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INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest



Global Risk Consultants

We're Hiring!

Who we are

NOW IN BKC Mumbai India, Global Risk Consultants (GRC) is an Actuarial consulting partnership, established under the leadership of Liyaquat Khan, FIAI, FSAS, Hon. Fellow AASL, FIII, FIA as Managing Partner, providing consultation to clients in the areas of Life Insurance, Non-Life Insurance, Health Insurance, Pension & other Employee Benefits, Employee Stock Option Plans and IFRS 17. GRC has combined experience of more than 70 years and servicing clients in South Asia, GCC States, Africa and Europe.

We are Growing and looking for self-driven individuals with graduation in Statistics/ Economics/ Mathematics/ Commerce/ Science and domain knowledge of Insurance Concepts/ Basic Statistics. Individuals with strong technical, Actuarial modelling skills and good communication skills as required. Experience in IFRS 17 will be an add on.

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Candidate should have 2-3 years of General Insurance experience in areas viz. pricing, reserving, statutory reporting and others, and all CT subjects cleared.

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Job Title: Senior Consultant – Experienced Location: Mumbai
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Job Title: Senior Consultant – Experienced, Location: Mumbai
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How to apply?

Send your resume to grc@globalriskconsultants.in
Those who have applied in response to advt. in Dec 2021, issue of the Actuary India need not apply again.

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"A noble man's thoughts will never go in vain. - Mahatma Gandhi"

"I hold every person a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends to help and ornament thereunto - Francis Bacon"

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Budget 2022 has been announced. With thrust on digitization, infrastructure and capital expenditure, consensus has emerged that this is a growth oriented budget aimed at reviving demand and consumption over the long term. Although there were no major takeaways for the financial services sector, few other interesting announcements in the Budget on the digital front were the introduction of digital currency, tax on virtual digital assets and rollout of 5G spectrum.

It was also reiterated in the Budget that the LIC IPO is expected soon which is critical for the government to meet its divestment targets and keep its fiscal deficit in check. Some news reports have started emerging on the likely embedded value of the public sector life insurance giant. I look forward to following further developments on this important event in the insurance sector in India.

Many of us will be attending the upcoming Virtual Actuarial Conclave 2022 themed “Preparing for a new era - Decoding disruption”. The last two years have been disruptive in every way; lifestyles have been disrupted, work patterns have been disrupted, basically the tried and tested ways of the world have been disrupted. So I look forward to some fantastic insights for actuaries on decoding and responding to the disruption! I am also looking to interact with several members of the expanding actuarial and data science community at the event.



This issue of the magazine includes coverage of the recently held webinars on Risk Management (Derivatives), Health and Care Insurance, Current Issues in Life Insurance and Career Pathways for Actuarial Students.

Keeping pace with the digital world, the Actuary India magazine is going digital with wider content and a contemporary look and feel. Whilst we are in this transition process, do write into us with your thoughts and specific suggestions at Prajakta@actuariesindia.org. My best wishes to those taking examinations in the upcoming March 2022 exam diet.

March 2022 Actuarial Examination - Registration Announcement

The upcoming March 2022 Actuarial examination has been scheduled in Home based online format from 9th March 2022 to 26th March 2022.

Key Dates	
Registration starts	14 th January 2022, Friday from 4.00 pm
Last Date of Registration without late fee	12 th February 2022, Saturday upto 4.00 pm
Last Date of Registration with late fee	18 th February 2022, Friday upto 4:00 pm
Hall Ticket Live	25 th February 2022, Friday, 6:00 pm

For more details visit at www.actuariesindia.org
For any examination related queries email us on exam@actuariesindia.org

Institute of Actuaries of India



When the December 2021-January 2022 combined edition of the magazine reaches to you, lots of New Year wishes would have already exchanged. Though I have wished all our members individually by mail, once again I extend my best New Year 2022 wishes to each one of you and family members. The bad news in the new year is that the time flied so fast for each one of us, but the good news is that each of us remain as the pilot to the our time vehicle.

The VAC 2022 preparations have taken most of the time of the month of January and expected to continue the trend till the conclave gets over. Many of our members are volunteering for the event and have been working tirelessly of their day and night to make it a grand success. The IAI office also not lagging behind for anything to extend their support to all VAC activities in time. I am very happy to share that the Hon. Minister of Finance and corporate Affairs, Govt. of India, Smt. Nirmala Seetharaman is likely to address the VAC 2022 as a Chief Guest for the first time ever. We will also have other dignitaries like President of International Actuarial Association (IAA), Ms. Roseanne Harris, Chairman of PFRDA Mr. Supratim Bandyopadhyay and Member Actuary, IRDA, Mr. Parmod Kumar Arora to address the audience. By number of qualified Fellow and Associate members, it would be a new record with 40 fellows and 46 associates would be awarded. With the advantage of virtual conclave, many dignified speakers across the globe is going to

be part of the three full days packed with variety of sessions based on the “decoding disruption” theme.

Our members would be delighted to know that the work is on full swing to move The Actuary India magazine on to a high definition quality digital platform with lots of deliverables in different formats. A group of young and energetic actuaries formed an editorial board which is led by the Chief Editor of The Digital Actuary India Magazine.

The March 2022 examinations are announced and registrations open. Online coaching classes for technical level subjects have started in advance, enabling many students to start their early preparations. Guidance and support programs for advanced level subjects including SA2 & SA3 are in the pipeline is also will be offered to members this time along with strategical guidance programs for subjects CP1, SP1 & SP2. My request to all members to utilise all training programs to complete their Fellowship examinations earlier than later.

An IFRS17 Curtain raiser learning program also scheduled in the month of February which will be held as full day programs on 19th & 26th February. The Machine Learning webinar series just ended with a lot of new learnings to all participants. Those who missed the LIVE webinar series for Python and Machine learning may subscribe to the recorded videos to upgrade their professional knowledge and skills.

The 4th TechTalk webinar on retirement benefits has been held on 9th December 2021. The 6th webinar on Risk Management (ERM) conducted on 11th Jan and 36th India Fellowship Seminar also being held in January on dates 21st, 22nd, 28th & 29th.

With a quote from a famous author-“We yearn for opportunities, we pray for opportunities and we seek for opportunities. The good news is that we meet opportunities. The bad news is that we miss the opportunities only to come to a later realization of missed opportunities.” I am inviting you all again to be part of VAC 2022, NOT TO MISS THIS LIFE TIME OPPORTUNITY.

Date: 25th September 2021, Saturday Time: 15:00 - 19:00 IST

Chair: Subhendu Bal, President, IAI

Moderator: Mohan Bhatia, Executive Director, IAI

Speakers: Mohan Bhatia, Executive Director, IAI

Pradeep Kumar Gomathinayagam, Head Pricing Services South Asia & ANZ, Vice President-Life & Health Products, Swiss Re Global Business Solutions

Neeraj Kumar, Corporate Vice President - Actuarial, WNS

Saigeeta Bhargava, Director and Lead Actuary, PWC

Chinnaraja C Pandian, Secretary, Advisory Group on Banking, Finance & Investments

Sanket Kawatkar, Principal & Consulting Actuary - Life Insurance (India), Milliman

Insurance/Reinsurance

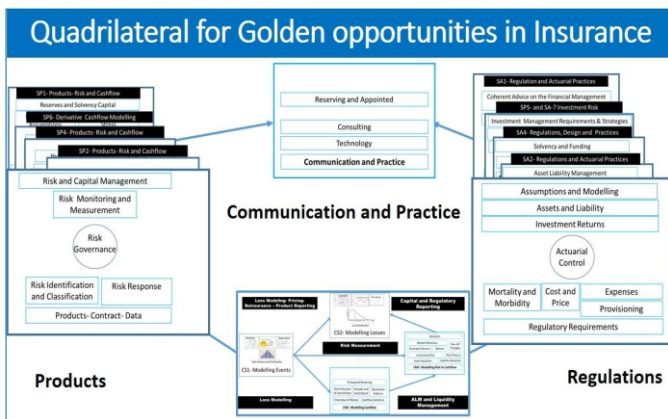
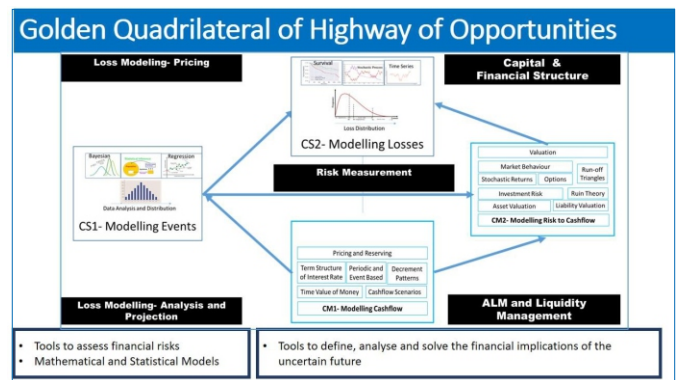
- Life & Health Insurance
- Annuities & Retirement
- General Insurance
- IFRS 9 & 17
- Data Analytics & Data Science
- Reporting, Visualization & Automation
- Banking Risk & Regulatory Risk

Golden quadrilateral of Highway of opportunities in Other Industries

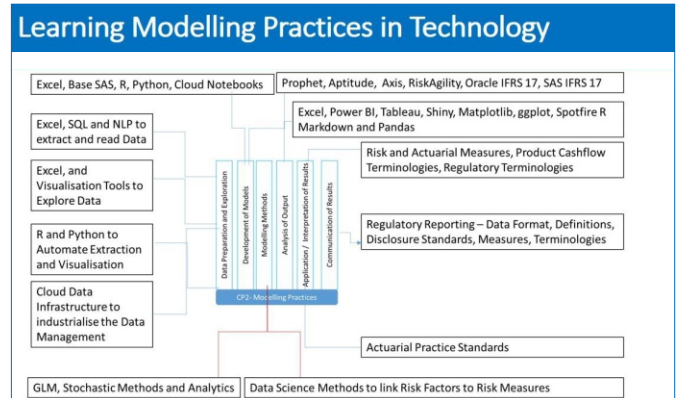
Introduction

The financial services industry in India is on a strong upward growth trajectory which creates immense opportunities of actuarial students to apply their skills in various fields:

The values, numbers and responsibilities involved in the financial services industry are huge and current environment is very fragile and challenging. The webinar started with explaining the quadrilateral of golden opportunities in various fields and industries mentioned as below:

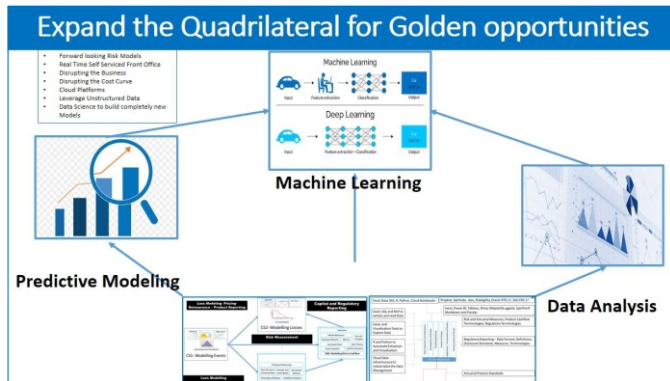


To start a career in actuarial science, start with above 4 papers. One may start with CS1, then go to CM1, CM2 and CS2. CM1 is all about time value of money. When you do not know about the market direction, you may need to make stochastic assumptions, that is where CS2 and CM2 come. This is base for technology, Banking and data science.



Excel and R are the tools from where one can start developing their skillsets.

CP2 is the paper where you convey your model to various stakeholders. So, if someone is looking to clear around 10 papers, then Technical papers along with CP2 can be done.



IAI is also planning on coming up with certifications and programs for the additional skillsets mentioned above.

- Financial or accounting institutions
- Banks
- Corporations managing financial asset investments
- The government, managing the Medicare, Medicaid and other insurance programs
- As consultants
- Start-up

Initiatives by IAI

President Subhendu Bal gave glimpse of various initiatives taken by IAI to improvise the course curriculum and introduce courses with new skillsets, like developing IAI's own study material and developing new educational policy for development of skillsets.

Skills are the key to acquire your USP!

Learning technology is the key to get success in the market, since the technology, keeps on changing day by day and it has to be continuous learning for example after the discovery of android platform, learning to operate the smartphone itself became the necessity to do our day to day activities!

It is important to note that 99% of the resources in the Financial Sector industry must be technology savvy.

The key to securing a job in a competitive job market is to acquire and be proficient in skills relevant to the profile you are targeting. These skills include:

- Excel
- Modelling programs like SAS, SQL, Python & R
- Visualization tools such as PowerBI & Tableau
- BI reporting tools
- Reading text and documents using R and Python.
- Skills like data science and machine learning can give added advantage.

DS and ML Skills on a Single Page							
Python and R modeling	DS Modules on Cloud	DS Techniques Supervised	DS Techniques unsupervised	DS Textual Data	Visualisation and Reporting	Cloud DB	DS Ethics and Privacy
<ul style="list-style-type: none"> • R and Python connectors and Data Quality • RStudio • Keras for DS and DL • Python Scikit for DS and ML 	<ul style="list-style-type: none"> • R Studio and AI Notebooks like Jupyter on Cloud • AWS • GCP • Azure 	<ul style="list-style-type: none"> • GLM • GAM • Trees • Random Forest • Boosting • Neural Network • K-nearest neighbor • SVM • Graph Model 	<ul style="list-style-type: none"> • PCA • K-means/ medoids clustering • Gaussian mixture model • Self organizing maps • t-SNE • UMAP • Bottleneck neural networks • Variational autoencoder 	<ul style="list-style-type: none"> • Text processing • Text classification • Sentiments analysis • Search engine • NLP • NLG 	<ul style="list-style-type: none"> • Shiny for visualisation • Python Matplotlib for Visualisation • Python ggplot for visualisation • Power BI for Visualisation • Tableau for Visualisation • Spotfire for visualisation • R markdown for Reports • Python Pandas for Reporting 	<ul style="list-style-type: none"> • MySQL • PostgreSQL • MongoDB • Redshift 	<ul style="list-style-type: none"> • GDPR • Data Protection and Data Privacy • Data Security • Ethics • PII

Given above is the DS and ML (Data Science and Machine Learning skills). Learning some of them can be an added advantage.

To start the career in any of the industries, the student should start studying the papers CM1, CS1 and then CS2 and CM2, for areas other than core insurance technical jobs, it is advisable to pass CP1 and CP2 for risk perspective and communication.

Fintech is also one of the The future of Actuarial Profession

Tips for interviewees

- Research and understand the organization you are aspiring to join.
- Read the financial statements of the organisation.
- If you are going for a role that focuses on a foreign market, try to have a high-level understanding of that country's regulation and environment.
- Maintain confidentiality: remain aware of any confidential information you might have from your current role and adhere to professional standards. The interviewer might test your commitment to these standards.
- Do not put something on your CV which you don't know anything about.
- Be crisp in our resume - highlight relevant experience & don't exaggerate.
- Be prepared for the unexpected

Further some of the things which are required to be done regularly in the career journey are as follows:

Rotate Roles

Career conversations

Pulse check (Checking if our skillsets are in line with people in the industry)

Focus on the right kind of experience

The fundamentals covered in the relevant subject must not be forgotten, in other words, subject has to be always in touch.

Participants Q&A

Is it good for a person in mid-30s to start an actuarial career?

Age is not a bar to having a successful actuarial career. I can give you multiple examples of people who started much later than this and have very successful actuarial careers.

Are there opportunities for internships in actuarial science?

Yes, I would recommend that you do an internship during your graduation if possible. Multiple companies including Swiss Re offer internships to students pursuing actuarial science.

I am an audit professional who did not have maths in 12th. Do you think I can be successful if I attempt for an actuarial career?

I think you are in the best position to have a successful actuarial career. Your knowledge of processes and accounting would be an added advantage.

What kind of experience do we require to get internships?

Your experience should showcase your ability to multi-task, your leadership skills or pull in resources to solve a problem. Experience in specific fields is not mandatory.

How much time is required for good no of actuarial subjects to be passed?

There is no precise answer. But, for Associate level subjects, it approximately requires between 3000 Hrs to 4000 Hrs of Study and learning.

How can one decide what should be my salary based on my experience and number of paper cleared?

Salary is negotiable. At times if the interview goes really well and the company seniors feel that the candidate is worth giving more, they may hire them at a high salary. Also, it depends company to company. You can try searching on Glassdoor too.

What skills have the potential of making me stand out to an employer so that I can land in the interview?

In order to differentiate oneself from the crowd, you can participate in Kaggle competitions and hackathons. This will prove that not only you have the subject knowledge but also technologically updated. Also, you can curate an article on some of the hot topics which might grab interest of the recruiters.

What if we didn't clear any paper in one attempt? Is there any impact on interview / job?

No, there is no impact on interview or job. When one goes for an interview what matters is that you must know the subjects that you have cleared. Be thoroughly prepared to answer the questions from those subjects. Number of attempts doesn't matter.

What preparations should I do before going to an interview?

Few tips are -

1. Go through the company's website thoroughly.
2. Read the Job description (JD) well. It says what the employer wants from you. Hence, pick topics from JD and brush up on those.
3. Be aware of the latest developments in the industry for which you applied - General Insurance, Life Insurance, Health Insurance, Pensions or the non-traditional roles.
4. Read the subject papers which you have already cleared.
5. Be very much aware of the projects or tools which you have mentioned in your resume. One might get questions from the resume itself.

Conclusion - Sky is the limit!

Opportunities are endless for actuarial students. We possess skills which can be applied to a variety of fields like IT, finance, accounting, training, marketing, general management and the list goes on. The key is to acquire skills which align with our career goals and go out in the job market.

Written by



Ritika Agarwal

aritika233@gmail.com

Ritika is a student member of IAI and IFoA. She is working currently as an Assistant Manager (Product Filing and Pricing) at a leading InsureTech. She is also a member of Banking Community Leadership Team at IFoA.

Date: 10th November 2021; Wednesday Time: 16:00 - 17:30 IST

Introductory Address: Vishwanath Mahendra, Chair, Advisory Group on Health Insurance

Presidential Address: Subhendu Bal, President, IAI

Speakers: Nicola Oliver, Founder, Medical Intelligence (London) Ltd

Josephine Robertson, Associate Director of Actuarial, Optum

Adrian Baskir, Chief Underwriting Officer, Bupa Insurance Ltd

Introduction

The COVID-19 pandemic has been raging on since last year and a half. Apart from COVID-19 infection, we keep hearing the word Long COVID from various medical experts around the globe. The Webinar titled "Long Covid" was conducted by the Health Insurance Advisory Group on November 10, 2021. The objective of this Webinar was to understand what Long COVID is and its impact on population, society and the insurance industry.

Vishwanath Mahendra started the session by introducing the term Long COVID. Mr Subhendu Bal followed the introductory session with the presidential address.

Long COVID

Nicola started with the challenges of not having a consensus around the definition of Long COVID. Long COVID is more likely to be found in people who have recovered from COVID-19 even if the infection was mild but still have long-lasting symptoms that persist for more than 8-12 weeks of the disease. One of the crucial things that she mentioned regarding Long COVID was damage to the organs other than the lungs, which might be permanent.

To understand the impact on other organs, she mentioned that the spike protein of the virus combines with the ACE2 protein of the human cells. ACE2 protein is involved in many organs such as the heart, lungs, kidneys and brain. A few effects of Long COVID could be

- New or worsening control of Diabetes
- Bone mineral thinning (Side effects of using steroids)
- PTSD (especially for people admitted to intensive care)
- Thromboembolic events (impact on clotting cascade leading to increased chances of stroke)
- Pulmonary fibrosis (scarring of the lungs) leading to breathlessness
- Reduced pulmonary function
- Myocardial fibrosis (scarring of heart muscles)

There are three groups in which Long COVID could be segregated.

- Group 1 - Initially hospitalised or admitted to Intensive care- They are likely to have long term respiratory distress.
- Group 2 - People not hospitalised- Multiple organs such as heart or lungs at risk
- Group 3 - Persisting symptoms- Dominated by fatigue

Impact of Long COVID

To measure the impact of Long COVID, we need a streamlined definition of Long COVID, and this is still in the development phase. However, we can use some basic information to estimate the impact of Long COVID, for example, a COVID 19 infection which is a prerequisite for developing Long COVID. Higher risk factors for disease would mean higher chances of Long COVID.

To estimate the population impact and the disease burden, we use the loss of QALYs (quality-adjusted life years).

There are the following ways that the Long COVID can emerge from the infection stage.

- Positive test- If the person tests positive for COVID, they are more likely to develop Long COVID. However, since the testing might not be as widespread, there are challenges with this approach.
- Hospitalised at ward
- Hospitalised in Intensive Care

To estimate the disease burden, we divide the population into two groups

- The first one with Lasting symptoms of Long COVID (Group 2 and 3 defined in Nicola's model)
- The other is COVID Injured (Group 1 defined in Nicola's model). These are more likely to have a permanent injury.

Josephine stressed that there is also the societal level of impact of Long COVID. Society has a knock-on effect because of the population experiencing widespread ill-health. To minimise the effect on society, we have the following intervention stages.

- Tertiary prevention: Required for people suffering from Long COVID, and we need to think about the provision of care. Multiple treatments (like anti-viral tablets) are in the development phase for COVID-19 and might reduce its likelihood of Long COVID. Also, tablets will have better reach than vaccination, so it may prove to be a better solution in reducing the impact of Long COVID.
- Secondary prevention: Vaccination. Some researches suggest that vaccination, even at the stage of infection, could reduce the chances of Long COVID.
- Primary Prevention: Detection and management of risk factors for future disease. For example, managing existing conditions like Diabetes.
- Primordial Prevention: This is about people who are experiencing Long COVID can get back to education or employment

Long COVID - Insurance Perspective

Adrian mentions that Exclusions can help find out long COVID, that is, getting tests of different conditions, and if it is none of the expected conditions are detected, the condition could be Long COVID. Hence the determination of Long COVID is still dependent on the judgement of Underwriters.

Adrian highlighted a couple of policy implications in insurance

- There could be a pandemic exclusion for Long COVID. However, this might not work due to not having an

unambiguous definition for Long COVID.

- The company could repudiate the claim if Long COVID is detected at pre-authorisation.

From the UW point of view, there could be a temptation to treat policyholders suffering from Long COVID differently. There could be loading or exclusion of cover for people who have suffered COVID, but the following Underwriting Considerations might be there.

- People could be asymptomatic when infected with COVID, and hence might not have got tested.
- In the absence of a Long COVID diagnosis and high prevalence of ('Short') COVID, companies could exclude COVID (because 'short' COVID has higher chances of leading up to Long COVID). However, it might exclude too big of a market because as countries open up, more people are likely to get 'short' COVID.
- It will be very challenging to identify if a claim is related to complications caused by COVID or it is due to any other condition if Long COVID is excluded.

Understanding COVID-19 and its long-term consequences could be the best way of dealing with Long COVID; Pricing Long COVID might be a better approach than totally excluding it. However, due to significant uncertainty and lack of data regarding Long COVID, it is challenging to price.

The way forward

- It is essential to realise that Long COVID is likely to impact organs other than lungs, and there may be a long-lasting impact on the organs. There will be a significant impact on long term morbidity and mortality due to Long COVID.
- The Long COVID is likely to severely affect the population and society, which may lead to an impact on the economy in the form of loss of QALYs.
- We mustn't exclude people who have had COVID infection even though they are more likely to have Long COVID, and we would exclude a significant amount of the population.

On behalf of the Advisory Group of Health Care Insurance, IAI, Sumit Ramani delivered a vote of thanks thus concluding the Webinar.

Written by



Ashish Swarup Gupta



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Ashish Swarup Gupta is a Senior Marketing Actuary at Munich Re India Branch.

Date: 18th November 2021; Thursday **Time:** 15:00 - 18:00 IST

Chair: Kailash Mittal, Chair, Advisory Group on Risk Management

Moderator: Tanay Chandra, Member, Advisory Group on Risk Management

Speakers: Philip Jackson, Principle and Consulting Actuary - Milliman

Badrish Kulhalli, HDFC Life, Head Fixed Incomes

Prithesh Kumar Chaubey, Appointed Actuary, SBI Life Insurance

Adhiraj Bhowan, Director, KPMG

Muzammil Patel, Managing Director, Acies Consulting

Introduction

The current focus of the Life insurance industry is mainly on the protection and Non-Participating Savings based products. The main factor driving the interest of policyholders on such products is the current situation of interest rates in the market. These insurance products provide an opportunity for the policyholder to lock in to the interest rates and assure a future income cashflows. On the other hand, for the insurers this creates investment risk. As per IRDAI regulations insurers in the Indian market can use derivatives to hedge investment risk. As risk management is a major concern area for Insurers, the Institute of Actuaries of India is conducting webinars on various relevant topics. A webinar titled - "5th Webinar of Risk Management-Capacity Building on Derivatives" was conducted by the Advisory Group on Risk Management. The objective was to cover various elements of Derivatives Strategy in the Life insurance segment.

Kailash Mittal, started the session by providing his views on the requirement and importance of Derivatives in the Life Insurance market, which was followed by the presidential address by Subhendu Bal.

Philip Jackson provided an introduction on derivatives as applicable in insurance industry. Badrish covered the technical aspect of pricing and valuation of derivatives. Prithesh Kumar Chaubey provided an Appointed Actuary's view on use of derivatives in ALM and their

associated risk. Adhiraj covered the risk management metrics followed by an overview of accounting for derivatives by Muzammil.

Derivatives as applicable to the insurance industry

Derivatives is a key asset class which is used by insurers for hedging their interest rate risk from future cashflows. Life insurers mostly design and sell long duration products, it is a common situation that liabilities duration is much longer than assets. Even if the insurer has more assets backing the liabilities, they may still be exposed to interest rate fall due to the long duration of liabilities. Derivatives as an asset category provide a way to match the duration between liabilities and assets. Instead of investing in long duration bonds to increase asset duration, insurers can opt for a cost effective and long duration asset class - Derivatives. As per IRDAI Regulations, insurers can use the following derivatives-

- Interest Rate Swaps (IRS)
- Interest Rate Futures (IRF)
- Forward Rate Agreements (FRA)

FRAs are currently becoming very popular in the Indian Market. These are OTC contracts from an investment bank. The basis risk can be considerably reduced in FRAs by carefully selecting the bond. However, as these are OTC contracts, the insurers are exposed to counterparty risk.

Therefore, derivatives play an important role in the matching of liability and asset cashflow.

Derivative - Pricing and Valuation

The theoretical futures/forward price of an asset is the spot price plus all the costs and benefits associated with holding the asset for the period. Here, costs can include funding cost, storage cost etc. and for benefits we may have dividends, coupons/interest benefits. In case of forwards the forward seller does not warehouse the market risk, and takes a position in the underlying asset for the duration of contract.

So Theoretical Forward Price = Spot Price * (1+r)ⁿ

In the actual market the prices differ from theoretical price which could be due to:

- Demand - Supply difference
- Market Imperfections
- Capital Cost

For Forward pricing for bonds, is impacted by the coupon payments made to the bond holder for the holding period. Hence, any difference between the funding cost in the market and the current yield on the bond, will impact the forward price of bond.

The FRAs are currently witnessing a structure where the bond yields are significantly higher than the funding cost which the counterparty has to bear thus, enabling the banks to pass on this as a price benefit to the forward buyer.

Use of Derivatives in ALM and associated risks

The risk management approach followed by life insurers can be split into two segments - the pre derivative phase and the post derivative phase.

In the pre derivative phase when investment in derivative was not allowed under IRDAI regulations, the actuaries would adopt a prudent approach in pricing while deciding interest rate and take account of any reinvestment risk that may arise in future. At the same time, the insurers will also maintain access margins in the liabilities by increasing the MAD on valuation interest rate. This will have an impact on the returns offered to customer under the product and also reduce the available capital for the insurer.

In current scenario where derivative investment is allowed as per the regulations, the insurers can now lock in the yield on future premiums thus reducing reinvestment risk and leading to reduced margin requirement while pricing of products. At the same time this locked in yield will also help in reducing the interest rate sensitivity of the liabilities which will lead to lower reserves requirement and allow the insurer to release the locked in capital.

Interest Rate derivatives will:

- Manage ALM risks: duration & cashflow matching
- Immunize the economic and strategic balance sheet
- Insulate future profits from interest rate risk
- Protect the value of New Business and embedded value
- Lower capital requirement
- Enable companies to write guaranteed products

Risk Management for Derivatives

For life insurers the objective of hedging strategy is to mitigate interest rate risk by hedging a percentage of the cashflows using interest rate derivatives like FRA. Main focus points of hedging strategy include hedged item and hedge ratio.

Hedged item is the expected net cashflows of a product or portfolio of products and hedge ratio is the comparative value of an open position's hedge to the overall position.

Insurers generally follow the route of cashflow hedging, which is a process of hedging in which cash outflows are matched with cash inflows over a given time horizon. Hedging at a given point in time can be done only for insurance contracts which are already underwritten. Important aspects which are to be considered while designing the hedging strategy include the Hedge Ratio and the frequency of hedging (monthly/quarterly/yearly).

A decision on the optimal hedge ratio will take the following factors into consideration:

- Sensitivity of lapses on the cashflows
- Risk appetite of the company
- Product specific investment strategy
- Position of future interest rate moment
- Solvency ratio and future growth plans

Risks related to an hedging strategy:

- Actual risk which will mainly include lapse risk and expense risk. In case of higher than expected lapses, hedge will be ineffective and lower lapses will put constraints on meeting policyholder commitments. Also higher expenses will impact the P&L.
- Risk of hedge Ineffectiveness which means that the hedged instrument will move with a difference beyond the hedged corridor.
- Market Risk wherein the movement in market rates will impact the value of forwards.
- Counter party risk as the counter party (investment banker may default in case of adverse market movements
- Basis risk if in case the interest rate curve used to value the derivative is not consistent with the yield of the underlying
- Operational Risk related to inappropriate valuation, risk management or reporting of derivatives
- Legal Risk which will be created due to improper documentation.

Risk Mitigation Strategies that could be adopted:

- Regular experience monitoring of lapses and expenses and any adverse experience than expected should lead to a detailed review.
- Deploying hedge strategy and operational controls over computation of cashflows and structuring of the deal to match the cashflow on derivatives with the underlying.
- Market risk should be monitored using Value at Risk (VaR) and stress testing.
- Documents should be reviewed by legal council

Accounting for Derivatives

Different basis of accounting between the derivative financial asset/liability and the underlying asset/liability creates volatility in the income statement. Hedge accounting deals with this accounting mismatch by adjusting the basis of accounting.

Behavior of the derivatives may not be straight forward from a solvency standpoint and hence the accounting approach will have an impact on the insurer's financial statements. Under cashflow hedge accounting, the

fluctuations in the value of the derivatives are passed on to Fair Value change account (FVCA) so that the P&L is shielded. A key challenge under this approach is experienced when FVCA is exhausted like in case of interest rates up and the solvency margin is exposed.

Conclusion

The webinar covered all the important aspects that impact a derivative program including the uses of derivatives in the insurance sector, pricing of such contracts, the associated risk and mitigation strategy, the accounting approach used for this asset class.

The Webinar was concluded with Vote of Thanks from Kailash Mittal on behalf of the Advisory Group of Risk Management.

Written by



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Kritika Sharma is a student member of IAI and currently working with Max Life Insurance Co. Ltd.



युनाइटेड इंडिया इंश्योरेंस कंपनी लिमिटेड
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At **United India**, it's always **U** before **I**

RECRUITMENT OF APPOINTED ACTUARY

Applications are invited for the post of "Appointed Actuary" in the Company as per IRDAI Regulations on Full Time Contractual basis. Interested persons may apply on or before **31.01.2022**.

Please log on to our website www.uiic.co.in for details.

Corporate HRM Department

IRDAI Regn. No. 545 | CIN: U93090TN1938GOI000108 | Toll Free No.: 1 - 800 - 425 - 33333 | E-Mail: customercare@uiic.co.in

Date: 20th November 2021, Saturday Time: 16:00 - 17:30 IST

Topic: SUTRA - A mathematical model for pandemics in India and Elsewhere

Welcome Address: Vishwanath Mahendra, Chair, Advisory Group on Health Insurance, IAI

Moderator: Sumit Ramani, Secretary, Advisory Group on Health Insurance, IAI

Speaker: Dr. M Vidyasagar FRS SERB National Science Chair and Distinguished Professor

Introduction

The ninth webinar on Health Insurance started with a welcome address by Vishwanath Mahendra, Chairperson of Advisory Group on Health Insurance who briefed on the application of SUTRA Model - a mathematical model for pandemics in India and elsewhere as to how this model was used in predicting the behavior of the pandemic which exhibited varying behaviors across the time and geographic regions in the last two years. He shared his experience of using the model for predicting Covid related claims in his organization.

The Distinguished Speaker M. Vidyasagar started by thanking the brains behind this mathematical model and to set the context he said the reference will be made to the 1918 Spanish Flu as this is the earliest pandemic for which some reasonably reliable data had been recorded and made available. Though there were other pandemics like Bubonic Plague, data related to those pandemics were not reliable to make any meaningful inferences. He shared the pattern of Spanish Flu over a period and how the case load varied across time during the pandemic.

Three distinct peaks were observed in 1918 pandemic: the second peak being the highest, the third peak higher than the first. It was estimated that India lost almost 7% of its population at that time. US also had experienced the worst with approximately 675,000 deaths recorded for Spanish Flu. He gave a brief introduction of SIR (**Susceptible, Infected, Recovered**) and SIRS (**Susceptible, Infected, Recovered, Susceptible**) for reinfection models that

were introduced in 1927. The difference between SIR and SIRS models were lucidly explained and their applicability in different scenarios was also cited with examples.

While explaining the SIR model, he emphasized on the importance of “R” which actually stands for “Removed” either through recovery or death and not actually “Recovered” as is most often misconstrued. The concept of R_0 was clearly stated with an example. He also discussed the SAIR model (**Susceptible, Asymptomatic, Infected, and Recovered**) which appeared in a research journal for the first time in 2013 that deals with Infected but Asymptomatic patients which was not present originally in SIR model of 1927. As we all know by now that Covid 19 unlike other [pandemics of the past, has a unique characteristic of infecting people without causing any symptoms. Asymptomatic patients have the potential of infecting others, most often these patients are not detected since they do not come to know that they are infected.

Rationale behind SUTRA model

In SAIR model, it is assumed that almost all the people in state I (infected) do not infect others since they are isolated in general. In the case of Covid 19, due to contact tracing approach adopted by almost all the countries in the world including India, some portion of A (Asymptomatic) also gets detected. Therefore there is a need to revisit the division between 'A' and 'I' in SAIR model. This led to a new classification - **T**ested positive (T), **U**ndetected (U) it is also observed that within T most of the people (around 85%) are asymptomatic and recover and almost everyone in U recovers. It is also to be noted that a small fraction of U (most recent entrants) move into T. Thus the name SUTRA comes from **S**usceptible, **U**ndetected, **T**ested Positive, and **R**ecovered aka **R**emoved (including deaths) **A**nalysis stages of the model.

It is assumed a proportion of susceptible people get infected and initially remain Undetected (termed contact rate β , then a portion of these Undetected test positive. From Undetected a proportion move to Removed state R_0 and approximately the same

proportion move from Tested state to Removed R_r state (termed recovery rate γ). Thus the model takes care of those who are undetected and recover as well as those who are tested and recover.

Fitting the parameters from the existing data

The professor highlighted the importance of fitting the parameters from the actual data. He explained how he arrived at the linear relationship between some measured quantities that in turn helped in estimating the parameters with very high value of R^2 - coefficient of determination thereby indicating the model to be a good fit. Whenever there is a drift from the linear relationship then the parameters are recalibrated thus making the model more appropriate based on the various factors that keep evolving and pointing to the start of the new phase. The new phase could be related to new mutations or fresh lockdowns or relaxing of Covid protocol, etc. Each of these changes leads to recalibration to reinstate the linear relationship.

Prediction using SUTRA model

The model could make predictions for more than 20 countries fairly accurately. Particularly, predictions were made for US and UK with 10 and 7 phases respectively. The model predictions were pretty much closer to actual data. For India, the first wave and the second wave were dealt separately for the obvious reasons as the circumstances for both the waves were entirely different in following aspects: - testing facilities, data availability, different stages of lockdown from complete lockdown to step by step relaxations.

In the first wave, model was used to predict the emergence of cases under various scenarios- no lockdown, delayed lockdown at various points of time. The first wave peak with lockdown was predicted almost closer to the actual peak of 1000000 cases in the mid of September 2020. From the time of peak in September 2020, till the end of the first wave around April 2021, the predictions of the model were very close to the actuals.

Second Wave and Reasons that led to it

There are various factors that led to the second wave, the most obvious being the complacency of both general public and the government, negligence of the possible and dangerous variants, inadequate capacity of sequencing of virus samples prior to March 2021- an important aspect to identify the virulent nature of the new mutants in advance, slow pace of vaccination

drive, inadequate stock of vaccines when the second wave hit, etc. The professor opined that the second wave would not have been avoided however; its effect could have been mitigated if the above factors have been taken care of. An illustration of the model prediction vs. actual was shown and the model could accurately predict the peak of the second wave too. The parameters of the model were recalibrated after the second wave peak with new data and the other factors that developed in course of time like the effect of delta variant waning, relaxation of Covid protocols in most places, increase in vaccinated **population**, etc. The contact rate β has increased from 0.23 at the start of the pandemic to 0.44 until most recently.

Possible Triggers for a third wave and beyond

The speaker also discussed the possible triggers for the next wave - emergence of more infectious variant than delta, erosion of previously developed antibodies or the ineffectiveness of those antibodies, vaccination not being efficient against the emerging new variants, etc. The speaker also discussed about the vaccine efficacy against the delta variant and the future variants. He reiterated how vaccination can reduce the impact of infections and the associated hospitalization requirements. He also indicated the possible future studies related to the following:

- The rate at which reinfected people transmit the virus: is it the same as the first time infected people or lower or higher?
- What is the level of risk of hospitalization faced by these reinfected people in comparison with the first time infected people?

Conclusion

The session was very insightful and enlightening where many of the practical and unique aspects of the ongoing pandemic are given due weightage in developing and proving a more appropriate and realistic model. The session ended with vote of thanks by Sumit Ramani, Secretary, advisory Group on Health Insurance acknowledging the efforts and time given by the speaker, IAI team, President, IAI and other advisory group members.

Written by



Subbulakshmi V



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Subbulakshmi is a fellow member of IAI and is a consulting actuary in areas of Life Insurance, General Insurance, Pensions and Investments.

Date: 25th November, Thursday **Time:** 14:00 – 17:00 IST

Welcome Address: Prithesh Kumar Chaubey, Chairperson, Advisory Group on Life Insurance, IAI

Introductory Remarks: Ranabir Ghosh, Member, Advisory Group on Life Insurance, IAI

Session 1: Managing Customer Retention

Panellists: Sunil Sharma, Chief Actuary & CRO Kotak Life

Anand Pejaware, Executive Director, Chief Operating Officer, SBI Life Insurance

Amit Palta, Chief Distribution Officer, ICICI Prudential Life

Moderator: Bikash Chaudhary, Appointed Actuary & CRO, Future Generali

Session 2: Managing Investment Return

Panellists: Anil Singh, Chief Actuarial Officer and Appointed Actuary, Birla Sun Life

Niraj Shah, Chief Financial Officer, HDFC Life

Kunj Behari Maheshwari, Partner, Willis Towers Watson

Harshad Patil, Executive Vice President and Chief Investment Officer, Tata AIA

Moderator: Akshay Dhand, Appointed Actuary and Director - Products, Canara HSBC OBC Life

Introduction

The first module of the Current Issues in Life Assurance webinar began with a welcome address from Prithesh Kumar Chaubey wherein he welcomed all and summarized the key topics to be discussed in the module. This was followed by the address from Subhendu Bal, President on the recent initiatives of the IAI. Ranabir Gosh introduced the panellists.

Session 1: Managing Customer Retention

Bikash Chaudhary set the background for the session by reviewing the persistency data for the Life insurance industry, the customer complaints trend and the impact of digital payments and data analytics in improving customer retention.

The panellists discussed the key drivers of persistency and explained how managing these drivers affect the persistency of the company. The importance of engaging with the customers and how data analytics can be used to segregate the customers and adopt different approaches to increase retention was examined. The panel deliberated the issue of customer retention from the perspective of Sales, Operations and Financial management. The panellists shared deep insights on the topic drawing from the rich experience and it was a thought-provoking and lively discussion. The key points of the discussion included

- The importance of retaining policies irrespective of whether the policies are lapse supportive or not and growing the in-force portfolio to a critical mass is key to the long-term sustainability of the company.
- Selective lapses which leave behind a portfolio of policies with more than average mortality.
- Fairness and disclosures at the point of sale to ensure that the customer makes the purchase being fully aware of what the product offers and what it does not.
- How the disclosures help both the insurers and customers in making the right decisions and increase in the level of disclosures for complex products
- How the current and future trends look like with regards to customer needs and the likely impact of that on the product features, selling methods and retention management
- Changes to the remuneration structure of Distributors to improve retention
- Risks of mis-selling/wrong-selling and the implications of customers buying products without understanding its features

The session concluded with the vote of thanks from Ranabir Ghosh

Session 2: Managing Investment Return

Ranabir Ghosh opened the session by reviewing the 10 Year G Sec and Nifty returns over the last 2 years and highlighting the challenges faced in managing different product types due to the decline in interest rates and volatility of investment returns.

Akshay Dhand threw the forum open for a lively discussion by eliciting the opinion of panellists on managing the investment return under different types of products and asset classes. Different products like Non-Par, Par and Unit Linked need to be managed differently to achieve the investment objectives underlying to meet the expectations of policyholders and shareholders. The assets have to be chosen keeping in mind the liability profiles of products, risk characteristics and the regulatory requirements. The key points of the discussion included

- Management of Par fund, especially the Policyholder's Reasonable Expectations. The importance of keeping reversionary bonuses lower to have more investment freedom
- Management of products with cash bonuses, the challenges around liquidity and reinvestment risks.
- Strategies that can be adopted to manage investment return under
- Management of non-par products, use of the Forward Rate Agreements, Investing in bond issues of Institutions etc
- Use of derivatives like the Forward Rate Agreements and Interest Rate Futures in enhancing investment return and minimising risk
- Alternative investments that can be considered to increase returns and reduce risk

- Current regulations around the asset classes eligible for investment and any changes needed
- Management of Index-Linked products and issues associated with it like tracking error
- Investment in properties and its merits and demerits
- Implications of investment management for shareholders and investors
- Learnings on Investment management from overseas insurers

The discussion was followed by the Q&A session with participants raising relevant topics like the impact of climate change on investments, the use of equity derivatives and cryptocurrencies as an investment.

Ranabir Ghosh concluded the session by proposing the vote of thanks.

Written by



Muralidharan R

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Muralidharan is an Associate Member of IAI and currently working at HCL Technologies Ltd as General Manager - Actuarial leading the Actuarial and Finance functions.

CB3 June 2022 Examination - Registration Announcement

Introduction:

CB3: Business Management Online Module involves students taking part in a ten day online business game, and submitting seven completed exercises. Students who take the online examination will be required to do advance study involving online tutorials, and also an online examination following the ten days business game.

Key Dates:

1. Online Registration starts from 28th December 2021, Tuesday from 3.00 P.M.
2. Last date of Registration will be 2nd March 2022 till 3.00 P.M.
3. Login Details for study material and case studies will be provided on 5th March 2022.
4. Last date to submit the pre course assignment is 21st May 2022 up to 3.00 P.M.
5. Business Game: Business game dates will be communicated to you via confirmation email.
6. Online Examination will be held from 1st June 2022 from 3:00 P.M. onwards.

Examination explained stepwise

Stage 1 - Login details: By 5th March 2022, 6:00 pm you will be given Login ID and password wherein the study material and case studies will be made available to study online for the examination. CB3 Study Material will be available only in windows platform.

Stage 2 - Business Game: Business game will be scheduled for 10 days for all the students, dates of which will be communicated via confirmation email sent to your registered email ID.

Stage 3 - 7 Exercises/Case Studies: Once login details are received by you, you need to download the 7 Exercises/Case studies which you need to complete and submit under the IAI member login by 21st May 2022 up to 3.00 P.M. You shall be entitled to appear for the online examination only after the assignment is submitted by you.

Stage 4 - Online Examination: There will be an online examination which will be held from 1st June 2022 from 3:00 P.M. onwards.

Institute of Actuaries of India

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Date: 26th November, Friday Time: 14:00 – 17:00 IST

Introductory Remarks: Ramakant Malpani, Member, Advisory Group on Life Insurance, IAI

Session 1: Next-gen AI-driven risk assessment: learnings for the actuarial profession

Speaker: Lee Sarkin, Chief Analytics Officer, APAC, Middle East, Africa, Life & Health, Munich Re

Session 2: Continuous Control Monitoring in Life Insurance

Speaker: Mani Palaniswamy, Head of Fraud and Security Intelligence - BFSI, SAS India

Vote of Thanks: Asha Murali, Member, Advisory Group on Life Insurance, IAI

Introduction

The second module of the 17th Current Issues in Life Assurance (CILA) webinar began with a welcome address from Ramakant Malpani. He introduced the topic of Big Data and how the importance of data is increasing in the current world. He discussed how continuous monitoring is important in the Life Insurance business.

Session 1: Next-gen AI-driven risk assessment: learnings for the actuarial profession

Lee Sarkin started the session by describing how the use of data in decision-making has been increasing in recent times. He stressed the importance of getting meaningful outcomes from the data and explained how Artificial Intelligence (AI) and Machine Learning (ML) techniques can be used to develop solutions to problems in the Life insurance industry.

Lee presented a case study on how AI and ML techniques can be used to develop automated underwriting solutions.

Case Study: Augmenting Underwriting with AI

The Case Study involved how to combine data and AI/ML techniques to develop a solution that will automate the underwriting process. The solution aims to target an optimum level of cases that will be automatically processed while keeping the false-positive rates at an

acceptable level. The solution consisted of the below stages:

- Combining different data sources, Data from the Application forms, Behavioural Data, Back Office data, Customer photos, voice, video, and External data.
- Using the combined data in an AI-driven model to develop an automated Underwriting Solution
- Validating the AI Model by examining the proportion of cases accepted at standard rates out of the manually underwritten cases. Lesser the proportion, the more accurate the model.
- Assessing the accuracy of the model by examining the no of false-positive results
- Calibrating the model to achieve the optimum balance between cases processed through STP and the proportion of false positives
- Incorporating AI-driven risk assessment techniques like BMI prediction, Smoker prediction, Claims prediction, Anti selection prediction, etc.
- Retraining the model to incorporate new scenarios and past learnings to keep it accurate
- Using the model to improve the application form questions and identifying which questions are more significant

Lee also covered the other aspects like using predictive modelling to assess propensity to buy, the opportunity for cross-selling /up-selling, risks from fraud, and propensity to claim.

Active participation was seen in the Q & A session with many relevant questions being raised. The session ended with a vote of thanks from Ramakant.

Session 2: Continuous Control Monitoring in Life Insurance

Ramakant opened the session by introducing the speaker, Mani Palaniswamy. Mani set the context by referring to the Sec 45 of the Insurance Act, 1938 which provides three years during which any issues related to misstatements, misrepresentation by the policyholder need to be identified and appropriate action is taken. This requires monitoring the data on policyholders, agents, nominees, and the information provided in the application to reduce the risk of fraud.

The Continuous Control Monitoring Framework refers to the set of controls in place to proactively monitor the risks related to frauds and identify potential high-risk policies and take preventive action to mitigate the risks.

Mani introduced the SAS Continuous Control Model (CCM), which combines the techniques from predictive modelling, Artificial Intelligence/ Machine Learning to identify the high-risk cases from the portfolio of policies and help in the risk management process. The following aspects of the model were discussed in detail.

Drivers of the CCM: Sec 45 regulations, Liberalised KYC norms, Covid 19 scenario, Unified platform to manage risk and Risk management approach.

SAS Model: Risk-based planning and monitoring, Use of Hybrid analytics, Multilevel analysis, and Risk-based scoring

Multi-Level CCM: Monitoring events and entities associated with the policies; monitoring as a network of customers, agents, and claims

Hybrid Analytics: Use of multiple techniques like Anomaly detection, Machine learning, Database

searches, and Image/ Text mining to detect fraudulent activities. Assigning a Risk score to each policy based on the various information collected

Benefits of CCM: Business, Operational, Financial, Compliance and Technical

CCM Requirements: Policy Monitoring, Compliance Monitoring, Agency Assurance, Conduct Assurance and Underwriting

In addition, the use of analytics in the underwriting of policies and in making targeted searches of fraudulent transactions was discussed.

The session concluded with a Q & A session and Asha Murali proposing the vote of thanks.

Written by



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Muralidharan is an Associate Member of IAI and currently working at HCL Technologies Ltd as General Manager - Actuarial leading the Actuarial and Finance functions.

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Website : <http://www.orientalinsurance.org.in>

APPOINTMENT OF PEER REVIEWER - ACTUARY

Applications are invited for peer review of the all statutory actuarial valuations carried out by the Appointed Actuary of our Company for the Financial Year 2021-22 in compliance of APS 33 of Institute of Actuaries of India. Interested persons may submit application on or before **21.02.2022**.

Please log on to our website <https://orientalinsurance.org.in/web/guest/tenders> for details.

Deputy General Manager (Actuarial)
sudip.dutta@orientalinsurance.co.in

17th Current Issues in Life Assurance (CILA) Webinar

Module 3 - Modelling - Advanced modelling techniques, making models efficient, Making models future ready

Date: 2nd December; Thursday **Time:** 14:00 - 17:00 IST

Group: Advisory Group on Life Insurance (LIAG)

Introductory Address: Keyur Parekh, Member, Advisory Group on Life Insurance

Moderator: Keyur Parekh, Member, Advisory Group on Life Insurance

Session 1: Advanced Actuarial Modelling

Speakers: Abhishek Saraf, Group Risk Director, ERM and Capital, Prudential plc

Gaurav Bhalla, Regional Director, ERM and Capital, Prudential plc

Kailash Mittal, Partner - FRM - Actuary, KPMG - India

Purushottam Lakhani, Manager, KPMG - India

Session 2: Interface of Actuarial Models with Upstream and Downstream Processes

Speakers: Swati Umre, Partner, EY Actuarial services LLP

Ahum Mitra, Sr. Manager, EY Actuarial Services LLP

Session 3: Best Practices in Actuarial Modelling

Speakers: Rohit Malhotra, Senior Associate, Milliman

Ritchie Adaman, Senior Actuarial Associate, Milliman

Vote of Thanks: Keyur Parekh, Member, Advisory Group on Life Insurance

Introduction

The webinar started with introductory address by Keyur who highlighted how models form a critical part of any actuarial work. The quality of actuarial advice to senior management critically depends on output of models and the sophistication of those models to be able to address real world experience. Many financials plunders of the past can be attributed to either weak controls over the model or manual intervention which could have been easily avoided through automation.

Keyur then introduced the speakers and handed over the session to Kailash.

Session 1: Advanced Actuarial Modelling

Kailash set the context of the topic emphasising that the focus of the session would be on global

developments in modelling on the liability side and also on asset side. He particularly stated the trade off at the time of modelling - should we focus more on the accuracy of the modelling exercise or should we pay more importance to the business realities associated with it covering all the major business exigencies.

Kailash then outlined the three major areas which have led to advances in modelling -

- Innovative product design with options and guarantees
- Risk management and asset liability management
- Financial reporting requirements from liability and capital standpoints

He also mentioned that the advances of IT and reduced run times have helped us to conceptualize complex models in practice.

Purushottam then discussed in detail how financial reporting requirements have contributed to advances in modelling. He enumerated the major aspects which decide the complexity of actuarial models - the sophistication of the financial regime, the maturity of the financial market and complexity of products.

He further enumerated various capital regimes viz Solvency II, US-Based RBC Regime, Bermudan Economic Balance Sheet Regime and Solvency I Regime and emphasised the importance of ALM matching in order to reduce the statutory reserve and solvency capital requirements.

Gaurav then discussed in detail the two approaches to Risk Based Capital with their pros and cons:

- **Standard Formula Approach:** Although a more pragmatic approach, it could be onerous due to running of various scenarios and modelling of time value of guarantees. Traditional models can be used here.
- **Internal Model Approach:** Although a company-specific approach, it leads to a much better integration of the company's risk model with enterprise risk management activities. Stochastic

modelling may be required here and hence traditional models may be unsuitable.

He then went ahead in discussing the critical aspects of stochastic modelling -

- Scenario generators for **economic as well as non-economic assumptions** and the whether to use **real-world probabilities or risk neutral probabilities**
- **Key considerations for scenario generators viz choice of models (Hull, Vasicek, etc.), calibration of models, risk of appropriate correlations between the risks especially in the tail**
- Whether to use **Heavy Models** (traditional actuarial models) or **Proxy models** (simplified version of traditional models) for stochastic scenarios

Purushottam then outlined the current market landscape in India. He focused on **how the ALM toolkit of companies can be improved**. Following major points were discussed -

- Focusing more on the **economic surplus** rather than looking at the valuation cash flows
- Focusing on **steepness twists and curvature changes** along with parallel shift while giving interest rate shocks.
- Long-term coupon stripping and hedging using forward rate agreements
- Adopting global practices like effective duration-based gap management on valuation basis, dollar duration (DD) based gap and changes in controlling position, spread duration monitoring, monitoring duration gap based on BEL and MV assets, convexity check, extending the cash flow matching principle, multiple liability immunization, key rate duration, etc.

He then focused on importance of **strategic asset allocation** stating that currently it is being done more using a judgement based approach. But given the computational power now, he stated that the allocation can be done based on multiple iterations using advanced constrained optimization techniques.

Purushottam then focused on innovative product designs by citing examples from the US Market which require complex modelling -

- **Spread based business:** Fixed Index Annuity (using equity derivatives and option strategies) - here instead of offering a guaranteed IRR, returns based on equity returns are guaranteed with a cap of say 10% and floor of 0%.
- **Fee-based business:** Variable Annuity (hedging and

stochastic simulations for guarantees calculations)

He also touched upon the two approaches to model dynamic policyholder behaviour viz - Based ITM-ness guarantee and Market conditions based modelling.

Gaurav then discussed some aspects of **Dynamic Asset Liability Management** -

- **Dynamic Investment Strategy** - Formula based re-risking or de-risking by change in Equity Backing Ratios (EBRs)
- **Dynamic policyholder behaviour** where lapse assumptions are varied based on the prevalent economic scenario
- **Dynamic guarantee charges** - Guarantee charges can be formulaically linked to market conditions in the models and applied to asset shares for the cost of guarantee

Some other considerations for complex modelling were discussed by Abhishek like -

- Risk Carried Approach where risk carrier like asset exposure or size of contracts can be identified and then the exposure can be run-off based on the identified risk carrier
- Projection of Liabilities and Required Capital through time

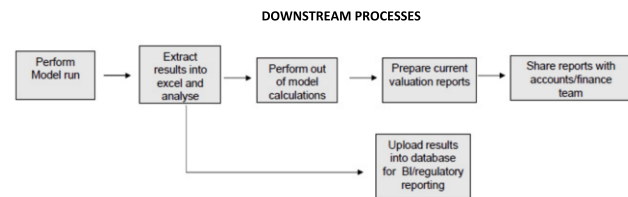
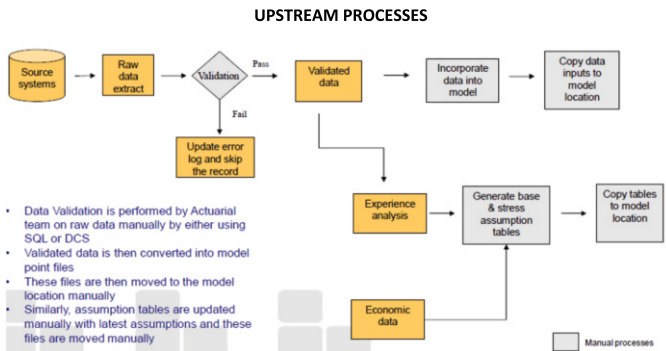
The presentation was followed by an interactive Q&A session, moderated by Keyur.

Session 2: Interface of Actuarial Models with Upstream and Downstream Processes

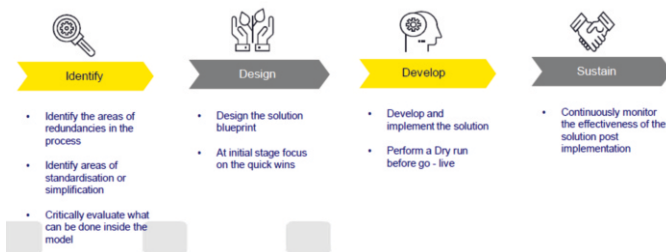
Keyur introduced the speakers and handed over the session to Swati.

Swati set the context for the session by enumerating the challenges that insurers are facing in their day-to-day operations viz changes in regulatory environment, focus of management on cost optimization and integration of new-age technologies to enable digital transformation. She further went ahead stating that this would necessitate a change in the current operating model where manual tasks can be automated and actuarial talent can be used for more strategic activities and value-adding tasks thus leading to increased efficiency.

Swati then went ahead in analysing each step of upstream and downstream processes and identified the manual processes involved. She clearly stated the pitfalls of these manual processes like high turnaround time, propensity of human errors, possibility of reiterative work which may be required, etc.



Ahmed then gave a robust four-phase framework to streamline end-to-end processes –



He mentioned that current processes should be critically reviewed from a transformation lens and hence automation may not be the only solution. He further mentioned that initially focus should be given to standardize redundant activities and simplify overly complex activities. Only after doing this one should move to automation to yield maximum benefits of automation.

Each phase was discussed in detail with practical examples –

- 1. Identify** - At this phase, one can identify redundant activities. Activities which are currently performed outside the model can be done inside the model to reduce the scope of manual error. Use of Excel can be minimized and analysis which is done manually now can be done in SQL by uploading the files using an ETL script.
- 2. Design** - While designing the solution, **3 aspects** should be consideration - **reduction in TAT, improvement in efficiency and increased control / increased robustness of the process.** He enumerated certain processes which can be automated using VBA viz assumption setting, same as products, data checks, dashboards, valuation reports, etc. He also mentioned about how **Robotic Process Automation** techniques are being

investigated to automate all the end-to-end processes. He further gave a case study where RPA was implemented using Blue-Prism for a life insurer for the actuarial valuation process. He further mentioned how AI/ML can be used to strengthen financial reporting controls.

3. Develop / Implement - Once the design has been finalised, the to-be process flow under the proposed automation should be clearly laid down.

4. Sustain - Proposed automation should be continuously monitored and the effectiveness of the solution should be assessed with changes in the underlying process flow.

The presentation was followed by an interactive Q&A session, moderated by Keyur.

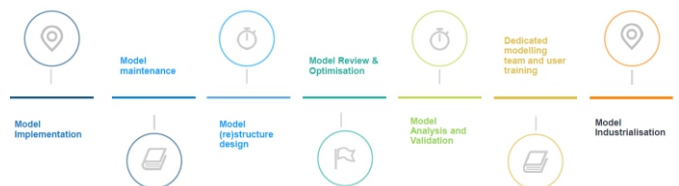
Session 3: Best Practices in Actuarial Modelling

Keyur introduced the speakers and handed over the session to Rohit.

Rohit started with enumerating the three lines of defence for model governance. At each of these levels, model governance can be ensured -

- Model development
- Model validation
- Internal audit

The actuarial model cycle and its various steps was laid down and then how model governance is to be ensured at each step was stated.



- Model implementation** - Defining scope, assessing capabilities, budgeting, developing a proof of concept before full implementation and then the final development of the model
- Model maintenance** - At this stage it should be ensured that standardisation and best practices are being followed
- Model architecture / restructure design** - Model should be developed to be transparent, flexible and efficient such that it fits the users' needs
- Model Review & Optimization** - Independent internal peer review to ensure that the models can produce result with high accuracy and credibility. Minimized run times, accurate and robust codes and efficient processes are the key factors to be

considered while developing the optimal solution

- **Model Analysis & Validation** - Model can be validated using parallel testing, static testing, dynamic testing, sensitivity testing, etc. Regard shall be had whether the model meets the purpose and meets the regulatory requirements.

Ritchie then explained various essentials of **Model Documentation** -

- Explanation of the structure of the data management system and the model
- Important input data and output variables
- Model version control
- Assumption table set-up
- Technical details of reporting bases
- Regression test results
- Model governance

The session ended with a case study of how a global insurance company organized itself better to better manage model risk, ensure robust model governance and control financial impact.

The presentation was followed by an interactive Q&A session, moderated by Keyur.

Written by



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Introduction

“Learning is a constant process of discovery - a process without end” - Bruce Lee. Our institute has been continuously providing opportunities for constant learning for its members. The Annual Flagship programme, 17th Current Issues in Life Assurance provided a mammoth of opportunities for its members. Module 4 of the event was focussed on discussions that revolved around current relevant challenges in Protection Business and way ahead with them. There were also important insights being shared and discussed around an Actuary's influence within Life Insurance Business. The discussions while providing useful inputs and thought processes around relevant topics also served as a perfect closure to the flagship audience with leaving each member of the audience with food to thought on how to embrace this beloved profession of ours in a much better way.

Sunayana Mahansaria, Secretary of Life Insurance Advisory Group (LIAG) eloquently started the session and introduced the session to the audience. She was joined by Mr. Vivek Jalan, Member, LIAG as her co-moderator. They set the context for the upcoming discussion referring to a similar discussion done in CILA 3 years ago regarding sustainability of term insurance rates. Challenges of both insurers and reinsurers were listed down and discussion on what has been done in the industry so far were discussed. There has been tightening of underwriting norms and implementation of better risk models which further needs to be updated to minimise frauds. Impacts of COVID in this line of business were highlighted. To further add to the context, some steps for the way forward were discussed as food for thought like Data Monitoring, Investment in risk mitigating technologies etc.

Challenges and way forward for Protection Business

Mr. Vivek Jalan started the session by asking the panellists to comment on the challenges looming around the sustainability of protection business. Mr. Sanjeeb Kumar, CEO, Gen Re stated that any line of business is sustainable if its is growing at a healthy rate, needs of stakeholders most importantly customers are being met on a long-term basis. For insurers, sustainably of profits is a key area. Mr. Avdhesh Gupta, Appointed Actuary, Baja Allianz Life highlighted the importance of maintain the customer segmentation initially priced for and that about the impact of Covid on long term mortality. He also stated that sustainability is very much dependant on distribution/sales of term insurance products. Mr. Jose John, Senior Director and Appointed Actuary, Max Life contemplated on the positive side of the current scenario with such a huge opportunity at hands.

The panellists discussed the challenges faced from the time Covid initially hit like underwriting, upgradation of technology, faster reporting, assumption setting challenges,

huge losses especially from second wave, mispricing, differentiating covid and non-covid claims, pandemic risk not being priced in.

Mr. Sanjeeb Kumar stressed upon the importance of investing and upgrading the current technologies especially in underwriting. Mr. Avdhesh Gupta agreeing on the same added that the investment should be continuous and there are many risk models both internally and externally developed now coming into practice. Mr. Jose John continued with highlighting the silver linings reminding everyone about long term goals which should not be disrupted by becoming risk averse.

The session was followed by Q&A round with many relevant questions coming up and panellists appositely answering them.

A Life Actuary's manifold influence within the Life Insurance Business

Mr. Vivek Jalan started the session by introducing the speakers. He invited comments from the panellists regarding the evolution of an Actuary's role in the last 20 years. Mr. Subhrajit Mukhopadhyay, ED, Edelweiss Tokio Life started with highlighted the impact of privatisation on the profession. He stated that the first decade post privatisation was about pricing, valuation, reporting, setting up systems, cleaning data while in the second decade concepts like Economic Capital, ALM etc have also come up. Mr. B N Rangarajan, CRO & AA, Exide Life, highlighted the impact of Actuaries in LIC. He stated that dependence on foreign actuaries which was prominent back then is not there now.

The discussion shifted on the benefits of working in other domains of the insurance business as done by actuaries earlier primarily in LIC helping them understand the end-to-end processes much better. Mr. Subhrajit listed down many important points to keep in mind while working as an Actuary or making actuarial decisions. Mr. B N Rangarajan agreeing to this added that we as Actuaries should become more open and transparent. In addition to this, he added the need to develop communication skills within the actuarial team.

Written by



Gurpreet Babbar



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Gurpreet Babbar is a nearly Qualified Actuary with 14 Actuarial Exams. He is currently working as a Consultant with EY.

Introduction

Indian insurance companies report premium and claim statistics on a gross and net basis. The difference between gross and net is the portion of risk that is transferred to another company, this is known as reinsurance. Reinsurance is a means by which an insurance company can protect itself against the risk of losses by ceding the risk to the reinsurers.

Reinsurance can be divided into two categories:

- Proportional - A certain percentage of gross premium is ceded to one or more reinsurers. Reinsurers would also be liable for the same percentage of claims. The reinsured is typically paid a ceding commission by the reinsurer.
- Non-Proportional - The reinsurer is only involved in a claim if it exceeds a particular amount, subject to an upper limit. The reinsurer's premium is a percentage of the reinsured's net written premium that has been agreed upon. Reinsurer's premium and claim are not proportional, and ceding commission is usually not paid.

Methods of reinsurance

- Treaty - A treaty is a contract for a specified term in which reinsured cedes all those risks to the reinsurer which meet the contract conditions. For all risks, the ceding pattern, commission structure and rates, various exclusions, and exceptions to those exclusions are as specified in the contract.
- Facultative - Individual risks are negotiated, and the ceding pattern and other financial parameters are determined on per risk basis.

A General Insurance company conducting business in multiple line of businesses (LOBs), in India has approximately 35 percent to 40 percent of its business reinsured on proportionate basis, i.e proportional treaties plus proportional facultative reinsurance. A stand-alone Health Insurance company would have relatively reinsured a lower proportion of its business.

Furthermore, the company's net business is protected by catastrophic excess of Loss (XoL), risk XoL, and stop loss treaties.

Reinsurance contracts (Treaty and Facultative) have

certain clauses which could impact the reinsurance recoveries and have an impact on the net claims.

It is important for the Appointed Actuary and the insurance company's actuarial team to understand the company's reinsurance program and account the intricacies of the reinsurance contracts setting the reserves.

Topics addressed

The reinsurers may include certain clauses in the treaties to improve the pricing of the underlying products, treaty loss ratios, and cedant's underwriting discipline.

Through this two-part series, we will be addressing such clauses of reinsurance treaties and their impact on reserving

- Indexation clause
- Loss participation clause
- Clean cut Treaties
- Protection of PML Error

Indexation clause

Concept

- For long tail lines of business such as motor-third party and liability, typically takes some years from the date of loss for the claim to be fully paid off.
- The actual settlement takes place based on inflation prevalent in the year of settlement. The reinsurance terms applicable would be based on the contract entered during the year in which policy is issued or the year in which loss occurs.
- It is appropriate and logical that the retention of the reinsured and the limit of liability of the reinsurer are reinstated at settlement year's level.
- Applicability
 - This clause is usually present in the non-proportional treaties of long tail line of business such as Motor TP and Liability.
 - The essence of this clause is since in Motor TP and Liability settlements usually happen after a lot of years the reinsurer should share the same advantages and disadvantages as the insurer and for this reason the retention of the reinsured and limit of liability of the reinsurer are adjusted.

Sample Clause

- In the event of any loss exceeding beyond retention of the reinsured, the following are adjusted by reference to an index
 - the retention of the reinsured and
 - the limit of liability of the reinsurer
- Adjustment is to be made to actual payment only if the index at the date of payment of loss shows a percentage variation of more than 10% (say for illustration purpose here) by comparison with Base Index (It implies the index on the starting date of the treaty.)
- The index could be the wage index for the country or the cost of living (inflation) index.
- The amount of each payment is adjusted by means of following formula
Amount of Payment * by Base Index/Index at date of payment = Adjusted Payment Value
- All actual payments and adjusted values would be separately totalled and the retention of the reinsured and limit of liability of the reinsurer would be multiplied by the factor: -
Total of Actual Payments/Total of Adjusted Payment Values
- Factor** thus becomes a weighted average depending upon the quantum and number of payments and corresponding index on those payments.
- Index to be used
 - Index to be used would be defined in the treaty. Index clause could be worded as below:-
 - Wage Index for the country in which the claim is settled, from the statistics as published by an International agency.
 - If wage index is not available, then consumer price index or the cost of living index.

Example

Reinsured	ABC
Reinsurance Company	REN
Treaty Type	Loss-Occurring Non-Proportional treaty
LOB	As per treaty defined LOBs
Treaty Inception date	1 st April 2020
Treaty End date	31 st March 2021
Retention limit of the Insurer/Reinsured	1 Crore
Reinsurer's limit of liability	4 Crores

A loss occurs to ABC with loss date 1st May 2020. The case estimate for this reserve set up by the claims team is above 1 crore and the average settlement period of this segment is 7 years as per experience. It is estimated that the annual inflation will be 4.05% per annum and hence the index will be 132 in 7 years (32% increase).

Scenario 1 (Estimated settlement is 3 crores)

Figures in Crores

Particulars	Month	Index (A)	% variation to Base Index	Indexation applicability (B)	Estimated Payment (C)	Adjusted Payment* (D)	Factor (D/C)
Treaty start month	April-20	100	0.0%	NA	0	0	
Estimated Payment	April-27	132	32.0%	Yes	3.00	2.27	
Total					3.00	2.27	1.32

Indexation applicability = "Yes" if variation to Base Index is greater than equal to 10%, NA if variation to Base Index is less than 10%

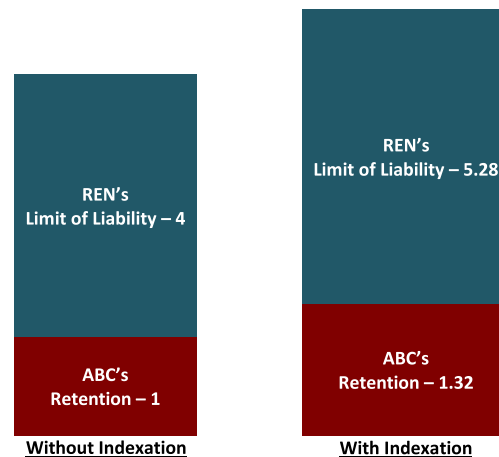
* Adjusted Payment = Estimated payment * Base Index/Index as at date of payment

The Estimated revised retention for the insurer and reinsurer's limit of liability for this loss would be as under for estimated payment of 3 crores (as per column C in above table)

Figures in Crores

Particular	Original	Revised
Insurer's Retention	1.00	1.32
Reinsurer's Limit of Liability	4.00	5.28
Total Protection to Insurer up to	5.00	6.60
Insurer's liability	1.00	1.32
Recovery from reinsurer	2.00 (3.00 - 1.00)	1.68 (3.00 - 1.32)

Due to indexation the estimated recovery from the reinsurer stands reduced by 0.32 crores from 2.00 crores to 1.68 crores. The estimated net loss has increased by 0.32 crores.



Scenario 2 (Estimated settlement is 10 crores)

Figures in Crores

Particulars	Month	Index (A)	% variation to Base Index	Indexation applicability (B)	Estimated Payment (C)	Adjusted Payment* (D)	Factor (D/C)
Treaty start month	April-20	100	0.0%	NA	0	0	
Estimated Payment	April-27	132	32.0%	Yes	10.00	7.58	
Total					10.00	7.58	1.32

Indexation applicability = "Yes" if variation to Base Index is greater than equal to 10%, NA if variation to Base Index is less than 10%

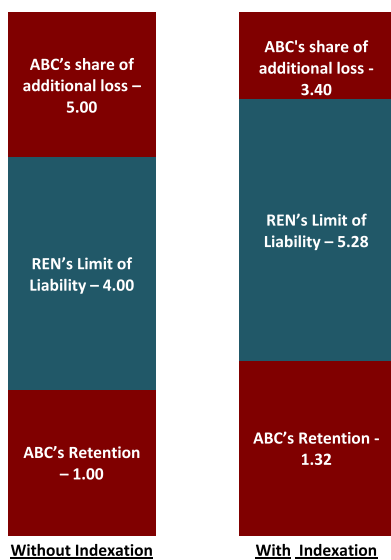
* Adjusted Payment = Estimated payment * Base Index/Index as at date of payment

The Estimated revised retention for the insurer and reinsurer's limit of liability for this loss would be as under for estimated payment of 10 crores (as per column C in above table)

Figures in Crores

Particular	Original	Revised
Insurer's Retention	1.00	1.32
Reinsurer's Limit of Liability	4.00	5.28
Total Protection to Insurer up to	5.00	6.60
Insurer's liability	6.00 (1.00+5.00)	4.72 (1.32+3.40)
Recovery from reinsurer	4.00 (5.00 - 1.00)	5.28 (6.60 - 1.32)

Due to indexation the estimated recovery from the reinsurer stands increased by 1.28 crores from 4.00 crores to 5.28 crores. The estimate loss on net stands at 4.72 (1.32 crores of insurer's retention and 3.40 crores of loss above 6.60 crores). Had indexation reserve would not have been there the estimated loss on net would have been 6 crores (1.00 crores of insurer's retention and 5.00 crores of loss above 5.00 crores). Thus, the indexation clause assists the insurer in this case.



Impact on Reserving

- An indexation reserve of 0.32 crores should be maintained under both the scenarios as ABC's retention has increased from 1 crore to 1.32 crore due to indexation.
- ABC's Actuarial team should constantly monitor all the payments and case estimate updates from this loss. The actual future payments as and when done should be incorporated in the working. Appropriate assumption should be made regarding the settlement time, index level and indexation reserves should be adjusted as per the circumstances.

Loss Participation clause

Concept

- This clause is usually present in the Proportional treaties where the loss ratios for past few underwriting years have been quite high e.g. - Fire. (with surplus treaty, Gross and Net loss ratio experience of the insurer could look significantly different)
- The essence of this clause is to minimize the losses for the reinsurer and to bring more underwriting discipline for the insurance company. Due to this clause the insurance company may prefer to underwrite risk with lower hazard grades i.e. preferred occupancies.
- We will also need to understand the concept of portfolio transfer here, as it commonly used in proportional treaties and has impact on loss participation clause.
 - Accounting of Fire treaties is usually done on underwriting year basis. This means that recovery of claims would happen from the set of reinsurers to whom premium is ceded.
 - A portfolio transfer clause is present in fire proportional treaty implies that the treaty accounting for a particular year would be closed after 24 months after its inception and would be transferred to next open underwriting year (this period depends upon the negotiation between insurer and reinsurer and would be mentioned in the treaty).
 - For eg:- 2016-17 treaty with inception date on 1st April 2016 would be closed on 31st March 2018 and transferred to treaty year 2018-19.
 - 35% of premium and 90% outstanding losses would be transferred from 2016-17 treaty to 2018-19 treaty. This is termed as Portfolio withdrawal for 2016-17 treaty and portfolio entry for 2018 treaty. (The % of premium and outstanding losses are used for sample purpose and in reality will depend upon the negotiations between the insured and reinsurer).
 - So now 2018-19 treaty contains the portfolio transferred from 2016-17 treaty year and policies underwritten in 2018-19.
 - Similarly, 2018-19 treaty would be closed on 31st March 2020 and transferred to 2020-21 treaty. So now 2020-21 treaty contains the portfolio transferred from 2016-17, 2018-19 and policies underwritten in 2020-21.
 - Earned Premium = Premium for the current year + Portfolio entry from previous treaty - Portfolio withdrawal for the current treaty
 - Incurred Losses = Losses Paid for the current year - Portfolio entry from previous treaty + Portfolio withdrawal for the current treaty

- The benefit of this clause is that insurer always deals with latest set of reinsurers who are expected to be more stable financially and is beneficially from administration point of view.

Impact on Reserving

- ABC's actuarial team will need to set up additional reserves under scenario 2 and 3. Even under scenario 1 the treaty loss ratio is very close to loss corridor mark of 80% and there are chances that the loss corridor may be breached in coming months.
- Constant monitoring of the treaty loss ratios having loss corridor clauses should be part of actuarial team's monthly exercise. Regular interaction needs to be done with the underwriting team to forecast the possibility of the loss corridor (80%) being breached and losses falling onto the company's net.

The second part will cover the clean-cut accounting method for treaties as well as the protection of PML error treaties.

Disclaimer

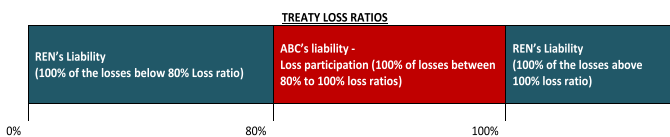
"I hereby certify that the content of the Article titled General Insurance Reserving related to Reinsurance Treaties (Part 1) which I have offered for publication in the Actuary India magazine is my own work and I agree to be responsible for anything adversarial that may arise from its publication. The views expressed here are personal and do not represent the views of my employer."

Sample Clause

- The Loss Participation clause states that if the incurred treaty loss ratio for the underwriting year 2018-19 exceeds 80% of earned premium of the treaty, the ceding company (insurer) would take 100% share of losses exceeding 80% to loss ratio of 100%. The reinsurer stays liable for losses above 100%.
- Claims affecting the treaty from Natural catastrophe would not be considered for the calculation.

Example

Reinsured	ABC
Reinsurance Company	REN
Treaty Type	Proportional treaty
LOB	Fire
Treaty Inception date	1 st April 2018
Treaty End date	31 st March 2019



Portfolio transfer takes place 24 months after treaty inception for 2016-17 treaty and 2018-19 treaty

Calculation of earned Premium

Premium for 2018-19 (A)	Premium Portfolio Entry from 2016-17 (B)	Premium Portfolio withdrawal from 2018-19 (C)	Earned Premium (A + B - C)	Loss Portfolio entry from 2016-17	Loss Portfolio withdrawal from 2018-19
200.0	40.0	50.0	190.0	30.0	35.0

Scenarios after 2 years and accordingly the reinsurer's and insurer's liability would be as under

Scenario	Earned Premium 2018-19 (A)	Losses paid for 2018-19 (B)	Loss Portfolio Entry from 2016-17 (C)	Loss Portfolio withdrawal from 2018-19 (D)	Incurred Losses (E=B-C+D)	Loss Ratio (F = E/A)	Threshold breach (G=If F < 80% then "No", If F > 80% then "Yes")	Insurer's Liability (H = If F < 80% then H=0, If F > 80% and < 100%, then H=A*F-A*80%, If F>100%, then H=A*20%)	Reinsurer's Liability (I=E-H)
1	190.0	137.5	30.0	35.0	142.5	75.0%	No	-	142.5
2	190.0	156.5	30.0	35.0	161.5	85.0%	Yes	9.5	152.0
3	190.0	204.0	30.0	35.0	209.0	110.0%	Yes	38.0	171.0

This implies

Scenario	Treaty Loss Ratio	Reinsurer's liability	Insurer's liability in Treaty Losses	Requirement of Additional Reserves
1	75%	75%	0%	No
2	85%	80%	5%	Yes
3	110%	90% (80% + 10% above 100%)	20% (80% to 100%)	Yes

Written by

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Reviewer:

Pushkar Deodhar

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Shriram Life Insurance Co. Ltd, Hyderabad invites application for:

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Location: HO - Hyderabad

Role Requirements:

Qualification:

- Passed 6 - 8 Subjects in the Actuarial examinations conducted by Institute of Actuaries of India or equivalent
- Prophet/DCS Knowledge is must

Professional Experience/Skills:

- Total experience of 6 to 8 years
- Minimum 3-5 years of experience working in Valuation & Reporting team with any

Experience areas should include:

- Data validation process, Valuation & Modelling in Prophet software, IRDAI reporting, EV and VNB reporting,
- Business and solvency projections

Please share CV to Paulina Sil (paulina.sil@shriramlife.in) & Pavan Kumar (pavankumar.mps@shriramlife.com)

The Actuary India wishes many more years of healthy life to the Associate & Fellow members whose Birthday falls in December 2021 - January 2022 and have crossed above 60 age

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HAPPY BIRTHDAY

Demise of Sh. R Ramakrishan ji – A modern time Actuary

Memories to be treasured throughout our lives!



Sh. R Ramakrishnan - a modern time Actuary was lost by the Actuarial Profession in India and overseas in the third week of January. He breathed his last in Appollo Hospital, Chennai on 19 January 2022 early morning. The memories written are not individual but the collective one of many actuarial professionals and are based primarily on the memories of staff recruited under various years' actuarial apprentice schemes across India of LIC of India during 90s and their immediate officers. I got the news from an ex-LIC friend in a WhatsApp group Many of them were connected to the then Delhi Chapter of Actuarial Society of India (ASI). ASI is now the IAI.

We students used full name as R Ramakrishnan with respect whenever we talk about him. But here I am using RRK Sir as found on a photograph appended hereunder and received from one of his admirer.

We can always take a sense of pride that we were lucky enough to get introduced with the Actuarial Science by RRK Sir- A visionary Actuary. Any batch mate can speak for hours about his actuarial acumen, humanity, humility. A perfect couple for whom we actuarial apprentices were like their own children and did not find parallel who as then serving Executive Director (Actuarial), LIC of India could invite the students to their official residence. The Actuarial Apprentices had come to Mumbai first time from Northern Zonal Office Delhi unaware of culture and etiquettes of new place and hierarchy.

The Actuarial Apprenticeship Scheme and encouraging other LIC eligible employees to take up actuarial science as career under leadership of RRK Sir proved to be historic. Once the insurance sector was opened up for private players the gap in actuarial demand and supply was met by these actuarial personnel along with the actuaries and other actuarial personnel willing to work in India and giving their best. It proved to be mutually beneficial. It also served the surging demand of LIC also.

In later years while serving IRDAI I used to get guidance from RRK Sir on various topics in abundance. He might have completed around a decade post normal retirement from LIC when he told me that he was learning VBA. He had to design and price a unique dream product as the consulting actuary. My respect reached to the new height. Thus, whole of insurance industry got benefited by RRK Sir vision, expertise and vast experience. Name any area of actuarial work and one will find him there.

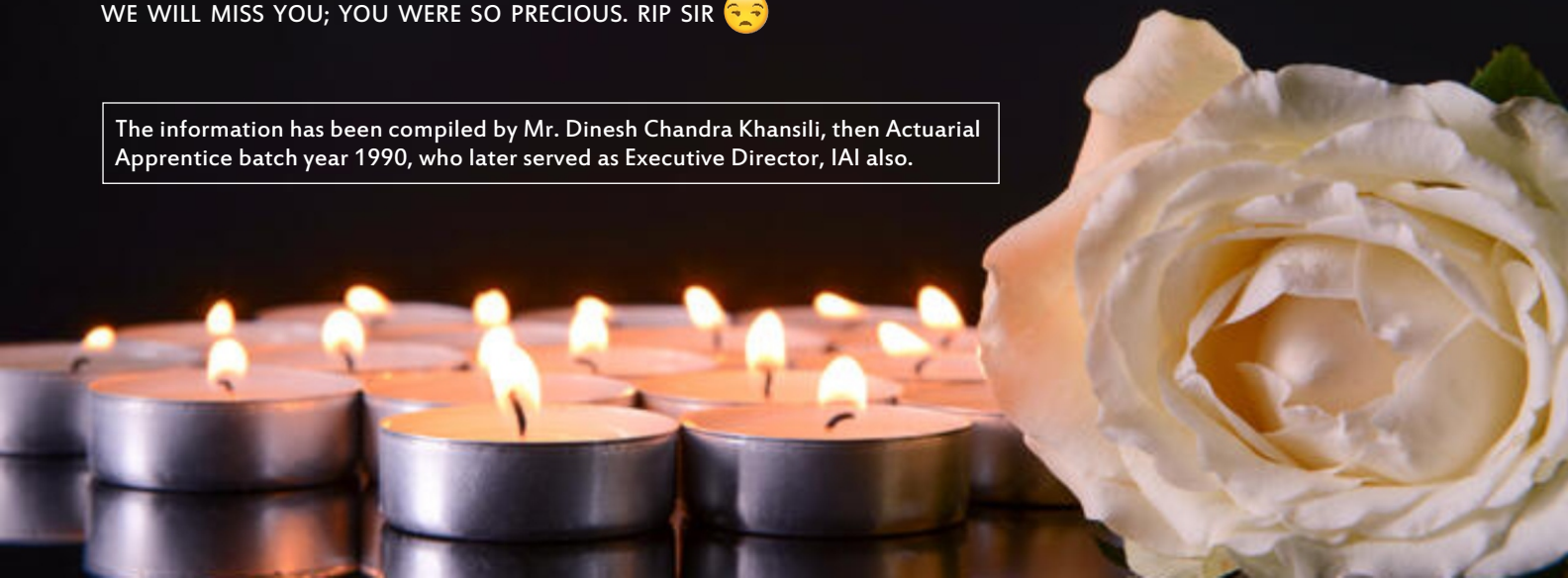
My friends provided info and some I have personal info about Sir that.

- He authored a book Statistics, recommended textbook for FIII exams.;
- He was member of Malhotra committee and was responsible for all Actuarial input to this committee.
- He was instrumental in using NIA for training of actuarial students in subject like economics;
- Provided detailed feedback to various products committees' setup by IRDAI
- He presented many papers during GCAs;
- He wrote many articles for the Actuary India magazine.

The list is never ending!

WE WILL MISS YOU; YOU WERE SO PRECIOUS. RIP SIR 🥺

The information has been compiled by Mr. Dinesh Chandra Khansili, then Actuarial Apprentice batch year 1990, who later served as Executive Director, IAI also.





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1st January, 2022

Institute of Actuaries of India (IAI) recognize and felicitate candidates who scores highest marks in different subjects in each examination session in the Global Conference of Actuaries/ Virtual Actuarial Conclave. The Salient Features of the Scheme of Academic Excellence Award includes a personalized trophy along with a cash award of ₹ 10,000/- each for performers in the examination sessions of the year. The sponsor of the award will be given a time slot in the conference to deliver the personalized trophy and Prize Money to the candidate on stage.

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- Any employer of Actuarial resources

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Regards

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