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S to the power E • An Intro to Climate Risk from a Banking Perspective • **Weathering the Climate Risk Storm** • Opportunities for Actuaries in Banking in the Face of Bank Failures • **The Actuarial Landscape in Uganda** • What Life as a Caregiver for a Child with Cerebral Palsy is Like and Why it matters



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South African Actuary Editorial Team: Adrian Burke, Hannah Chivaka, Mike McDougall, Lydia Mutepfa, Maseeha Rawat, Nomfundo Nkambule, Michael Tichareva (Lead Editor) Design & Layout: Vegiah Design

A PRESIDENTIAL PERSPECTIVE

I recently presented on the topic of green insurance at the International Congress of Actuaries in Sydney. It is certainly something that is gaining attention, as it forms part of sustainability, as being discussed in this SA Actuary. It speaks to inclusion, social responsibility, and all those good things. It really is something for all of us to consider and challenge ourselves to make our world a sustainable place. I was reflecting in my talk whether people will be more inclined to be more conscientious on exhibiting green behaviour than improving their health. With wellness programmes embedded in almost everything, perhaps we should consider how that interplays with green behaviour and vice versa!

This edition of the SA Actuary certainly provides a lot of food for thought on the increasing impact of climate change, and what effects it may have on a range of human activities. It almost feels impossible to arrest. I remember when recycling was first introduced and arranged to be picked up at home, making it easier to do. At the same time, I added a compost heap to the garden for kitchen scraps. It was incredible to see the impact that had on my garbage load, it suddenly became so much smaller. I guess it is on all of us to do even the small things like being energy conscious, walking or cycling rather than driving, and eating sustainable food. It all adds up. And, as actuaries, we can also get involved in the bigger stuff - we are modelling experts after all!

There certainly is something for everyone in this edition of the SA Actuary.

Our personal stories matter a lot, we are human after all, not just actuaries that spend their time looking at numbers. So thanks for sharing your stories, Janina, Tassius, Sharon, Thebe, Enoch and Tony, it's inspirational! Similarly, the great book discussion and film review add to our appreciation that there is more to life than work. And we are also touched by the cerebral palsy caregivers' plight. We sometimes forget that carers also need care to process what's happening around them.

And for the purist amongst us, there are lots of equations, graphs and deep analysis of financial risks and opportunities. There certainly is something for everyone in this edition of the SA Actuary. I also want to wish the Actuarial Society of Uganda all the best in their continuing journey!

Thank you to all the contributors to this SA Actuary - it is a great read and offers incredible insights. Thank you also to the editorial team, you have produced a great SA Actuary! 🇿🇦



EDITORIAL

In the first edition of the 2023 SA Actuary, released in April, we covered interesting articles on bank failures in the US and Europe, artificial intelligence, and advice from a senior actuary among others. In this second edition, we bring you more stimulating articles covering both South African and global content. So, as usual, we are sure you will not be disappointed!

Climate risk is taking centre stage in the financial services industry both in South Africa and globally, with many countries issuing guidance on how to incorporate climate risks in the management of financial institutions. The ability of financial institutions to incorporate climate risks in their risk management frameworks will most likely define the future profitability and sustainability of the financial services industry, hence sustainability of economies and society at large.

PLEASE READ THE MANY
OTHER GREAT ARTICLES
IN THIS EDITION OF
THE SA ACTUARY, WITH
**INTERNATIONAL
CONTRIBUTORS FROM
DIFFERENT PARTS OF
THE WORLD**

In his article on environmental, social and governance (ESG) issues, **John Anderson** recognises the importance of sustainability as a pressing concern in today's world, highlighting the increasing focus of countries and companies on ESG issues that affect long-term sustainability. **John** highlights the interplay between climate change (the E in ESG) and social equality (the S in ESG) that is garnering much attention, especially in South Africa due to its history of inequalities. He urges retirement funds to review their overall governance, risk management, and investment strategies to take into account the impact of climate risks that are likely to affect economies, job opportunities, and investment returns. **John** also urges actuaries to take a proactive approach to incorporate climate-related impacts into actuarial valuations, asset-liability models and specific scenario assessments to ensure that trustees and members of retirement funds are well positioned to navigate the uncertainty.

Jerome Mahadeo and Chris Sterley make reference in their article on climate change, and the related climate risk, that it is being noted as the most material global risk over the next 10 years. Both insurers and banks in South Africa are taking steps to incorporate climate risk into their risk management processes as guided by the regulator. **Jerome and Chris** give insights on their learnings in building a climate risk stress testing capability at a large bank in South Africa. They go into detail covering both physical risks and transition risks related to climate change, and how these could be measured and quantified from both a banking and insurance perspective. **Jerome and Chris** conclude by recognising the significant role that actuaries can play in climate risk assessment, measurement, and management, which could include modelling, capital management, product management, and reporting and disclosure.

On the same topic of climate risk, **Esmerelda Oberholzer, Kamenee Govender, and Marc Otto** look at climate risk from the perspective of a bank's credit portfolio on mortgages. Based on their experience as analysts in the mortgage loan capital and impairments team at a large South African bank, they highlight the complexity of trying to accurately quantify climate risk and its potential impact on credit risk. In outlining the approach they followed, they conclude by suggesting additional measures that should be considered including obtaining more climate risk data provided by external climate risk companies, collaboration between banks, insurers, and reinsurers on climate scenario modelling, incorporating climate risk effects into macroeconomic forecasts to investigate a top-down impact, isolating climate risk and equivalent effects into historic data to better understand the long-term impacts on house prices in specific areas, understanding the interdependencies between physical and transition risk

and, lastly, doing more research and remaining close to the global community with regards to climate risk. These are areas where actuaries can play a significant role.

We then cover the futuristic topic of quantum computing from **Syed Danish Ali** who argues that it is only a few years away and will significantly change the way we work by improving both the accuracy and the speed at which we can undertake actuarial assignments when combined with other emerging tools such as machine learning applied to big data. **Danish** argues that, while broad commercial applications may remain several years away, quantum computing is expected to produce breakthrough products and services likely to successfully solve very specific business problems within three-to-five years. He believes that actuaries should start investing in knowledge on quantum computing to avoid being taken by surprise.

Profiling of role models in business and the actuarial profession with **Lydia Mutepefa**, a member of the SA Actuary editorial team, continues to be one of the most exciting sections of the SA Actuary magazine as we learn from others. This time **Lydia** interviewed **Janina Slawski** and **Tassius Chigairi** who shared great insights about their history. We trust that this will influence our young actuaries as they navigate their actuarial, business, and life journeys. As I always say, there is always something to learn from those who have walked the road before you, so please pay attention to these great profiles.

Please read the many other great articles in this edition of the SA Actuary, with international contributors from different parts of the world sharing wonderful insights and experiences from their jurisdictions. Topics such as inclusive insurance where actuaries should play a greater role in building more sustainable societies through designing and pricing products that improve quality of life and create wealth for ordinary people should be of great interest to actuaries.

As ASSA turns 75 in 2023, we have chatted to past and present ASSA members, employees, and affiliates, to get a sense of their history with the society and their memories of the society throughout the years. We will be sure to bring you some more content in the third and final 2023 edition of the SA Actuary as we continue to mark our 75th anniversary celebrations and reflect on our history!

Until next time, please keep well! 

Michael Tichareva

Lead Editor, on behalf of the Editorial Team

S to the POWER E

the relationship between environmental and social factors in ESG by John Anderson



JOHN ANDERSON

EXECUTIVE FOR SOLUTIONS AND
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Sustainability is a pressing concern in today's world, with countries and companies increasingly focusing on environmental, social and governance (ESG) issues that affect long-term sustainability. While sustainability encompasses various aspects, one crucial issue garnering attention is the interplay between climate change (the E in ESG) and social equality (the S in ESG).

The South African perspective

In the context of South Africa, the social component of sustainability takes centre stage, given the country's history of inequality.

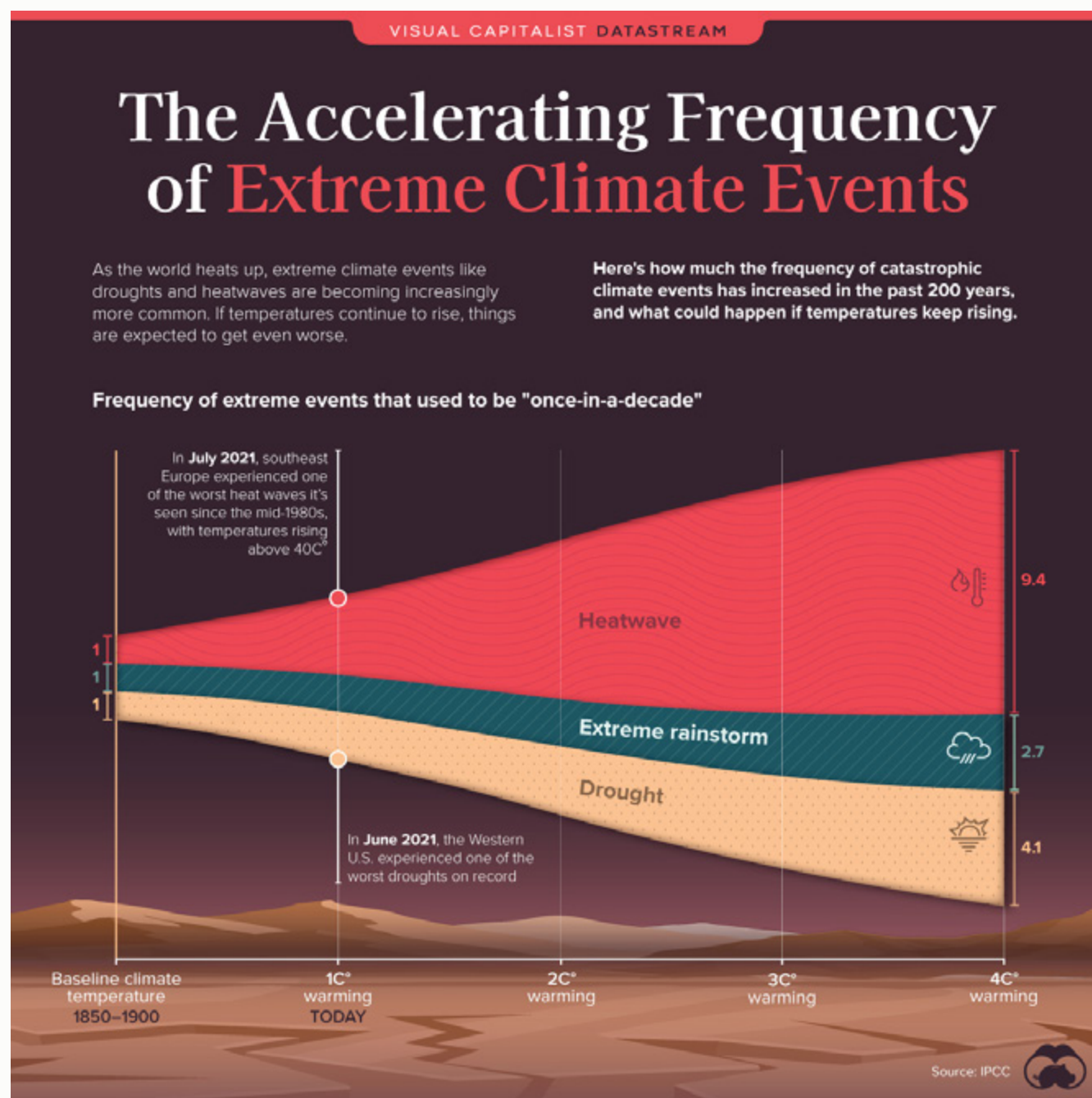
The mathematical equation: Impact = SE

We can summarise the relationship between environmental and social factors in a simple equation: Impact = S to the power E. As the environmental component (E) intensifies due to climate change, it magnifies the effects on the social aspect (S). To comprehend the gravity of this relationship, we will explore the reasons behind it.

Intensification of the E part: climate change and its significance

Scientific evidence overwhelmingly supports the link between human-induced greenhouse gas emissions and global warming. The average global temperature has already risen by 1.1 degrees Celsius above pre-industrial levels (1850-1900). This escalation in global warming leads to a cascade of effects, such as more frequent and severe climate-related disasters, including floods, droughts, rising sea levels, and heatwaves.





The economic toll

The economic ramifications of climate change are undeniable. Recent flooding in South Africa serves as a stark reminder of the economic implications that climate change can bring. A recent study focusing on climate-vulnerable countries, many of them in Africa, revealed that over the past two decades, climate change has already diminished 20% of their wealth. These economies have collectively lost around US\$525 billion (approximately R10 trillion) in GDP, with an annual growth reduction of 1%.

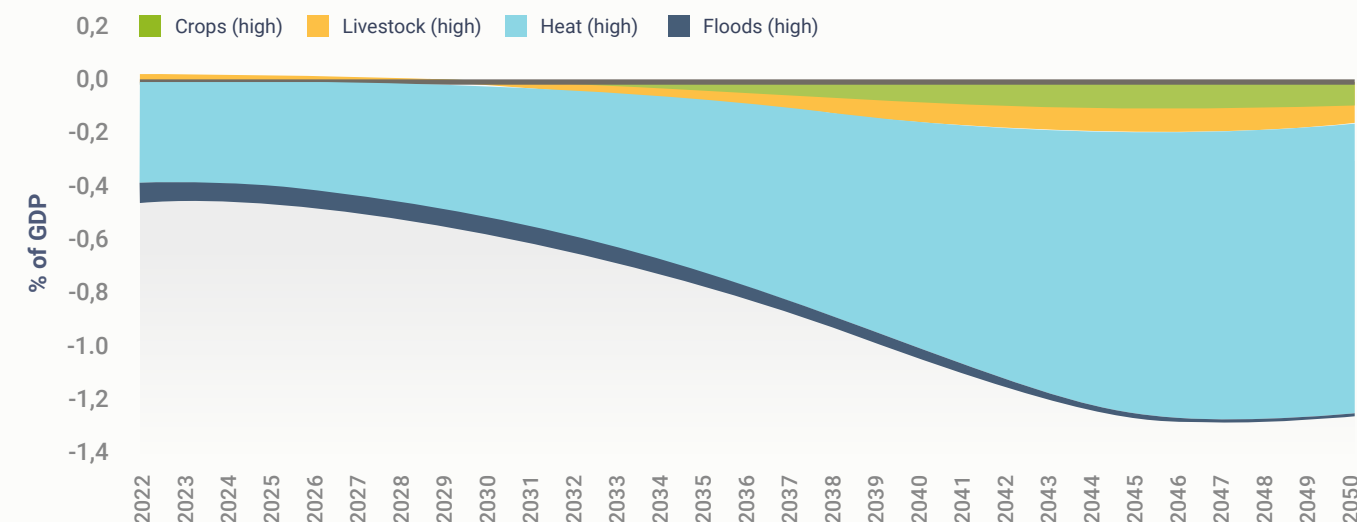
Projected impact on South Africa

While South Africa may not be among the most vulnerable economies, the long-term cumulative impact of climate change is expected to be significant. Studies vary in their assessments, but the overall annual GDP growth is expected to reduce by 0.8% on average between now and 2050 if we assume:

- effects in key industries in South Africa
- unsuccessful action to prevent global heating
- an ultimate heating of around 4 degrees above pre-industrial levels (which is also not the most pessimistic outcome)

This impact increases over time and reaches a reduction in GDP growth of 1.2% per year between 2040 and 2050.

Projected economic damages from climate risks from 2022 to 2050



Source: World Bank Group, Country Climate and Development Report, October 2022

Another important implication is what actions international trading partners take in the pursuit of mitigating climate change. One such action is the Carbon Border Adjustment Mechanism which the European Union is on track to introduce, effectively introducing tariffs on goods imported from non-EU countries. As a result of South Africa's carbon intensive economy (3.2 times higher than the global average in 2019), the World Bank has estimated that around 50% of South Africa's current exports are at high risk of being penalised by the introduction of this mechanism, losing about 1% of GDP growth per year because of this trade exposure.



The amplification of the S part: impact on jobs and investment

The link between climate change and social equality becomes even more apparent when examining its effect on jobs and long-term investment returns. Transitioning to a low-carbon economy necessitates the transformation of certain industries. A short-term concern is the potential impact on jobs and the livelihoods of communities dependent on the companies underlying those industries. Paradoxically, failure to address climate change adequately and

continuing on the current trajectory would result in substantial job losses for South Africa in the long run.

To put this into perspective, our estimate is that between now and 2050, South Africa, based on long-term population and economic modelling, needs real economic growth of around 4% per year to avoid the unemployment rate reducing further. For every 1% per year lower growth rate, the unemployment rate worsens by between 8% and 10%. Put differently, for every 1% per year real growth reduction between now and 2050, we expect around 3 million additional South Africans to be unemployed by that time.



Balancing today's jobs with tomorrow's losses

As we confront these challenges, it is crucial to strike a balance between the jobs of today and the potential job losses of tomorrow if we fail to take action to mitigate against and adapt to climate change. This requires a just transition, ensuring a responsible shift towards a low-carbon economy. While there may be concerns about job losses in certain industries, transitioning to a sustainable future also brings new opportunities for employment and economic growth.

This shift can contribute to reducing unemployment and fostering inclusive growth.

Investment returns and climate change

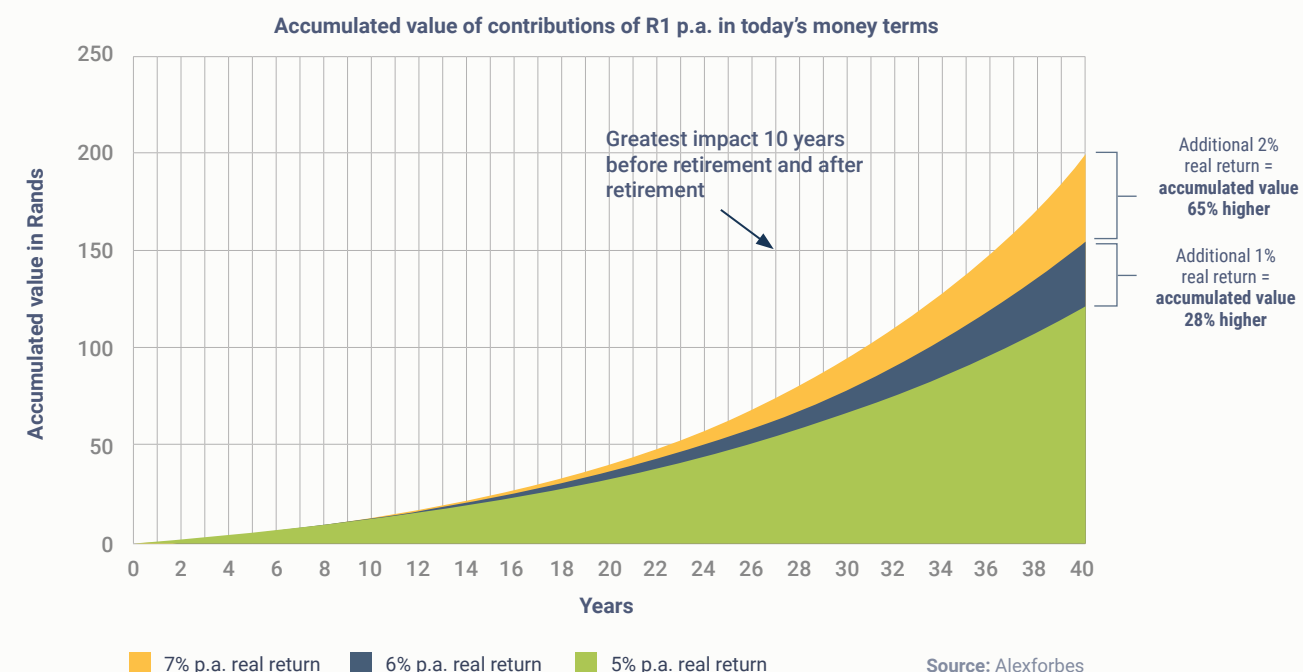
Beyond its impact on jobs, climate change also affects the returns on long-term investments, including retirement funds. Emerging markets like South Africa are particularly susceptible to the pronounced effects of climate change on investment returns.



Emerging markets like South Africa are particularly susceptible to the pronounced effects of climate change on investment returns

A 1% per year impact on investment returns is very plausible for South African investors. The effect of this will be felt by current pensioners, but more so future generations when they retire, as illustrated in the following graph:

Every 1% reduction in returns from climate change reduces retirement income by ~28%



There is, therefore, a direct link between climate change and investment returns. It is clear that emerging markets such as South Africa will be affected to a greater extent, especially with higher levels of warming.

Ultimately, this means a lower pension for individuals in retirement, affecting their livelihoods at and during retirement.

Actuaries to retirement funds have an important role to play

Trustees will need to review their governance, risk management and investment strategy frameworks and align these to the framework set out by the Task-force on Climate-related Financial Disclosures (TCFD).

Given that climate-related risks are of a long-term nature with a long-tail of outcomes, actuaries to retirement funds have an important role to assist in relation to managing the risks and opportunities in

The sustainability agenda around the world is rapidly moving, with key issues affecting long-term investment returns and liabilities.

relation to climate change. This applies to both defined contribution funds as well as defined benefit funds where actuaries have an understanding of the interplay between the assets and liabilities.

The sustainability agenda around the world is rapidly moving, with key issues affecting long-term investment returns and liabilities. For actuaries to remain relevant in the industry, a proactive approach should be taken to incorporate climate-related impacts into actuarial valuations, asset-liability models and specific scenario assessments to ensure that trustees and members of funds are well positioned to navigate the uncertainty. ⚠️

AN INTRO TO CLIMATE RISK FROM A BANKING PERSPECTIVE



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COMMITTEE | HEAD: EC &
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INTRODUCTION

Climate change, and subsequently Climate Risk, was noted in some sources as being the most material global risk over the next 10 years. Between this, and the recent focus from the Prudential Authority (PA) and South African Reserve Bank (SARB), both insurers and banks have taken steps to try and incorporate Climate Risk into their risk management processes. The saying “you can’t manage what you can’t measure” comes to mind, however. In the case of Climate Risk, this is very much easier said than done. To aid with the initial exercise of measuring Climate Risk, we discuss some initial learnings in the building of the Climate Risk stress testing capability at a large bank, as well as give some recommendations around best practice for future integration.



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COMMITTEES | CLIMATE RISK
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CLIMATE RISK TERMINOLOGY

Before we can get to quantification, however, it is useful to define key Climate Risk terminology. The Task Force on Climate Disclosures (TCFD) breaks Climate Risk into two sub-risks: Physical and Transition Risk. Physical Risk stems from the physical impact of climate change, while Transition Risk stems from the transition to a lower emission economy. The nature of these risks, and how they translate to profit and loss impacts, can differ substantially. This is important to keep in mind during the quantification process, as one will more than likely need at least two models to quantify the impact of both risks.

From a theoretical standpoint, it helps to think of Physical Risk as being an underwriting risk. We are effectively trying to quantify the extent to which the past climate isn't a good predictor of the future climate. It's also important to note that we are not trying to capture 'weather risk': there are general insurers and reinsurers who are already experts in this. We are trying to understand how the change in frequency and severity of weather events and climate hazards can impact various portfolios.

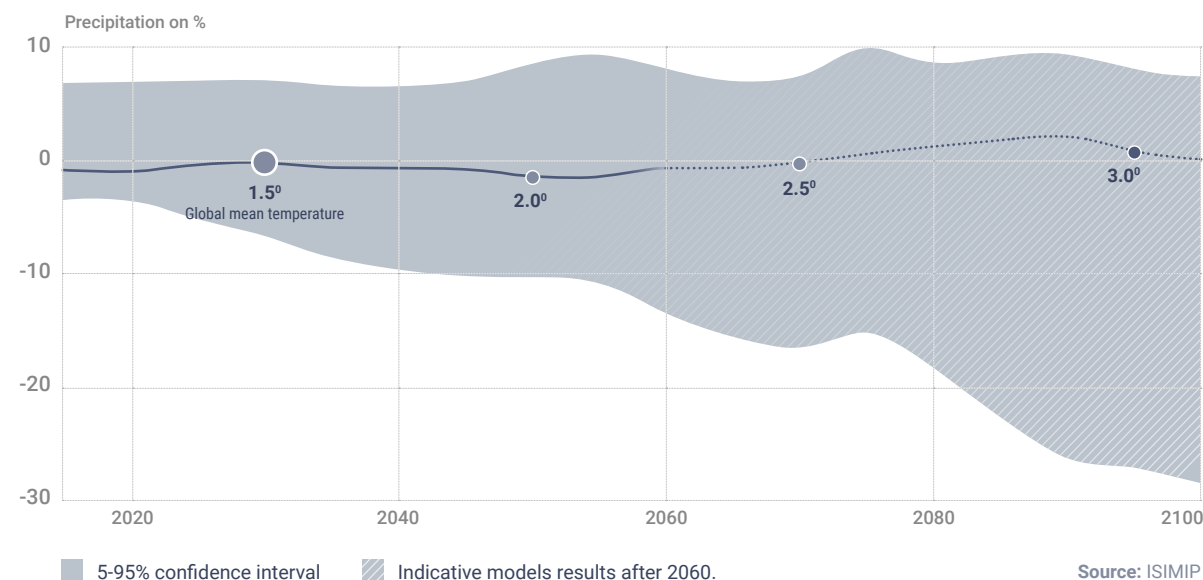
Transition Risk can also be thought of as an underwriting risk. Given that it is predominately forward looking and has not occurred in the past, it is a new factor that one must capture to get a realistic view of how risks may look like in the future.

QUANTIFYING THE IMPACT OF CLIMATE RISK

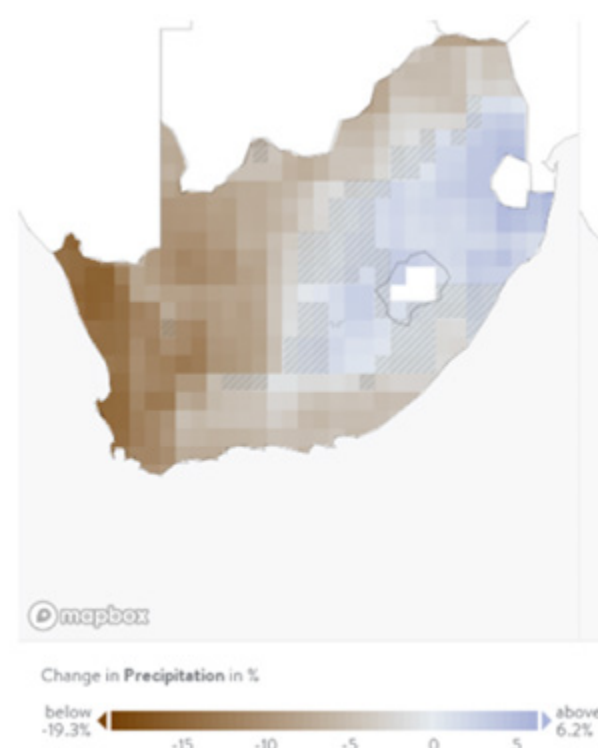
The current best practice is to quantify Climate Risk through a scenario analysis exercise. There are several well-defined scenarios that are used globally to understand how different emissions and warming levels would impact economies and climate patterns around the world. The Network for Greening the Financial System (NGFS) has defined their own scenarios with the intention of standardising how Climate Risk stress testing is conducted internationally. The NGFS gives free access to a wide range of resources and climate forecasts that can be used as a starting point for building out an internal Climate Risk stress testing process. With these scenarios, and a sufficient understanding of how historical loss distributions relate to climate variables, one can theoretically determine their Physical Risk exposure. However, more likely than not, it will be important for some additional work to get real value from the exercise.

Geographic granularity is very important in the context of Climate Risk. This is clear from the distinct variance in climate throughout South Africa - for example, winter has a very different meaning in Gauteng compared to the Western Cape. However, because of this difference, there is likely to be some geographic diversification that stems from having exposures in different parts of the country.

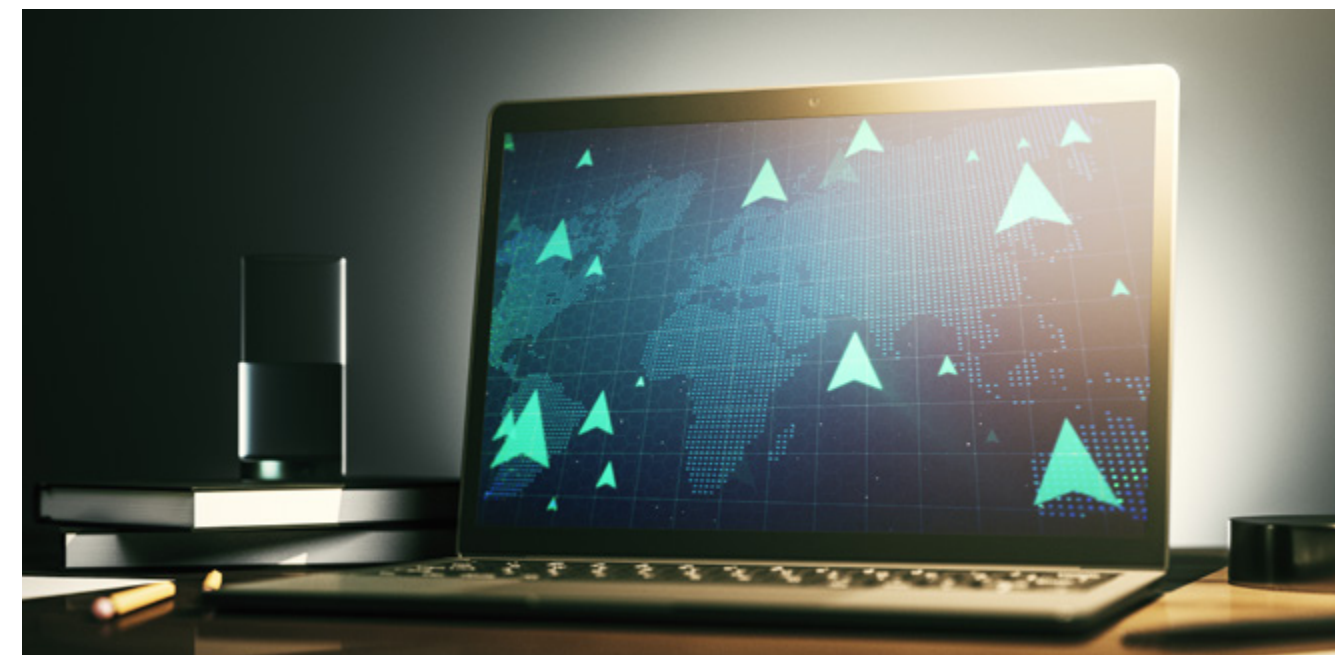
The two graphs that follow outline the need for a more granular view of exposures. The first graph shows the relative change in precipitation in South Africa up until 2100 - it is quite clear that the forecast is suggesting that rainfall is not expected to change materially. The second graph shows the expected changes in rainfall around the country by 2050. Some parts of the Western Cape are due to see a 19.3% reduction in rainfall - much different from the 1.5% reduction at the South African level.



Graphs: Precipitation changes for SA. Source: ISIMIP - The Inter-Sectoral Impact Model Intercomparison Project



it is quite clear that the forecast is suggesting that **rainfall is not expected to change materially.**



It should be quite clear that geolocation is an important part of understanding Physical Risk. Claim types, and their relationship with climate variables, are likely to vary considerably around the country. Take, for example, fire – the likelihood of fire occurring generally depends on the type of biome in an area. Some biomes are significantly more prone to fire than others and South Africa has over 10 distinct biomes, each with its own characteristics.

Physical risk has both direct and indirect impact for a bank. Direct impact includes impacting a bank's operations, properties and equipment, resulting in an operational risk for the bank. Indirect impact includes physical risk impacting the secured lending portfolios, resulting in damaged properties and vehicles, which could result in increased credit risk. There is also an indirect impact where customers are affected by floods and fires, and are unable to continue the repayment of their loans.

It is also critical to highlight the relationship between a bank's credit risk and an insurer's risk of loss due to climate risk. For example, if insurers decide to stop insuring properties in certain regions, then banks may face a large challenge as there will be little to no protection on their loans from climate hazards.

Transition Risk, on the other, tends to require industry granularity rather than geographic granularity. One can further break Transition Risk into: Market-related

Risk (supply/demand considerations), Reputational risk, Technology risk and, Policy and Legal risk. These sub-risk types tend to apply at a sub-industry level. For example, one firm in the energy sector could be one of the world's largest emitters while another firm could be actively helping to mitigate climate change. It's important to be able to separate these two into different categories. One would likely face significant upside risk while the other would face significant downside risk. The ability to distinguish is essential for effective risk management and strategic planning.

THE ACTUARIAL SKILL SET

Like commentary from other actuarial bodies, we believe that actuaries can play a significant role in climate risk assessment, measurement, and management approaches. This could include themes such as: modelling, capital management, product management, and reporting and disclosure. The Actuarial Society of South Africa has started to integrate climate risk into its various subjects. Closer to our field of application, which is banking, we have included climate related risks in both the F107 (B100) Banking Principles and F207 (B200) Banking Applications syllabi and notes.

SOME LINKS RELATED TO THE ARTICLE:

TCFD <https://www.fsb-tcfd.org/>

NGFS <https://www.ngfs.net/en>

Weathering the Climate Risk Storm

Preventing Climate Risk Losses in a Mortgage Portfolio



KAMENEE GOVENDER



ESMERELDA OBERHOLZER



MARC OTTO

In recent years, the topic of climate risk has emerged as a novel area of focus within the financial services space. Faced with the increasing influence of climate related events and ensuing policy dialogue surrounding necessary transitions to a lower carbon economy, financial institutions recognise the need to integrate climate risk into their risk management frameworks. However, recognition of climate risk is one thing, but being able to accurately quantify climate risk and its potential impact on credit risk is proving to be a complex endeavour indeed. Complex or not, this was a task that two analysts from the mortgage loan capital and impairments team at a large South African bank were willing to take on and, ultimately, an approach that separately quantifies physical and transition risk for a mortgage portfolio was developed.

Before delving into the details, it is important to have a basic understanding of physical and transition risk, in the context of the credit space. Physical risk refers to potential financial impact and losses that may arise from physical effects of climate change. It encompasses risks associated with extreme weather events such as floods, hurricanes, droughts, heatwaves, and rising sea levels, as well as gradual changes in temperature and precipitation patterns. On the other hand, transition risk encompasses the risk of financial losses associated with the pace and extent to which institutions manage and adapt to the move towards a net-zero carbon economy. In theory, these two concepts may seem simplistic, but don't be fooled, there were many hours of research involved in gaining a comprehensive understanding of the two risks and their associated potential impacts.

When tasked with assessing the impact of physical risk on the mortgage book, we found it necessary to ask: "Are physical climate occurrences a cause for concern?". The answer is unequivocally yes, as it is no surprise that experts unilaterally agree that climate change has and continues to drive extreme changes in global weather patterns. In fact, the Global Risk Report of 2022 categorised extreme weather as the most significant risk faced by the world in the next 0-2 years. Within a South African context, this is reflected in the increased frequency and severity of events such as drought, storm-associated floods, wildfires, as well as rising sea levels and coastal erosion.

In the mortgage loan space, these climate events will potentially have a direct impact on collateral valuation and insurability, subsequently, leading to higher loss given defaults (LGDs) and probabilities of defaults (PDs) in the expected credit loss (ECL) calculation.

The many data constraints faced and the complex interdependencies of climate events, presented a difficult task in quantifying the physical risk impact on the mortgage portfolio. As such, the physical risk impact on the mortgage portfolio was examined based on two components.

The first component relates to the concept of underinsurance. Underinsurance, as it pertains to physical collateral, is brought about in situations where



the sum assured is insufficient to fully compensate for potential damages or losses occurring in the event of a claim. Over the past few years, the rate of increase in South African building material and construction costs has risen more swiftly than that of sum assured values, which could result in insurance replacement cost shortfalls. Consequently, should a climate related event destroy a property, the insurance pay out would be less than the actual rebuild costs resulting in a lower collateral valuation, which would bring about increased LGDs.

The second component explores the idea of a location eventually becoming uninsurable. Over time, climate events will become significantly more severe and frequent in certain regions than in others and insuring properties in these regions may become increasingly problematic for insurers. In response, insurance companies may raise premiums to unaffordable levels,



which could affect customer affordability and in turn, lead to higher PDs. An alternate response could be a cease of insurance offerings in these geographical locations altogether, resulting in increased LGDs. Additionally, a secondary LGD effect exists, where LGDs could be further exacerbated by decreasing property prices as people may no longer wish to purchase property in the affected areas.

Unlike physical risk, the impact of transition risk in the context of credit risk is less apparent. This is especially true in a country such as South Africa where policy changes are slow to react compared to the rest of the world. Moreover, physical risk effects are inherently captured in the underlying data as physical risk events have been occurring for many years and it is the increasing trend in these events that are of particular concern. In contrast, transition risk has only really started to arise in the last few years, leading to sparse data, and is likely to remain for the foreseeable future.

One of the most influential PD drivers for reserving calculations is customer affordability. Hence, analysts should ask the question: “How will transition risk influence customers’ affordability?”. Considering the

“How will transition risk influence customers’ affordability?”

data available at the time, we were of the opinion that customers’ affordability can be impacted in two ways.

Firstly, if policies related to transition risk (such as carbon tax policies) change, employers’ profits will be squeezed. This could result in employees being retrenched, especially in lower income segments.

Secondly, the functionality of small towns (including job creation) is usually dependent on a few employers’ activities in-and-around the town. Take Carletonville as an example – these residents rely on the economic activity generated by mining companies like Harmony Gold. If policies are amended to reduce carbon emissions, the sustainability of some small towns will be put into question. Furthermore, a second-order impact exists with regards to small towns.

If demand for housing reduces due to a reduction in employment growth, then house price growth will likely be slower than the average South African market, or even decrease. Consequently, the valuation amount will reduce, and the LGD estimates will worsen.

Once the methodology is sketched out, the difficulties surrounding practical implementation arises and some may even argue that this is where the fun begins! Ideally, the next step would have been to construct the perfect climate risk data set and build a sophisticated model that could integrate into the ECL process seamlessly. But let’s be honest, nothing is ever that easy, especially with regards to IFRS 9. A common thorn in an analyst’s side is the data available for analytics and model development purposes. The available data can be of poor quality and acquiring acceptable data can be extremely costly. As a result, analysts have to be creative in the way they utilise existing data – who said analysts are boring? Our solution? Raise a simple, well-thought-out post-model adjustment (PMA) using evidence-based assumptions and available data.

The physical risk PMA focused on drought, flood, and wildfire risk, where event risk ratings ranging from low to very high, and their associated probabilities, were assigned to accounts on-book. Since physical risk is largely dependent on geographical location, the first step was to create a geocoded property base for the mortgage portfolio. Geospatial data sourced from AfriGIS, the South African Deeds Office, as well as internal data was collated and then used to map all properties on-book.

Subsequently, climate analysis was performed, and each property was assigned a physical risk rating, based on the frequency and severity, for each of the three physical risks. The extent of both underinsured and uninsurable exposures was considered and the resultant increase in impairments, based on the assumption that PDs and LGDs are proportional to impairments, were used to compute the PMA.

Much like physical risk, the portfolio’s IFRS 9 PD and LGD estimates as produced by the ECL were used to measure the impact of transition risk. Employers were assigned a transition risk rating ranging from low to very high whereas small towns that are very reliant on agricultural and mining activities were assigned a high-risk rating. These risk ratings were then used to construct risk scalars based on a combination of expert judgement and analytics. Similar to physical risk, the risk scalars were used to calculate the transition risk PMA.



Albeit simplistic, the approach looks to provide a building block for future enhancements, and we hope that sharing the methodology will ignite future discussions regarding the quantification of climate risk in the context of credit risk. For us, the work has only just begun and several promising avenues for improvement of the methodology are currently being explored. These include:

- 1) Obtaining more climate risk data provided by external climate risk companies to enhance and improve accuracy of the climate analysis.
- 2) Collaboration with insurers and reinsurers on climate scenario modelling.
- 3) Incorporating climate risk effects into macroeconomic forecasts to investigate a top-down impact.
- 4) Isolating climate risk and equivalent effects into historic data to better understand the long-term impacts on house prices in specific areas.
- 5) Understanding the interdependencies between physical and transition risk.
- 6) Lastly, doing more research and remaining close to the European Union and American developments with regards to climate risk.

Ultimately, our objective is to leverage the aforementioned avenues to effectively integrate climate risk into the ECL model. By laying the foundation for future enhancements and embracing collaborative partnerships, we can pave the way for a more robust and accurate quantification of climate risk within the credit risk space to ensure sustainability and resilience in the face of an increasingly uncertain climate landscape. 🌱

HELLO WORLD MOMENT FOR THE QUANTUM ACTUARY

by Syed Danish Ali



SYED DANISH ALI

DESCRIPTION OF KEY CONCEPTS IN QUANTUM COMPUTING^[1]

Every now and then we come across news describing the latest milestone achieved in quantum computing. For example, Google achieving quantum supremacy, making time crystals and so on. Even though the hardware challenges have been extreme to date, this progress creates hope that soon, possibly within a decade, we might have quantum computers as accessible as we have classical computers right now. It is still up to each of us and our mindset how early we anticipate a 'Hello World' moment for quantum computing to come sooner or later?

How soon?
How much
later?



PROBABILITY IS THE CORNERSTONE IN THE ACTUARIAL CALCULATION, WHILE THE QUANTUM MECHANICS COULD GIVE DIFFERENT PERSPECTIVES ON THE PROBABILITY^[5].

It was Richard Feynman who proposed, in the early 1980s, that if we want to simulate a quantum system, we will need a quantum system to do it with. "I'm not happy with all the analyses that go with just the classical theory, because nature isn't classical, dammit, and if you want to make a simulation of nature, you'd better make it quantum mechanical," he concluded, in his inimitable way. Classical computers, as he deemed what everyone else just called computers, were insufficient for the task^[2]. The next stage of realizing the vision of Alan Turing for a universal computing machine is a continuous progression from vacuum tubes to hand-built transistors, to the densely packaged chips, to now quantum computers in the foreseeable future.

As Feynman once wrote, quantum mechanics "describes nature as absurd from the point of view of common sense. And it fully agrees with experiment. So I hope you can accept nature as She is-absurd."

The history of the strange world of quantum mechanics can be traced back to Young's double-slit experiment demonstrating the wave nature of light in 1801^[3]. During the 1920s, the Copenhagen interpretation of quantum mechanics was devised, largely by Bohr and Heisenberg, and remains the most common interpretation. According to this Copenhagen interpretation, microscopic quantum objects do not have definite properties prior to being measured, and quantum mechanics can only

predict the probability distribution of a measurement's possible results, such as its location.

The wave function ψ is a mathematical representation of the quantum state of a quantum system and the probabilities for the possible results of measurements can be derived from it. The Schrödinger equation determines how wave functions evolve over time. Upon measurement of the object, the wave function collapses into a single state^[4]. Quantum theory is one of the significant concepts in modern physics, which was proposed by Max Planck in 1900. Many phenomena in nature and society also show the characteristics of "quantization", including the insurance market.

Probability is the cornerstone in the actuarial calculation, while the quantum mechanics could give different perspectives on the probability^[5]. Just like force, mass, acceleration, energy, and momentum in classical mechanics are continuous deterministic variables, actuarial variables, such as premium, claim, profit, expense, and distribution earning, are also considered to be continuous deterministic variables. In quantum theory, when several particles interact with each other, due to the properties of each particle having been integrated into a whole property, it is impossible to describe the properties of each particle alone, but only the properties of the whole system, which is called quantum entanglement.

In the insurance field, there also exists the phenomenon of quantum entanglement. The reason why insurance can be priced and provide risk protection is not based on the individual risk probability, but the overall risk probability. In the face of a complex and changeable quantized insurance market, traditional actuarial theory may lack effective explanatory and predictive power. Each policy can be regarded as the smallest unit and cannot be separated continuously, so it can be said that each policy is similar as the quantum and have the quantum property.

**THE SCOPE OF THE PROBLEM
WILL REMAIN THE SAME, BUT IT
IS OUR ABILITY TO ARRIVE AT
SOLUTIONS THAT WILL CHANGE**

Quantum computers utilize Qubit instead of bit in the classical computer. Qubit have superimposition so that both 1 and 0 can occur simultaneously to speed up calculations. Parallel computing is given a huge boost due to entanglement as well. Quantum entanglement is where pairs or groups of quantum particles are linked so that each particle cannot be described independently of the others, even when the particles are separated by a large distance - opposite ends of the universe, for example, which negates the general relativity point that nothing can travel faster than the speed of light. This is why Einstein called this “spooky action at a distance” and it’s the theoretical basis for quantum teleportation. The practical implication of this “spooky action”^[6] is that, unlike conventional computers where bits and processing power are linearly related (doubling the number of bits results in double the processing power, simplistically), quantum computers grow exponentially more powerful with each qubit added—a one-qubit computer acts like two bits, a two-qubit computer acts like four qubits, four qubits act like 16, and so on.

The reason why quantum computing hasn’t yet become available in everyday life is due to hardware challenges. Qubits that are entangled are said to be in a state of “coherence,” and they can lose their coherence easily (called decoherence). Decoherence eliminates the scaling effects that make quantum computing so powerful and the computer’s results unusable. Decoherence is caused when the large outside world enters the small, insulated world of the entangled qubits. Vibrations, temperature fluctuations, light and other environmental interference are all culprits, so



quantum computers are kept in very cold and heavily managed environments to insulate them from these effects. Increasing the number of qubits and the length of time they are held in coherence is the key barrier to the growth of quantum computing technology.

APPLICATIONS OF QUANTUM COMPUTING

When writing on the applications of quantum computing, it is usually emphasized that this will open doors unknown so far. But it’s important to understand a nuance here. Our problems have been always extremely huge in scope and we have always relied on practical patchwork/shortcuts to arrive at solutions. The scope of the problem will remain the same, but it is our ability to arrive at solutions that will change. For example, since the 1700s, we have tried to quantify mortality risk so that we can load it for expenses and profits and charge that as the premium for providing life protection insurance. At that time, we had no calculators, so dates of deaths were painstakingly taken from graveyards to arrive at a mortality table. That led us to know the average mortality probability of a given life. In the 1950s,

we heard that there were clunky heavy machines that would set the life reserves. Then came calculators and spreadsheets, and our computation capacity increased enormously at a fraction of the given time.

However, we still rely on a limited number of rows and columns and factors to calculate mortality risk given the limitations of our computers. Once a quantum computer becomes a reality and merges with other tech components such as big data and machine learning, we can get an almost unlimited number of different types of data and use that to determine mortality risk in a more surgical way, and in more permutations and combinations than possible currently. The original scope was, and still remains, the same over the centuries, which is quantifying mortality risk. But it is the scope of our solution formulation that keeps improving.

Given this, every application will benefit from quantum computing. All problems are huge in scope, from asset management to insurance to biology to many other areas, and there is modeling for many problems in these areas. Modeling will face a paradigm shift to determine better solutions. Hence, it is difficult to say that any area will not benefit from quantum computing.

Within insurance, our ability to dimensionalize risk will shoot to the moon. The preferred method for creating simulations today, to analyze the impact of risk and uncertainty in financial models, is Monte Carlo simulation, but that will be replaced by quantum simulation. Even in the present time, IBM published research recently that used quantum algorithms to outcompete conventional Monte Carlo simulations for assessing financial risk^[7].

Monte Carlo simulations are routinely employed to compute frequently-used risk measures like the Value at Risk (VaR) or the Conditional Value at Risk (CVaR, also called Expected Shortfall or TVaR Tail Value at Risk). The Monte Carlo method’s convergence rate (i.e. the rate at which the desired accuracy is approached) scales as the inverse of the square root of the number of samples (one sample corresponds to one set of parameter values). In contrast, the researchers’ quantum algorithm converges at a rate proportional to the inverse of the number of samples that represents a quadratic speed-up with respect to the Monte Carlo method.

Optimization problems are all around us, and we have to keep them to manageable levels through various shortcuts, otherwise the complexity would quickly explode and our classical computers would shut down. With quantum computing methods such as quantum annealing, we can increase the scope of depth considered in optimization problems without worrying about it blowing up in our face. Quantum annealing is well suited for solving optimization problems. In other words, the approach can quickly find the most efficient configuration among many possible combinations of variables.

D-Wave offers a commercially available quantum annealer that uses the properties of qubits to find the lowest energy state of a system, which corresponds to the optimal solution for a specific problem that has been mapped against this system. For example, D-Wave says that Volkswagen used its quantum annealer to make its paint shops more efficient by figuring out how to reduce color switching on its production line by

**THE FINANCIAL SERVICES
SECTOR HAS A HISTORY OF
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THORNIEST PROBLEMS.**

more than a factor of 5. Meanwhile, Canadian grocer Save-On-Foods claims that D-Wave's system helped it reduce the time taken to complete a recurring business analytics task from 25 hours per week to just 2 minutes.

The financial services sector has a history of successfully applying physics to help solve its thorniest problems. The Black Scholes-Merton model, for example, uses the concept of Brownian motion to price financial instruments – like European call options – over time. Econophysics is a whole field dedicated to combining physics with economics. Thermodynamics energy modeling, law of conservation and so much more can be applied to modeling in economics, finance and insurance. It is my hope that we are able to merge my two passions over my lifetime; not just quantum, but overall physics as well, with actuarial science modeling. Insurance modeling both on the assets and liabilities side is ripe for disruption by quantum modeling.

Quantum mechanics was developed when it was realized that energy comes in discrete amounts, called quanta, instead of continuously. The same is true for money—it comes in discrete packets, such as a paycheck or premium for an insurance policy.

Now that we can increase the variety of data, algorithms and computing power due to quantum computing,

we can answer more questions in the same given time and open up avenues into which we were shy to wander before. This opens up unexplored avenues as well as providing better insights into the same existing problems that we have been grappling with historically.

There are many such examples. Cyber insurance is an area that does not respect boundaries like climate change and pandemics and is a collective risk entangled with our inter-connected modern world and its manufactured risks. For such risks, assuming simplifying assumptions like 'ceteris paribus', 'future will be similar to history' and assume only 4 variables in our model doesn't make much sense. Web3.0 and metaverse is another example that requires fast intensive computing in real time and is too vast to be modeled using our traditional modeling tools. 3D printing and material sciences require testing of almost infinite permutations and combinations but, if quantum computers can open these, it can mean personalized materials can be made by individuals that are not seen in nature and can change the way we make our tools and buildings. Genomic testing can be done to reveal hidden secrets inside DNA and drugs and vaccines can be developed fairly quickly and cheaply (especially the latest drugs like biologic drugs, making Brain Computer Interfaces etc.; in-fact there is even a field quantum biology).



A lot of real-world phenomena such as weather forecasting or traffic management or autonomous vehicle driving software have small starting points that become very huge very quickly (this is known as the butterfly effect) and suffer from skewed, imbalanced data. But if quantum computing can increase the data that we can model, the variables and type of datasets, our predictive analytics can churn out more realistic forecasts as well.

CONCLUSION

While broad commercial applications may remain several years away, quantum computing is expected to produce breakthrough products and services likely to successfully solve very specific business problems within three-to-five years^[8].

There is no reason to wait for quantum computers to be invented and wait for their 'Hello World' moment. We need to start training now, as actuaries, to enter the quantum realm so that we can take advantage of it when it comes available. When it comes and if we haven't done our homework, catching up at that stage might prove to be very difficult. Within a few years, we might have to modify this iconic statement of Frank Redington "An actuary who is only an actuary is not an actuary at all" to "An actuary who does not recognize the quantum realm in his practitioner's toolkit is not an actuary at all".

If there is a technology that allows us to solve the same problems in a fraction of the time it takes currently, and with a fraction of the resources, shouldn't we be exploring that technology to the fullest of its possibilities? The quantum industry pace is accelerating. Some people say it's three years away, others argue it is five or seven. Every week there is a major milestone in the field (either from basic research, engineering or company launches), so it appears that within a few years our industry will be fully disrupted^[9].

So even if quantum computers are years away, we need to prepare for it from today before it is too late to play catch-up. We need not be fooled by the linearity of progress as the nature is such that there will be no likely progress but suddenly a huge paradigm shift changing everything. Change is coming quickly. Once key achievements in quantum computing are unlocked, the gap between early adopters and laggards will widen quickly.

"It looks like nothing is happening, nothing is happening, and then whoops, suddenly you're in a different world."

— HARTMUT NEVEN, DIRECTOR, GOOGLE QUANTUM ARTIFICIAL INTELLIGENCE LAB. 

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BUILDING FINANCIAL RESILIENCE:

Exploring how mitigating risk through financial reinsurance could be a path to sustainable growth



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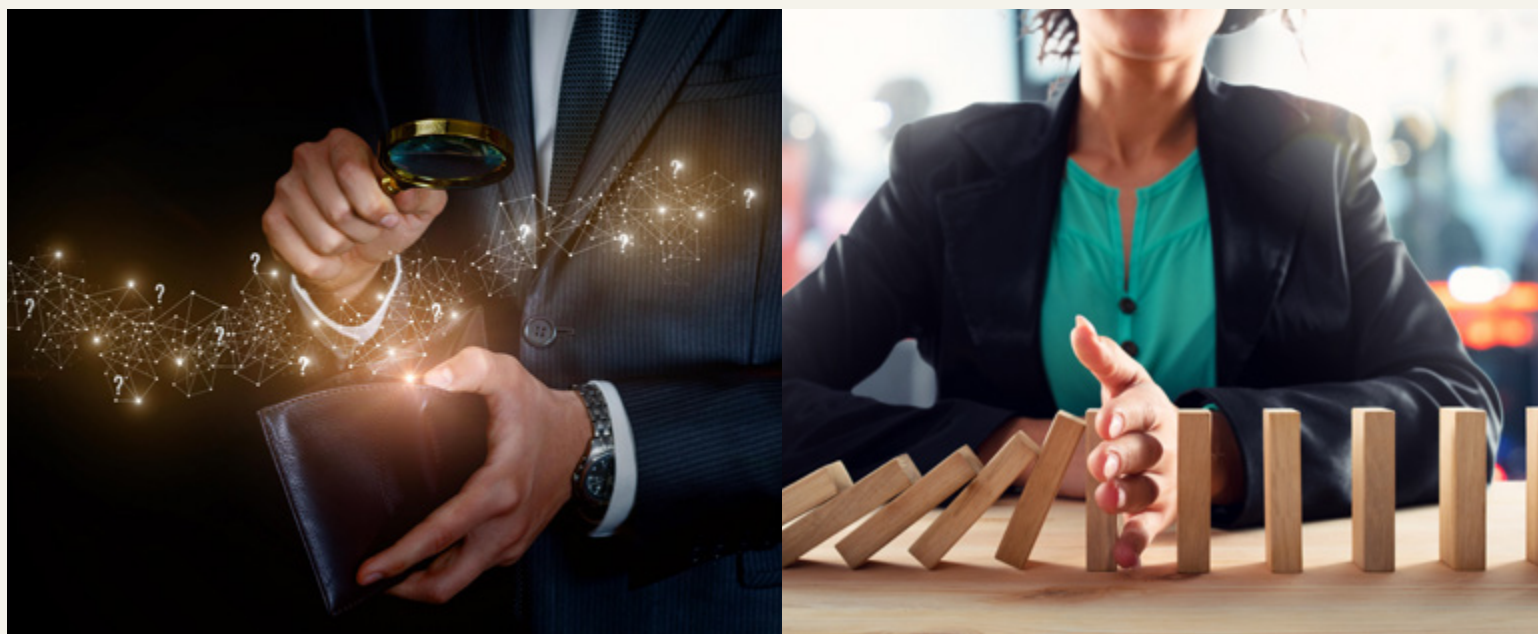
The curatorship and subsequent winding up of a high-profile traditional insurer sent shockwaves through the South African insurance and reinsurance marketplace late 2022, forcing industry participants to reassess their own solvency positions. Warding off insolvency requires a comprehensive approach to risk, including capital management; commitment to ongoing learning and improvement; and most importantly, proactive risk management. In this article, we explore how mitigating risk through financial reinsurance could be a path to sustainable growth.

CATASTROPHES

To place the recent insolvency into perspective requires an understanding of the trading conditions facing domestic and global insurers and reinsurers over the three-year period spanning March 2019 until March 2022. Developments over this period introduced challenges to both insurers and their reinsurance partners as each sought to indemnify their respective customers for business interruption losses following the 2020/2021 COVID-19 pandemic; for property losses following widespread looting that affected areas in the Gauteng and KwaZulu-Natal provinces in July 2021; and for extensive damage due to the devastating KwaZulu-Natal floods in April 2022.

Over the same period, the rising frequency and severity of extreme weather events forced insurance industry stakeholders to place climate change high on the agenda and accelerate their responses to 'big picture' environmental issues such as global warming and greenhouse gas emissions, among others.

At an operational level, insurers are positioning for climate change through reduced greenhouse gas emissions targets and promoting environmentally sustainable practices. At a solvency level, insurers are engaging reinsurers on appropriate options for catastrophe reinsurance solutions. There is a growing awareness that failing to meet capital solvency levels could lead to insolvency, job losses and industry wide reputational damage in the event an insurer is unable to meet policyholders' claims.



INSOLVENCY

One of the challenges facing insurers is how to prevent insolvency without detracting from the important economic protections they provide. According to the Prudential Standard FSI 4, insolvency arises when the minimum level of eligible own funds expected to be held against the key risks to which an insurer is exposed, is not sufficient based on the basis stipulated on which the Solvency Capital Requirement (SCR) should be calculated. There are increasing ladders of intervention, with the toughest regulatory consequence of an insurer trading insolvently being to be placed under curatorship or going into liquidation.

In South Africa, the Financial Sector Conduct Authority (FSCA) is responsible for monitoring the financial stability of insurers, having the power to intervene if an insurer is at risk of becoming insolvent. They may appoint a curator to take over the management of an insurer and protect the interests of its policyholders. However, when an organisation breaches its solvency capital requirement as reported under a set of Financial Soundness Indicators (FSIs), the Prudential Authority (PA) steps in. The FSIs derive from various indicators that assess the soundness of financial institutions, covering aspects such as asset quality; liquidity; profitability as well as solvency. Solvency is closely correlated to capital, hence the cost of capital should also be assessed.

Developing a culture of risk awareness and transparency is non-negotiable

RISK MANAGEMENT

Ongoing risk management and risk mitigation are good tools to limit exposure to insolvency. Insurers could, therefore, continually scan their operating and trading environments to identify potential risks and develop strategies to reduce the likelihood of such risks occurring and the impact, should the risk occur. It is also essential for the insurer to build up its balance sheet to withstand and recover from catastrophic, unexpected loss events. This can involve investing in technology and infrastructure; educating and training employees on risk management practices; and the use of financial reinsurance to optimise the balance sheet.

Developing a culture of risk awareness and transparency is non-negotiable as it helps to prevent blind spots from forming and facilitates early action in response to potential threats. Another consideration is to explore financial and reinsurance solutions that are tailored to an insurer's underlying operating needs. For example, engaging with reinsurers to gain access to pooled solutions; risk-sharing mechanisms; and financial reinsurance among other levers.

FINANCIAL REINSURANCE

Financial reinsurance is a structured solution that helps an insurer to meet objectives that go beyond traditional risk transfer. This requires significant experience to structure and customise. In a broad sense, these solutions are to be put in place over a number of years with the intention to stabilise insurer results and reduce volatility in profits, allowing insurers to achieve targeted growth through risk-adjusted return on equity.

It is common practice when putting financial reinsurance in place, to analyse and model an insurer's experience using stress testing and scenario analysis. The process offers two immediate wins: first, it identifies scenarios that could 'break' an organisation's solvency, providing an opportunity to mitigate the risk; second, it offers a vital prediction of whether the solvency coverage ratio is in danger of being breached. In practice, an insurer can participate in various financial reinsurance solutions including solvency quota shares, stop losses and spread loss covers. Insurers can get the best results by engaging with financial reinsurance managers to inform long-term strategy and deliver value alignment across all stakeholders.

Resilience

Tough economic conditions have highlighted a deep sense of community across the domestic insurance landscape, with the industry by-and-large fulfilling its promise to protect businesses, individuals and society from financial losses due to unexpected events. This response is made possible through insurers' commitments to understanding and managing risks, as well as their dedication to meeting the needs of policyholders. By continuing to show resilience and tenacity – and by working together to manage risks and support those impacted by catastrophic events – the insurance industry has not only protected policyholders but demonstrated its resilience and strength. ⚠️



ASSA 75TH ANNIVERSARY YEAR: Past and present...

In commemoration of ASSA's 75th year anniversary, The South African Actuary Magazine chatted to past and present ASSA members, employees, and affiliates, to get a sense of their history with the society and their memories of the society throughout the years.



THEMBA GAMEDZE

(Independent Director and former ASSA President)

Can you please tell us a bit about your history with ASSA and describe the landscape of the society and the profession at the time?

I began my actuarial studies in 1989 as a 31-year-old actuarial trainee at a life office in the UK called Clerical Medical, based in Bristol, only having heard about the actuarial profession accidentally, just two years earlier, while carrying out mathematics research at the International Centre for Theoretical Physics in Trieste, Italy.

In response to my mother's prompting, our family relocated back to the land of my birth in 1995, where I

continued writing the exams of the Institute of Actuaries, of which I was then a member. I eventually qualified as a Fellow in 2001, having completed the exams the year before and was persuaded in 2004 to get more involved in ASSA, and ultimately even to put myself forward for membership of the ASSA Council.

During the course of that journey, I ended up as the first black President of ASSA in 2012, at a time when our profession had developed our own local examination system and was still deeply involved in negotiating mutual recognition agreements with the major international actuarial professional bodies. It was during this time that I became intimately familiar with the interesting "politics" of our profession at a global level, about which I shall say no more in this forum.

What has been the most notable change that you have observed from when you were at ASSA up until now on its 75th anniversary?

Although those emerging from more recent generations may not see things as I do, my perception is that apart from growing numerically, the profession has also grown appreciably in its general awareness of the social framework that provides us with the privilege of making a living from our special set of skills and the rigorous training we undergo.

So although we still have a way to go to addressing what I feel to be an unhealthy diversity imbalance, which increases the risk of tunnel vision, I believe today's actuaries are more assertive and entrepreneurial than was generally the case in the past. Nevertheless, I must acknowledge a few prodigious exceptions to that generalisation, even from my rather traditional generation, including actuaries such as our own fellow actuary Adrian Gore, who together with other entrepreneurs, pioneered transformational innovations in the healthcare sector.

What do you recall being the biggest challenge during your tenure – do you think it is any different now?

When I joined the profession as a student, there were no South African born black African actuaries at all in the profession, and at that time, and for some years afterwards, there had never even been a female president of ASSA - a role that fellow actuary Janina Slawski would eventually take on a few years later. The issue of transforming the profession, both in order to harness the enormous benefits of racial and gender diversity, and to address the wasteful injustice of reserved occupations (from which black people were excluded by law) that existed under Apartheid, was a huge existential challenge for a relatively small profession to take on.

Looking back, I can say that from my perspective, very significant strides have indeed been made in the area of transformation over the last 10 to 15 years. In this regard, knowing fully well that I will leave many individuals out, I would like to mention the significant contributions made in this regard by the late Wim Els, who made sure that the issue was always on the ASSA agenda, and fellow actuary and adjunct Professor Dr. Shivani Ranchod, who did groundbreaking research that helped the profession begin to understand the barriers faced by black entrants into the profession as they journeyed towards qualification. The challenge of course still remains, in that the task of finding ways to tackle the adverse effects of the deeply entrenched reality of ingrained disadvantage into which many black professionals continue to bear remains with us. We desperately need to find innovative ways to identify, and overcome, the many hidden barriers to qualification that they still face today, and which ultimately rob us of the enormous untapped potential of all too many black professionals.

Our expansion into the wider fields introduces new reputational risks for the profession, in part because the unique ethical issues inherent in those commercial

cultures may not have been sufficiently thought through. I am, therefore, occasionally concerned about the pace with which we produce professional guidance to these members of our society who work in non-traditional areas of actuarial practice, particularly those who find themselves working in professional isolation within those frontier environments. Our profession continues to be generally held in very high regard, so let us protect that hard-won reputation vigorously.

What do you believe has been ASSA's greatest achievement or contribution in its 75 years of existence?

ASSA and the South African actuarial profession have distinguished themselves on the global platform in quite a variety of ways, but especially in our consistent track record of innovative thinking in expanding actuarial involvement in what we have always rather quaintly referred to as the wider fields. The early work of actuaries in modelling and pricing dread disease cover eventually mushroomed into deep actuarial involvement across the healthcare sector and then, most recently, created significant roles for actuarial involvement in a number of even wider fields, including banking. I also believe our recognition of the importance of embedding normative skills awareness and training into the core of our education system will ultimately prove to have been a critically important development for the global profession.

The greatest achievement? I would place the fact that it was the South African actuarial profession, led by fellow actuary Michael Tichareva, that spearheaded the thinking behind the development of a banking stream for actuarial practice. The fact that, as ASSA, we went on to develop the Fellowship in Banking from scratch, as a global first, is perhaps the one thing that makes me proudest of all to be a South African actuary. It really makes my heart sing.

What are your hopes for ASSA and the actuarial profession in the future?

I believe my ultimate hope is that both the profession and ASSA would continue to be relevant to the needs of South Africa. This will require us to remain alert to changes in the risks faced by our society and to update our skills constantly in our understanding, modelling, and management of those risks. I would also love to see the profession of the future leveraging intentionally on the absolutely awesome power of diversity, and am waiting with bated breath for us to demonstrate that AI can never compete successfully with the infinitely vast innate human capacity for innovation.



RENCHÉ JANSEN

(Financial Accountant at The Actuarial Society of South Africa)

Can you please tell us a bit about yourself and your history at ASSA and describe the society at the time?

I have an Honours BCom degree in Financial Accounting. In 1998, during ASSA's 50th year, I applied for the position of Bookkeeper which was a half-day position at the time. To give some context, I still had to use a fax machine to get my CV to Wim Els, who was the Executive Director of the Society at the time (For the younger generation that might not know what a fax machine is, remember, Google is your friend). My first day at the Office was 18 January 1999. The permanent staff comprised of three people, Wim, Leonie and then myself in a half-day position.

What has been the most notable change that you have witnessed from the time you first arrived at ASSA up until now on its 75th anniversary?

Our offices were at Old Mutual in a tiny glassed in box that barely accommodated two desks (and a fax machine). Wim had his own office filled to the brim with files papers and boxes of information. He had a small path leading between these items to his desk... everything was paper based and, thankfully, Wim had an extraordinary ability to retrieve any document within seconds. We still had to print membership and other forms that were then posted via the South African Post Office (snail mail.) At that stage, the accounting system was manual and all transaction were recorded by hand in large green journals. An electronic system was acquired, and my first task was to transfer all the transactions from the green journals to the new system. The three of us did everything, from finance,

to membership, to UK based exams, as well as conventions, seminars, and events. At this time, the Society was still affiliated to the Institute of Actuaries and the Faculty of Actuaries in the UK.

What has been the most notable change that you have observed from when you were at ASSA up until now on its 75th anniversary?

I am proud to say that the major technological changes are the most notable changes. In my view, the quality of the electronic progress and the way that it was done by ASSA has placed us amongst the best of societies and organisations that we deal with daily. For example, the old style of timeous and costly printing of all forms versus the online versions we work with today, the costly mailing versus emailing (everything had to be posted to members in the "old" days) - examination registration forms were either posted or faxed or hand delivered to the Society, and the risk of misplacing important documents was always present. A further example is that all exam registrations were recorded on Excel spreadsheets on a desktop computer and stored on stiffy discs that had a tendency to corrupt, and all of the original exam documents had to be posted to the UK. A further historical process was, of course, the payment in cheques and cash. This was another area of great concern. So in terms of the technological changes, for me, the eager manner in which ASSA embraced all of these new electronic ways of increasing accuracy and productivity was a sign of a real forward thinking approach and it was and continues to be hugely exciting to work in an organisation that enthusiastically embraces the future.

What are your hopes for ASSA in the future?

That ASSA will continue to grow in leaps and bounds in order to be the premier international actuarial body.



CONRAD BACKEBERG

(ASSA Education Executive and Council Member)

Can you please tell us a bit about yourself and your history at ASSA such as the year you started, the position(s) you filled, and then describe the landscape of the society at the time?

I am Conrad Backeberg, a Fellow member of ASSA. I am not exactly sure when I joined ASSA, but it must have been around the same time that I joined the Institute of Actuaries in the UK. I joined the Institute of Actuaries in 1981, during my last year at the University of Cape Town ("UCT"), when I completed a B.Sc. (Hons) degree in Operations Research, after completing a B.Sc. in Actuarial Science and Statistics in 1980 also at UCT. I decided to write some of the Institute of Actuaries examinations during the year of full-time study at university for my Honours degree, in those subjects where I did not get my exemptions during the B.Sc. degree at UCT. Fortunately, I was successful in passing a few of the Institute of Actuaries examinations in 1981, and this motivated me to continue with the professional examinations when I started working for Sanlam, who had supported me with a university bursary during my three years studying towards the B.Sc. degree at UCT, at the beginning of 1982. So, I must have joined ASSA either when I joined the Institute of Actuaries in 1981 or in 1982, when I started working.

ASSA in those days was a different organization to the one we are familiar with now. There were no full-time staff members, and the secretariat of ASSA was supplied on a rotational basis by Sanlam and Old Mutual.

After completing my examinations with the Institute of Actuaries in 1987, I attained the Associate qualification with the Institute of Actuaries and, in those days, you needed to complete another year of work experience

before you could become a Fellow member, which I then attained in 1988. I also became a Fellow member of ASSA, but the FASSA certificate was only issued to me in September 2010, when ASSA granted the FASSA qualification to all the FIA's and FFA's that had already qualified through the Institute and Faculty of Actuaries.

I left the corporate world of work as a full-time employee around 2010 and started focusing on self-employment opportunities as an independent director of companies and strategy consultant around 2010. Garth Griffin, who was President of ASSA at the time, invited me in 2012 to get involved in the ASSA Education Board structures. I agreed to join the Education Board and serve as Chairman of the Accreditation Committee. I also agreed to be the ASSA representative on the International CERA Treaty Review Panel. This voluntary work then eventually led to me joining the ASSA office staff on a part-time contract basis as Education Executive and I have thoroughly enjoyed this role for the last six years or so. I will be "retiring" at the end of this year from my role as Education Executive at ASSA.

What has been the most notable change that you have witnessed from the time you first arrived at ASSA up until now on its 75th anniversary?

When I qualified as a FIA, there were only about 150 Fellow level actuaries working in South Africa and sadly, around the same time I qualified, I recall that there were fewer than 5 female Fellow level actuaries working in South Africa. How the landscape has changed since then, in terms of the greater diversity of our profession, and this greater diversity is definitely for the better!

Another feature of ASSA in those early days of my membership is how the annual ASSA Convention followed a different (more daunting to a young student or professional) format. If you presented a paper to the annual convention, you had to find a "first respondent" speaker, who would challenge the content of your paper and often present an opposing perspective! I recall listening to many fascinating sessions, where the healthy debate between two senior actuaries taught me a lot about healthy professional discourse on sometimes very complicated and ambiguous issues of the day. I find that today, we have lost a bit of that

healthy professional discourse in our annual ASSA Convention sessions.

What do you recall being the biggest challenge when you started – is it any different now?

Being an actuarial student when starting work in those days was a great challenge, particularly when preparing for the final Fellowship examinations in the four areas of actuarial practice that all had to be passed then, namely, Investments, Life Insurance, General Insurance and Pensions. There was no clearly specified syllabus with clearly set out learning objectives. Mostly, there was no prescribed textbook or study material. ActEd, as we know it today did not exist and the local South African universities did not in those days support the final subjects required to attain your professional designation. We would receive some suggested study material (mostly, named Monographs) and it was expected of the student to read widely to cover what could be assessed in the examinations. You were left to study by yourself and find your own study support network amongst your fellow students, mostly those that you worked with or others you would know from your university days. We focused on writing old examination papers and informally sharing notes within our network of students on how best to develop examination techniques that would ultimately lead to success in those challenging exams.

I did enjoy one very special privilege in that my employer at the time, Sanlam, offered me the fantastic opportunity to study for 9 months full-time overseas in London to prepare for my final Institute of Actuaries examinations. Although the support was not much better, I was able to attend one tutorial session per week for each of the two subjects I had entered (Life Insurance and General Insurance), offered by a course leader who was a specialist in that area of actuarial practice. That experience, living and studying in the UK for a period of 9 months, was definitely a big help in me overcoming the challenges we faced as students studying part-time towards our professional qualification as an actuary.

I would say that the support offered to actuarial students now is significantly improved from the time when I was studying. Although it is still very much up to the students themselves to put in the effort

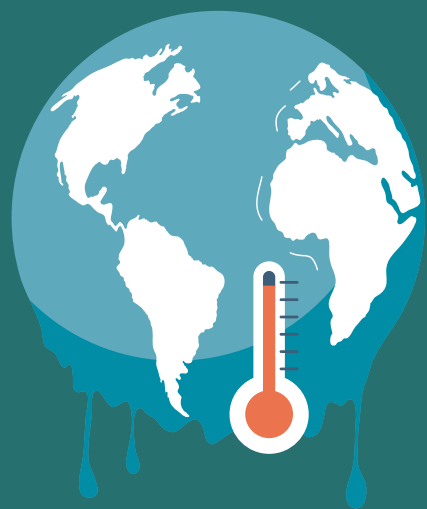
to pass the challenging examinations, the various options available to support students, from accredited university programmes to the many education support initiatives offered by ASSA and via ASSA by ActEd, are much better than we enjoyed.

What do you believe has been ASSA's greatest achievement in its 75 years of existence?

ASSA has grown into a globally recognized quality actuarial professional association brand that can, in my humble opinion, compete with any of the global actuarial professional association brands. ASSA and its members are globally recognized by our global peers for the quality of ASSA's pre-qualification education and post-qualification life-long learning, and for the quality of and innovative approach to actuarial professional practice. I also believe that ASSA can be proud of the ongoing contribution of its members to South African society in the public interest, in the various areas and activities of actuarial practice.

What are your hopes for ASSA in the future?

I fundamentally believe that actuaries have a profoundly purposeful contribution to make to society in many diverse areas of societal public interest. My hope is that ASSA can continue to play a central and pivotal role in preparing professional actuaries practicing in South Africa for these contributions and supporting the members of ASSA in fulfilling the professional promise towards making this societal contribution. In saying that, I am also keen to see much more diverse activity in areas that may at present not seem obvious to us as actuaries. I am convinced that our potential roles in supporting sound and sustainable social planning and development beyond the purely financial risk management components are not yet fully exploited by actuaries. I also see great opportunities for collaboration with other subject matter experts, where the contribution by actuaries can make a substantial difference to achieving better outcomes in resolving societal challenges. The future of professional actuaries looks great and exciting, and ASSA can continue to grow and support its members in realizing this future. 🇿🇦



ACTUARIAL SKILLS

critical in assessing the risks
of global climate change

THE ROLE OF THE ACTUARY IS TO QUANTIFY AND MANAGE FUTURE RISK TO ENSURE THAT ORGANISATIONS ARE PREPARED TO MANAGE POTENTIAL CHALLENGES.

Environmental and social risks and their potential effect on a company's bottom line are no exception. For example, global climate change affects life insurers because it influences mortality rates through an accompanying increase in extreme weather events, with resulting effects on vector-driven diseases, water, air and food qualities, migration and civil conflict.

Actuarial skills are therefore increasingly recognised as critical in assessing the risks of global climate change, with actuaries becoming involved in a number of critical projects. In the United States and Canada, for example, the actuarial profession has recently launched the Actuarial Climate Index to measure variability in climate. Work on the extension of this index to cover Europe is already underway.

In the UK, the Institute and Faculty of Actuaries (IFoA) has addressed the issue of claims for damages caused by contributors to climate change. The IFoA has also signed a statement by the Overseas Development Institute (ODI) urging the G20 Governments to honour their long-standing commitment to phase out fossil-fuel subsidies.

A working group of the International Actuarial Association (IAA) is currently researching the effects of global climate change on mortality. A member of this working group has further been selected as part of an expert panel advising the European Commission on policies targeting sustainable finance, specifically within the context of the Capital Markets Union.

The IAA is also involved in the Warsaw International Mechanism, tasked by the United Nations Framework Convention on Climate Change (UNFCCC) with risk-management approaches to loss and damage associated with the adverse effects of climate change, including slow-onset impacts such as sea-level rises.

Both the IAA and the IFoA have submitted responses to the Task Force on Climate-Related Financial Disclosures established by the Financial Stability Board, an international body that monitors and makes recommendations about the global financial system.

Furthermore, the IAA is working on the regulation and pricing of carbon emissions, the effects of climate change on government budgets, and the usefulness and limitations of insurance as it relates to the effects of climate change on vulnerable populations. In light of the Paris Agreement, the IAA has already drafted a paper on the monitoring of progress towards the stabilisation of CO₂ concentration in the atmosphere.

The IAA is additionally collaborating with the United Nations Environmental Programme's Principles for Sustainable Insurance and with the Organisation for Economic Co-operation and Development on disaster recovery.

It is clear that the actuarial profession sees the need to embrace all three domains of the triple bottom line - environmental (or ecological), social and economic. In recognising this, the IAA is also extending its knowledge on ecological economics and on formulating measures that can be used for environmental, social and economic accountability by entities in both the public and private sectors.



**ACTUARIAL SOCIETY
OF SOUTH AFRICA**



JANINA SLAWSKI

A focused high achiever, moving
from humble beginnings to leading
with passion and humility -
interview with Lydia Mutepefa

May you share a glimpse of your personal background with us? We would love to hear about your upbringing, where you grew up, and any cherished memories or experiences from your childhood that have had a lasting impact on you.

So this is a long story that I have told many times, and it definitely goes down better with a glass of wine, especially for the person I am sharing the story with yet again! I was born in Zimbabwe (Rhodesia at the time), and I was the fourth and last child to join the family. My father was Polish, and he had come to Zimbabwe to re-join his parents, after the Second World War, where they were living in a little gold-mining town now called Kadoma. He was born in a village in Poland that is now in Ukraine, and he and his family were taken to Siberia after the Russians invaded Poland in 1939. As you would expect, this means that I have a lot of empathy for those affected by the current conflict between Russia and Ukraine.

The family was released under an amnesty in 1941, and he and his older brother were separated from the family when they joined the Polish cadets to follow the British army through their campaigns in Northern Africa over the rest of the war. He had some great memories of seeing the pyramids in Egypt, but also of the challenges of having little in the way of schooling, and having to learn to speak English on the fly. He was demobbed, at the end of the war, to London and learned how to be a “fitter and turner” (you might need to look up what that is!) as well as a baker. The family asked that he join them in Africa to help to fill the family coffers, and so he travelled to Kadoma, and continued his baking career there.

In Kadoma, my father met a little (she was only 5' ¾" in height – you might need to look that up also ...) Irish school teacher. She had come from Waterford in Ireland to Kadoma to teach at the mining school. They got married and soon had their first child, but, after various challenges, including both my father and sister contracting tuberculosis, the family moved to Harare to get medical treatment, and to start a new life in the big city. My father changed career by joining Greatermans Department Store, rising to the level of a senior buyer who travelled internationally to source product, no doubt helping to inspire my love of travel.



By the time I arrived, my family had successfully come through many challenges, and I was lucky enough to be the youngest and most spoiled of my siblings (although I will always deny the latter ...).

I had a truly magical growing up in terms of being exposed to the many things that I Loved, including a menagerie of animals and the opportunity to study art all the way up to A-level. We had guinea pigs, rabbits, tortoises, bantams, chickens, a white mouse and a hamster, and I had a playground at home linked to my mother's nursery school – what more could a child ask for!

I did also manage to fit in some technical schooling and ended up writing 6 A-levels with results of 3 A's and 3 B's, including my beloved Art, as well as Pure and Applied Mathematics, Physics, Chemistry and Biology. You might think I was an over-achiever, but, actually, I was just desperate to get a bursary to study at the university of my dreams. I was unsuccessful in getting a bursary, and one interview for a bursary with a mining company was particularly memorable in terms of their comment about “just wanting to meet a young lady who wanted to study engineering”. I never had a formal reject response from them.

My most lasting memories of my childhood years are of the joy of growing up in a loving family with exposure to so much that I enjoyed, including my animals and my Art, but also of resilience in the face of life's challenges. My family was made to be tough, and that forged my spirit and drive to succeed in life. A very necessary trait that all of you who have faced the challenges of actuarial exams will know well.

How did you discover the actuarial profession, and what inspired you to become an Actuary?

You might have been puzzled by my reference to engineering rather than actuarial studies in the above. When I was considering the career that I wanted to follow, I was keen to study anything that included Pure and Applied Mathematics, as well as Physics. My first wish was a career that included all three and I, therefore, focussed on options in the engineering space, specifically electrical engineering. In the absence of a bursary, my parents paid for my first year as an electrical

engineering student at UCT, but on the understanding that I would need to get a bursary for the subsequent years. Unfortunately, it soon became clear that I would need to seek an alternative degree where bursaries were more likely to be forthcoming, in particular for a profession that had started to consider the benefits of diversity in membership. I, therefore, considered my alternative option, which was to become an actuary. I knew about the actuarial career initially through an article that I read in the Fair Lady magazine ... although obviously I did do more “technical” research before deciding that this was indeed an appropriate career for me, especially in terms of maintaining my exposure to Mathematics, although unfortunately losing any exposure to Physics (although, luckily, I did retain some key learnings from my Physics studies such as how to change a plug and how home appliances work!).

I have very fond memories of the many members of the actuarial family that I have had exposure to over the years, but must make special mention of Paul Truyens and Irene Petrony (our most recent honorary member) who I regarded as my “actuarial parents”, specifically because they believed in me enough to give me the bursary that I needed to undertake my studies, and my first job when I joined Southern Life after graduation.

I threw myself enthusiastically into my UCT actuarial studies under the oversight of Dr Rob Dorrington as head of the UCT actuarial department. He was terrifying for us poor students, especially in the early years of our degree when he seemed to be trying to scare us away by emphasising how hard our studies would be (and how true that turned out to be ...). For those of us that survived to our final year, though, trying to solve the “beer problem” was one of the highlights, and I recall we all enjoyed a beer with the prof, even if we hadn't all managed to solve the problem he had set....

At UCT and in my actuarial class, I met and started dating my partner Mark, who continues to be my partner today. I managed to qualify first in my year before I had even started work at the tender age of 23, and Mark qualified second. We were a very driven actuarial partnership, although he maintains that he chose the superior actuarial career as a life actuary, whereas I took a “ramble through the actuarial countryside”.

What fascinated me about being an actuary was the ability to solve puzzles. Compound interest, life contingencies, commutation factors, Redington's theory of immunisation, etc. – all were elements of an actuary's ability to distil complex issues into elegant solutions. I found, and continue to find, this magical

I have always loved doing puzzles, and I had found a profession that gave me the opportunity to do this every day and get paid for it!



I notice that you have considerable experience in Investment Consulting and have scaled up to positions of leadership. May you share what inspired you to pursue a career in this field? What factors or motivations led you to choose investment consulting as your professional path?

In my ramble through the actuarial countryside, I have had exposure to a wide variety of positions across the actuarial spectrum ranging from corporate actuarial, embedded value calculations, AIDS modelling, group risk benefits, employee benefits, asset consulting, short term insurance, asset management, marketing, and where I have currently landed in Investment Consulting. I believe this makes me a well-rounded actuary (and I am not talking about any “middle-aged spread” that has developed over the years ...). I have had exposure to both the asset and liability sides of the actuarial world, and I believe this really assists me in understanding client challenges that, of necessity, require an understanding of both.

As the first female president of the Actuarial Society in 2003, your achievement is truly groundbreaking. I am curious to know about the challenges you faced while accomplishing this remarkable feat. Could you please share some of the obstacles you had to overcome during your journey?

I was truly privileged to be appointed as the first female president of the Actuarial Society in 2003. Whilst I was pleasantly surprised by my nomination and felt truly honoured to be considered for the role, I really did not actually expect to be voted in. Imagine my shock on the day when the results were announced – it really was time for me to step up and follow the calling that had come to my door.

I became president at a particularly challenging time for the profession not only in South Africa, but also in the United Kingdom. The latter was facing the “Morris Review” following the collapse of Equitable Life, and the South African profession was under review for various reasons, and especially in respect of past uses of, and the proposed process to, distribute surpluses from retirement funds. It was a time when actuaries were facing many hard questions in terms of competency, as well as whether they had been acting in the public interest in some of the work undertaken.

Some of my most memorable interactions in my time as president were with the Financial Services Board as it was then called, with COSATU representatives, with the Presidents of the various international actuarial associations who came to South Africa for the International Association of Actuaries meeting, and the many, many actuaries who contributed to the successful work of ASSA in my two-year period as president. Luckily, over my term, I was supported by a strong contingent in the ASSA office, and specifically the late Wim Els, as well as by my predecessor Joubert Ferreira and the ASSA Council. Some of the robust conversations during this period lead to the establishment of the Actuarial Professionalism Committee, and revisions to the Disciplinary process to ensure that lessons learned could be well embedded to ensure the enhancement of the reputation of the profession going forward.

I should also mention the support I received during my time as president from my partner Mark. Those who know him well can imagine how supportive he was ... let’s just say he took the opportunity to make sure I was aware of all the challenges he faced as a member of the society ...!

What are some of the key lessons you learnt in your experiences as a leader?

I have enjoyed a wide range of experiences during my career as an actuary. One of my key passions has been an absolute thirst to remain on a continuous learning journey. There have been very few times where I have felt that I have known all of the angles of a problem in front of me, and where I could not gain from pausing and considering the input of those around me. And not only the more experienced, but also those with new and fresh thoughts perhaps less jaded from having “seen this all before”. I am always open to learning more – in fact I have just embarked on a coaching journey (despite my partner Mark believing that it is a bit late for me to think I can learn and change my ways ...) which I am really enjoying. It is refreshing to step out of the hurly burly of the world to identify how things could be achieved in a more efficient way.

I have learnt, over time, of the true joy of sharing your experience with others and watch them grow and blossom as they take their learnings and apply them in ways that are new and beneficial to their own challenges. I feel like a very proud “mama bear” when I see those that I work with blossom, but I definitely feel the “mother tiger” emotions when I see the need to defend my team ...

Drawing from your wealth of experience, what key qualities do you believe are essential for someone to become an outstanding leader?

I believe that it is imperative as a leader to remain humble – we can never know everything, and we can always learn from the experiences as well as the fresh perspectives of others. I believe that outstanding leaders take into consideration the facts and experiences in front of them, act decisively, but then are willing to be flexible to review decisions to continue to achieve a positive outcome. I believe outstanding leaders are authentic, and truly care about the people they work with. There are not “tick boxes” when it comes to working together

as a team, only truly appreciating the value that each individual adds, and harnessing the potential of each individual that will lead to ultimate success. And that success is achieved through the efforts of a team pulling together rather than through only the success of individuals.

As a leader, what characteristics or attributes do you value most in your team members and in your subordinates?

I love working with a team that seeks to work together to achieve common goals. Some of my most fulfilling experiences over my career have been in building successful teams. To take a team that is not functioning optimally, perhaps somewhat demotivated or lacking clear direction, and working with them to turn things around is truly wonderful to experience. I love working with a team that is deeply motivated to succeed, with every team member feeling empowered and enabled to be their best. In order to achieve this, the team members have to be willing to step up and take responsibility, to work collaboratively with their colleagues, and to delight in the success of the team and each other rather than only their own success.

How would you say the actuarial profession and ASSA have evolved over the past two decades? How do you think the profession may evolve in the next few years?

When I look back on the actuarial profession as it was when I was president, and where it is today, a few significant changes stand out. Back then, we used to talk about “traditional” actuarial work and “wider fields”. Over time the scope of actuarial work has broadened so that it is now much more common for actuaries to be accepted and to be succeeding in a wide range of roles. What were regarded as “wider fields” are now more often regarded as mainstream.

As a profession, I believe that we have become a lot more conscious of our role in terms of working in the public interest, of a need to act with integrity, and our ability to add value to the ultimate recipients of the work that we do, for example policyholders, members of retirement funds, and the general public. I’m not

saying that these weren't previously considerations for actuaries, but they have now had to become foremost in our minds.

The other major change I have seen has been the growth in the numbers in the profession, as well as the change in diversity of its profile in terms of race, gender and age. To go to an ASSA Convention today (or at least at the last Convention pre- COVID given that we are not quite back to the in-person volumes) and see the packed halls of the Convention Centres is truly overwhelming. And it is especially humbling to realise that the majority of people probably have no memory of you being president – the baton has definitely been handed over to the young and diverse current members of the profession, ready to take on the new challenges that face us.

Another significant change has been the development of ASSA as a professional organisation. Having set up our own qualification and our own exams, we have really graduated to being a proud, standalone organisation, that actuarial societies across the world can admire. Gone are the days when we were sitting at the table with other much larger organisations, with a voice that punched above our weight, but still being reliant for qualifications and especially exams set by the larger organisations.

And ASSA is now a professionally run organisation with a competent team run by a CEO. Whilst I enjoyed the highly competent and dedicated support from the late Wim Els and his smaller ASSA team, the level of support that can now be provided has truly progressed in leaps and bounds.

Looking forward to the next few years, I expect the trends of actuaries being involved in a broader range of roles, a consciousness of our public interest role, and an increasing level of diversity and especially a strong voice coming from the younger members of our profession to continue. I believe that ASSA and its members are well positioned to take advantages of opportunities for actuaries to make a difference through innovation and solid contributions to the financial stability of the entities that we work with, for the ultimate benefit of those who rely on these entities.

Could you kindly provide our readers with a glimpse into your daily routine during weekdays? We would also love to learn about your interests and

Whilst I enjoyed the highly competent and dedicated support from the late Wim Els and his smaller ASSA team, the level of support that can now be provided has truly progressed in leaps and bounds.

hobbies that fill your weekends with joy and fulfilment.

I greatly increased my exercise levels during lockdown (to help avoid the middle- aged spread ...), and now exercise for 1.5 hours most days. This therefore takes up quite a bit of my daily routine both during the week and at weekends. During the week I wake up most days at 05:30 to get through my exercise and get to my home office desk by 08:00 or so. Since lockdown I have (unfortunately) got used to living in back-to-back MS Teams calls each day, and these can often fill my day until 17:00 ...

And then it's time to start working, unfortunately often quite late into the night. After all this pressure of the week, my weekends are spent on some serious "rest and relaxation" i.e. sleeping late, long soaks in the bath, lots of cooking, reading and watching TV, and a few afternoon snoozes.

Two of my greatest loves are cooking and travel. I have a very long list of places I want to visit, and whilst I have got through many of these, there is still a long list remaining. Two of my most recent journeys (at least before and after COVID) were to Russia and to Egypt – I do like to quote that I was the first in my family to voluntarily go to the first, and to experience the latter without having to enlist. Other countries I've travelled to for fun include Vietnam, Thailand, India, Mexico, Turkey, Morocco, Laos, Cambodia, Ecuador, Peru, Chile, China and Malaysia ... and that doesn't include the many countries I have travelled to for work and during my time as president. When I travel, I love to sample the local cuisines, and my best souvenirs are the cook books and recipes that remind me of my travels – who needs photographs when you can cook and remember the food! 🍴



TASSIUS CHIGARIRO

a focused, resilient, and tenacious leader with great passion for winning through delivering – interview with Lydia Mutepfa

May you kindly walk me through your early years? How did you come to discover and pursue the actuarial profession?

In my early years, growing up in Zimbabwe, Actuaries were an unknown profession. I was a passionate mathematician who enjoyed problem-solving throughout my school years. I enrolled at the University of Zimbabwe to pursue a Bachelor of Science degree in Mathematics. It was during this time that I met an Actuary from Old Mutual named Paul Lacock on a career event at the Faculty of Mathematics and Statistics. The event was one of their campus engagements, meant to raise awareness about the actuarial profession. It wasn't too long after that I met the first generation of Zimbabwean student Actuaries, Clement Chinaka and Douglas Hoto.

The insights into the field of actuarial science captivated me, and I was intrigued by the possibilities the profession offered. I had completed my first year with a distinction, therefore Old Mutual offered me a scholarship for my studies and the opportunity to join them upon completion of my Honors Degree. I was inspired by this opportunity and went on to complete my BSc Hons in Mathematics - first class, after which I went on to work for Old Mutual.

Considering that you began your journey in the actuarial profession while simultaneously working, what advice would you offer to individuals who need to balance studying with their work commitments?

Studying while working is often considered challenging, but I strongly believe that with genuine determination, it is indeed achievable. In fact, I find it advantageous to study while working in the industry where you can simultaneously apply the concepts you learn. There is some interaction between work and studies that allows for immediate application of theoretical knowledge in practical situations, so that one's growth becomes evident as one progresses.

My advice to anyone in a similar situation is quite simple: If you really want to succeed in something, then make the worthy sacrifices. There is a well-known saying that resonates deeply with me: "If you do what others are not willing to do today, you will be able to do what others cannot do in the future." The time of studying to become a qualified Actuary is much shorter than the decades of satisfaction ahead, paving the way

for long-term fulfilment.

Therefore, embrace the opportunity to combine work and study, and relish the satisfaction that comes with witnessing your own professional development.

Could you please provide some details about your experience and insights gained during your time working as an investment actuary in Glasgow? I'm particularly interested in understanding the responsibilities and key takeaways from your role in this field.

I somewhat stumbled into the Investment profession; at the same time, it was not a surprise. I was very quick to complete the first half of the Actuarial exams without a "fail" and became Part-Qualified after only 3 sittings, from no exemptions. I took on the challenge of studying Investments as my first specialisation subject and failed it. This experience profoundly impacted me, and defined how I deal with my setbacks even till this day. I face my weakness head-on and with one mission in mind, to win. I therefore set my sights on becoming an Investments actuary.

I did my fellowship in Pensions and qualified as such, simply because I worked in that field, but I brought Investments into my field by designing Liability Driven Investment solutions. I was always in pursuit of establishing a relationship between assets and the liabilities they back, mainly to serve my clients who had suffered the impact of the 2000 dotcom crash. To address the challenges I observed, I developed an asset liability model that proved instrumental in solving some of the problems at hand.

During my participation in the Young Actuaries Convention, in the early 2000s, I delivered a presentation on liability-driven investments, and doors of opportunity began to open. These opportunities paved the way for me to transition and work within the Investments profession in Scotland. Upon joining a team with only CFA charter holders, I found myself in a somewhat unfamiliar environment, despite the actuarial profession being more encompassing and all-rounded. To meet the demands of my environment, I pursued the CFA designation and qualified.

Consequently, my investment career extended beyond Scotland to South Africa. The combination of my actuarial thinking alongside the CFA qualification proved to be an asset during my time as a successful Risk-Managed

solutions fund manager. This combination of skills allowed me to approach investment management from a unique perspective, leveraging both my actuarial background and the insights I gained through the CFA program.

What guidance would you offer to individuals currently engaged in or contemplating a career in the field of investments?

Financial education holds tremendous significance as it serves as a powerful tool in one's life. The consequences of poor financial education can be severe, like those of poor health, as the latter, for many, is a symptom of such. The ability to navigate investments is key to safeguarding one's most vital assets. This field is intellectually stimulating and presents a fresh set of challenges on each sun rise, keeping one's mind ready for problem solving.

The actuarial profession, being inherently well-rounded, complements the comprehensive skill set required in the investment domain. For individuals considering a career in investments, but who have not yet qualified as actuaries, pursuing the CFA qualification may be a less challenging route to take. However, it is important to note that risk management skills, which are increasingly crucial today, are predominantly found within the actuarial training. Actuaries possess a unique aptitude for managing and mitigating risks, making their expertise highly valuable in different fields. *

In what ways do you perceive the skills and knowledge gained from your CFA qualification to differ or complement those acquired through your actuarial qualification?

The actuarial qualification provides a complete understanding of financial services, encompassing various areas such as insurance (long and short), banking, and investments etc. This wide knowledge has been instrumental in my role as a CEO, where I oversee operations across these diverse fields. The actuarial qualification equipped me with an in-depth understanding of problems.

Conversely, the CFA qualification enhanced my ability to analyze and assess the value of company stocks. It allowed me to identify the factors that differentiate one company from another, even without prior practical

I believe that the value of spending a day in a network of billionaires, learning from them, far exceeds the significance of having a million in your bank account.

experience in specific industries. The CFA qualification provided me with the exposure and expertise necessary to delve into the intricate details of the stock market and evaluate investment opportunities with a high level of scrutiny.

It is truly inspiring to see you in the esteemed position of Group CEO at Old Mutual Namibia. Your accomplishment is noteworthy, and I would be interested to know your perspective on the qualities that contribute to being an exceptional leader.

A few centuries ago, it was commonly believed that possessing a high Intelligent Quotient, IQ, was the primary characteristic of a great leader. The leader was typically the smartest among their peers. Although IQ remains important, a decade or two ago we observed a significant shift in leadership requirements. A leader needed to exhibit a new skill of Emotional Quotient, EQ. Understanding people, own-self-awareness and empathy, and how to extract the best in others have become crucial aspects of effective leadership.

Another shift is currently taking place in leadership. Social Quotient, SQ, is becoming a defining factor for great leaders. The ability to establish connections and strong networks with key stakeholders. By cultivating a network within one's sphere of influence, leaders can gain access to exclusive opportunities and valuable insights. It is this ability to forge connections and tap into influential circles that truly distinguishes exceptional leaders in today's world. My advice for anyone is to network with the right people and channel your energy towards forming valuable connections. I believe that the value of spending a day in a network of billionaires, learning from them, far exceeds the significance of having a million in your bank account.

Having gained experience in various countries, how do you perceive the differences and similarities between the actuarial industries in Africa and Europe?

The actuarial industry in Africa has witnessed a lot of expansion, providing actuaries with greater potential for growth compared to Europe, where prospects may be more limited. This has resulted in a notable rise in actuaries assuming leadership roles in Africa. Actuaries in Africa are rapidly venturing into different fields.

Conversely, the actuarial profession in Europe is well-established, well-regulated and sustainable. European actuaries hold influential positions to shape regulations to ensure that the profession is sustainable.

While the expansion of actuaries into diverse fields in Africa is a positive development, I am concerned about the long-term sustainability of the profession on the continent. Some companies have closed their actuarial departments, whereas, accounting and audit firms remain in full production mode for Accountants. It feels to me that we have branched out too fast before establishing a solid foundation for the sustainability of the profession in Africa.

May you provide a glimpse into a typical day in your life?

If you were to ask my children, they would describe my job in one word - Meetings. The normal business hours are filled with back-to-back meetings. I only have control over my schedule outside of business hours and I use those effectively.



My day begins early hours of the morning, allowing me an hour of uninterrupted time for reading, after which I prepare for the day ahead. I make it a point to read at least one book per month, particularly books on the lives of successful individuals and take lessons on how they failed and how they bounced back from their failures. I also read books on learning new skills but mostly I enjoy reading about people. By 7 am, I arrive at work and do a quick catch-up on the latest news before my Executive Assistants start dragging me from one meeting to another.

During my evenings, I take the opportunity to update on market movements that I may have missed during the day and catch-up with my family. From Friday evening until Sunday evening, I dedicate myself entirely to my family, taking a break from work and completely enjoying memorable time with them. I have a loving wife, two beautiful daughters and a young version of myself (junior), and they simply know me as Dad, no other titles or qualifications. At the end of the day, there is no success elsewhere that compensates for lack of success at home. 🚗



OPPORTUNITIES FOR ACTUARIES IN BANKING IN THE FACE OF BANK FAILURES

– by Michael Tichareva and Iain Allan

INTRODUCTION

The International Actuarial Association (IAA) Banking Virtual Forum, chaired by Michael Tichareva, published a paper, in July 2021, on Opportunities for Applying Actuarial Techniques in Banking.

This paper can be accessed here:
PLEASE CLICK HERE

The IAA Banking Virtual Forum subsequently resolved to update the original paper and to add some additional chapters and, if possible, to convert the updated and expanded paper into a book. The additional chapters cover the following areas:

- Interest Rate Risk in the Banking Book
- Market Risk Management
- Operational Risk and Resilience
- Recovery Planning

The revised paper, which the IAA Banking Virtual Forum still hopes to publish as a book, is currently work in progress, with further reviews expected in line with the normal IAA process. The additional chapters have already been reviewed by Iain Allan (United Kingdom), Deputy Chair of the IAA Banking Virtual Forum, and Michael Tichareva (South Africa and Zimbabwe).



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The banking crisis earlier this year, with four US banks, namely Silicon Valley Bank, Signature Bank, First Republic Bank, and Silvergate Bank failing in three months, and with Credit Suisse facing its own challenges in Europe, highlights opportunities for actuaries to apply their skills in banking risk management, including in the areas discussed in each of the four additional chapters.

To showcase growing opportunities for actuaries to apply their skills in banking, the IAA Banking Virtual Forum recently held a webinar on 22 June focusing on the 2023 banking crisis. The additional chapters were highlighted briefly in this webinar. The articles that follow summarise the four chapters.



YASH RATANPAL (INDIA)

INTEREST RATE RISK IN THE BANKING BOOK

by Yash Ratanpal – India

Banking as an industry has been around since the 14th century. Since then, the industry has evolved significantly, sometimes in ways that few could have imagined. While sources of income for a bank have been diversified through the introduction of various new business models such as trading, investment banking, wealth management, brokerage and so on, the core business model of a bank has remained largely unchanged in the activities of what is known as its ‘banking book’.

At the heart of it, the business model driving the banking book is relatively easy to understand. Banks generate long-term assets (loans and advances) using funds obtained via short to medium-term liabilities (deposits and borrowings). That is, banks normally ‘borrow short and lend long’ and manage the maturity transformation. Banks’ assets and liabilities are typically not fully matched.

In the banking book of a typical bank, some assets (such as some mortgages) and some liabilities (such as term deposits) have pre-determined interest rates that are fixed until maturity. To limit interest rate risk, fixed rate assets are likely to be financed by fixed rate liabilities. In Denmark, long-term fixed rate mortgages are financed by covered bonds issued to long-term investors. In the US, long-term fixed rate mortgages are sold to Government Sponsored Entities such as Freddie Mac and Fanny Mae and are often securitized.

A large part of the banking book of a typical bank is likely to be in the form of floating rate assets and liabilities. Interest rates may be tagged to a benchmark rate (such as LIBOR, up to end of 2021) and may be repriced (re-set) at pre-determined periodic dates. Alternatively, interest rates may be set by the bank and changed by the bank



at any time, subject to giving an adequate period of notice. Funding a floating rate asset with a floating rate liability with identical sensitivity to interest rates leads to minimal interest rate risk.

In the real world, banks would rarely use a borrowing vehicle that would exactly mirror their floating rate loan portfolio due to lack of availability of such borrowing instruments. Hence, banks tend to fund floating rate loan portfolios with floating rate liabilities that don’t perfectly mirror the sensitivity of floating rate loans they are intended to fund (e.g. a 5-year floating rate loan funded by a 5-year floating rate bond, where the floating rate bond is not tagged to the same benchmark) or with a mixture of floating and fixed rate liabilities (e.g. a 5-year floating rate note funded partly by a 3-year floating rate bond and partly by 5-year fixed term deposits).

This typical mix of the balance sheet of a bank makes the banking book vulnerable to adverse changes in interest rate regimes from two perspectives: earnings perspective and economic value perspective.

- **EARNINGS PERSPECTIVE:** If floating rate assets and liabilities are not tagged to the same or a very similar rate benchmark i.e. if they respond differently

to changes in interest rates, this could lead to uncertain net interest income and earnings.

- **ECONOMIC VALUE PERSPECTIVE:** Adverse changes in interest rates can significantly deteriorate the net worth / economic value of a banks’ balance sheet.

Historically, most banks across the globe have relied simply on approximate and traditional methodologies such as traditional gap analysis and duration gap analysis based on parallel interest rate shock scenarios to quantify Interest Rate Risk in the Banking Book (IRRBB)

The table below illustrates key differences between EVE and NII as measures to quantify IRRBB:

Criteria	EVE	NII
OUTCOME	Measures changes in the net present value (NPV) of the bank’s assets, liabilities and off-balance sheet items, subject to specific interest rate shock and stress scenarios.	Measures changes in future profitability within a given time horizon, affecting future levels of the bank’s own equity capital.
ASSESSMENT HORIZON	Long term measure of risk, which reflects changes in value over the remaining life of the bank’s assets, liabilities and off-balance sheet items, i.e. until all positions have run off.	Short to medium term measure of risk (3-5 years). Does not fully capture those risks that will continue to impact profit and loss accounts beyond the period of estimation.
NEW BUSINESS ASSUMPTION	Calculated on a run-off balance sheet. Considers the NPV of repricing cash flows of instruments on the bank’s balance sheet or accounted for as off-balance sheet items.	Usually calculated on a constant balance sheet i.e. assume rollover of maturing items and / or dynamic balance sheet (new business projections).

Management of interest rate risk in the banking book is an area where actuaries can play a significant role, as the approaches used are familiar to actuaries. This is enhanced with the modern age of computing and big data processing.

The era of modern age computing and big data processing has made the IRRBB evolution more than just an ambitious theoretical exercise on an Excel spreadsheet. Banks have started realizing that they cannot conduct meaningful IRRBB analysis in a reasonable time frame without overhauling their existing technical infrastructure and legacy systems and spreadsheets.

Today, distributed big data processing and parallel computing have made it possible for large banks to measure IRRBB using a range of sophisticated metrics covering millions of banking book exposures, across several interest rate scenarios, at lightning speed.

The potential benefits of moving to new-age technologies are as follows:

- Significantly reduced turnaround time for cashflow generation
- Simultaneous processing of several parallel and non-parallel interest rate scenarios

from an earnings and economic value perspective.

However, the revised guidelines on IRRBB by the Basel Committee on Banking Supervision (BCBS) led to a paradigm shift in measurement methodologies used by banks to quantify interest rate risk. Banks have now been asked to use net interest income (NII) and economic value of equity (EVE) based on non-parallel interest rate scenarios and macro-economic behavioural models to quantify IRRBB from an earnings and economic value perspective respectively.

- Ability to practically conduct stochastic term structure modelling and Monte Carlo simulations
- Robust calibration and granular application of behavioral models
- On-demand reporting at desired level of granularity with deal level attribution and drill-down analysis.

In conclusion, IRRBB is a double-edged risk. It simultaneously impacts a bank’s net worth and its future earnings. If a bank tries to maximize its economic value by minimizing the repricing gap between assets and liabilities, it could reduce its future earnings. Conversely, if a bank is willing to accept a degree of repricing gap between its assets and liabilities, to increase its earnings, it could reduce its economic value. Hence, effective measurement and management of IRRBB requires a blend of both science and art.

Banks that manage IRRBB effectively and treat it as more than just a checkbox exercise can optimize their balance sheet design and, as a by-product, achieve strong economic value resilience and stability in future earnings irrespective of adverse changes in interest rates. Actuaries can play a significant role in the process to assist banks accurately measure and quantify IRRBB.



LAWRENCE HABABBEH
(JORDAN)

MARKET RISK MANAGEMENT

by Lawrence Habahbeh – Jordan

The Basel Accord was introduced in 1988. Market risk was added to the Basel regulations in 1996: banks were allowed to quantify their market risk either using a prescribed standardized approach or, subject to regulatory approval, by using their own internal models. Various shortcomings in the market risk regulations became apparent in the 2007-08 banking crisis. These were initially addressed in 2009 in what became known as Basel 2.5.

Subsequently, from 2012, the Basel Committee on Banking Supervision (BCBS) embarked on a fundamental review of the trading book (FRTB). In 2016, the BCBS issued a paper Minimum Capital Requirements for Market Risk. Three years later, in 2019, the BCBS issued a revised version of this paper. These FRTB papers clarified the boundary between a bank's banking book and its trading book and made a number of changes to the measurement of market risk under the standardized approach (SA) or under the internal models approach (IMA).

When the BCBS issued the revised version of Minimum Capital Requirements for Market Risk in 2019, it also issued a useful Explanatory note on Minimum Capital Requirements for Market Risk. This paper explains the evolution of the BCBS market risk regulations from Basel 2.5 to the revised version of the FRTB paper. In addition, the BCBS issued a very short summary in The Market Risk Framework in brief. Within the Basel Framework (which extends to 1879 pages), the calculation of Risk Weighted Assets (RWAs) for market risk is covered in sections MAR10 to MAR99, to which reference is made in this chapter. In the EU, these



regulations are made effective through the Capital Requirements Regulation (CRR).

The Fundamental Review of the Trading Book (FRTB) is a comprehensive suite of capital rules developed by the Basel Committee on Banking Supervision (BCBS) as part of Basel III, intended to be applied to banks' wholesale trading activities. Finalized in January 2016 as the Minimum Capital Requirements for Market Risk, it aims to address a number of identified shortcomings in the existing Basel 2.5 framework, in particular: (i) an insufficient trading book/banking book boundary; (ii) the weakness of the Value at Risk (VaR) measures (which do not include "tail risks" of extreme losses); (iii) the need for more coherent and comprehensive risk capture (including market liquidity under stressed conditions); and (iv) the need for the standardized approach (SA) to serve as a credible fallback for the internal models approach (IMA).

Originally, the revised framework was scheduled to be implemented as final rules under domestic legislation on 1 January 2019, with regulatory reporting under

the framework becoming a requirement from 31 December 2019. However, on 7 December 2017, the Basel Committee's oversight body, the Group of Central Bank Governors and Heads of Supervision (GHOS), announced a delay in its implementation until 2022. In the EU, FRTB will be implemented as part of the Revised Capital Requirements Regulation (CRR II), published in November 2016.

Events such as the banking crisis of 2008 and the market volatility resulting from the COVID-19 pandemic have emphasized how critical it is for banks to hold adequate capital to protect themselves against unforeseeable adverse market movements. In response to the 2008 banking crisis, the Basel Committee on Banking Supervision (BCBS) undertook a comprehensive review of market risk requirements and introduced a sweeping set of reforms in the form of FRTB to address the potential systemic risks arising from such unprecedented levels of market volatility.

FRTB is expected to create changes in capital requirements, business strategy and overall risk architecture for global financial institutions. In the lead up to the implementation of the new regulations, banks are required to implement more sophisticated calculations for market risk capital under the revised standardized approach (SA). Larger global players that opt to go for the internal models approach (IMA) to optimize capital requirements will also need to ensure compliance with complex internal model requirements,

including comprehensive approval processes. For UK firms, this deadline is likely to be January 2025. Banks, therefore, need to ensure that their FRTB programs are now a key strategic priority. This implies allocating sufficient budget and resources to ensure that the required implementations are not only fully compliant with supervisory expectations, but that they also result in optimum capital requirements across all desks.

The revised FRTB rules include being forced to fall back to the standardized approach (SA) from the internal models approach (IMA) if models cannot be approved by regulatory authorities, as well as punitive capital charge add-ons for non-modellable risk factors (NMRF) in the absence of a suitable repository and validated sourcing of sufficient 'real' pricing data, in addition to complex computations and substantial data storage requirements for expected shortfall (ES) and stressed expected shortfall (SES) calculations. The complexity of FRTB implementation for an impacted bank bears a direct correlation to the size and complexity of its trading portfolio, the maturity of existing market risk infrastructure and associated governance and reporting processes.

From a risk-based capital allocation perspective, banks' capital is allocated with a comprehensive view toward risk in trading positions across all trading desks and portfolios. Banks' risk capital represents the capital required to cushion them against potential losses arising from adverse changes in the value of assets or earnings



due to market risk factors, credit events and operational risks. The amount required to provide for unexpected losses under worst-case or extreme market conditions considering quantitative and qualitative factors is also considered in the allocation of a bank's risk capital. This process ensures that the allocation of risk capital is consistent with the bank's approved market risk appetite and strategic objectives.

From a capital preservation perspective, many banks have portfolios of traded instruments for short-term profits. These portfolios – referred to as trading books – are exposed to market risk, or the risk of losses resulting from changes in the prices of instruments such as bonds, shares and currencies. Institutions preserve capital by defining, measuring and controlling the exposure to market risk factors according to regulatory approved standardized and internal models. Specifically, banks: (a) allocate capital according to market, credit, operational and liquidity/funding risks; and (b) limit the concentration of risks in any given asset class, risk factor, counterparty, time period, and geographic region.

To put market risk into perspective, market risk is defined as the risk of losses in on and off-balance sheet risk positions arising from movements in market prices. No single risk statistic reflects all aspects of market risk. Banks, therefore, use different risk metrics individually or in combination to provide a comprehensive view of their market risk exposure. Market risk management provides information to calculate the required risk metrics used to measure market risk across all trading book positions in financial instruments and commodities held in trading portfolios either with trading intent or in order to hedge positions held with trading intent.

The scope of regulatory reporting of market risk FRTB under Pillar 1 covers all market risk in the trading book, and foreign exchange and commodity risk outside the trading book. In particular, this means that the following risks are not subject to the FRTB Pillar 1 market risk regime:

- Interest rate risk outside the trading book
- Equity risk outside the trading book

Market risk can be divided into two broad categories:

- General risk, referring to systemic risk factors, e.g. central bank repo rates
- Specific risk, referring to idiosyncratic risk factors, e.g. the credit worthiness of an issuer

According to the Basel Committee on Banking Supervision (BCBS) Fundamental Review of The Trading Book Framework (FRTB), there are seven market risk classes:

- General interest rate risk (GIRR) such as interest rate (IR) curves in different currencies and credit ratings, IR swaptions at-the-money (ATM) volatilities, IR swaptions volatilities skew, IR caps/floors ATM volatilities, IR caps/floors volatilities skew, and bond/bond futures prices
- Credit spread risk (CSR): non-securitizations single name credit default swaps and index credit default swaps
- CSR: securitizations (non-correlation trading portfolio, or non-CTP)
- CSR: securitizations (correlation trading portfolio, or CTP)
- Equity (EQ) risk such as equity/equity index spot, equity ATM volatilities and dividends
- Commodity (COM) risk such as commodities futures/swaps
- Foreign exchange (FX) risk such as FX curves in different currencies, FX ATM volatilities, and FX risk reversal and butterfly skew

This new chapter provides a high-level framework for market risk management and a brief recap of the major revised market risk capital rules under FRTB, an area where actuaries can play a significant role. While the official deadline was January 2023, it was evident that banks were not going to meet it, so implementation timelines have shifted over the past few years. These fragmented timelines have created challenges within the banking industry across the globe. With local jurisdictions able to set their own timelines, there is fragmentation across South Africa, the European Union, the UK, North America, and Asia-Pacific, with timelines ranging between 2023 and 2025. The US, for example, has not yet even published any timelines or interpretation of the rules, whilst Canada seems ahead of others with the banking regulator working towards a live implementation date of November 2023.



AJAY SINGH (AUSTRALIA)

OPERATIONAL RISK AND RESILIENCE

by Ajay Singh – Australia

The criticality of banks in payments systems, deposit-taking and providing credit for productive investments makes the banking system vital to the stability and orderly functioning of economies around the world. This makes the management of risks in banking a central requirement.

Recognition of this has led to the development of regulations to ensure that banks have sufficient capital to maintain solvency and sufficient liquid assets to meet demands for withdrawals of deposits, and that they manage all material non-financial risks so that they can continue to provide critical functions, even during disruptions.

The Basel Committee on Banking Supervision (BCBS) is a Committee within the Bank for International Settlements (BIS). It is the primary global standard setter for the prudential regulation of banks, and it provides a forum for regular cooperation on banking supervisory matters. At the time of writing, the BCBS has forty-five central bank and banking regulators from twenty-eight jurisdictions as its members. Its standards are commonly referred to as “the Basel Accords” (or “the Basel regulations”). Member national regulators use these Basel Accords as the basis of their own prudential standards since the Basel Accords do not themselves have legislative authority.

In this additional chapter, along with the Basel Accords, the prudential regulations for banks in Australia and in the UK are used as the basis for illustrating the relevant concepts and tools of operational risk management and resilience. While only the banking industry is considered, these requirements for operational risk



and operational resilience are applicable also to insurance and superannuation/pensions industries.

At the time of writing, the updated requirements for operational risk and resilience are either in the initial stages of implementation, as in the UK, or are waiting for finalized prudential standards, following industry consultations, as in Australia. Thus, the interested reader is advised to regularly consult the literature to stay abreast of progress.

This additional chapter on operational risk and resilience covers the following:

- Background, providing an overview of the historical journey of how operational risk emerged as a distinct risk class, and its continued evolution, leading to the current state of operational risk and resilience.
- Operational Risk and Resilience, providing the definition of these terms and highlighting what, as a minimum, an Operational Risk Management Framework should include. Subsequent sections expand on these.

- Risk Governance, covering the role of the board, senior management and the widely used three lines of defence model.
- Operational Risk Management, providing the key components of the framework, beginning with the definition of operational risk. A brief subsection on conduct risk is included, as it has been the source of many significant operational risk events in financial services.
- Business Continuity Management (BCM), which is a focus of current regulatory requirements that are intended to ensure the operational resilience of banks.
- A brief outline of the requirements for material Service Provider Management. The requirements at present are high-level and will be a significant focus within banking as part of the updated requirements.
- An outline of potential opportunities for actuaries in the management of non-financial risks and the resilience of critical operations.



To put operational risk and resilience into perspective, operational resilience is defined as the ability of a bank or banking system to continue to provide services to its stakeholders, even during an adverse event, and to recover from the event. Operational risks are defined as threats that impact the operational resilience of a bank or banking system. Effective and robust operational risk management is necessary for banks and the banking system to be operationally resilient.

While in the above definitions of operational resilience and operational risk, the scope of both services and adverse events are broad, the current focus of regulatory requirements is on services which are deemed “critical operations” and on adverse events which might lead to disruptions arising from any type of operational risk.

Operational risk or, more appropriately, non-financial risk is an evolving area for risk management for all financial services, not just banking. The current regulation of banks focusses on the operational resilience of critical operations to disruptions. However, operational resilience to other operational risk failures may also have to be considered.

Involvement in this area of practice requires both quantitative analysis and sound judgement, informed by data and qualitative factors. In this area, colleagues

in banks generally have diverse professional backgrounds, such as law and accountancy, while the main stakeholders are senior management, the board and the bank’s regulators. With this diversity, there is a need for good verbal and written communication skills, and for the ability to explain issues without reliance on technical terminology. These are skills which actuaries acquire as part of their training.

Non-financial risk management is an application of the concepts of enterprise-wide risk managements (ERM). Operational risk managers have to consider risks across the business, and possible interactions between them. Actuaries interested in ERM will find opportunities and challenges here.

For actuaries seeking applications of their skills in data science, quantitative and qualitative information captured in operational risk databases and registers is a source that can be used for better management information, monitoring metrics and insights.

Setting forward-looking scenarios to assess a bank’s enterprise-wide risks, evaluating the results of the bank’s stress testing exercise for its ICAAP and BCM, and setting tolerance for critical operations/IBS are all ideally suited to the modelling and judgement skillset of actuaries.



STEVEN CLAXTON
(ASIA PACIFIC)

RECOVERY PLANNING

by Steven Claxton – Asia Pacific

“Failure is success if we learn from it.”

Malcom Forbes

The recent (March 2023) American regional banking crisis, relating to Silicon Valley Bank (SVB), First Republic, Silvergate and Signature Bank, highlights the importance of Resilience Risk Management within the financial sector. Resilience risk is a broad-ranging concept which leverages a variety of mutually reinforcing topics such as Senior Manager Accountability, Deposit Insurance and Recovery and Resolution Planning (RRP). Arguably, if the regional banks in question had followed such principles, the current crisis might have been avoided, or at least contained.

The principal cause of the failure of SVB was a liquidity crisis, in which an outflow of deposits (exacerbated by news that US Treasuries had been sold at a loss and by limited deposit insurance coverage) developed into a “run on the bank”.

SVB’s failure did not lead directly to the problems at Credit Suisse (CS). Over the last three years, CS has incurred a number of significant losses, ranging in cause from counterparty credit risk (Archegos default of USD 5.5 billion) to breaches of anti-money laundering (AML) legislation (imposed fine of approximately GBP 1.7 billion relating to the Bulgarian mafia). A CS Board investigation into the cause of the Archegos default identified a number of key failings, namely failure:

- to act on known information;
- of Investment Bank (IB) senior management to engage, challenge, oversee, or escalate;



- to adequately invest in risk culture, experience, training, personnel, and technology;
- of risk systems; and
- to learn from the past.

Prior to the banking crisis of 2008 (often known as the Global Financial Crisis), there had been banking crises in various countries. In their 2018 paper Systemic Banking Crises Revisited, Laeven and Velencia stated that, according to their definition of a banking crisis, there were 151 systemic banking crises around the globe between 1970 and 2017. They found evidence that, in high-income countries, banking crises tended to last longer and be associated with higher output losses. Interestingly, in the context of recovery and resolution planning, they found that sovereign debt and currency crises tended to coincide with or follow banking crises, in part because of the extraordinary support that governments, through their central banks, provided to banks in the form of liquidity facilities, guarantees, asset purchases and capital injections.

In the Global Financial Crisis, the principal cause of the crisis was the threat to banks' capital adequacy as a result of losses on collateralized debt obligations (CDOs) based on sub-prime mortgages. The failure of Lehman Brothers led to problems in other banks, including those which had exposure to Lehman Brothers through over-the-counter derivative transactions.

A bank may fail because of capital problems if too much capital is required to cover losses on lending and trading activities, because of liquidity problems if it does not hold sufficient unencumbered liquid assets to finance an outflow of deposits, or because it cannot provide critical services to personal and business customers in the real economy. In addition, as we saw in March 2023, a bank can fail because of a lack of public confidence in it, and such failures can be sudden and rapid.

This chapter of the proposed book focuses on banks' Recovery Plans and addresses the following:

- Introduction of the concepts of Critical Functions, Critical Services and Core Business Lines, understanding of which is required to appreciate the objectives of a Recovery Plan.
- An overview of the key regulatory requirements (within a broad international setting) and highlights interactions with existing prudential / risk management requirements.
- A illustration, in the format of a typical Recovery Plan report, of how banks have addressed their regulatory requirements.
- An outline of opportunities for actuaries seeking to work in the banking sector, including on recovery planning.

In concluding the chapter, the question of "How can actuaries support banks' recovery planning activities?"

is addressed. Systemically important banks will operate their Recovery Plan within a multi-disciplinary team setting. Group Functions such as Risk Management, Finance, Treasury, Operations, Technology, Company Secretary and Corporate Strategy / internal M&A team all have their roles to play. So, the question might be framed as "How can actuaries contribute to such teams?"

Firstly, the actuary is well equipped to handle risk and uncertainty relating to a financial institution's enterprise-wide business and operating model. This training allows the actuary to effectively communicate the consequences of the Recovery Plan across capital, liquidity, funding, leverage and franchise value.

Secondly, actuaries are trained to exercise understanding and judgement, rather than simply to rely on compliance with regulations. In the context of recovery planning, actuaries can make an effective contribution to the setting of severe stress scenarios, allowing for possible interactions between risks, to the assessment of the results of the stress testing exercise and to discussions about possible mitigants, which could include changes to the bank's risk appetite statement or even to its strategy and business plan.

Thirdly, The Actuaries Code encourages actuaries to speak up if they have concerns. Also, actuaries are trained in communication skills. However, in banking, as in other areas of corporate life, speaking up may not be well-received. The Actuaries Code might have prevented the numerous (significant) losses incurred at Credit Suisse, in the absence of a Senior Managers Regime. The setting of a recovery plan provides the actuary with an opportunity to voice potential concerns (and recommended mitigants) relating to the enterprise within a politically neutral environment.

CONCLUSION

As illustrated in these four articles, there is great scope for actuaries to apply their techniques in banking. The IAA webinar on 22 June about the 2023 banking crisis was intended to illustrate the growing knowledge and expertise of actuaries in the management of banking risks, and to showcase where some of the opportunities for actuaries lie. The revision of the IAA Banking Virtual Forum paper on *Opportunities for Applying Actuarial Techniques in Banking*, with four additional chapters added, and with the intention of converting it into a book, is intended to provide further literature for actuaries who are interested in banking, and to showcase the opportunities that exist in this emerging and growing area of actuarial practice. 

BOOK REVIEW

Piranesi: Susanna Clarke



What a journey this book was! I almost stopped reading Piranesi because the first third of it had me

feeling exceptionally confused and doubtful, but I'm immensely glad that I didn't. At its core, this is a story about isolation and the desire for human connection wrapped up in a world that defies physics and reason.

Piranesi is a man who finds himself in a strange House. This House is unlike anything of this world. It is gigantic and filled with halls full of marble statues. The strangest thing about this House is that there are tides that sweep through the House. Waves threaten to harm him and ensure that he keeps a strict record of the dangerous tides so that he can escape to a safer part of the House when they occur. We witness Piranesi explore this strange world he finds himself in and we find ourselves asking questions such as 'How did he get there?', 'Where is this place?', 'Is this House alive?' and 'Is he alone?'

The story is filled with rich imagery and there is a particular heart wrenching scene where Piranesi, who usually has a childlike sense of optimism, hits rock bottom and finds himself hugging his favourite 'Statue of the Faun'. He falls asleep, weeping in the arms of the statue, seeking comfort. Clarke does such an amazing job of exploring the theme of isolation and its effects on the human psyche.

Clarke builds a world that is mystical. The House reminds me of the 'Allegory of the Cave' written by the philosopher Plato, in his work 'The Republic'. Plato describes a group of people who live in a cave all of their lives, facing a blank wall to which they are chained.

The shadows represent the fragmented reality that we use our senses to perceive, **while the objects represent objects that we can only perceive through reason.**

The people watch projected shadows of objects that pass in front of a fire that is situated behind them. The people name these shadows, but they are merely a projection of objects in the real world. They never get so see the actual object unless they unchain themselves from the wall to turn around and see it. The shadows represent the fragmented reality that we use our senses to perceive, while the objects represent objects that we can only perceive through reason.

In the book, Piranesi finds himself in a similar situation to the group of people chained to the wall. What makes this book so good is that we, as the reader, are chained to the wall too. Although we may desperately want to unchain ourselves from the wall to turn around and see the true objects, we are forced to wonder helplessly whether Piranesi will unchain himself from the wall, or whether he even wants to.

I will stop there as I do not want to spoil this book for anyone who hasn't read it. All I can say is that this book is a work of art and I am so grateful to have crossed paths with it. 

Reviewed by **Taryn Petersen**

FILM REVIEW

Reckonings (2022) Roberta Grossman



The shadows represent the fragmented reality that we use our senses to perceive, **while the objects represent objects that we can only perceive through reason.**

On 30 May 2023, I attended the Johannesburg Holocaust and Genocide Centre's screening of the film *Reckonings*. *Reckonings* is a 2022 documentary film by Roberta Grossman that tells the story of the negotiations between Jewish and German leaders in 1952 to determine reparations for the victims of the Holocaust. The film explores the complex and often fraught process of trying to quantify the immeasurable loss and suffering of the Holocaust, and the challenges of finding justice for survivors and their families.

On 27 September 1951, the first Chancellor of the Federal Republic of Germany, Konrad Adenauer delivered a landmark address in which he stated:

"The federal government and the great majority of the German people are conscious of the immeasurable suffering that was brought to bear upon the Jews in Germany and in the occupied territories during the period of National Socialism. Unspeakable crimes were perpetrated in the name of the German people which impose upon them the obligation to make moral and material amends, both as regards the individual damage which Jews have suffered and as regards Jewish property for which there are no longer individual claimants."

Chancellor Adenauer extended an invitation to the State of Israel and representatives of world Jewry to enter into negotiations. At the time of Chancellor Adenauer's address, there was no representative organization of world Jewry. The Conference on Jewish Material Claims Against Germany (the Claims Conference) was formed over the days of 25-26 October 1951 when representatives of 23 Jewish organizations met in New York. One of the 23 founding members of the Claims Conference was the South African Jewish Board of Deputies, who continue to be represented on the governing body. From the outset the Claims Conference

stressed that no indemnity, however large, can make good the destruction of human life and cultural values or atone for the murder of the Jews.

On 9 January 1952, the Knesset (the unicameral legislature of Israel) accepted Chancellor Adenauer's offer of talks for compensation. The first round of talks took place on 21 March 1952 in Wassenaar in the Netherlands. Parallel talks took place between representatives of the Israeli government and West German government; and between the Claims Conference and representatives of the West German government.

On 10 September 1952, the Federal Republic of Germany (FRG), the State of Israel, and the Claims Conference signed the Luxembourg Agreements. These agreements established a framework for the FRG to provide compensation to Holocaust survivors.

Under the agreements, the FRG agreed to pay Israel 3 billion Deutsche Marks (DM) in annual instalments over a period of 12 years. The FRG also agreed to provide the Claims Conference with 450 million DM to help Holocaust survivors with their relief, rehabilitation, and resettlement.

The FRG did not have the hard currency to make the full payments to Israel and the Claims Conference. Instead, it provided Israel with goods and services worth 3.45 billion DM. Israel then converted some of these goods and services into money, which it used to pay the Claims Conference the equivalent of 450 million DM.

The scope of compensation payments administered by the Claims Conference has developed significantly over the decades. Over the last 10 years, some significant agreements negotiated by the Claims Conference include:

2013: An agreement with the German government to provide approximately \$ 1 billion in compensation



GREGORY WHITTAKER

for home care in respect of Holocaust survivors. The Claims Conference and the German Ministry of Finance have used comprehensive data including current and projected needs in assessing home care requirements for some 90,000 Holocaust survivors worldwide. The recipients of this additional package of benefits are those in receipt of welfare services such as food, medicine, socialization

programs and transportation from the Claims Conference.

2015: The establishment of a Child Survivor Fund that issues once-off payments of € 2,500 to certain Holocaust victims who were children at the time of their persecution. Many such applicants endured trauma such as separation from their parents, abuse in ghettos and the horrors of the concentration camps.

2018: The establishment of the Kindertransport Fund. This involved over 10,000 children who were saved from death when parents found refuge for them in England, often relinquishing their babies and infants to the care of older children in the hope of getting them to safety. Most of these children never saw their parents again.

2019: The establishment of a Surviving Spouse Payment. This represented a new agreement which allows the surviving spouse of a Holocaust victim to receive a payment for a period of 9 months to assist with funeral expenses and living expenses.

2020: In response to the Covid-19 pandemic, a Survivor Emergency Fund was established worldwide. The fund was established to reinforce existing services and involved volunteer programs to help alleviate isolation and loneliness.

In 2023, the Claims Conference will distribute approximately \$625 million in direct compensation to over 260,000 survivors in 83 countries. This money will help survivors to pay for their living expenses, such as rent, food, and medicine. The Claims Conference will also allocate approximately \$750 million in grants to over 300 social service agencies worldwide that provide vital services for Holocaust survivors. These services include home care, counselling, and transportation.

The German government's payments of indemnification and the Claims Conference's grants are a vital lifeline for Holocaust survivors. These funds help to ensure that survivors can live with dignity and security in their old age. They also help to keep the memory of the Holocaust alive and to ensure that future generations never forget the horrors of this dark chapter in human history. 

Reviewed by **Gregory Whittaker**



THE ACTUARIAL LANDSCAPE IN UGANDA

by Badru Bengo



BADRU BENGO

LIFE, MEDICAL AND PENSION MANAGER
UGANDA INSURERS ASSOCIATION

Uganda is a country located in East Africa. Just like many other African countries, Uganda is struggling with the challenge of growth of the actuarial profession.

The actuarial profession as a practice is only currently taking shape, especially in the insurance industry, which has for long been a traditional area of practice for this old profession. This is thanks to the new Insurance Regulations ACT of 2017 that ushered the industry into the new risk regulatory regime, away from the old compliance based one.



The insurance industry contributes close to 1% of Uganda's GDP of US\$41 billion. Insurance, being largely under-developed will, without doubt, stifle the growth of the profession despite there being other fields actuaries can practice in. Whilst the profession has evolved to newer non-traditional frontiers in other jurisdictions, we are still taking baby steps, and we are looking at insurance as a spring-board for the growth of our profession locally.

The relevance of Actuarial practice in Uganda has come to light in recent years, where we have seen an increase in the uptake of the professional Actuarial exams by students and other interested professionals.

The Actuarial Society of Uganda (TAAU) has been in existence since 2007, founded by the pioneer Actuarial students from the first graduate class of the course that was rolled out in 2004 at Makerere University (The National University). This body was tasked with the growth of membership and raising awareness of the profession. However, this initiative was curtailed as the potential employers, predominantly in the insurance and banking sector, were not appreciative of the importance of growing internal actuarial teams, of meeting the costs of training staff, and because actuarial related roles were largely handled at group level using actuarial professionals outside Uganda.

There were also high failure rates for the teams that attempted actuarial exams in the early years because of the non-alignment of the actuarial course offered by Makerere University, and the lack of affiliation and accreditation of the course with other actuarial societies. Growth of the profession, therefore, stagnated

as graduates moved to other non-actuarial roles like underwriting, banking, research, and education.

The discussion around insurance reforms reignited the potential for the growth of the profession and the eventual enactment has paved the way for its growth. Each of the 35 insurance players in the market are supposed to have an internal Actuarial Function, and also an external Actuarial resource.

These developments have also led to a greater appreciation of this skill set, even in the emerging markets of banking, investments, broking etc. This has seen Actuarial graduates being employed in these areas, given that the role they play is pivotal in terms of prudent pricing of premiums and benefits of insurance and bancassurance products. These developments have seen the growth of consultancy firms in the market, where the country now has three actuarial consulting firms - with two from Kenya, and Claxon Actuaries International from South Africa - being the pioneer firms to set foot in Uganda with the aim of growing the actuarial profession locally.

A number of Ugandans have enrolled for the Institute and Faculty of Actuaries (UK) and the Society of Actuaries (US) exams. Discussions are taking place with the Actuarial Society of South Africa (ASSA) to have accreditation of the Actuarial science degree course at Makerere University, and for graduates to take that route. This is likely to see the number grow from 2 Fellows to a sizable number in the near future, as the window for insurers to comply with the actuarial resource requirements has been extended up to 2024. We appreciate the efforts by ASSA in assisting with developing the actuarial profession in Uganda. 🚧

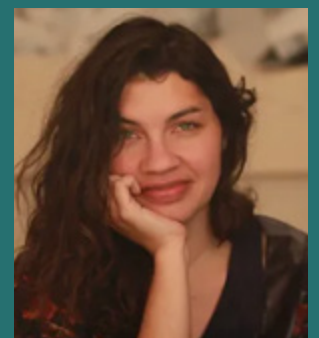
WHAT LIFE AS A CAREGIVER FOR A CHILD WITH CEREBRAL PALSY IS LIKE, AND WHY IT MATTERS

by Jodi Wishnia and Beth Vale

When Percept researchers, Dr Jodi Wishnia, Michelle Penso, and Dr Beth Vale, investigated the cost of caregiving for children with cerebral palsy, they discovered that the role of the caregiver is severely undervalued.



JODI WISHNIA



BETH VALE

Of every 1,000 babies that are born in South Africa, 10 are born with cerebral palsy (CP), a disorder of movement, muscle tone or posture.

It’s a rate well above the global average.[1] The primary cause of CP is a lack of oxygen to the developing brain which can occur during pregnancy, the birth process, or up until the age of 2 years.[2] CP ranges in severity, and is associated with other impairments, like communication difficulties, visual impairments, epilepsy, cognitive dysfunction, and hearing impairments.

In the last seven years, there has been a dramatic rise in the number of medical negligence claims in South Africa, with birth injury claims accounting for a large proportion. While diagnosing CP is fairly easy using modern health technology, attributing the exact cause of the condition is difficult due to the interplay of genetics, environmental factors and quality of care received. A misunderstanding of the cause of CP has led many to believe that all CP is as a result of medical negligence, and this has partly contributed to the rise in CP claims against the State.

In addition to the direct health and financial burden on children and families, CP caused by alleged medical negligence during delivery has consequences for provincial health budgets. Once diagnosed, there are several standardised measures to determine functionality, and these provide clinicians with evidence-based ways to realistically determine the level of support required for a child with CP. However, the most critical gap (from a medico-legal standpoint) remains in the estimation of life expectancy for children with CP. Current estimates are based on high income countries with incomparable access to care and resources, and this has resulted in claims that are out of sync with both the day-to-day needs of the child and their caregiver, and with the number of years of life the child can reasonably expect to live with their condition.

Accessing care for a child with CP

Children with disabilities have the same healthcare needs as typically developing children, as well as additional specialist services, such as rehabilitation



(which is included in the definition of comprehensive primary healthcare). In the public sector, children with CP should access primary healthcare at their nearest community health centre or clinic, and this healthcare should be free. However, long waiting times, negative attitudes, lack of knowledge among healthcare workers, and inadequate communication between providers and families all contribute to poor quality care for children with disabilities. These factors are worsened in rural districts where travel times and costs are higher, education and information are poorer, and healthcare services are few and poorly resourced.

As one of the family members of a child with CP said:

“Transport, that’s a big challenge ... Because our buses and taxis don’t accept these kinds of wheelchairs. They don’t have the space ... Like we don’t have any transport. That’s the main challenge that we have here ... It’s difficult; it’s really difficult because you see our transport, they don’t have access for the wheelchairs.”

Healthcare workers’ attitudes towards people with disabilities, including children with CP, has been widely cited as a barrier to healthcare across South Africa. This is true even among CP rehabilitation personnel. Newly graduated South African physiotherapists, occupational

therapists and speech therapists feel inexperienced and inadequately prepared to manage CP, particularly in low-resourced settings where hospitals have a high caseload of children with CP.[3]

Another caregiver of a child with CP said:

“I felt bad in the beginning, but later on I just had to accept and live with it. What can you do? They kept on telling me when I get to the hospital that there is nothing that they can do; he will stay like that for the rest of his life.”

Even in well-resourced provinces, research shows high unmet needs; in a peri-urban township in Gauteng, only 26% of children with disabilities were found to be accessing rehabilitation. And even when children are able to access rehabilitation, the intensity and duration is inadequate.

In South Africa, children with CP who access rehabilitation through the public healthcare system are receiving roughly 30 minutes of therapy once a month, which amounts to six hours of therapy a year if they are able to attend every month for a year.[4] The Department of Health only takes responsibility for the rehabilitation of children up to six years old - this amounts to roughly



in a peri-urban township in Gauteng, only 26% of children with disabilities were found to be accessing rehabilitation.

36 hours of therapy in those six years. Thereafter, they are required to receive rehabilitation from the Department of Education, but again, access to schools with the necessary resources is also constrained. Calculations show that South African children with CP (who have many motor impairments) receive roughly 60 hours of therapy in their lifetime. International guidelines recommend between 25 to 40 hours of rehabilitation to improve a single motor ability.[5]

Turning to the NPO sector for state-provided care

Because of these barriers to care for public sector users, the not-for-profit and non-government organisation sector has moved in to support these families, often on shoestring budgets. In our research, we found

Research shows that the health and wellbeing of children with CP is intimately tied to the health and wellbeing of their caregiver, and the extent of support they receive.



that parents of children with CP were heavily reliant on, and grateful for, these organisations who helped them to learn about CP and understand their children better. These organisations also provide interpersonal support and space to connect for these parents. One interviewee reflected on the role an NPO has played in her journey as a parent of a child with CP:

“When I came here, I was not working, I didn’t have money... One of the NPO staff, Lerato (pseudonym), would give me food so that I could sleep better, and she explained to me about CP [...] and organised the occupational therapy. They explained to me what CP is, what I can do for my child.”

Caring for the carers

Research shows that the health and wellbeing of children with CP is intimately tied to the health and wellbeing of their caregiver, and the extent of support they receive. Many of the parents of children with CP that we interviewed described periods of depression and anxiety, and a sense of being isolated from their communities.

Our public and private health systems are not yet where they should be in terms of mental healthcare - in the private sector, the model is still predominantly hospicentric, and in the public sector, there are severe shortages in mental health personnel. In a previous study conducted by Percept, we found that there were 186 psychiatrists in the public sector (which cares for 84% of the population), compared to 439 (70%) in the private sector.[6]

There needs to be a shift not only in access to care for children with CP but also more psychosocial support for these childrens’ parents. One mechanism in the constrained public-sector environment is for the Department of Health to contribute funding to the NPOs and NGOs who are currently ensuring access and support for these families. There are several of these organisations in South Africa with excellent track records and a deep commitment to empower and support children with CP and their families. Without these organisations, life would be considerably harder for many of South Africa’s caregivers. 

Note: The authors are grateful to the participants of this research and the Actuarial Society of South Africa for the project funding.

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INCLUSIVE INSURANCE – A DIFFERENT GAME

by Nigel Bowman

About 4 billion of the world's current 9 billion population may benefit from inclusive insurance initiatives, but this potential market may not be easy to access from a traditional insurance perspective.

This leaves a large group of people without access to insurance who, with access, could improve their lives by utilising formal inclusive insurance products - not only for recovery of losses from adverse events - but also to provide the confidence to take risks to advance their economic growth. Inclusive insurance products are relevant to economically disadvantaged groups in all countries, so it is a mistake to presume that these products are only applicable in countries with relatively low average incomes or less developed insurance markets.

South Africa has a thriving inclusive insurance market with many insurance companies writing what can be considered inclusive insurance business under their traditional insurance licenses. There has also been significant interest in microinsurance licenses since their introduction a few vvyyears ago. Yet there remain many lessons that individuals with actuarial skills can learn from the international inclusive insurance industry, whether working in South Africa or beyond our borders.

Numerous major insurance providers are now working on delivering commercially viable inclusive insurance products in many countries. There has been a steep learning curve for these providers as they have needed to understand the inherent differences between inclusive and traditional insurance provisions.

The International Actuarial Association's (IAA) Risk Book chapter on Inclusive Insurance provides a high-level introduction to Inclusive Insurance and how this type of insurance differs from traditional insurance, as typically taught in actuarial qualification syllabuses.

THE IAA RISK BOOK

The IAA is the global body representing the actuarial profession and its Risk Book introduces actuarial topics, in an accessible way, to a wide audience including users of actuarial services, actuarial students, the wider business and regulatory community, and actuaries. Actuarial advice to businesses, policy decision-makers, and supervisors can give them insight into the potential consequences of future risk events by quantifying the financial impacts and supports them in making better business decisions.

The Risk Book's Inclusive Insurance chapter, published in 2021(see IAA 2021) introduces Inclusive Insurance. Here are some highlights from it and we encourage you to read it for yourself. The full Risk Book is also available from the [IAA website](#).



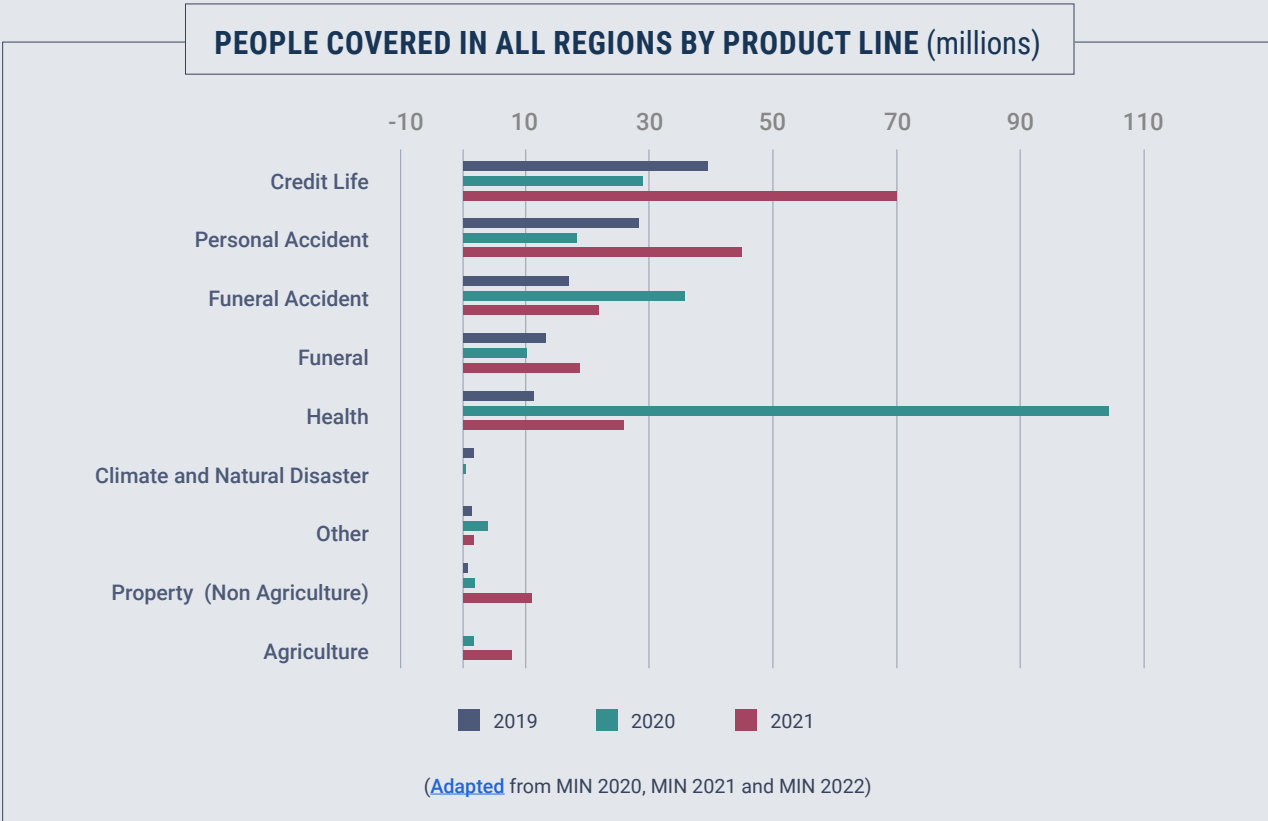
WHAT IS INCLUSIVE INSURANCE?

The Risk Book chapter defines Inclusive Insurance as insurance products through which adults have effective access to insurance and savings products offered by insurers through formal providers. Effective access is explained as the involvement of convenient and responsible service delivery, at a cost affordable to the customer and sustainable for the provider, which results in financially unserved or underserved customers using formal financial services rather than existing informal options.

Inclusive insurance products include all insurance products aimed at unserved or underserved markets. These markets typically are insurance markets in developing countries (from an insurance perspective) but are not restricted to such countries. Microinsurance is a subset of inclusive insurance focussing on lower income populations.

It is well established that increased access to inclusive financial services, including insurance, helps to reduce poverty and improve social and economic development. It is also the case that insurance of all types not only provides protection coverage for adverse risks but also provides the confidence to undertake riskier commercial activities, playing both a positive social and economic incentive role and providing security in adverse circumstances. These supports are especially valuable to those living near the poverty line as one adverse event risks pushing them permanently below the poverty line.

The inclusive insurance landscape is evolving rapidly. Recent global surveys, see MIN 2020, MIN 2021 and MIN 2022, reinforce this point as illustrated by the following diagram.



The increased prominence of health insurance product lines in 2020 reflects the rapid response of the inclusive insurance industry to the needs of its customers during the COVID-19 pandemic. Adaptability and responsiveness to customer needs is a trademark of many inclusive insurance providers.

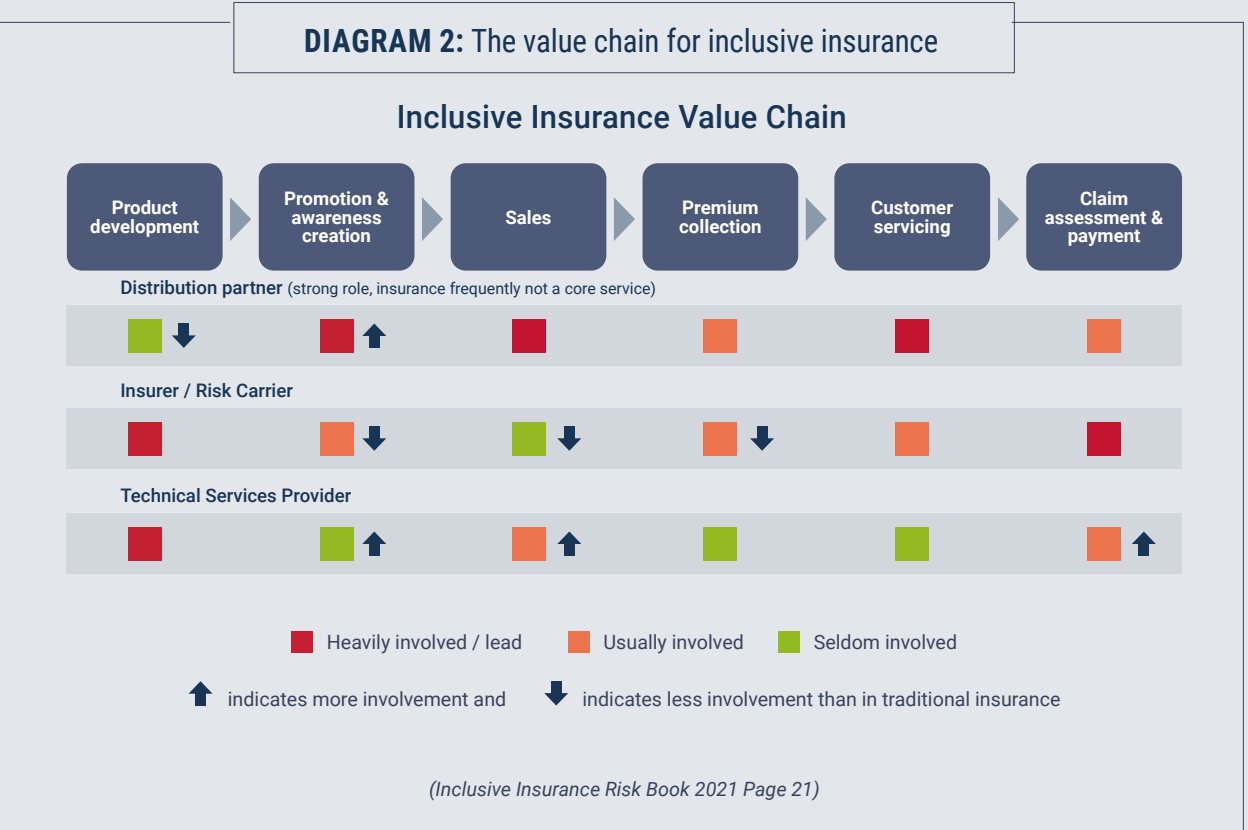
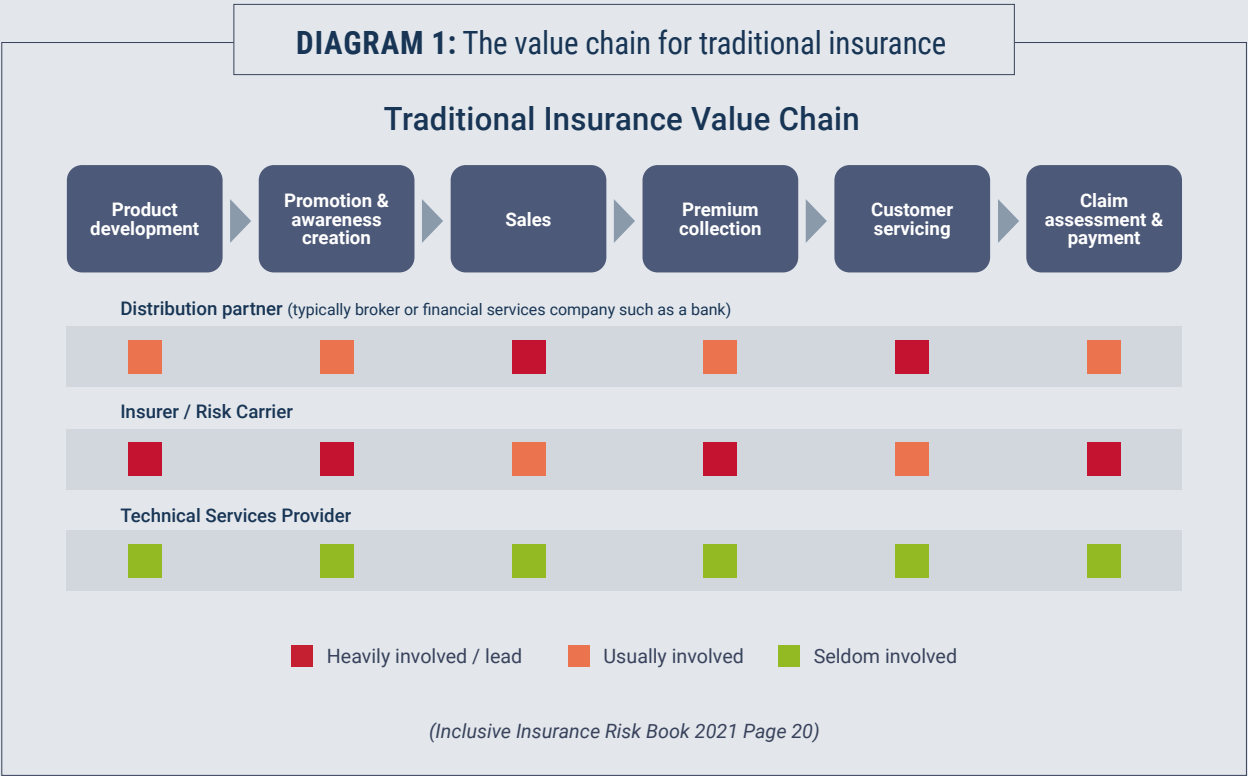


DIFFERENCES BETWEEN INCLUSIVE AND TRADITIONAL INSURANCE

At a high level, there are three key roles in the insurance value chain:

- **DISTRIBUTION PARTNER:** Any player that has a role in the distribution of insurance. There may be several distribution partners working together or sequentially to distribute insurance to the customer.
- **INSURER OR RISK CARRIER:** Any party that accepts financial risk in return for payment of the insurance premium.
- **TECHNICAL SERVICES PROVIDER (TSP):** Provides technical services to a distribution partner, insurer, or any other party in the insurance value chain. These services can include actuarial services, technology and data services, international development services or country and market-specific knowledge on how to reach a type of consumer. TSPs are often the “glue” that holds the multiple partners of an inclusive insurance initiative together.

The following diagrams, taken from IAA 2021, summarise the significant differences between traditional and inclusive insurance. As these value chains are indicative there will be variations in practice reflecting local conditions. The differences and the changes in the importance of various players are highlighted by the arrows in Diagram 2.





TSPs typically play a significantly stronger role in inclusive insurance than in traditional insurance, bringing skills and experience that more traditional insurers and distributors may not have. Multiple stakeholders are often involved in delivering key aspects of inclusive insurance, and some of these stakeholders (such as telcos) may be outside the insurance industry, something that differentiates inclusive and traditional insurance and often complicates effective inclusive insurance delivery.

ACTUARIAL PRECONDITIONS

From an actuarial perspective, the differences noted above reflect the context of actuarial work. In traditional well developed insurance markets like South Africa, a number of pre-conditions are typically presumed:

- A ready supply of actuaries, the availability of actuarial education, and the presence of robust professional standards;
- The availability of relevant, timely and appropriate data;
- Access to systems through which data can be collected and analysed by providers, the industry and at the national level; and

- A regulatory framework that is reasonably well developed and understood by market participants.

In many inclusive insurance markets, the reality may well be different and traditional pre-conditions are frequently not met:

- The supply of actuaries and the actuarial profession may be limited or non-existent. The same applies to other insurance skills;
- Data may not be available or not readily collectable (this could, for instance, lead to a lack of insurance mortality and morbidity tables);
- Systems for collecting and analysing data may not be well-developed or integrated;
- Customer understanding of insurance may be limited, especially for first-time customers of inclusive insurance;
- Trust in insurance may be lacking; and
- Regulation that is appropriate for inclusive insurance may not be in place or, conversely, existing regulation may act as a barrier to inclusive insurance.

These issues are discussed further in IAA 2014, and some examples of how these issues could be addressed are given in Blacker 2015.

There is a risk that standard actuarial tools and approaches may not be appropriate in inclusive insurance markets, and that their application may lead to unintended outcomes, such as inappropriate premiums or claims processing.

For more information on the Risk Book Inclusive Insurance chapter, you can review the chapter itself (see IAA 2021) or you can watch two webinars, delivered in February 2023, where the IAA reflects on the findings from this chapter (see IAA 2023 reference).

Globally, there is a great need for inclusive insurance products. Actuaries can play an important role in the efficient, effective, and sustainable delivery of these products. To achieve this, actuaries need to be aware of the differences between traditional and inclusive insurance products, reflecting their environment and their consumers.

The challenge for actuaries is how to take traditional actuarial knowledge and transfer it into an environment in which traditionally expected pre-conditions, actuarial and more general, are not met. This will require flexibility and resilience from actuaries and the capacity to apply underlying principles, as distinct from standardised, 'textbook', traditional practices. This challenge is compounded by the need to reflect the specific circumstances in specific countries. ⚠️

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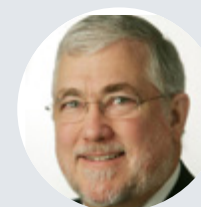
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Adapted by Nigel Bowman, Chair of the IAA's Inclusive Insurance Virtual Forum, from the original article authored by Jules Gribble and published on the Actuaries Digital platform on 23 March 2023.



Jules has been a member of the Australian Institute's Council (board) for two three year terms. He represents Australia at the IAA's Inclusive Insurance Virtual Forum and Risk book Editorial Board. Until recently, he represented the Australian Institute on the IAA's Advice and Assistance committee for over a decade. Jules has also been a thought leader on the actuarial education in Australia and supervisory capacity building for over 20 years. He is an experienced consultant and a Principal at PFS Consulting who can be reached at julesgribble@psfconsulting.com.au

INSURANCE PRICING: Discrimination, Causality, and Fairness

by Ron Richman



RON RICHMAN

Over the last decade there has been a surge in applying machine learning techniques in non-life insurance pricing. This is mainly due to cheaper data collection and storage, combined with new analysis methods for unstructured data and increased computational power. In parallel, there have been rising concerns about data privacy and hidden implications of using “black box” price predictions.

An obvious concern when using black-box models for pricing is that of implicit discrimination. As we will see below, this is always a potential issue, regardless of the model, and this is regulated in EU-law, see [4]. A related question is that of (algorithmic) fairness, and below it will be seen that these two concepts will often fail to agree.

Further, in order to adjust for implicit discrimination, discriminatory information needs to be collected (more on this below), which is a privacy concern in itself. More generally, this relates to the question of which covariates are suitable to use for pricing. This in turn connects to discussions about covariates’ causal effects and risk factors. However, below it will be seen that this is not essential for avoiding implicit discrimination.

The actuarially fair premium and discrimination

Let $\mathbf{X}$ denote the covariates (rating factors or policy features), and $\mathbf{Y}$ the claim cost that we try to predict.

The actuarially fair premium, $\mu(\mathbf{x})$, is defined as $\mu(\mathbf{x}) = E[\mathbf{Y}|\mathbf{X}=\mathbf{x}]$ and can be interpreted as the best prediction of the future claim cost $\mathbf{Y}$, given the specific policy features $\mathbf{X}=\mathbf{x}$.

Charging the premium $\mu(\mathbf{x})$ to each policyholder will, on average, generate a total premium income equal to the expected claim cost.

How will pricing be affected when there are covariates, $\mathbf{D}$, that are considered protected, such as sex or ethnicity? For example, EU regulation [4] stipulates that insurers are not allowed to price insurance policies based on sex, neither directly nor indirectly.

Direct discrimination occurs when the price explicitly depends on $\mathbf{D}$. Therefore, the actuarially fair, best-estimate, premium based on all information, $\mu(\mathbf{x}, \mathbf{d}) = E[\mathbf{Y}|\mathbf{X}=\mathbf{x}, \mathbf{D}=\mathbf{d}]$, cannot be used by insurers, since it explicitly depends on $\mathbf{D}$.

The definition of indirect discrimination is more complex [4] and can be interpreted as reflecting two distinct ideas:

- when using the non-protected covariates $\mathbf{X}$, adjustments should be made to ensure that $\mathbf{D}$ is not implicitly proxied by $\mathbf{X}$;
- the effect of the pricing practice should not lead to a disadvantage for either sex.

Property (i) is meant to prevent proxy discrimination by requiring that $\mathbf{D}$ cannot be learned from $\mathbf{X}$; e.g. for some portfolios a policyholder’s ethnicity may be accurately predicted from their postcode. For property (i) one can give a statistical definition [5].

Property (ii) is referred to as disparate impact, for which there are multiple alternative (and potentially conflicting) mathematical formulations and which has a specific meaning in US law.

For the remainder, we therefore focus on property (i), as precisely formulating property (ii) remains in part an open research question.

Adjusting for potential proxy discrimination

The premium $\mu(\mathbf{x})$ does not explicitly use the protected information $\mathbf{D}$, and is hence not subject to direct discrimination. Nonetheless, we cannot be certain that it will not be affected by proxy discrimination. This is because the calculation of $\mu(\mathbf{x})$ implicitly reflects the dependence between $\mathbf{D}$ and $\mathbf{X}$.

To see this more clearly, consider the situation where $\mathbf{D}=0$ (“man”) or 1 (“woman”), for which we can write:

$$\mu(\mathbf{x}) = \mu(\mathbf{x}, \mathbf{d}=0)p(\mathbf{d}=0|\mathbf{x}) + \mu(\mathbf{x}, \mathbf{d}=1)p(\mathbf{d}=1|\mathbf{x}) \quad \text{Eq. (1)}$$

where $p(\mathbf{d}|\mathbf{x})$ denotes the probability of a policyholder having the sex $\mathbf{D}=\mathbf{d}$, given the non-protected information $\mathbf{X}=\mathbf{x}$. This illustrates how standard covariates may carry information about the protected covariate $\mathbf{D}$. At the extreme, if we could perfectly predict the sex based on non-protected information, then there would be no practical difference between direct and indirect discrimination.

We can, however, remove the potential for proxy discrimination, by modifying Eq. (1) to:

$$\mu^*(\mathbf{x}) = \mu(\mathbf{x}, \mathbf{d}=0)p^* + \mu(\mathbf{x}, \mathbf{d}=1)(1-p^*) \quad \text{Eq. (2)}$$

where p^* is some probability between 0 and 1 for which the portfolio fraction of $\mathbf{D}=0$ is a natural choice. We call the adjusted premium from Eq. (2) the discrimination-free insurance price (DFIP), see also Ref. [5] where the DFIP is discussed in more generality and detail.

By using $\mu^*(\mathbf{x})$, any potential dependence between $\mathbf{X}$ and $\mathbf{D}$ – and hence any proxy discrimination – has been removed, without requiring further assumptions.

Conclusion and outlook

Through the pricing method of Eq. (2), we have proposed a way to adjust actuarially fair prices in order to address proxy discrimination. Importantly for practice, the calculation of DFIP is model-agnostic, in the sense that it can be derived as an adjustment to any pricing model, from GLMs to complex machine learning models.

Nonetheless, in order to determine the DFIP in Eq. (2), it is necessary to have access to the more detailed price $\mu(\mathbf{x}, \mathbf{d})$, which can only be estimated using protected data. Thus, to appropriately quantify the materiality of proxy discrimination and correct for it, the collection of some protected information is needed. This requirement may raise privacy concerns and a technical solution is discussed in Ref. [6].

A further consideration is about which types of covariates should be used in the first place, when calculating an insurance price. Some policy features may be classified as risk factors, if they have a direct causal effect on claims, see e.g. [3, 1, 8]. Standard rating factors are not necessarily assumed to causally impact Y ; instead, they are characterised by statistical association with Y .

In Ref. [5] it is shown that, following certain causal assumptions, the DFIP from Eq. (2) will coincide with the expected direct causal effect of X on Y .

However, in real-world applications, it is rarely the case that all risk factors are observed or that their causal interrelations are fully understood. In these situations, the causal effect can likely not be assessed, and the causal connection to Eq. (2) is lost.

Nonetheless, also in such more complex settings, the DFIP will still correctly adjust for proxy discrimination. Furthermore, a requirement to use only risk factors with a direct causal effect on claims will likely reduce the number of covariates that are available, see [3]. This, despite its conceptual appeal, will also incur a cost in terms of predictive accuracy.

Finally, arguments around discrimination relate to notions of algorithmic fairness, which has attracted considerable attention in the machine learning literature. For example, there is persistent concern that machine learning algorithms discriminate against sub-populations, in applications ranging from e.g., mortgage lending to facial recognition [2].

Algorithmic fairness is typically defined in terms of statistical properties of predictors. For example, in order to satisfy demographic parity, a predictor [Equation] should be independent of D . This means that there should be no statistical association between risk predictions and protected characteristics. This is a very penal requirement, because in situations where there is some statistical association between the nonprotected covariates X and the protected covariates D , the prices are not allowed to include any information from X .

Requiring that prices are statistically independent from protected covariates implies that in some portfolios, e.g. where policyholders from one demographic group are more likely to engage in high risk behaviours (e.g. smoking), it becomes impossible to apply risk pricing.

We note that this is not the case with the DFIP, which allows risk pricing based on non-protected covariates, only adjusting for their proxying effect. More generally, this illustrates potential conflicts between adjusting for proxy discrimination, while trying to satisfy common algorithmic fairness conditions. For more, examples see [7]. 

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IFRS 17: WHERE ARE SOUTH AFRICAN LIFE INSURERS? - INDUSTRY SURVEY REPORT BACK

by Pamela Hellig



PAMELA HELLIG

SENIOR ACTUARIAL MANAGER, INSIGHT LIFE SOLUTIONS

Insight Life Solutions conducted a series of five surveys from February to May 2023 to seek South African life insurers' views on specific IFRS 17 topics. The surveys aimed to summarise the progress made to date on IFRS 17 implementation and industry thinking – especially in areas where the Standard allows discretion.

A total of 16 entities, comprising traditional insurers, bancassurers and reinsurers, participated in the series, with between 6 and 13 respondents to each survey. A similar series of surveys was conducted in 2022, which meant that inferences could be made, to an extent, regarding the progress of the industry over the preceding 12 months.

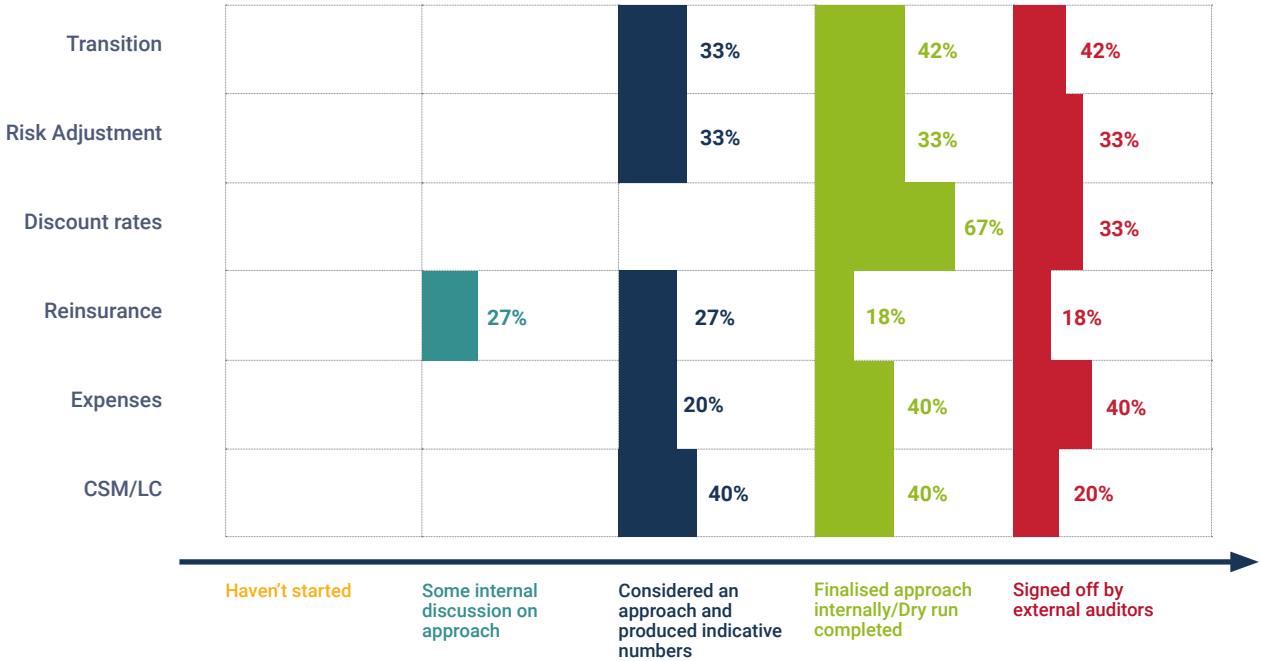
It is hoped that participants and readers will use the results to benchmark their approach against the rest of the market, as well as against their own future decisions as IFRS 17 implementation matures, discussion around these topics settles, and industry consensus is reached.

Participants answered questions on their thoughts on and approaches to: transition, risk adjustment, discount rates, reinsurance, KPIs, embedded value, business planning, CSM and loss component, tax, expenses and OCI. A full report will be released in the third quarter of 2023. This article highlights some key findings of the surveys.

PROGRESS

Respondents were asked to assess their progress on each of the major topics covered by the surveys. The graph below summarises progress across respondents for each topic, with the size of each block representing the proportion of respondents who had reached that milestone.

Figure 1. Participant progress across IFRS 17 topics surveyed

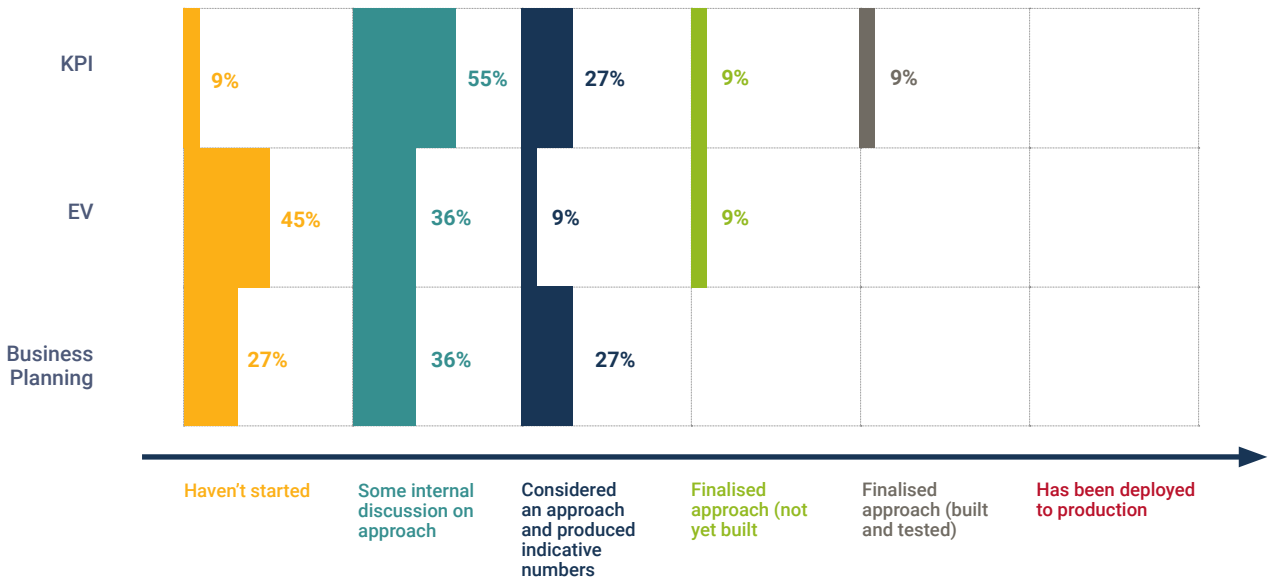


With respect to topics covered by the IFRS 17 Standard, progress seemed to depend on the size of the insurer and the financial reporting period, with larger insurers and those with a 31 December year-end being further progressed than others.

With most of the key methodology and implementation decisions already made, Key Performance Indicators (KPIs), embedded value (EV) and business planning are areas that many insurers have now turned their attention to. The graph the follows shows progress with respect to KPIs, EV and business planning. This graph includes those insurers that do not plan to report EV at all under IFRS 17 (hence the large number who fell into the “haven’t started” category).



Figure 2. Participant progress for KPIs, embedded value and business planning under IFRS 17

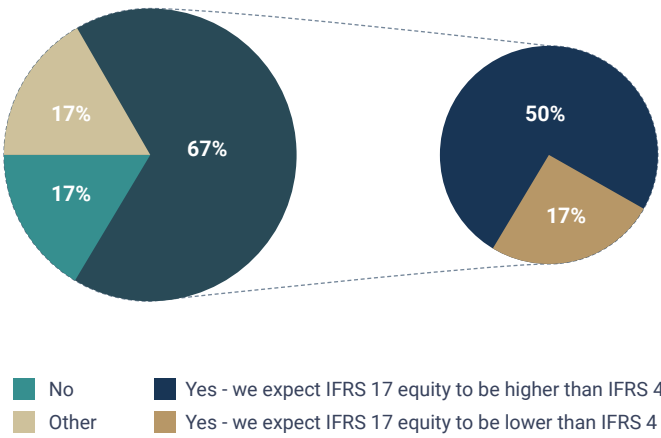


TRANSITION BALANCE SHEET

We asked participants whether they expected to see a difference between their IFRS 4 and IFRS 17 balance sheets at transition.

Figure 3. Expected differences in IFRS 4 and IFRS 17 balance sheets

Differences in transition balance sheets

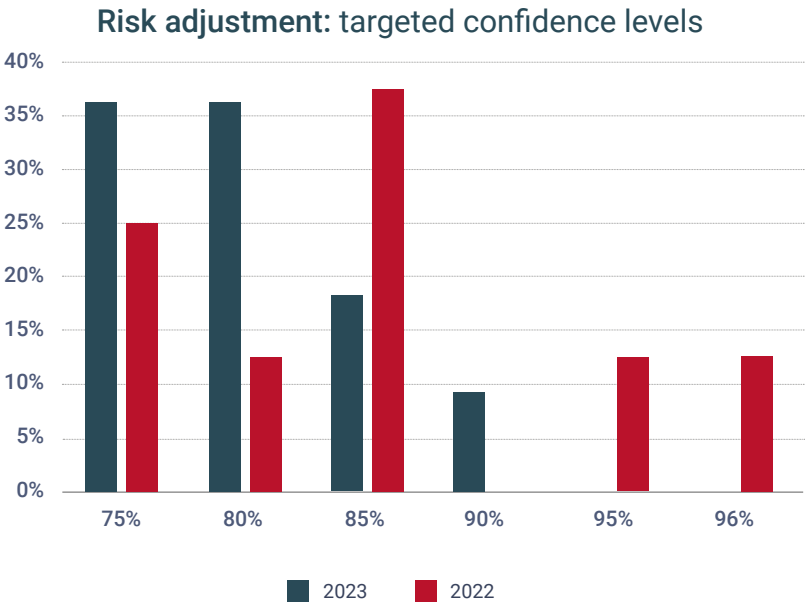


Most respondents expect to see a difference between IFRS 4 and IFRS 17 equity at transition, with half of all respondents expecting IFRS 17 equity to be higher, largely due to having followed a previously more conservative approach to calculating liabilities.

RISK ADJUSTMENT CONFIDENCE LEVEL

Most respondents are targeting confidence levels of either 75% or 85% for their life business, with the most popular confidence level having decreased from 85% to 75% and 80% over the last year.

Figure 4. Targeted risk adjustment confidence level

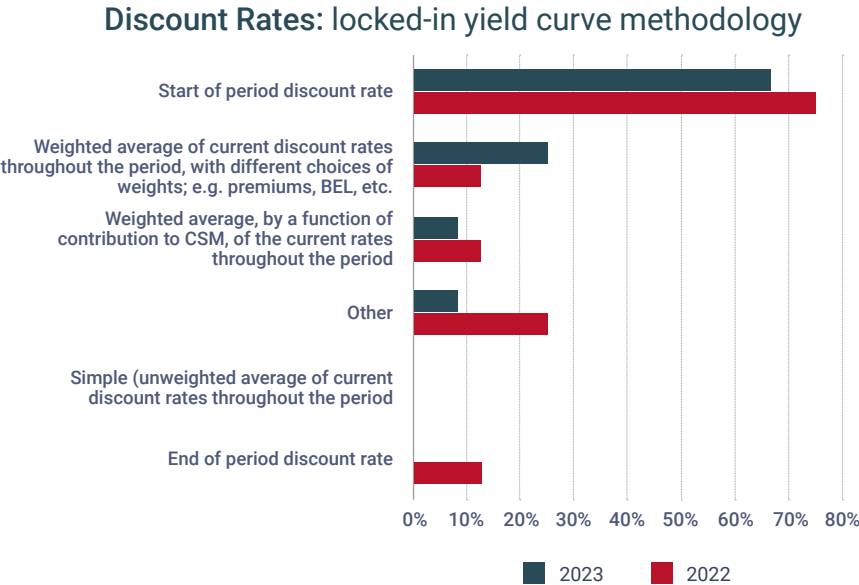


LOCKED-IN YIELD CURVES

Similar to 2022, most respondents in 2023 are using the start of period discount rate for their locked-in yield curves, largely for pragmatism.

None of the respondents indicated that their approach had changed in the last year.

Figure 5. Approach to calculation of locked-in yield curve



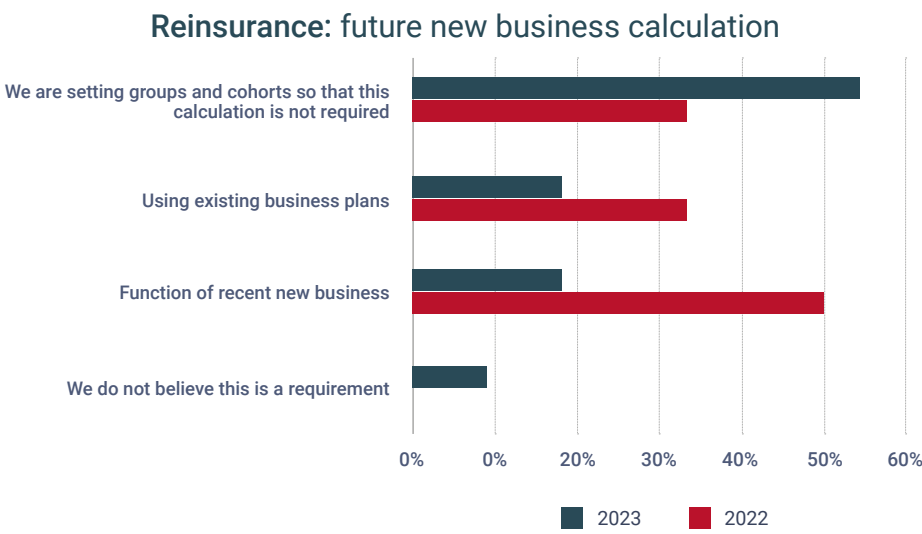
FUTURE NEW BUSINESS FOR REINSURANCE

In their February 2018 staff paper, the Transition Resource Group for IFRS 17 Insurance Contracts (TRG) said that “...the boundary of a reinsurance contract held could include cash flows from underlying contracts covered by the reinsurance contract that are expected to be issued in the future.”

Insurers, therefore, need to consider whether and how to measure the cash flows of underlying contracts that have not yet been issued.

In 2023, over half of all respondents are setting their groups and cohorts so that the need to perform this calculation is avoided. Others are projecting future new business as a function of recent new business or based on existing business plans. One respondent does not believe that the projection of future new business is required.

Figure 6. Future new business calculation for reinsurance groups

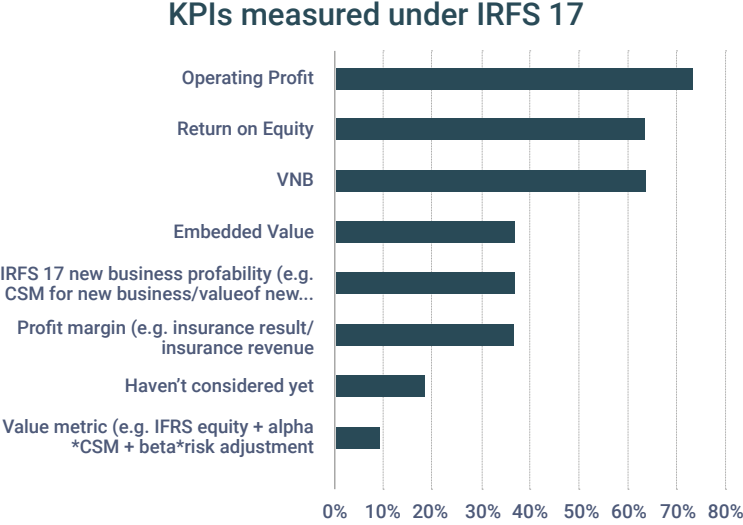


KPIS UNDER IFRS 17

IFRS 17 will change the way insurance accounting works, with new financial statements and methodology for profit emergence. For many insurers, this may mean new KPIs.

Most respondents foresaw Operating Profit, Return on Equity and VNB being their top KPIs under IFRS 17, with some introducing KPIs based on IFRS 17 metrics, such as CSM.

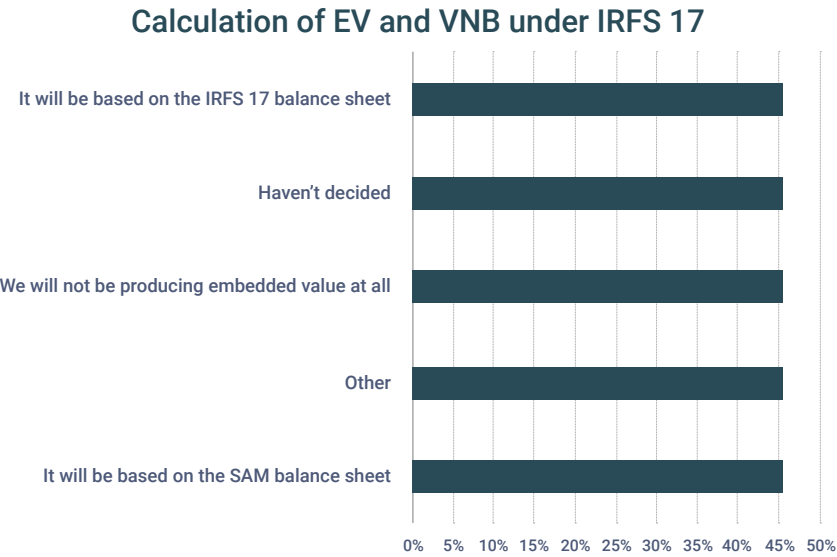
Figure 7. Top KPIs under IFRS 17



EMBEDDED VALUE UNDER IFRS 17

Most respondents who will produce EV under IFRS 17 have decided to base EV and VNB calculations on the IFRS 17 balance sheet. As can be seen from the graph below, there are some insurers who will not be producing EV at all. This includes reinsurers, part of international groups, that have not produced EV in the past, as well as insurers that will no longer produce EV.

Figure 8. Calculation of EV and VNB under IFRS 17

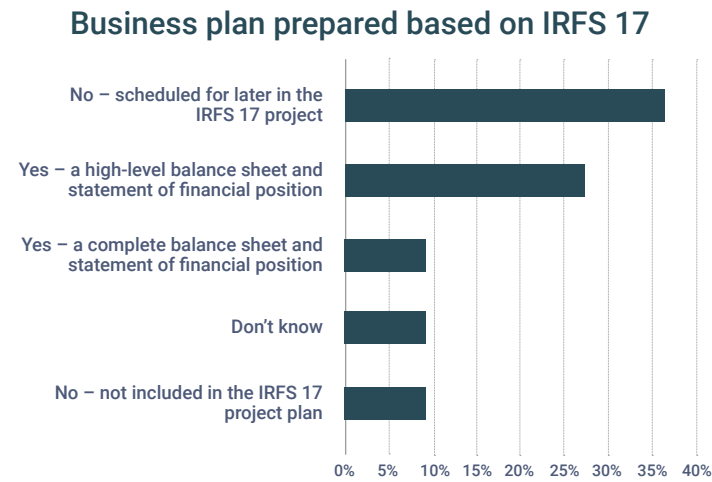


BUSINESS PLANNING UNDER IFRS 17

Almost all respondents have either performed some kind of business plan or plan to do so within the next year. Challenges around business planning cited by many respondents included: setting budgeting and forecasting methodologies in line with IFRS 17, the manual nature of current processes, and interactions with relevant stakeholders.



Figure 9. Indication of whether a business plan has been produced based on IFRS 17

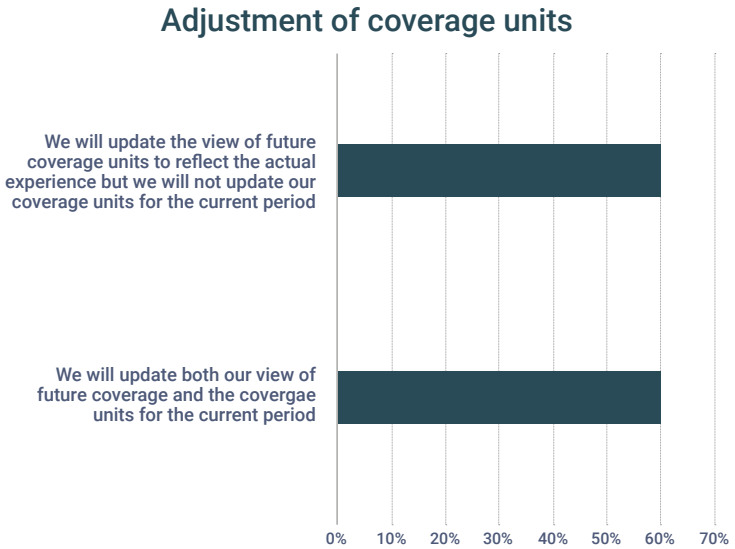


ADJUSTMENT OF COVERAGE UNITS

Expected future coverage units defined in previous reporting periods may need to be revised to account for differences in experience. Insurers need to choose the extent to which they will reflect this revision of coverage units and whether this revision should apply at the start of the reporting period or at the end of it.

Most respondents to the survey will update their view of future coverage units to reflect their actual experience, but will not update their coverage units for the current period.

Figure 10. Adjustment of coverage units based on experience



These are just a few findings from the series of surveys conducted. Keep an eye on Insight's social media to download the full report once it becomes available.

HEALTH WARNING:
Education can be a poverty trap!



Help us help more children to escape the poverty trap.

Contact Paper Video (Chris Mills, 072 347 6154, chris@papervideo.co.za) or the Actuarial Society Educational Trust (Mike McDougall, 087 073 8952, mmcdougall@actuarialsociety.org.za) and make education a powerful catalyst for change in more children's lives.



ACTUARIAL SCIENCE STUDENT SECTION

THE UNIVERSITY OF JOHANNESBURG STUDENT EXPERIENCES



In this section, we have compiled a few articles from actuarial science students at the University of Johannesburg sharing their experiences and the importance of mentorship and community in the actuarial student journey.

ACTUARIAL STUDENTS NEED COMMUNITY

– by Njabulo Mudau

University life can be exciting, but it can also be challenging, especially for actuarial students. The actuarial science program is rigorous, and students are required to put in a significant amount of time and effort to complete the program successfully. This can lead to isolation and stress, which can negatively impact their mental health. This is where having a student society or community comes in handy. In this article, we will discuss the importance of having a student society or community for actuarial students and how the ASABA student chapter at the University of Johannesburg (UJ) plays a crucial role in making students feel supported.

Actuarial science is a challenging degree, and students tend to spend most of their time studying and doing assignments. As a result, they may isolate themselves from their peers, leading to feelings of loneliness and anxiety. This is where a student society or community can make a significant difference. A student society provides a sense of belonging, support, and camaraderie to students who may feel overwhelmed by the demands of their degree.

It creates a space where students can interact, share experiences, and learn from one another.

The ASABA student chapter at the University of Johannesburg is an excellent example of a student society that plays a crucial role in supporting actuarial students. The student chapter aims to provide a platform for actuarial science students to network, learn, and grow. It achieves this by organizing various events, such as workshops, guest lectures, and social events, that bring students together. These events provide an opportunity for students to learn from industry experts, share experiences, and build relationships with other actuarial students.

Other universities that do not have a student society or community for actuarial students should consider implementing such a structure. The benefits of having a student society are numerous, and students are likely to welcome it.

In conclusion, the importance of having a student society or community within a university setting cannot be overstated, particularly for students pursuing challenging degrees such as actuarial science. By fostering a sense of belonging, providing academic and professional support, and helping to mitigate the negative impacts of isolation on mental health, student societies can play a crucial role in helping students to succeed and thrive. For universities that do not currently have such structures in place, the example set by UJ's ASABA chapter provides a powerful case for implementation. 



UJ Actuarial Science students social event, 2022



LEADERSHIP ROLES IN STUDENT SOCIETY

– THE ASABA UJ CHAPTER – by Sharon Tshishonge



During my undergraduate years, I was lucky enough to join the Asaba UJ chapter, which is a student society for University of Johannesburg students who want to be actuaries or work in quantitative roles. I had the good fortune to join as the event coordinator in its earliest

stages. The following year, I succeeded the chapter's founder and previous president as the 2021–2022 president. I had never held a leadership position prior to joining the chapter, so this was all very new to me. Even though the entire experience was daunting, I enjoyed every moment of it because I learned more about leadership and making an impact on the lives of other students.

Being a leader and a member of the society gave me a sense of belonging at the university. Knowing that there is a community around you that is always willing to lend a

hand and help you get closer to achieving your goals feels truly amazing. It also allowed me to give back to others and contribute to the growth and development of the actuarial community in meaningful ways. Being a part of something larger than myself brought a sense of purpose and fulfilment to my university experience.

The role I played within the chapter forced me out of my comfort zone and helped me develop into the confident person I am today. I am naturally a very shy person who tries to avoid the spotlight at all costs. I distinctly recall how reserved I was before I joined the Asaba UJ chapter. I never imagined I would hold the position of president of the student society, but I value the opportunity ASABA gave me and the chance to contribute to the future development of more actuaries. I believe that leadership extends beyond just holding a title, and I strive to inspire our members to take on their own initiatives and be active leaders.

Working with ASABA has taught me that leadership is about supporting and nurturing the potential of those around you, which is why my team and I have consistently



pushed for leadership and opened it up to students of all years so that our members can grow before graduating from university. As president, I worked to implement new programs that encourage cross-disciplinary collaboration and expand opportunities for professional development. I believe this approach will help accelerate the growth of the actuarial community and prepare our members to take on the challenges of tomorrow.

While I was president of the chapter, my team and I kept putting more emphasis on making connections within the University of Johannesburg's actuarial science community. To achieve this, we organized several events and a mentorship program that was primarily aimed at first-year students adjusting to university life as they began their actuarial journey. We also considered using the resources we have to provide our students with additional tutorial classes before tests and exams because we are all aware of how challenging earning an actuarial degree at a university can be. In the beginning, considering our financial situation, we were only able to do this for the statistics and mathematics modules in the first year because, for those modules, students are supposed to get an average of 70% or above to go into the second year. We observed that, ever since we arrived at university, not everyone is able to get that average and make it into a second year, and so we decided that our main focus should be on that. Our members gave us a

lot of positive feedback regarding that, so we intend to keep doing it.

On other occasions, we welcomed outside speakers to give career talks. Our members appreciated that because it gave them a sense of what to anticipate in the workplace and possible areas of specialization. It also provided networking opportunities and allowed members to ask questions and gain insights not readily available in their classes. These talks were often an invaluable resource for those looking to transition into the workforce.

Additionally, we held gatherings where our members could unwind from studying and have a good time playing games while getting to know one another. The organization's commitment to both professional development and social connections made it a popular choice among students. It provided a well-rounded experience that catered to the needs of its members beyond just academic support.

Last year, our society conducted its first-ever school outreach. We went to a high school in Westbury to spread awareness about actuarial

and quantitative skills and to donate sanitary towels in honour of Women's Month. The fact that so few students were aware of the actuarial profession was not a surprise to us, but we were happy to be able to assist them in learning more. We also emphasized the importance of quantitative skills in various fields and how they can lead to rewarding careers, and we hope that our visit inspired some of the students to pursue these skills in their future studies and careers.

To top off everything that our team achieved, we were honoured with the top university chapter in September 2022, thanks to the hard work we put into the chapter. That was the best news we received last year, but that wouldn't have been possible without the support we were receiving from ASABA, especially from the head of the mentorship and also our third-year lecturer. Their guidance and encouragement played a key role in our success. We are truly grateful for their unwavering support and commitment to our growth as students. Without their mentorship and expertise, we would not have achieved as much as we did. We owe them a debt of gratitude for their invaluable contributions to our education and future careers. Their dedication and commitment to our development have made all the difference. 

MENTORSHIP IN VARSITY

– by Thebe Dikobo



The jump from high school to varsity can be emotionally, psychologically and academically overwhelming, especially when you are studying rigorous courses like Actuarial science. However, with the right guidance and support structure, it may feel a lot easier to navigate the new environment. This article highlights the importance of mentorship in educational institutions.

The ASABA UJ chapter mentorship programme has been providing one-on-one mentorship to first-year students since its launch in 2021. This is achieved by assigning senior students and graduates to mentor junior students. Mentorship is a mentor-mentee relationship wherein the mentor provides guidance, and support to mentees through their academic journey. Adapting to the new environment of a varsity institution could play a key role in the success of junior students. The initial experience of varsity life and the high academic standards can be daunting, but the support and guidance provided by a mentor can make the adaptation a lot better. Varsity requires striking a balance between academics and social life, which for actuarial science students can be hard to achieve.

It's important for senior students and graduates who are mentors to approach mentoring relationships with empathy and understanding and to listen to and respect the needs and goals of the mentees. It is also a good quality of a mentor not to impose their ideas and views on mentees, and he/she must also appreciate their mentee doing their own thinking and coming up with new ideas for themselves. This can be achieved by being present and listening with respect and interest to their mentees. A good mentor should encourage the mentee to think for themselves during sessions, knowing that what they think is appreciated and welcomed by the mentor. Mentors also need to understand that it is okay not to have the answers for the mentee, but they can help the mentee by asking the right questions. By building positive relationships and providing support and guidance, the mentor can make a meaningful difference in the academic and personal success of their mentee.

Academic support: Senior students and graduates can provide academic support to mentees by sharing study techniques and time management support and sharing personal experiences and how they overcame obstacles.

SOCIAL SUPPORT: A mentor can give a mentee a sense of belonging and foster a sense of community away from home. The connection and relationship can extend beyond the academic journey.

PERSONAL SUPPORT: A mentor can offer personal support to the mentee who is struggling with personal challenges or adjusting to varsity life. This can include providing advice on stress management and other life skills.

ROLE MODEL: A mentor can serve as a role model by demonstrating positive behaviour, leadership and community involvement.

In summary, mentorship in an educational institution can provide a wide range of benefits to both the mentors and mentees. By fostering connections, providing support and creating opportunities for personal and professional growth, mentorship can help students to succeed academically and beyond. 

TAKING UP LEADERSHIP ROLES

– THE YOUNG AFRICAN LEADERS INITIATIVE by Enock Soko



As an Actuarial Science student and a Young African Leaders Initiative (YALI) Cohort 16 Alumni, I understand that Actuarial Science students are often perceived as shy and less inclined to take up leadership positions. However, I am here to challenge this narrative and share my leadership journey.

It all started back at Dominican Convent when I had the privilege to serve as the Head Boy of the high school and Boys' Boarding House in 2018. Little did I know that this experience would ignite my passion for leadership.

When I enrolled in Actuarial Science at UJ, I realized the need to give back to my high school by informing younger students about the Actuarial profession. Despite being a first-year student with limited knowledge, I sought to surround myself with individuals who were more informed and skilled. At that time, UJ did not have an ASABA Chapter, but I remained determined to make a difference.

The year 2020 brought significant achievements for me. Building on my strong academic performance from my first year, I was invited to join the Golden Key International Honorary Society. Additionally, I received a merit bursary from the university and a scholarship from Nedbank, further fuelling my motivation.

However, the transition from contact lessons to online learning in the second semester posed unexpected challenges. I faced difficulty in adapting and, unfortunately, I failed Financial Mathematics. It was a setback that I had not anticipated, but I refused to let it define me.

In 2021, I joined the executive team of the Golden Key UJ chapter as part of the public relations subcommittee. This role required me to coordinate publicity for chapter activities and events, a skill that I had to develop.

I seized the opportunity to offer online career guidance sessions, providing valuable information to high school students regarding university admission requirements and available financial support structures and how to best position themselves in their first year of undergraduate studies.

With the launch of the ASABA UJ Chapter by Mamoshabe Rakoma, Njabulo Mudau and Luvhone Khwanda, I eagerly took up the role of an Academic Mentor for first-year Actuarial Science students. I wanted to share the challenges I faced during my actuarial journey and provide mentorship and support to those who needed it. Recognizing my dedication, I was later promoted to serve as the Vice President of ASABA and Golden Key for the 2022 academic year.

In 2022, my involvement with Golden Key reached new heights as I was selected as one of the 5,000 Youth Delegates worldwide to represent the organization at the YOUNGA Youth Delegates program. This prestigious opportunity allowed me to connect with influential decision-makers and collaborate on solutions for global challenges related to the UN's Sustainable Development Goals. Inspired by this experience, I was honoured to be appointed as the President of Golden Key.

Despite facing illness and missing several classes during the second semester, I persevered in my journey. In 2023, I was selected for the Young African Leaders Initiative for the Southern African Region, an initiative launched by former US President Barack Obama to invest in the next generation of African leaders. This is my final year of my degree and I have the honour to serve as the President of ASABA UJ and the Graduate Advisor of Golden Key UJ, where I continue to make a positive impact.

I share my story with the hope of inspiring others not to measure themselves solely by their failures but to embrace the challenges they face and use them as stepping stones toward personal and leadership growth. 



BACK STORY – ENOCK SOKO'S Interview with TONY CHIMBADZADZA

Tony Chimbadzadza is a Zimbabwean student who completed his matric in 2019 in Limpopo, South Africa, with 5 distinctions including Mathematics.

He was admitted to study at UCT. However, he couldn't manage to pay the registration fee as he is from a poor background as his father is a security guard and his mother is unemployed. As a result, he had to go back to Zimbabwe and sell cold drinks on the roadside because there were no job opportunities.

He ended up coming back to South Africa to create his own luck. As a result, he ended up tutoring to raise funds to pay for the registration fee and study visa. Then in 2022 he was a volunteer tutor for WeSolveForX and shared his story with Tsietsi Ngobese who then connected Tony with Soshan Soobramoney.

Enock Soko: Tell us a bit about yourself.

Tony Chimbadzadza: My name is Tony Chimbadzadza. I'm from Zimbabwe. I finished my matric here in South Africa in 2019. I'm doing my first year of BSc in Mathematical Science with financial orientation at UJ, hoping to change to Actuarial Science next year because that's the degree I want to pursue.

ES: Take us through the journey from after you finished matric in 2019 to today. What was it like?

TC: To be honest, it hasn't been easy because after finishing matric with 5 distinctions in 2019, I got accepted to study at UCT, but I did not have enough money to pay the registration fee as I come from a poor family, my father is a security guard, and my mother is unemployed. It was also a challenge to find bursaries for international students as I didn't have access to such information. As a result, I tutored high school students to try to raise funds to pay for registration fees and my study visa, which was impossible. That's when I met Tsietsi in 2022, and he encouraged me to apply to study actuarial science at as many universities as possible. I didn't have much hope, but I applied because I was determined to study.

ES: What was going through your mind during that time?

TC: It was a terrible feeling. I would often ask myself where I had gone wrong. I wondered why students with lower grades than mine were able to study while I couldn't, simply because I come from a poor background and my nationality. It was something that affected me and made me feel stuck.

I ALSO WANT TO USE THE ASABA UJ PLATFORM TO SHARE MY STORY TO HIGH SCHOOL STUDENTS IN THE RURAL AREAS WHO DON'T HAVE ACCESS TO INFORMATION ABOUT THE UNIVERSITY REQUIREMENTS OR AVAILABLE FINANCIAL SUPPORT STRUCTURES.

ES: What would you describe as your lowest point during that time?

TC: My lowest point was when I had to go back to Zimbabwe in 2019 and sell cold drinks on the roadside because there were no job opportunities there. It was disheartening to have good grades but not be able to pursue further education. It was a stressful and challenging time for me.

ES: After facing such difficulties, what kept you going? What motivated you to keep pushing forward?

TC: It was the people around me who kept me going - they provided constant support and motivation. My family played a significant role in keeping me motivated. Whenever I felt like giving up, these people guided me and encouraged me to keep going. Even though I had doubts, their support gave me hope and the strength to continue. I also held onto the belief that miracles can happen and that something positive would eventually come my way.

THE CONNECTION

Tony was working as a tutor under WeSolveForX. ASABA UJ had invited Tseitsie to be one of the guest speakers at the 2022 Chapter End of Year Function, and Tsietsi Ngobese shared Tony's story with Soshan Soobramoney who then connected Tony to Enock Soko, the president of ASABA UJ.

ES: When you finally received the confirmation that UJ would pay your registration fee and 75% of your tuition, what was the feeling like?

TC: I cried. I hate to cry but just reflecting on those past 4 years made me cry as it had not been easy. It was a huge relief, and I couldn't wait to get started. I told myself that since I got this opportunity I must work hard because if I relax, I don't think I'm going to get any other opportunity like this one. I was happy. But at the end of the day, it gave me this mentality of working hard.

Although I couldn't study the degree I initially wanted, as registration had closed for Actuarial Science because my study application was pending, but just knowing that I had the chance to attend university and pursue my dreams was a weight off my shoulders.

When Tseitsie told me he would connect me to people, I initially didn't believe it. I had applied to universities before but never received any help. It was only when I received a call from you, inviting me to UJ, that's when I realized it was real. Meeting you in person at UJ gave me hope and made me believe that I could go to university. It was my first time being on a university campus.

Tsietsi and Soshan helped me a lot, they paid for my travel costs and study visa fees. Without them I don't think I was even going to be studying this year.

ES: And as you know, we are helped to help others. What does that mean and how are you hoping to help other people in the future who were in similar situations to yours? [How are you planning to pay it forward? What are your hopes and goals for the future?

TC: I have a friend struggling to register because of lack of funds and I am certain that there are many people in the situation that I was in. The hope is for me to help others and the only way I can do that is by having a company or a program whereby people with similar situations to mine are given the platform to share their stories. I believe this platform will enable students to connect with sponsors and well-wishers just like it happened to me. I also want to use the ASABA UJ platform to share my story to high school students in the rural areas who don't have access to information about the university requirements or available financial support structures. Some of these students qualify for NSFAS bursaries but they don't have the right information that would enable them to access these bursaries. 🙏

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