral type products are also not feasible, where more complex underwriting and claims processes might exist.

In order to solve these problems companies need to cut out as much of the distribution and servicing costs as possible from their products and services, making them cheaper and also ensuring that their offering is scalable.

GOING DIGITAL

The first digital life insurance products are emerging in markets across the world. This is where the entire value chain is collapsed into a digital platform. Underwriting, on-boarding, policy issue, servicing, premium payment and ultimately claiming are all handled on the digital platform. Much of the distribution will also happen on the platform.

A successful example of this is Zhong An in China, which has been described as the first truly digital insurer to reach scale. This company started with short-term products but has moved into health and life insurance.

For its health insurance product Zhong An utilizes an end-to-end digital process. It even encourages its policyholders to act as distributers of the product to new policyholders through the platform. The reward for introducing a sale is reductions in their own premiums.

This form of insurance distribution and servicing generally requires smart phone technology. With Africa's growing young connected population and the ever reducing cost of smart phones, it is expected that smart phones will be much more ubiquitous. Many are anticipating that this will then be the next point of inflexion for digital products and services in Africa.

It is expected that digital insurance products and services in Africa could leapfrog more developed nations in their adoption and distribution. More developed markets have insurance companies that are hampered by legacy IT systems, infrastructure, processes and culture. These companies will struggle to suddenly become a digital insurer or add digital products to their offering.

It must also be remembered that the traditional evolution of insurance products, from brokers and paper contracts to online insurance and ultimately fully digital products, will be totally bypassed in many instances in Africa. For many the first insurance offering will just be digital.

Most of these countries have established traditional life insurance business, but these target a very small subset of the respective populations, mainly high net worth individuals or the expatriate community.

In addition to this leap to digital, the growing young African population have not moved from personal desktop computers to laptops and then mobile. They will only know mobile and

as such companies looking to reach these customers should not be trying to evolve from a standard or even an internet online insurance offering. This is an entirely new market.

It is a young underserved market from a financial services perspective, and they will ultimately be serviced by companies that can produce digital products combined with mobile payment solutions.

DOES DIGITAL SOLVE ALL PROBLEMS?

By reducing the distribution and servicing costs of insurance, the affordability issue will be addressed in a more meaningful way than it has at any point in the past. By putting your brand onto a digital platform and into the hands of potential customers this will also provide reach and enable scalability. Even in the mature South African market these developments are being eagerly tested with the hope of it ultimately unlocking the mass market which is also largely underserved. The hope is that these developments can finally prove to be the key to unlocking the full micro-insurance potential.

By having a fully digital service, it also allows the incorporation of other technologies into the process. This opens the door for significant automation, the use of big data and cloud computing to name a few. These are good examples of changes that will further drive down the cost of the provision of life

insurance products. With regards to automation, there are already examples of short-term products where the technology collects the data to verify a claim whether this be a weather event or accident. In the life and health insurance spaces technology is being used to verify medicine use, hospital stays and whether or not the life insured has died, for example.

Any company with access to customers, their data and to some extent their finances has a role to play in the rollout of financial services in Africa. This is why we see telecoms being quite active by having access to customers digitally, as well as having access to non-financial data and financial data via mobile money or at least pay as you go services. The traditional insurers and banks are also active.

Any company with large volumes of data could potentially enter this space, which is where big data plays a role. Companies in Africa are already finding innovative ways of using existing data to provide and price insurance products.

With a digital product, lots of physical medical underwriting and long application forms (or any paper forms) pose issues that need to be overcome. But at the same time, an insurer needs to manage selection. A straight-through process without leaving the platform until it is signed and payment arranged (preferably within minutes) is the Holy Grail. Data is also being used to bypass this process. By using information the companies already have, they are finding ways to predict what the underwriting outcome would be or the likelihood of insured events occurring for people with similar risk profiles. This then cuts out much of the underwriting.

This also enables companies to make targeted offers. Based on what a company knows about a person, it could make an insurance offer knowing that the selection risk is acceptably low without further underwriting, or it can make an offer by just asking you to confirm a couple of points. This becomes very powerful for banks and telecom companies with large customer bases that are underserved from a life insurance perspective. This enables them to simply put easy-to-accept offers in front of their clients. It also enables companies to move beyond just funeral type products and offer both higher covers and other types of insurance, like disability or illness cover.

Going a step further, building product into existing services could evolve further and this then provides huge scale and also eliminates selection. Already life insurance products are being built into other products and services like airtime. This then is also a big threat to traditional insurers trying to do business in Africa, where their product has been allocated as a value-add to the primary products in another industry.

A digital platform also enables more flexibility with regard to the insurance products and gives the consumer more control. In a market which is heavily affected by affordability and volatile streams of personal income, lapsing policies due to non or partial payment is not an option. A product that automatically adapts to premium payments or allows the policy holder to alter the product as they go becomes essential.

Products and services also need to be more flexible. Pay-as-you-go models for insurance products need to be adopted. This can be built into a digital platform through rules and functionality. These are the types of issues that traditional insurers with legacy infrastructure will struggle to match. Imagine trying to affect a policy change within a few minutes on a traditional life insurance policy.

Digital platforms also remove geographic borders. An insurance product that is distributed through digital platforms, is underwritten using existing data and a rule set, where the customer manages the product on the platform and claims can be verified by automating assessment procedures suddenly doesn't need a lot of local insurance expertise where the product is physically bought.

THE FUTURE

This is what life insurance products are likely to look like and how they are likely to behave in Africa in the not-too-distant future. The way that they get to the market will also involve a lot of partnerships which is likely to be a new way of operating for many companies. These could be partnerships between large established companies with complimentary experience and data as well as partnerships with emerging FinTechs providing parts of the solutions to the digitization of financial services and products.

And then again, maybe a fully digital company, the African version of Zhong An, will suddenly emerge and accelerate the pace of change.

Digitization of life insurance products will not solve all of the problems facing the African life insurance industry. But digital products and services will open the door to solving many of them through awareness, education, availability and affordability. It will also grow the potential market through better financial inclusion. ■

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Results of The 2017 SOA Life Reinsurance Survey

By Nancy M. Kenneally

2017 was a strong year for new business. Recurring individual life new business volumes grew in 2017 for both U.S. and Canadian reinsurers and estimated cession rates increased over prior levels.

ABOUT THE SURVEY

The SOA Life Reinsurance Survey is an annual survey that captures individual and group life data from U.S. and Canadian life reinsurers. The survey reports reinsurance new business production and in-force figures, with reinsurance broken into the following categories:

- Recurring reinsurance: Conventional reinsurance covering an insurance policy with an issue date in the year in which it was reinsured. For purposes of this survey, this refers to an insurance policy issued and reinsured in 2017.
- Portfolio reinsurance: Reinsurance covering an insurance policy with an issue date in a year prior to the year in which it was reinsured or financial reinsurance. One example of portfolio reinsurance would be a group of policies issued during the period 2005–2006, but being reinsured in 2017.
- Retrocession reinsurance: Reinsurance not directly written by the ceding company. Since the business usually comes from a reinsurer, this can be thought of as "reinsurance of reinsurance."

Individual life results are based on net amount at risk, while the group life results are based on premium.

The figures are quoted in the currency of origin (i.e., U.S. business is provided in USD and Canadian business is provided in CAD).

Please note, while we reach out to all of the professional life reinsurers in North America, there may be companies that did not respond to the survey and so are not included.

HIGHLIGHTS

The North American life reinsurance market experienced a boost in production for recurring individual life new business in both the U.S. and Canada during 2017. Group in-force premiums declined slightly in the U.S. in 2017 and were flat in Canada as compared to 2016. Table 1 summarizes the most recent survey results.

Individual Life New Business

Recurring life new business recorded a 9 percent increase in production in 2017, making it the second year in a row with an increase following a long period of decreases. Portfolio new business declined significantly, driving an overall decline in new business volume for the year.

Canadian recurring new business also saw an increase in production. The 5 percent increase in 2017 makes this the third straight year with an increase for Canada. Similar to the U.S., a

Table 1
Reinsurance Landscape

	Individual Life New Business Volumes ($ billions)			Group In-force Premiums ($ millions)		
	2016	2017	% Change	2016	2017	% Change
U.S.						
Recurring	457	498	9%	798	777	-3%
Portfolio	729	169	-77%	3,938	3,462	-12%
Retrocession	8	7	-17%	0	0	n/a
Total	**1,195**	**674**	**-44%**	**4,737**	**4,239**	**-11%**
Canada						
Recurring	160	168	5%	104	104	0%
Portfolio	41	0	-100%	786	835	6%
Retrocession	6	9	54%	0	0	n/a
Total	**206**	**177**	**-14%**	**890**	**939**	**5%**

significant decline in portfolio new business caused an overall decline in new business volume for the year.

Group Life Business

U.S. group in-force recurring business experienced a 3 percent decrease in premiums in 2017 after a prolonged period of increases. Portfolio in-force premiums were also down 12 percent.

In Canada, recurring in-force premium was flat as compared to last year. Overall in-force group premium exhibited a 5 percent increase in 2017 driven by increased portfolio premium.

UNITED STATES—INDIVIDUAL LIFE

Recurring New Business

U.S. recurring reinsurance recorded an increase in production for the second year in a row after a prolonged period of decreases. U.S. recurring new business rose 9 percent from $457 million in 2016 to $498 million in 2017. One contributing factor for the increase is believed to be the growth in streamlined or automated underwriting programs. Since these programs are relatively new to the market (and growing), direct writers have reached out to the reinsurance community for assistance in developing the programs and taking a share of the risk.

Figure 1 shows the annual percentage change in U.S. recurring new business production over the last 10 years.

U.S. recurring new business rose 9 percent from $457 million in 2016 to $498 million in 2017.

In 2017, 78 percent of recurring new business production was YRT and 22 percent was coinsurance, as compared to 80 percent YRT and 20 percent coinsurance in 2016.

This increase in recurring new business production also resulted in an increase in the cession rate. According to LIMRA, individual life insurance sales increased 1 percent in 2017 based on premium (and increased 2 percent based on face amount) driven by strong sales in the first half of the year.[1] Significant decreases in UL sales, particularly no-lapse guarantee business, were offset by strong indexed universal life sales and smaller increases in term and VUL sales. Comparing new direct life sales to new recurring reinsurance production results in an estimated cession rate for the industry of nearly 29 percent for 2017, a welcome 2 percent increase over 2016. As seen in Figure 2, the estimated cession rate has hovered around 27 percent since 2011. It's interesting to note that 2017 individual life recurring new business and the 2017 cession rate have nearly returned to 2010 levels.

Figure 1
U.S. Percentage Change in Recurring New Business

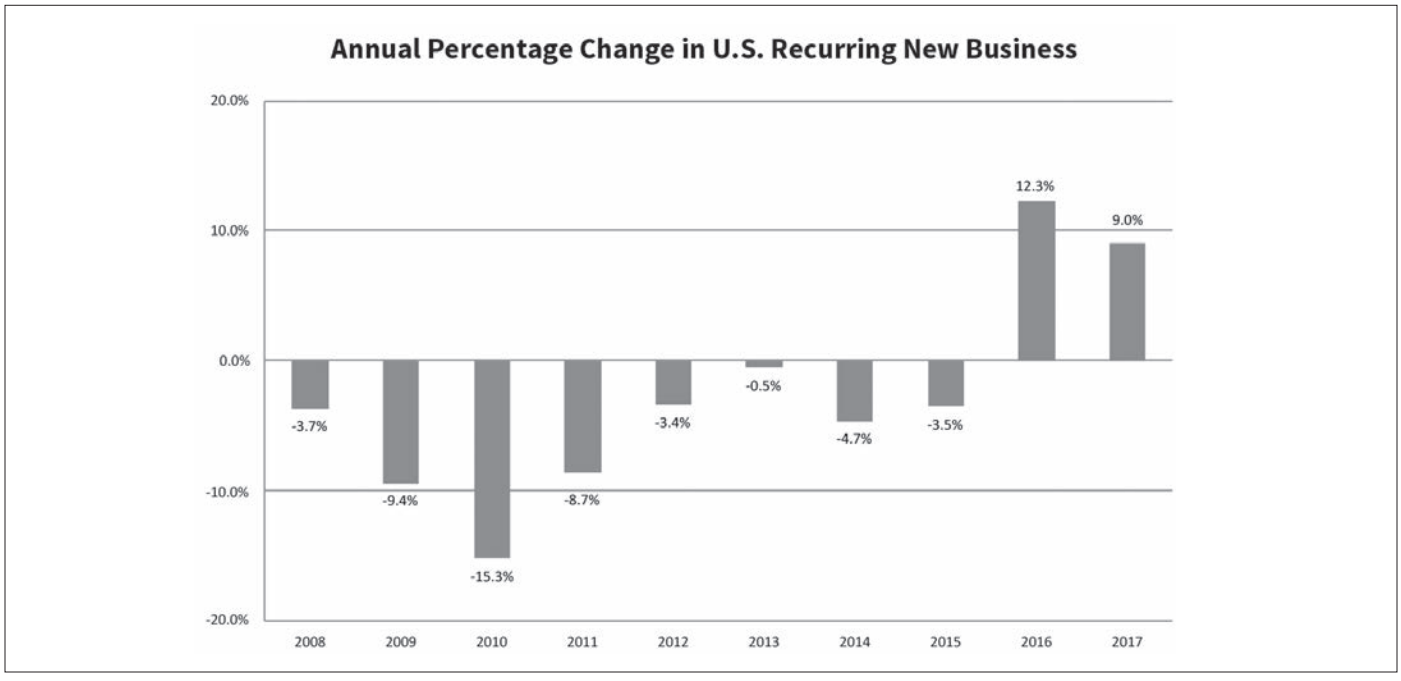
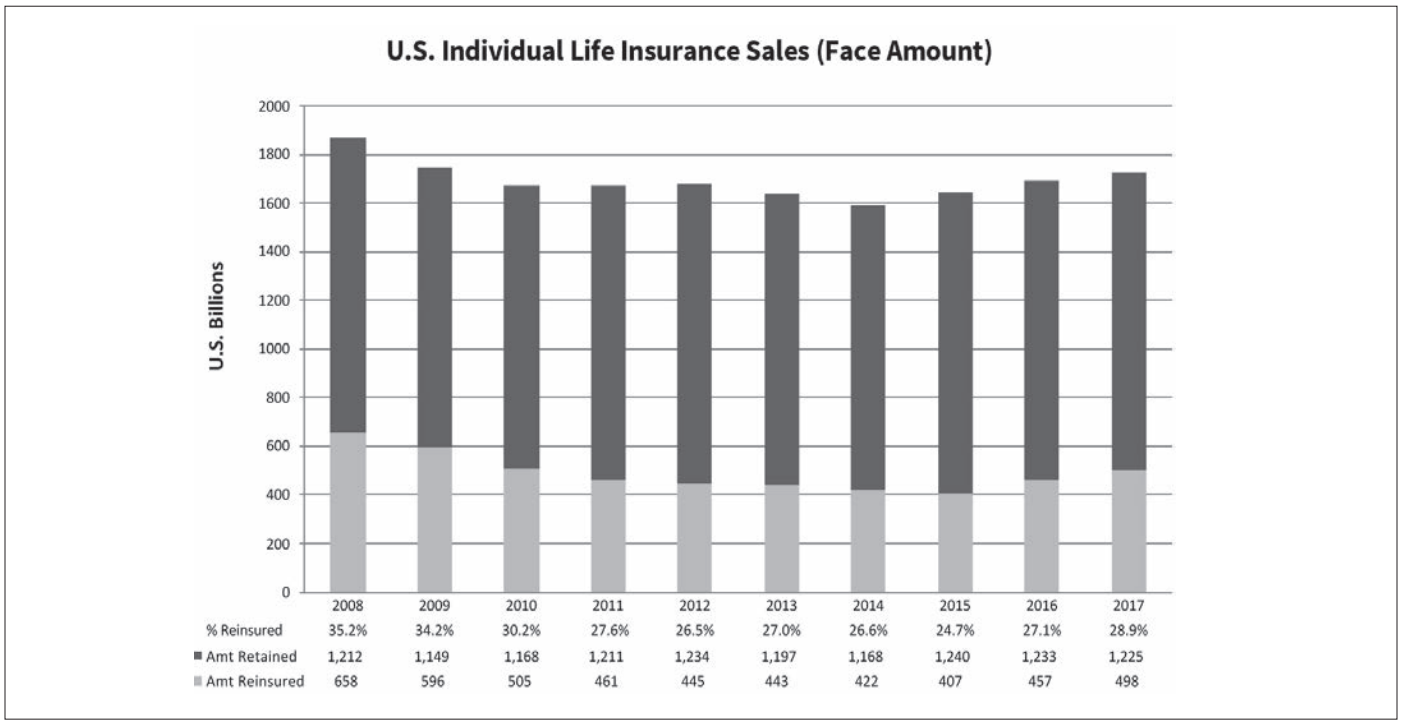


Figure 2
U.S. Recurring Cession Rate



The top five companies in the U.S. reinsurance market remained the same and represent 90 percent of 2017 market share as compared to 88 percent last year (see Table 2). SCOR once again led all reinsurers in recurring individual life new business. In 2017, SCOR reported $105 billion of recurring business, a 4 percent increase from 2016, although a 1 percent lower market share. Swiss Re and Munich Re each garnered a 19 percent market share, reporting $96 billion and $92 billion, respectively. Swiss Re reported a 13 percent increase over 2016 while Munich Re reported a 16 percent increase. RGA reported recurring new business production levels in 2017 of $89 billion, up 6 percent from 2016. Hannover Life Re's $66 billion of recurring production in 2017 represents an 18 percent increase from their 2016 figure. Swiss Re, Munich Re and Hannover Life Re each increased market share over 2016 at the expense of SCOR and PartnerRe.

Table 2
U.S. Recurring Individual Life Volume ($ billions USD)

Company	2016		2017		Change from 2016 to 2017
	Assumed Business	Market Share	Assumed Business	Market Share	
SCOR Global Life	101	22%	105	21%	4%
Swiss Re	84	18%	96	19%	13%
Munich Re	80	17%	92	19%	16%
RGA	84	18%	89	18%	6%
Hannover Life Re	56	12%	66	13%	18%
Canada Life Re	17	4%	19	4%	12%
PartnerRe (formerly Aurigen)	17	4%	12	2%	-33%
General Re Life	9	2%	10	2%	15%
Optimum Re	9	2%	9	2%	8%
Total	**457**	**100%**	**498**	**100%**	**9%**

Portfolio New Business

Portfolio reinsurance covers in-force blocks of business and financial reinsurance. As a result, there are often large fluctuations from year to year in reported portfolio results, and 2017 was no different. New portfolio business dropped from $729 billion in 2016 to just $169 billion in 2017. Munich Re accounts for $90 billion or 53 percent of the 2017 portfolio new business followed by SCOR Global Life at $32 billion (19 percent) and Hannover Life Re with $31 billion (18 percent). The remaining companies reporting portfolio new business are Swiss Re ($14 billion), RGA ($2 billion) and Canada Life ($0.1 billion).

Figure 3 illustrates the up and down nature of portfolio new business writings over the last 10 years. In the past, the large spikes were generated from a merger/acquisition within the life reinsurance industry. The spike in 2009 resulted from Hannover Life Re's acquisition of an ING Re block. The spikes in 2011 and 2013 resulted from SCOR Global Life's acquisitions of Transamerica Re and Generali, respectively. Lastly, the spike in 2016 largely resulted from Hannover Life Re's reported $612 billion of portfolio new business.

Retrocession

As noted in last year's survey, from 2005 to 2015, retrocession production in the U.S. had been on a downswing, dropping from $43 billion in 2005 to $5 billion in 2015. Following an uptick in 2016 to $8 billion, retrocession new business dropped back to approximately $7 billion in 2017. The primary retrocessionaires in 2017 (unchanged from 2016) were Berkshire Hathaway Group, Pacific Life and AXA Equitable.

CANADA—INDIVIDUAL LIFE

Recurring New Business

Recurring individual life new business in Canada ticked upward for the third consecutive year. Reported recurring new business totaled $168 billion in 2017 which is a 5.4 percent increase over 2016. Recurring new business likely benefited from the uptick in term sales experienced in 2017. The anticipation of Canadian tax law changes heavily influenced the stellar sales results in 2016, carrying over to the first quarter of 2017. However, according to LIMRA, Canadian individual life sales ended 2017 down 18 percent as compared to 2016 on an annualized premium basis (and down 5 percent on a face amount basis).[2] Level cost of insurance UL and WL were most affected, recording significant declines versus 2016. Term business, however, recorded a 2 percent increase in sales over 2016 on an annualized premium basis and a 1 percent increase on a face amount basis.

Figure 3
U.S. Portfolio Business Trend

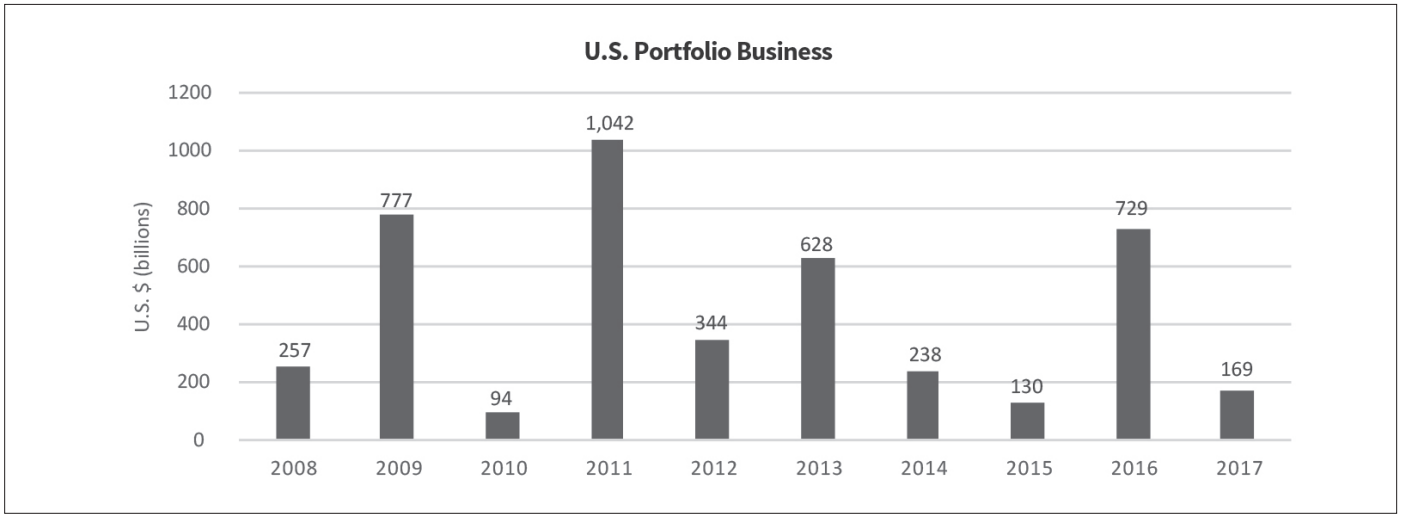
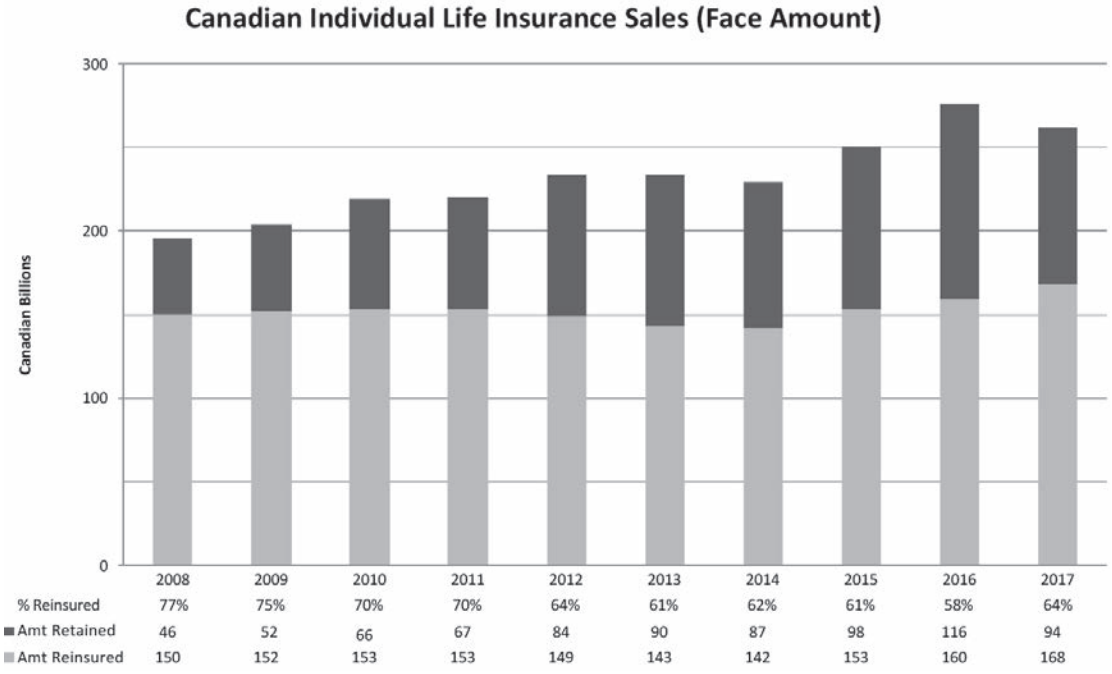


Figure 4
Canada Recurring Cession Rate



The increase in recurring new business resulted in a healthy increase in the estimated cession rate as well. It is estimated that about 64 percent was reinsured in 2017, in line with the cession rate from 2012. As shown in Figure 4, the cession rate has steadily dropped from 2008 to 2016 in Canada. However, the Canadian cession rate is still much higher as compared to the U.S., where approximately 29 percent is reinsured.

For both 2016 and 2017, 96 percent of recurring new business in Canada is YRT and 4 percent is coinsurance.

In terms of market share, the top three life reinsurers in the Canadian market are RGA, Munich Re and Swiss Re. These three companies have long held the top three spots. In 2017, they collectively represent 68 percent market share, down from 72 percent in 2016 (see Table 3). RGA topped recurring new business writers with $44 billion, a 1 percent increase over 2016. Munich Re followed with $42 billion (2 percent increase from 2016) and Swiss Re rounded out the top three with a reported $28 billion (3 percent decrease from 2016).

Table 3
Canada Recurring Individual Life Volume ($ billions CAD)

Company	2016		2017		Change from 2016 to 2017
	Assumed Business	Market Share	Assumed Business	Market Share	
RGA	44	28%	44	26%	1%
Munich Re	41	26%	42	25%	2%
Swiss Re	29	18%	28	17%	-3%
SCOR Global Life	21	13%	23	14%	7%
PartnerRe (formerly Aurigen)	15	10%	19	11%	23%
Optimum Re	9	6%	10	6%	15%
Hannover Life Re	0	0%	2	1%	3167%
Total	**160**	**100%**	**168**	**100%**	**5%**

SCOR, PartnerRe (formerly Aurigen), Optimum Re and Hannover Life Re all reported increases in 2017, albeit from a lower starting point in 2016.

Portfolio New Business

None of the Canadian reinsurers reported portfolio new business in 2017.

Retrocession

Canadian retrocessionaires included Berkshire Hathaway, Pacific Life and AXA Equitable. Berkshire Hathaway led the retrocessionaires with $5.5 billion, followed by Pacific Life ($2.9 billion) and AXA Equitable ($0.2 billion). Overall, the retrocession market in Canada increased from $5.8 billion in 2016 to $8.6 billion in 2017.

UNITED STATES—GROUP LIFE

U.S. group life reinsurers reported over $4.2 billion of in-force premium in 2017, down 11 percent from the $4.7 billion reported in 2016. Of this, recurring business accounted for $0.8 billion of the premium and portfolio represented $3.5 billion.

U.S. group life reinsurers reported over $4.2 billion of in-force premium in 2017, down 11 percent from the $4.7 billion reported in 2016.

Recurring in-force group premiums in the U.S. market fell 3 percent to $777 million in 2017 following a sustained period of growth. Nonetheless, group in-force premiums grew 63 percent from $476 million in 2011 to $777 million in 2017 (see Figure 5).

As shown in Table 4, the top three reinsurers in the U.S. group life reinsurance market for recurring business are Swiss Re, Munich Re and RGA. Collectively, these three companies account for 88 percent of the market. Swiss Re and Munich Re reported decreases in 2017 of 6 percent and 5 percent, respectively. RGA reported a modest 3 percent increase in 2017.

In-force group portfolio premium totaled $3.5 billion in 2017, off 12 percent from last year's $3.9 billion. Portfolio premium originates from four reinsurers. Canada Life Re reported $2.0 billion in portfolio premium in 2017, down from $2.4 billion in 2016. Munich Re reported $1.3 billion in 2017 versus the $1.0 billion reported in 2016. Finally, Hannover Life Re reported $132 million and SCOR reported $15 million in group life portfolio premium in 2017.

Figure 5
U.S. Group Premium Trend

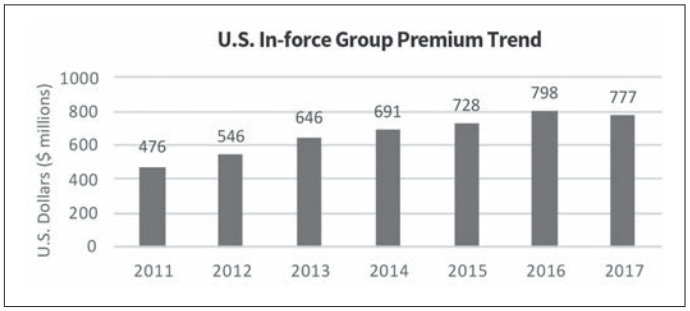


Table 4
U.S. Recurring In-force Group Premiums ($ millions USD)

Company	2016		2017		Change from 2016 to 2017
	Assumed Business	Market Share	Assumed Business	Market Share	
Swiss Re	346	43%	326	42%	-6%
Munich Re	206	26%	197	25%	-4%
RGA	156	20%	161	21%	3%
Group Reinsurance Plus	39	5%	37	5%	-5%
General Re	25	3%	27	3%	7%
SCOR Global Life	18	2%	21	3%	16%
Hannover Life Re	7	1%	8	1%	2%
Canada Life Re	1	0%	1	0%	-7%
Optimum Re	0.2	0%	0.4	0%	116%
Total	**798**	**100%**	**777**	**100%**	**-3%**

Table 5
Canada Recurring In-force Group Premiums ($ millions CAD)

Company	2016		2017		Change from 2016 to 2017
	Assumed Business	Market Share	Assumed Business	Market Share	
Munich Re	50	48%	51	49%	2%
Swiss Re	25	24%	26	25%	3%
RGA	22	21%	21	20%	-4%
Optimum Re	6	5%	6	5%	1%
SCOR Global Life	1	2%	1	1%	-51%
Total	**104**	**100%**	**104**	**100%**	**-0.2%**

CANADA—GROUP LIFE

In Canada, recurring in-force group premium levels have remained fairly steady over the last few years. For 2017, recurring in-force group premium totaled $104 billion, flat as compared to 2016. Similar to the individual market in Canada, the group market is dominated by three reinsurers: Munich Re, Swiss Re and RGA. These three account for 94 percent of the market (see Table 5).

Munich Re was the only Canadian reinsurer reporting group in-force portfolio business in 2017. Munich Re reported $835 million in portfolio premiums for 2017.

LOOKING AHEAD

Life reinsurance production is influenced by many factors, including direct life sales, the economy and regulation, in addition to the reinsurance ceding practices of a limited number of life insurers. The increase in both U.S. and Canadian recurring new business production in 2017 continued the positive trend from last year. Looking ahead, LIMRA forecasts moderate near-term growth in direct U.S. life insurance sales and A.M. Best maintains a stable outlook for the life reinsurance industry. Both are good news for life reinsurers. But there are a few other factors on the horizon that may impact life reinsurance.

Reinsurance remains a valuable tool for efficient capital management. Given current economic conditions, direct writers' appetite for financial reinsurance and reinsurance of in-force blocks is not expected to wane in 2018.

In the U.S., principle-based reserving, or PBR, still presents some uncertainty in terms of how this reserve regulation will impact life reinsurance. Although effective in 2017, it appears many direct writers are delaying implementation until later in the three-year transition period, meaning the industry has not yet experienced the impact of this change on a broad scale basis. While reinsurers are well-positioned to assist direct writers with PBR, the overall impact on product design and pricing structures remains uncertain.

According to LIMRA research[3], 52 percent of potential life insurance buyers said they would be more likely to purchase life insurance if they didn't have to go through a physical exam. Life insurers continue to look for ways to expand insurability to those that are uninsured or underinsured through the use of streamlined or accelerated underwriting programs and technology. One study suggests that more than 80 percent of direct writers already have a streamlined underwriting program; many are intending to enhance or expand their programs as well as the data sources used to replace fluids. Reinsurers can assist in several areas, including developing underwriting rules, assessing the protective value of new data sources, product development and providing automated underwriting engines. Reinsurers with expertise in these areas are well-positioned to capitalize on the new life sales generated by these programs.

Thanks to all of the companies who participated in this year's survey. Complete results are available at *www.munichre.com/us/life/publications.*

Note that Munich Re prepared this survey on behalf of the Society of Actuaries Reinsurance Section as a service to section members. The contributing companies provide the data in response to the survey. The data is not audited, and Munich Re, the Society of Actuaries and the Reinsurance Section take no responsibility for the accuracy of the figures. ■

Nancy M. Kenneally, FSA, MAAA, is vice president, Reinsurance Marketing at Munich Re. She can be reached at *nkenneally@munichre.com.*

ENDNOTES

1 Based on LIMRA, "U.S. Retail Individual Life Insurance Sales (2017, 4th Quarter)," March 2018

2 Based on LIMRA, "Canadian Individual Life Insurance Sales (Fourth Quarter 2017)," March 2018

3 Based on LIMRA "2018 Insurance Barometer Study," April 2018

Talk to Me: How Personalized Persuasion Could Enhance Protection Offerings and Reduce Underinsurance

By Matt Battersby

Many years ago, a preacher from a small village found himself asking a rather peculiar question: How do you get a horse down the stairs?

The preacher had made a wager with a friend that he could get a horse to climb up the stairs of his house. The horse made it up quite easily and the bet was won.

But that is when the problems began—once at the top of the stairs, the horse would not come back down. Neither carrot nor stick made a difference. The animal was spooked and refused to budge. With an increasingly panicked horse stuck upstairs in his house, what could the preacher do?

After much trial and error, the preacher persuaded the horse to go back down by partially covering its eyes, thus blocking out the strange new environment. This calmed the animal and it could take steps downwards gingerly, until reaching the safety of solid ground. This, supposedly, is how horse blinkers were first invented … and they have been widely used ever since.

The story itself may be apocryphal—it is commonly referenced, but poorly sourced. However, the lesson of the story is uncontested: blinkers reduce an animal's peripheral vision, often to as little as 30 degrees, keeping it focused on the path ahead. In this way, it can move forward, untroubled by any potential distractions.

I am not sharing this story in case you ever find yourself having made an unwise bet involving animals. I am doing so because I believe it has important parallels for understanding human behavior and communication—parallels which can be applied to our industry.

Just like a horse, human attention, and therefore behavior, is heavily influenced by our surroundings. Most of our actions are triggered by environmental cues which we process unconsciously. It is estimated that the human brain receives around 11,000,000 bits of information per second through all our senses, but the conscious brain can only process about 40 bits per second. This means we are continually being influenced in ways of which we are not consciously aware.

For example, experiments have shown that a person's honest and truthful disclosure can be influenced by environmental factors, such as light lux levels. In one experiment, participants were asked to score their own math tests. They would receive a cash payment for each right answer. Participants, it turned out, were about **37 percent less likely to be dishonest in their scoring** when completing the exercise in a well-lit room as opposed to a dimly lit room. There are good and honest people, but there also good and honest contexts, and too often we ignore the influence of these.

Understanding the true drivers of human behavior is essential if we are to capitalize on opportunities offered in a new era of personalized persuasion—opportunities that will enable us to reduce underinsurance, help our customers live healthier and longer lives, and deliver better risk results for our businesses. Developments in personalized communications and real-time decision prompts are enabling simple solutions that, when carefully applied, can deliver very meaningful results.

PERSONALIZED PERSUASION

"Personalization" has become a buzzword throughout retail financial services, not just insurance. Research from Accenture suggests that **80 percent of insurance customers are looking**

for more personalized offers, policies and recommendations from their auto, home or life insurance providers.

In reinsurance, the focus of personalization has often been on the use of demographic and behavioral data to improve underwriting. This has already had clear benefits: for example, using credit-based scores to predict mortality or lapse likelihood may provide a more sophisticated picture of each applicant's risk profile. Such personalized propositions are demonstrably favored by customers: the same Accenture research shows that 77 percent are willing to provide usage and behavior data in exchange for lower premiums, quicker claims settlement and insurance coverage recommendations.

To date, however, less attention has been paid to another very important aspect of personalization: direct communications with customers. The importance of this should not be overlooked, because persuasive communication is core to the success of the insurance industry—from selling protection to the need for honest declarations and encouragement of risk-reducing behavior.

Personalization involves tailoring communications to both the individual making a decision and the context in which their decision is made. It therefore applies to both the content and the timing of communications.

COMMUNICATIONS TAILORED TO THE INDIVIDUAL

It has long been known that a message or piece of information can be more persuasive if it matches a person's psychological traits. The trait-based approach most commonly used by academics is the Five-Factor Model of Personality. The five factors which define human personality and account for individual differences are: Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism (often referred to as OCEAN).

Numerous studies have shown that a message is more persuasive when framed to be congruent with the recipient's personality profile. For example, **Facebook adverts that match the content of persuasive appeals to an individual's psychological characteristics** result in up to 50 percent more purchases than to their mismatching or non-personalized counterparts. A message appealing to extraverts, for example, may focus on the excitement and unlimited creative opportunities of a new product, whereas one appealing to those with the greater need for stability associated with higher neuroticism index scores might focus on its safety and security.

People also perceive risks and rewards in line with their cultural values, a characteristic known as "culturally-motivated cognition." For example, those fitting the definition of "hierarchical individualists" believe in personal freedom and traditional family values. They may dismiss the existence of threats that would imply greater outside regulation of personal activities is needed—the threat of climate change, for example. As such, they are less likely to protect themselves or insure against these hazards. Conversely, when something seems to threaten someone's way of life or personal values, they will believe it is objectively dangerous even in the face of contradictory statistical information.

For insurers, the link between psychological traits, cultural values and behavior is not new. We have long-known that high levels of conscientiousness, for example, negatively correlate with risk appetite, increasing demand among individuals with high conscientiousness for insurance and reducing the risk of insuring them. The challenge has often been in identifying these psychological characteristics.

New technology and big data enables us both to better understand our audience and to communicate with them on a more personal level. Today, we can quite accurately infer much about people's psychological characteristics from their digital footprints, such as their Tweets or Facebook likes. For example, individuals who express concern for the environment, and are engaged with health and fitness issues tend to score highly on the conscientiousness scale.

Attempts have been made to use social media data such as these to screen potential customers and set the price of their insurance. But there are regulatory and, for some, ethical barriers to doing this: In 2016 **Facebook blocked the plans of Admiral, a U.K.-based car insurance company**, to enable customers to voluntarily share with it some of their social data to "secure a faster, simpler and discounted quote."

If we want to reduce underinsurance then we cannot just sell to the conscientious. We need to make insurance appeal to a wider audience and encourage this audience to behave in ways that reduce their premiums while increasing their sense of well-being. We need to personalize not just the product, but also the rationale for wanting it. But there are regulatory, ethical and reputational issues to consider here, too. Obtaining informed consent from individuals as to how their personality profiles are being used is likely to be key.

One area where this is likely to be an opportunity to use this approach openly with individuals is at the other end of the value-chain: in encouraging healthier behaviors amongst the insured. For example, research suggests that when creating and communicating interventions aimed at those who have been diagnosed as pre-diabetic or at risk of becoming pre-diabetic, tailoring the approaches to personality types can increase the effectiveness of the intervention.

These groups are likely to be more highly motivated to change their behaviors and so receptive to a more personalized and effective approach.

COMMUNICATIONS TAILORED TO THE MOMENT

In addition to understanding the psychological characteristics of individuals making their insurance-buying decisions, we need to understand the context in which those decisions are made. Often it is context, rather than character, that is the main determinant of behavior.

Most of the decisions we make are quick, intuitive and unconscious; our brains take mental shortcuts when making them to stop us from getting bogged down in endless detail. This "fast and frugal" cognitive processing style, while speedy and efficient, can create many biases and errors in our decision making.

For example, our brains often rely on information that is most easily available, rather than searching for information that is most valuable. This is known as the "availability heuristic"—a cognitive processing error that mistakenly equates ease of recall with truthfulness and importance. As such, people tend to heavily weigh their judgments toward more recent information, making new opinions biased toward that latest news.

Another common bias is our tendency to use the first piece of information we receive as the benchmark against which we evaluate all subsequent information. This is known as the "anchoring effect." Once an "anchor" is set, other judgments are made by adjusting away from that anchor, and the value of each subsequent judgement is often determined relative to the original anchor. This is a bias you see in the real world all the time. For example, people are often willing to pay more for a house, a car or even goods at a supermarket, if it has a high initial list price.

Biases such as these are very powerful and they can be difficult to override. Education and constant repetition of messages can have an impact, but they are expensive to provide and often yield disappointing results. It is much more effective to acknowledge these subconscious decision-making biases and account for them in our communications.

One of the most powerful approaches we can take is to communicate "in the moment"—that is, when a person's attention is already focused on the decision or behavior, not before.

Communicating important information at the exact point of decision making is the holy grail of persuasive communications, and this is being enabled by digital technologies.

For example, the U.K.'s National Health Service (NHS) has been trying to reduce the number of patients sent for unnecessary lab tests. In a randomized and controlled behavioral science trial, two hospitals in England programmed their IT system to show doctors the price of a discretionary lab test right at the moment they were ordering the test. The cost of a lab test should already form part of a doctor's decision-making process and information about the costs of each test are provided in books to which doctors can refer. These books, however, are rarely consulted. This simple act of reminding doctors of the cost to the NHS **reduced the number of lab tests booked by one-third.**

Similarly, the **Reword** campaign in Australia is looking at how providing information at the right time can reduce offensive and bullying online behavior by children. Reword is a simple tool that makes children aware when their online behavior starts to take on bullying characteristics. The app detects insults in a person's typing, and when one is found, the user is alerted with a red strikethrough of the offending text, instantly interrupting behavior, highlighting that these words might cause offense and prompting them to reconsider their words.

In both of these examples, the approach is not to force the person to behave in a certain way but to ensure an important piece of information is prominent at the point they are making a decision.

There is clear potential to apply some of these techniques to the insurance industry, especially as so much of the application and claims processes has moved online. Smart use of prompts, questions and key information could positively influence a decision. The focus should therefore be on designing online and mobile sites that allow this level of functionality rather than simply replicating a physical form online.

THE LOUDEST SOUND IS A WHISPER

Levels of protection are less than ideal for both individuals and society at large. Industry professionals know we need to do a better job persuading people to insure appropriately, and then to behave in ways that reduce their risks and premiums.

If someone is not paying attention to something we think is important, our instinct is often to shout louder than everyone else. However, this is an ineffective approach in a world where attention is at a premium. When communicating about insurance, we need to create messages that reflect how people really do think and behave rather than how we believe they should think and behave.

Technology can improve the timeliness and salience of our communications. Persuasion, just as products, should be personalized. ■

Matt Battersby is chief behavioral scientist for RGA. He can be contacted at *Matt.Battersby@rgare.com.*

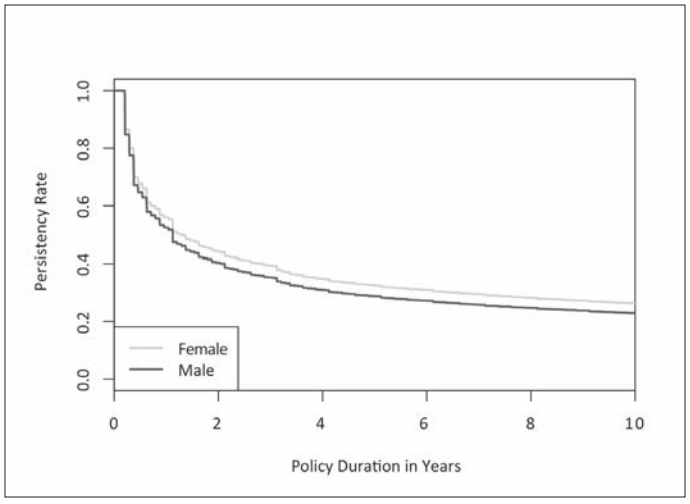
Survival, Persistency And SaleS[1]

By Kai Kaufhold

Reinsurers are becoming more and more involved in the entire value chain of insurance. And rightly so: With the techniques we have developed to understand risk and profitability, actuaries can make a valuable contribution to improving performance at the front end of the insurance business. In this article we explore a case study, in which we applied survival models to analyze the persistency of a life company in Asia and develop a strategy for actively managing the company's sales force.

Besides predictive modeling in life insurance using survival model techniques, there is another theme pervading this three-part series of articles: communicating actuarial concepts and results. The point I was making in my light-hearted introduction to survival models in the first article of this series was that the underlying concepts are very intuitive. Survival models are such a natural fit to the problems of life insurance that they can be a powerful tool for conveying results to non-actuaries—despite the fact that some interesting math is involved in using them.

Figure 1
Kaplan-Meier Curves for Persistency by Gender

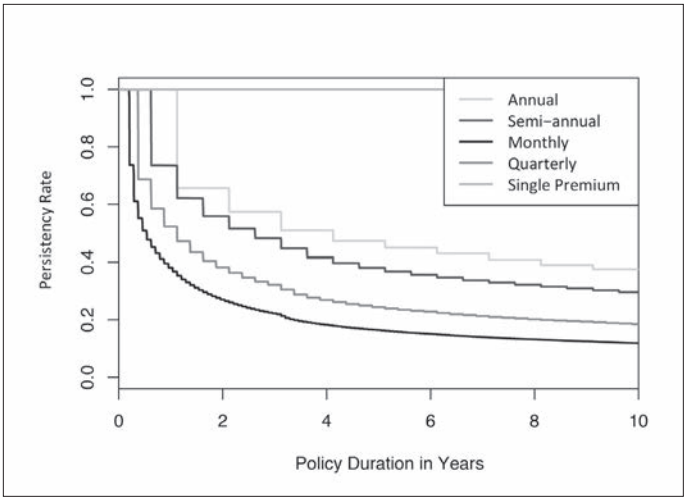


WHY ARE OUR LAPSES SO HIGH?

My team was asked by a life company in Asia to analyze their policy lapses and find out whether we could make any recommendations for improving persistency. The first order of work—after data cleaning, validation and preparation—as with any data analytics project, was to visualize the experience in a way that we could discuss it with management. Enter the tried and trusted Kaplan-Meier curves, a non-parametric method of displaying survival curves which is ubiquitous in data science, clinical research, life sciences, you name it. (See Figure 1.)

One look at the chart in Figure 1 showed the company's CEO what he needed to know: within the first year 40 percent of his business had dropped off the books, and after the second policy year, he had only around 40 percent of policies left. The next chart started to explain why. (See Figure 2.)

Figure 2
Kaplan-Meier Curves for Persistency by Premium Mode



While policies with an annual premium model stuck around for a year and then dropped by 35 percent, monthly premium policies just lasted the premium holiday and then their persistency started dropping like stones. Once you get the hang of using Kaplan-Meier curves, it is just a matter of stepping through all the likely risk factors and identifying which have the most impact. The next thing looked at was premium amount bands, given the financial impact of premiums. You can easily spot the concentration risk when the top 40 percent of policies make for 80 percent of the premium volume (see Figure 3).

Hopefully the higher premium bands had lower lapse rates ... No such luck! The top four premium deciles had higher than average lapses, as Kaplan and Meier show us in Figure 4. What

Figure 3
Policies by Premium (Deciles)

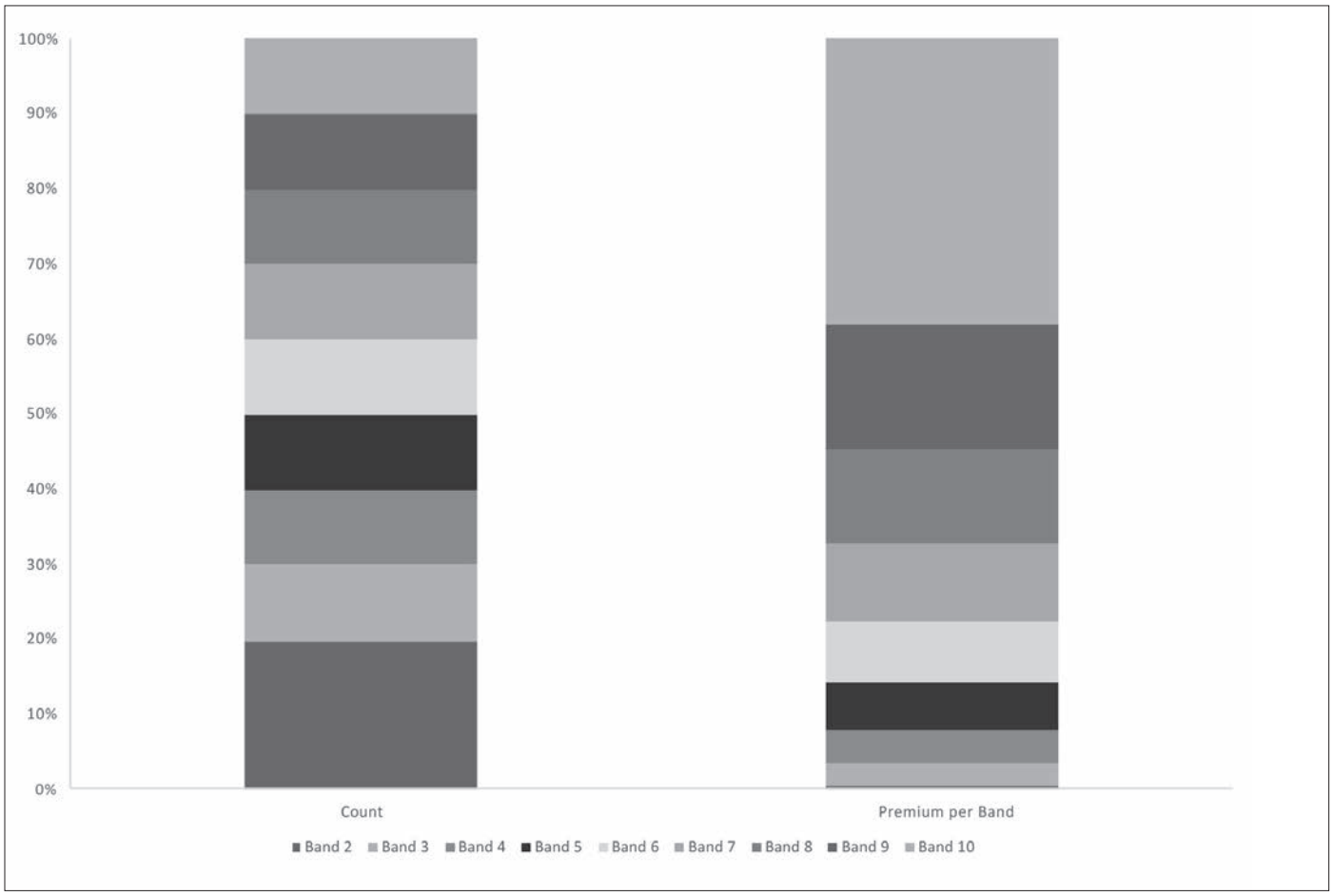


Figure 4
Kaplan-Meier Curves for Persistency by Premium Band

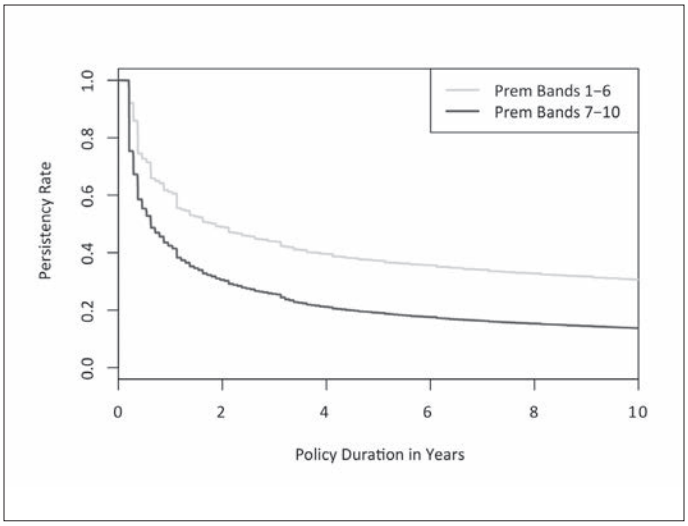
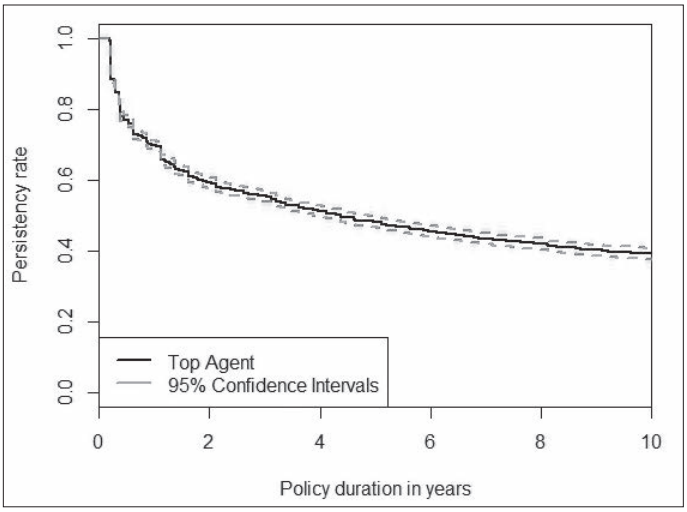
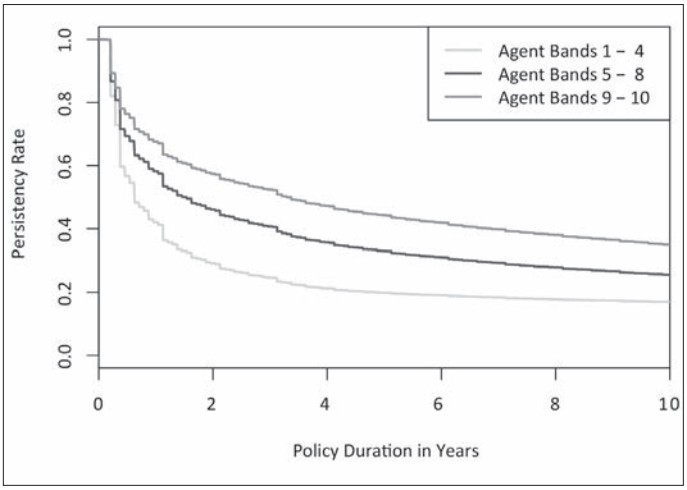


Figure 5
Kaplan-Meier Curves for Persistency for the Agent with Highest Premium Volume



to do next? Well, usually persistency has something to do with the insurance agents who sell the policies. So we took a look at the persistency patterns for individual agents. And finally we were on to something. In Figure 5 (pg. 41), we encouter the company's top sales agent with the highest overall premium production. This agent had a much higher persistency for the policies he had sold. After two years, nearly 60 percent of policies were still left, which is more than twice the average persistency. We could tell that this was a reliable result, because you can easily[2] generate confidence bands for Kaplan-Meier curves, and ours were really tight.

Figure 6
Kaplan-Meier Curves for Persistency by Agent Premium Band



If you now cluster the agents into groups with similar persistency patterns, you find out that you can categorize them by the amount of premium volume which they contributed to the overall book of business. We found three distinct groups of agents, grouped by total amount of business sold. As you can see in Figure 6 there are clear differences between the three groups of agents. The difference in performance of these three groups was so large that this was likely the key to unlocking the persistency riddle.

Figure 7
Crude Hazard Rates for Male Lapses with Log-linear Trendline

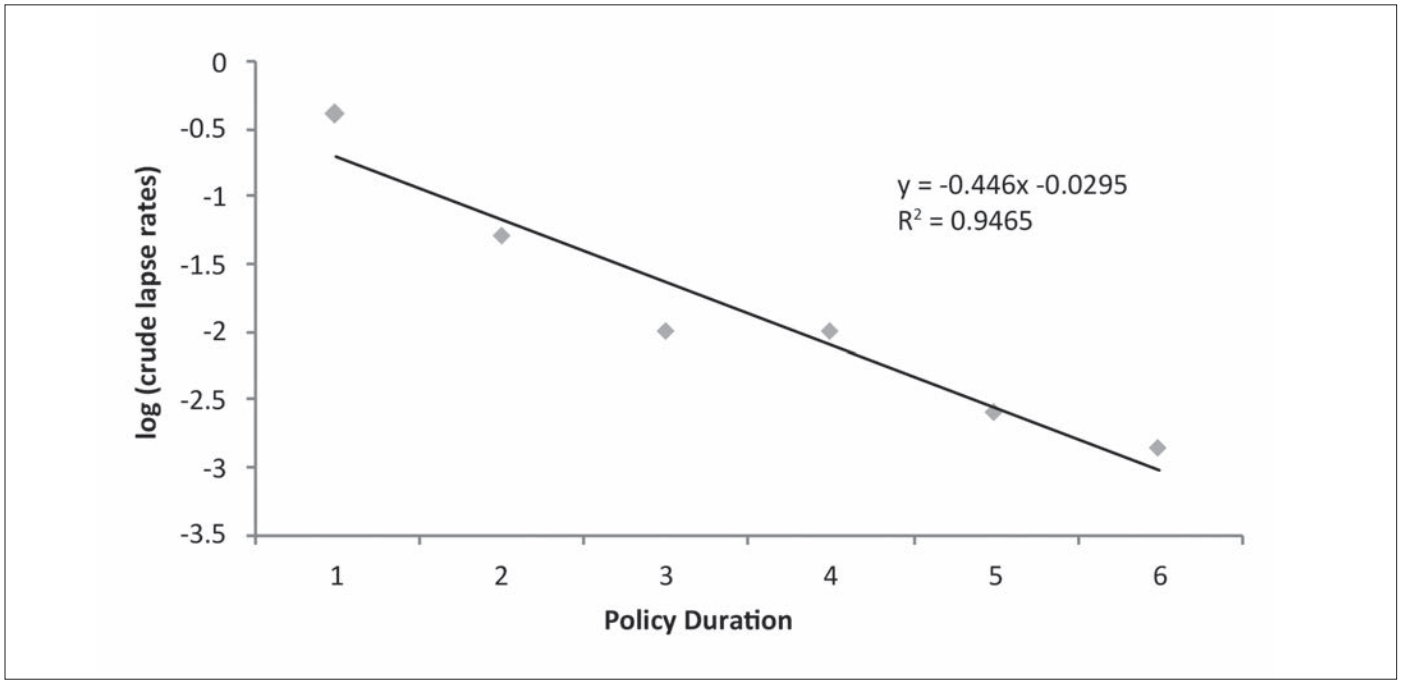
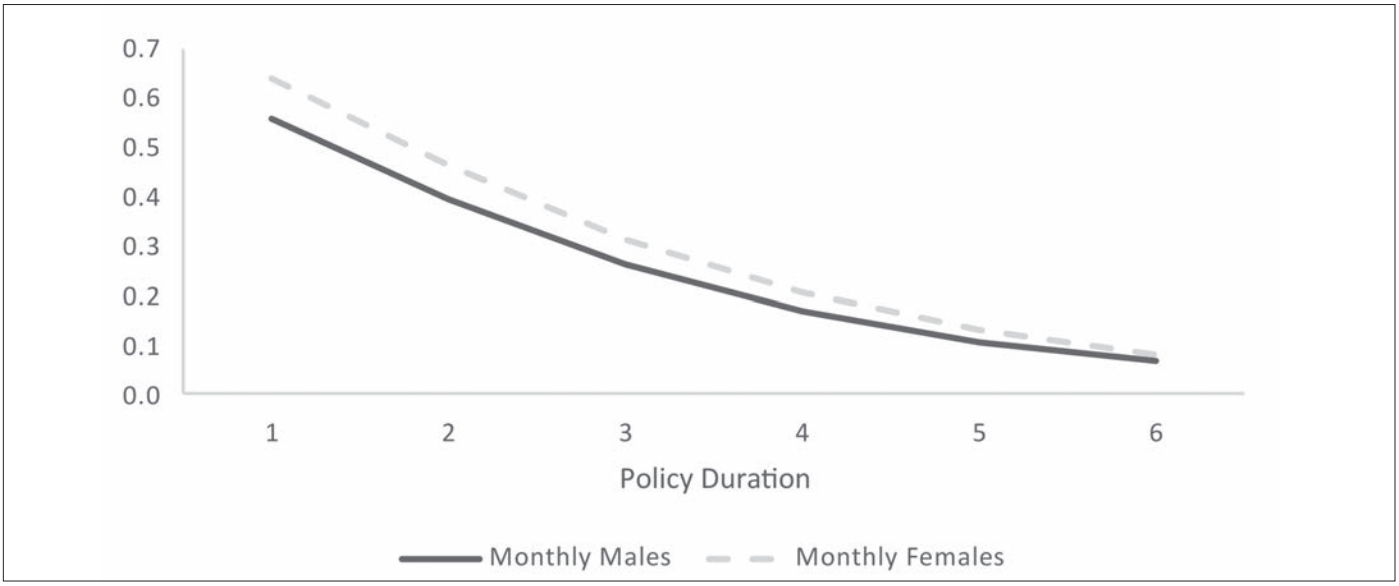


Figure 8
Lapse Hazard by Policy Duration Using a Log-linear Model



However, in order to quantify the impact of these different risk factors which we had identified, gender, premium payment mode and agent group, it was necessary to depart from Kaplan-Meier curves, because they give only a univariate view of the risk. We needed to find out what the impact of each risk factor was in the presence of all others. So we decided to model the persistency using a parametric hazard rate function, which is the basis of parametric survival models explained in part 1 of this series in the previous issue of *Reinsurance News*. The choice of hazard rate function was fairly simple. The chart in Figure 7 suggests that on a logarithmic scale, a straight line already accounts for a large portion of the shape, because the R^2 statistic is high at nearly 95 percent.

We can parametrise a straight line using only two parameters, and by letting the parameters vary by risk factor (gender, premium mode, agent amount band) we can measure the impact of each risk factor exactly. As it turns out, it was worthwhile doing the multivariate analysis. In Figure 8 we see that if we control for the premium model (here: monthly premium payment), males end up showing lower lapse rates than females, despite the fact that the Kaplan-Meier curves in Figure 1 suggested just the opposite. We can go even further: Using the simple survival model, we can not only diagnose which different risk groups display different persistency results, but we are also able to predict what the impact would be of changing the incentives for different agents. By training the agents in the intermediate category to behave in a similar way to the top agents, we can predict how many million rupies the company wins from higher profits due to higher persistency for this group. We cannot disclose the figure here, but what we can say is that the prospective gain easily merits the cost of enhanced training of the agency sales force and collecting more data on the agents themselves.

Now that we have a statistical model which describes the persistency rates and allows us to predict the financial outcome of interventions, it will also make sense to run simulations to quantify the volatility of this book of business. But that is the topic of part three of this series that will appear in the next issue of *Reinsurance News.* Stay tuned if you want to find out why Australian disability income business is so volatile. And if you are interested in the math behind Kaplan-Meier curves and parametric survival models, why not take a look at the newly published book on mortality modeling by Angus MacDonald, Stephen Richards and Iain Currie?[3] ■

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ENDNOTES

1 SPASS is the German word for fun.

2 All Kaplan-Meier curves shown here were generated using the R package *survival* with a single line of code.

3 Angus S. MacDonald, Stephen J. Richards and Iain D. Currie (2018) *Modelling Mortality with Actuarial Applications*, Cambridge University Press, April 2018.

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