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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"

CHIEF EDITOR

Bhavna Verma
Email: bhavna.vrm@gmail.com

EDITOR

Dinesh Khansili
Email: dineshkhansili111@gmail.com

COUNTRY REPORTERS

Nauman Cheema
Pakistan
Email: info@naumanassociates.com

Kedar Mulgund
Canada
Email: kedar.mulgund@sunlife.com

Vijay Balgobin
Mauritius
Email: vijay.balgobin@sicom.intnet.mu

Devadeep Gupta
Hongkong
Email: devadeep.gupta@prudential.com.hk

John Smith
New Zealand
Email: johns@fidelitylife.co.nz

Krishen Sukdev
South Africa
Email: Krishen.Sukdev@gpaa.gov.za

Nikhil Gupta
United Arab Emirates
Email: fornikhil@gmail.com

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From Chief Editor's Desk

Ms. Bhavna Verma

Greetings to all readers of Actuary India! At the time of writing this piece, I read that over 75 crore Covid vaccine doses have been administered in India - this is noteworthy progress since the mammoth vaccination drive commenced in the country and I sincerely hope the feared third wave in the country can be prevented.

I see interesting trends in the actuarial space all around me since 2020; remote work has become a long-term reality now. This is increasingly providing opportunities to actuarial professionals to work for international employers from within their home countries; i.e. beyond borders but not from across borders. The actuarial profession has always been positioned and seen as a global profession, and it is more global than ever today. I see actuaries putting their estimation and forecasting skills to maximum use not just in their own core areas of work but extending to other functions in the organisation. Events in the last year and a half have necessitated changes to the way we approach assessment and prediction of risk, resulting in several new learnings and some unlearning as well. For those of us who thrive on new challenges, there are abundant new learning opportunities in data science and analytics and subsequently to apply them to many business problems. I am beginning to think this may be the best time to be an actuary, after all there is abundance of risk and uncertainty in the world today. Would you agree?

Despite the prevailing uncertainty, the stock markets are buoyant and the mergers and acquisitions space in life

insurance is also active. Most recently, HDFC Life announced the acquisition of 100 per cent stake Exide Life Insurance. One also continues to hear about the LIC IPO which has piqued the curiosity of many actuaries and other stakeholders and is reportedly targeted towards the end of this financial year.

This issue of the magazine contains event reports of few recent events of the Institute and a feature on the topical Covid-19 predictions. As always, we humbly request readers to generously share their thoughts, suggestions and experiences with the rest of the fraternity through the Actuary India. Do write in to us at library@acturiesindia.org.

CALL FOR ARTICLES

Institute of Actuaries of India

We invite articles from the members and non members with subject area being issues related to actuarial field, developments in the field and other related topics which are beneficial for the students of the institute.

The font size of the article ought to be 9.5. Also request you **to mark one or two sentences that represents gist of the article.** We will place it as **'break-out' box** as it will improve readability. Also it will be great help if you can suggest some **pictures that can be used with the article, just to make it attractive.** Articles should be original and not previously published. All the articles published in the magazine are guided by **EDITORIAL POLICY of the Institute.** The guidelines and cut-off date for submitting the articles are available at http://actuariesindia.org.in/subMenu.aspx?id=106&val=submit_article

From President's Desk

Mr. Subhendu Bal

One of the dominant thought in my mind while reaching out to you through this column is a famous quote by Michelangelo- "The greater danger for most of us lies not in setting our aim too high and falling short; but in setting our aim too low, and achieving our mark."

The progress and development of any business or institution lies in setting aims too high, as per aspirations and ambitions of key stake holders. A profession with 75 years of existence is expected to be competent enough in comparison with similar bodies inside and outside the Country. Actuarial professions in all developed countries reached to a self-geared and self-driven stage where they could implement and adopt best and world class practices which can take the profession to a next level; be it technology, curriculum, services or expansion of membership base.

As per the latest age profile of India population, 43.82% falls below age 25, 85.38% falls below age 55 which leads to an ownership of huge human potential and resources, hence the future workforce cutting across countries is going to be an exclusive property of our country. The situation is also leading to tremendous opportunities to Actuaries in India to set their aim too high, probably not falling short.

The immediate priority is to re-vamp, re-structure and re-create ourselves to emerge as a leading Actuarial Profession, may possibly be called as - IAI-Version 2.0. The website of IAI and all service modules are under creation and reconstruction, targeting to offer world class services to members; all related works are in progress on a war-footing basis. Steps are being taken to prepare India specific course materials. A committee which was formed by the Institute to evaluate expression of interest and finalization of vendor has submitted its report. Institute is also looking forward to implement the Accreditation program with different Institutes to make proper collaboration for providing the exemption of few subjects based on their syllabus and quality of education in the near future.

I am happy to share with you all that, we have incorporated a section 8 company in the name of "IAI ACTUARIAL EDUCATION AND RESEARCH ORGANISATION" under sub-section (2) of section 7 and sub-section (1) of section 8 of the Companies Act, 2013 (18 of 2013) and rule 18 of the Companies (Incorporation) Rules, 2014] on 5th August, 2021 in order to develop our own course materials on the basis of curriculum defined by IAI. All course materials aligning to the India specific requirements in a time bound manner.

We have restructured the office administration to cope up with various emerging requirements along with providing the best possible services to our students and members.

One of the immediate top priority is the employment opportunities of actuarial students and other members. Along with developing Job portal as a module in the website, there will also be a placement cell exclusively managed by a placement officer. The office also will be strengthened with sufficient number of employees to drive all initiatives and implementation of services.

A task force has been appointed for looking into transition of "the Actuary India" magazine to a complete digital format as "The Digital Actuary India 2.0" and also a complete upgrading in respect of design and content of the magazine. The task force has submitted a comprehensive report within a short period of time with very creative and productive recommendations. It would become another milestone-crossing of the profession once we implement the report.

In order to fill in the casual vacancy created in the Council due to appointment of Mr. Parmod Kumar Arora, the process of election started in the month of June, which will be completed by 9th Sep on the date of declaration of result. Owing to the current situation, the election process related sections in Actuaries Act, 2006 has been modified to include voting and related activities by electronic means, which was notified in Gazette of India on 3rd June 2021. Consequently, the entire process of election to the Council will be conducted on electronic mode.

In order to meet CPD requirements of members, number of webinars were conducted during the month of June & July. This includes 3rd TechTalk in retirement benefits (2nd June), 4th Webinar on Risk Management (18th June), 6th Webinar on Health Insurance (25th June), 35th IFS (9th, 10th, 16th & 17th Jul), 4th Webinar on IFRS17 (23rd Jul) & 8th Webinar on Data Science and Analytics (31st Jul). Institute's Advisory Group on IFRS17 has conducted two days training session on IFRS accounting standards for the IRDAI and NFRA officials. The council has approved Code of Conduct for Council members in the month of July, which is first of its nature.

As the time approaching fast, it is the time to kick-start planning and preparation for VAC 2022, with all encouraging memories from the grand success of VAC 2021. As per Thomas A. Edison, "The three great essentials to achieve anything worthwhile are, first, hard work; second, stick-to-itiveness; third, common sense." We have all three in us. Let's continue to strive.

Module 1 - 35th Indian Fellowship Webinar

Date: 9th July 2021; Friday **Time:** 9:30 – 11:00 & 11:30 – 13:00 IST

Module 1 of the 35th Indian Fellowship Webinar was hosted impeccably by Anuradha Lal, Secretary, AGPEC, who started off the session by talking about the Program schedule. Day 1 focused on topics about Professionalism. The Welcome address was given by Rajesh Dalmia, Chairperson of the AGPEC, IAI. He spoke about the responsibility of being an actuary, especially in India, given the small number of qualified actuaries in the country, and hence it is our duty to uphold the name of our profession.

Session 1: IAI Disciplinary Process

This session was conducted by K S Gopalakrishnan, Vice President and Presiding Officer of the Disciplinary Committee of IAI. The objective of the session was to share how IAI's disciplinary committee work, and why was there a need for a disciplinary process. He took the audience through the constitution of IAI disciplinary committee, the disciplinary process, powers of the council, Appellate authority and other related topics. There was a vibrant discussion after the session, and a lot of questions were raised by both panel members and participating students.

Session 2: Professionalism Video

The next session was a case study, hosted by Vivek Jalan and Anuradha Lal, where a video was played, after which various questions were discussed with the student members. The video described a situation where an actuary in a Risk function was faced with a difficult Professionalism situation, where she was asked to give her opinion on a new product launch to the Financial Director in a short period of time. After the video was played, various discussion points were put up on the screen, and student members were given time to put their thoughts together. Post that, students were selected at random to share their views about the professionalism video, and what were the various courses of action the actuary could take.

Case Study Presentation

Guide: K Sriram

Presenters: Anubhav Chattoraj, Garima Chugh, Mrunal Trivedi, Yukti Belani

In this case study, the team had to act as the Reserving Actuary of a general insurance company who had recently joined, and was faced by various challenges due to accelerated year-end reporting schedule, data issues and limited face to face meetings with the team due to pandemic. When the reserving actuary raised these issues with the Appointed Actuary, the responses were short and did not address the reserving actuaries' concerns. The group discussed the professional responsibilities of both the reserving actuary and the appointed actuary. Group highlighted the need for the Appointed Actuary to improve his communication and ensuring that the reserving actuary should get the opportunity to speak up. The group then discussed the various courses of action the reserving actuary could take, such as looking through previous years workings, documenting all data issues, reaching out to the advisory group on professionalism, etc.

The session was followed by the CPD questions for the fellow members. Anuradha Lal thanked the fellows, participants, IAI team and all others who contributed to making this session lively, informative and successful.

Written by

Yukti Belani

yukti_belani@hotmail.com

Yukti Belani is also a Fellow of the Institute and Faculty of Actuaries, UK.

Module 2 - 35th Indian Fellowship Webinar

Date: 10th July 2021; Saturday **Time:** 9:30 – 11:00 & 11:30 – 13:00 IST

Rajesh Dalmia, Chairperson, Advisory Group - Professionalism, Ethics & Conduct (AGPEC), Institute of Actuaries of India (IAI) commenced module 2 of 35th India Fellowship Webinar (IFW) as moderator. He welcomed all the participants and set agenda for the session. Three technical case studies on concurrent issues were presented by different groups of aspiring Actuaries, details of which are as under:

Case Study 1

Topic: Managing in Pandemic (Health)

Speakers: Vinay Dwivedi, Parvathi S, Rahul Mamodiya & Arthi Narasimhan

Guide: Anuradha Sriram

For this case study, the group enacted as the Appointed Actuary (AA) of a standalone health insurance company, dealing in wide range of health insurance products. AA was needed to apprise the Board of the company regarding **impact of COVID-19** on various aspects of the business, as a part of Financial Condition Report (FCR) presentation.

The group started the presentation by explaining **COVID-19's journey** in India - its infection trend and impact on loss ratios of health indemnity portfolio of the company - during the year. They also discussed impact of COVID-19 on frequency - severity trends of Non-COVID claims and volatility involved. They then highlighted the need of **dynamic and efficient sales strategy** by covering favorable and unfavorable aspects of COVID-19 on company's business volume.

Volatility
Uncertainty
Complexity
Ambiguity

The group then explained general as well as specific considerations for re/pricing of existing and new products. It was highlighted that **'What-if Analysis'** is required during pricing exercise - to deal with uncertainty with respect to COVID-19 and **'re-pricing is not a panacea for all the ills'**. They then discussed projected solvency by providing **sensitivity analysis** to various parameters. Given uncertainty due to COVID-19, it was highlighted that company's projected solvency is the most sensitive to Claim Ratio.

The group then talked about the impact of COVID-19 on estimation of various reserves and highlighted the importance of keeping **margin for adverse deviation** in such uncertain environment. They then touched upon **Cyber Risk**, as dependency on digital means is increasing. The session was then concluded by highlighting the need for robust **Enterprise Risk Management framework** to deal with uncertain times like this.

Case Study 2

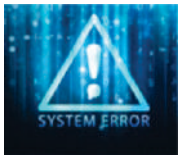
Topic: Analysis & Judgement on Impact on Unit Linked Policies due to System Errors (Life)

Speakers: Vikrant Sawant, Prasad Gadekar, Mitsu Shah & Mohit Choudhary

Guide: Ripudaman Sethi

In this case study, the group enacted as a newly qualified Actuary, who was part of Project Committee of a life insurance company. Two **errors - impacting fund value** of in-forced as well as terminated Unit Linked Policies were identified **in company's administration system**. Error 1 occurred for 20 days during the year 2018 and Error 2 initially occurred in the year 2018 and prevailing till date. The group was required to evaluate the impact of errors and possible ways out to deal with the same.

The group highlighted **considerations** to be made, **while evaluating impact of errors**, which include fair treatment to all policyholders and PRE, Regulatory compliance, shareholders' expectation, operational risk, fund management, reserve requirement, reinsurance arrangements etc. Also, **response to error** would depend on various **factors** such as magnitude, duration & scope of error, no. of policyholders impacted, remedial actions available, operational feasibility and policyholders' expectation.



Dealing with System Errors! Fair treatment to all PHs with Regulatory compliance is the Key

The group then discussed different **ways to assess the impact** of errors **and** accordingly **respond to the errors** - apprising constraints of each option. They also evaluated suggestions given by the COO of the company to make quick corrections in the system by ignoring past impacts. The group then concluded the session by highlighting the **importance of proper communication** to the Regulator and management of the company.

Case Study 3

Topic: Managing Cost of Guarantees (Life)

Speakers: Vedangini Singh, Vikas Gupta, Manisha Panhale & Charanraj Sampathirao

Guide: GLN Sharma

This case study dealt with managing the cost of guarantees for a medium sized life insurance company - with 70% contribution from non par business. In the current falling interest rate scenario, reserve requirement has increased - resulting in lower profits for current financial year. The management of the company proposed few suggestions to improve profitability of the company, which were required to be evaluated by the AA.

The group started the discussion by describing evaluation framework - used to assess proposals of the management, which is as under:

Regulatory Compliance	Financial Impact (Short & Long Term)
Customer Interest & Impact on Brand	New Business Volume & Competitive Positioning

They then evaluated proposals as suggested by the management - summary of which is as under:

a) **Encouraging surrenders** by temporarily increasing the surrender values: **Rejected** considering - Regulatory hurdles; contravention to PHs interest and possible negative financial impact.

b) **Discouraging renewals** by delaying the renewal notices: **Discarded** as could result into dissatisfaction among PHs & distributors; hampering brand image and against Regulatory norms of treating customers fairly.

c) **Withdrawing high guarantee products** for new business & **launching new products** with lower guarantee: **Should be considered further**, taking into account maximum price rise allowed for the existing products under 'Use & File'; time taken for approval of new product; target market; competitive positioning and hedging strategy.

d) **Deferring reduction of VROI** for one year: **Should be further evaluated**, considering the internal governance framework; prudence in current assumption; future investment market outlook etc.

The case study was followed by CPD questions for the fellow members. Rajesh Dalmia concluded the session by thanking all the speakers, guides, participants and IAI team for their contribution to make the session lively, informative and successful.

Written by

Rahul Mamodiya

rahul.mamodiya08@gmail.com

Rahul is a CA, Actuary (IFoA), having 5 years of experience in health domain and currently working with ManipalCigna Health Insurance.

Module 3 - 35th Indian Fellowship Webinar

Date: 16th July 2021; Friday Time: 9:30 – 11:00 & 11:30 – 13:00 IST

Introduction

Sanket Kawatkar, Member AGPEC was the moderator for first two sessions and Sai Srinivas Dhulipala, Member AGPEC was the moderator for the third session of module 3.

Group Topic - Issues in Participating Fund Management

Group discussed a case study on a decline in new business in participating fund wherein an estate has also built up. Group started the discussion with an introduction of Asset Share and its overall importance in participating fund management such as determine discretionary bonuses and maturity, surrender payouts. The components used in it's calculation were discussed alongside applicable regulations and Professional Guidance Note Gn6.

Group then introduced Estate and its calculation as excess realistic assets over the realistic liabilities within the par fund. The reasons for build of estate were discussed such as shareholder capital injection(s), surrender surpluses allocated to estate and inherited estate. Group then explained the difference between Estate and Funds for Future Appropriation.

Group presented 4 proposals to managing the current par fund situation. First proposal was of enhancing new business in par segment. Second proposal was on existing business management such as Free Asset Ratios to guide bonus declarations, etc. Third proposal was of better investment management including new strategic asset allocation to supplement the proposal of enhancing new business. Fourth proposal presented was to have a balanced product strategy to share the risks between policyholders and shareholders and not just focus on one line of business. The Group concluded by saying that proposals need to be deliberated in insurer's internal committees before getting formal board approval.

Group Topic - Cyber Insurance

Group started by setting the context of increased cyber-attacks across the globe. Group gave examples of wide variety of attacks and the costs involved in restoring impacted systems.

Group provided details on how cyber insurance policies assist organizations / individuals to mitigate the risks after a cyber-attack or data breach has occurred. They detailed different types of cyber threats prevalent in large corporations, small and medium enterprises and private individuals.

The group identified the 3 key factors driving cyber insurance coverage across the globe namely industry of operation, penetration of Information Technology in company's business operations and extent of litigation & level of country / regional regulations.

Group gave an overview of cyber insurance coverage covering events such as identity theft, financial frauds, cyber stalking and extortions, phishing, etc. in India. Group also gave overview of third party cyber insurance coverage such as Privacy/Data Breach, Network Security Cover, etc. They also touched upon the gaps in coverage such as cyber terrorism, Crypto currency payments, etc. In the end, the group covered the challenges faced by insurers in pricing of cyber insurance. Fast paced evolving nature of cyber risk, lack of statistics and non-standardized policies were stated as primary challenges faced by actuaries while designing and pricing of cyber insurance policies.

Group Topic - Retirement Planning & NPS

Group started with context setting for retirement planning such as high medical inflation, prevalence of nuclear families, lack of state sponsored pension etc.

Group then discussed about the mandatory savings offered during employment in the run up to retirement such as gratuity, employee provident

fund. The group gave a detailed description of the benefits payable under them and their tax treatment. They then elaborated on other non-mandatory schemes that may be sponsored by employers such as superannuation and post-retirement medical scheme in addition to Public Provident Fund, private pension schemes used by individuals during their working lives to generate additional savings.

Group then delved into the specifics of National Pension Scheme (NPS). They discussed features such as voluntary nature of the scheme, regulated by Pension Fund Regulatory and Development Authority (PFRDA), market linked nature of underlying savings, choice of fund manager, 2 tier accounts and tax benefits available. The group also discussed the overall NPS architecture including subscriber, Point of Presence, Central Recordkeeping Agency, Pension Fund Managers, Trustee Bank, Annuity Service Provider, NPS Trust and PFRDA.

Group ended by sharing retirement corpus projections under variety of scenarios for NPS and EPF with different investment returns and contribution rates.

Written by

Anurag Goyal

anuraggoyal@gmail.com

Anurag Goyal is currently working in IFRS 17 Reporting team at Lloyds Banking Group.

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Module 4 - 35th Indian Fellowship Webinar

Date: 17th July 2021; Saturday **Time:** 9:30 – 11:00 & 11:30 – 13:00 IST

Archana Anoor, Member, Advisory Group - Professionalism, Ethics & Conduct (AGPEC), Institute of Actuaries of India (IAI) commenced the 35th India Fellowship Webinar (IFW) Module 4 as a moderator for Group 8 and Group 9.

Group 8: Professional Life: Resign or Continue?

Guide: Anand Prakash

Presenters: Umang Doshi, Prakhar Hirawat, Tanvi Doshi & Seema Mali

The group started their presentation by describing the background of the case study. This case study was about a new Appointed Actuary (AA) in a Life Insurance Company. The previous AA has quit due to differences with the CEO as per the rumors. The new AA accepted the offer without an NOC from the previous AA after an assertion by the Company Secretory (CS) regarding the NOC of the previous AA. After joining, the new AA usually signs on regular items including investments, swiftly to avoid regulatory delays without proper review. A News breaks out regarding a subsidiary of the Company in which it has invested. Whilst the CEO asks the new AA to remain silent for a year to avoid risk of being named accomplice, the new AA is worried about the regulator's reaction. The new AA is in dilemma ...what to do now?

To start with, the group discussed the applicable Professional Conduct Standards (PCS), Actuarial Practice Standards (APS), IRDAI Appointed Actuary Regulations 2017 and Corporate Governance Guidelines 2016, which are relevant in this case.

The presentation then moved on to describe the possible professionalism issues involved in the case, such as New AA (1) not communicating with the previous AA before accepting the role, (2) not investigating the reasons for which the previous AA quit, (3) being asked to leave midway in a board meeting & (4) signing the documents without review.

Team now deliberated on the available alternatives and what could have done differently by the new AA. The AA, (1) should have communicated with the previous AA before accepting the role, (2) investigated the reasons for which the previous AA quit to understand the problems, (3) is entitled to attend the meetings as per the IRDAI AA Regulations 2017 & (4) should have done self-evaluation before signing the documents.

Presenting their views on the next steps for the new AA after the news break regarding a potentially impaired investment in the subsidiary of the Company, the team recommended the meeting with the previous AA to get more information. The board and the regulator should be informed of the problems after a discussion with the senior management of the Company, about the risk of insolvency and should suggest suitable remedial actions.

The group concluded their presentation with the remarks that all the members of the IAI should comply with the PCS, extant regulation and guidelines in both spirit and letter and always maintain professional integrity. They should speak up for their responsibilities and power. When required, members should whistle blow against any discovered breach. Also, the members should seek the case is on behavioral issues and the consulting actuary's style and conduct in delivering his message to the AA, this may be hard to defend for him.

The team concluded with the comments that disciplinary procedure in such a case is very formal and serious, similar to a court of law. Members should avoid any unprofessional behavior that may result into a case being filed against them.

After a short break, Anuradha Lal, Secretary, Advisory Group - Professionalism, Ethics & Conduct (AGPEC), Institute of Actuaries of India (IAI) took over the 35th India Fellowship Webinar (IFW) Module 4 as the moderator for a presentation by guest speaker from SEBI Dr. Ruchi Chojer, Chief General Manager, SEBI.

In her presentation Dr. Ruchi discussed Ethics and Professionalism from the lens of a Regulator.

She deliberated that, first step is the framing of the policy for functioning of the market participants. Then comes the execution of the policy to ensure the compliance of the policies. Third step is on enforcement actions that deters individuals from non-compliance. These roles are similar to functions of a legislator, executive and judiciary. SEBI has very far reaching powers. As it is said, with power comes a lot of accountability. Hence "ethics" becomes very important in a regulator's role.

Whilst it is very difficult to define "Ethics", it has various nuances. In her views, right way of doing right thing defines the ethics best. To decide what is "right", she takes help of Mahatma Gandhi, the epitome of morality. As per Gandhiji, morality is the basis of things and truth is the substance of morality. He also goes ahead to say in context of Satyagraha that one should appreciate the beauty of compromise while insisting on truth. He quoted "Truth is hard as adamant and tender as a blossom". Hence, it is important to have a fine balance. As we grow in a profession after spending years we draw our own ways of defining ethics. However, there are some unflanking principals or "Sanskars" which are the basic pillars on deciding what is right and what is wrongs.

Further, she emphasized on integrity. In every aspect "integrity" is very fundamental in regulator's operation. As a regulator the powers are very far reaching, and hence one has to be high on integrity while working as a regulator. One's level of integrity also plays very important role in the appraisals in SEBI.

The guest speaker further emphasized on how Integrity, ethics and professionalism plays an important role in a regulatory role.

Closing Remarks

Anuradha Lal, Member, AGPEC, IAI concluded the webinar guidance from the experienced members, experts and the professional body when required.

Group 9: Professional Life: Bura Jo Dekhan Main Chala?

Guide: Richard Holloway

Presenters: Vishwajeet Saharan, Kasutav Sen and Rajesh Kumar

The group provided the synopsis of the case first. The case study is about a life insurance consulting actuary in India, who is very well known in the Insurance sector. He has tendency to prove himself correct and others wrong. He gets a Due Diligence (DD) assignment with the unrealistic timelines from a private equity firm which is targeting a Life Insurance Company in India. Consulting Actuary accepts the DD assignment without any prior communication with the target's AA. During the course of the DD assignment, consulting actuary outsources the work to external consultants due to crunched timelines. Case study states that an important meeting of the consulting actuary with the AA of target life insurance does not go well, because the consulting actuary starts accusing the AA for the regulatory violations. The AA defends herself with reasons which the consulting actuary rejects. AA files a misconduct case against the consulting actuary for violation of sections 4.3 and 8 of PCS, Part 1 (5), (15), (16), Part IV (2) of Actuaries Act.

The group initiates their presentation by describing the relevant sections referred in the compliant of the AA.

Then, the team emphasized on the professionalism issues with the possible corrective steps that the consulting actuary would have taken.

The professionalism issues in conduct of the consulting actuary discussed were (1) general behavior of proving himself right and others wrong, (2) accepting the DD assignment with unrealistic timelines, rather in such time constraint situation, team suggested that a high level scope of work should have been finalized with the client, (3) selecting specific risk areas for the review due to crunched timelines increases risk of leaving out other important areas, (4) proper outsourcing contract, agreed with the client should be signed before any outsourcing of work to external consultants (5) prior communication with the AA, as is a PCS requirement is not important in a due diligence assignment mainly due to confidentiality involved & (6) consulting actuary is wrong in accusing the AA, and should have used the meeting as an opportunity to discuss his concerns with the AA. Any issues that he finds should have been documented in his final DD report for the client.

The team now moved on to discuss the disciplinary procedure that is followed in such a case in the IAI.

Then, the team discussed the next steps or the options that the consulting actuary now has, after a case has been filed against him. The consulting actuary may apologize to the AA, but it is a bit late now as the investigation has already started. He may hire legal advisor to guide him. During the hearing, the consulting actuary should provide more information to strengthen his case. If the compliant is on technical grounds, the consulting actuary can provide reasons for accusing the AA for regulatory violations. If by

expressing her appreciation towards the IAI team that had worked diligently to ensure that the webinar went flawlessly even in an online environment. She also recognized the guides, participants and AGPEC members for their hard work in conducting their respective sessions well.

Dr. Ruchi Chojer is with SEBI since 1995 and has a management degree with major in finance. She acquired her doctorate in management from the esteemed IIT Bombay in 2012 with the thesis on Governance in Mutual Funds. She has represented SEBI on domestic and international fora including that in Shenzhen (in 2008 on fund management experience during financial crises), in Botswana as a trainer in the fortnight capacity building programme for officials of Botswana Stock Exchange.

Written by

Vishwajeet Saharan

vishwajeet.saharan@gmail.com

Vishwajeet Saharan is a student member of IAI and currently working with Max Life Insurance.

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

A K Garg
C B Prasad
D C Khansili
Dionys Emil Boeke
H L Jain
K Ganesan
K K Wadhwa
K Subrahmanyam
Liyaquat Khan
Michael Joseph L. Wood
Nauman Afzal Cheema
P A Balasubramanian
R Gunasagar
R Kannan
R Srinivasan
Richard Walter Leiser-Banks

4th Webinar on IFRS17 - Practical Approaches used and Challenges Faced during Implementation

Date: 23rd July 2021; Friday Time: 15:00 - 17:00 IST

Speakers: Aditya Jain, AVP, Prudential Indonesia

Rusly Winandar, IT Lead, Prudential Indonesia (PT Prudential Life Assurance)

Moderator: Harshada Shringarpure, Secretary, Advisory Group on IFRS 17 (IND AS 117)

Introduction

IFRS17 is an International Financial Reporting Standard that was issued by International Accounting Standards Board in May 2017. This standard represents a fundamental change in accounting rules across the world, and is quite complex in multiple aspects during implementation and transitioning stages. While the INDAS 117 in India is still in the early phase, there are some insurers globally who have made considerable progress in the implementation stage. The webinar's main objective was to discuss the journey and the learning our peers experienced while performing the task of implementation abroad.

Kunj Maheshwari did a welcome address, setting the context for the webinar. He mentioned that Indian insurers have a good chance to learn from our fellow colleagues abroad, about the practical challenges that are faced in the implementation stage and work-around done.

Aditya and Rusly shared their experience over the past 3 years of implementing IFRS17 standard in their current company. They discussed the technical challenges faced and approaches used during the process of creating and designing solutions. While their work is still in progress, this session provided useful insights about the practical experience to the audience.

Technical Paper Interpretation

The standard is a Principle based one, and hence interpretation may differ among team members within the company or across industry as well. It is advisable to baseline the interpretation of standard, before heading towards solution and get key stakeholders' approvals (like senior management, auditors, regional partner).

Various topics of deliberation in standard pertain to:

- Variable Fee Approach (VFA) eligibility - required to be done at policy level
- Level of Aggregation (granularity vs. operational feasibility)
- Coverage units (driver for emergence of profits,: Present Value of benefits, or number of policies)
- Onerous contracts
- Discount Rates
- Transition approach - Cost benefit analysis of each of three approaches; and align with Shareholders' (SH) objective of either having higher SH equity or higher level of Contractual Service Margin (CSM)
- Determining Key performance Indicators - What can best represent performance of insurance companies in new accounting framework: Profit, CSM, Embedded value (EV), or any other metric?

Performing "Impact assessment" during early stage gives an idea about the financial results the company can expect to see. This high level exercise helps in understanding the levers, simplification/ complexity of solutions, or which transition approach may be favourable, by providing a high level indication of opening CSM and SH equity.

Transition Challenges

Functional challenges faced:

- Availability of past data is one of the major challenges faced, in terms of granularity and completeness, both for actuarial and accounting functions. Doing reconciliation with reported numbers in past and chart of accounts, extent of manual adjustments done during respective years and the materiality. This exercise of data and reconciliations may consume 6-7 months, depending upon size of the company.
- First part of the process can be done at a lesser granular level to understand the aspects of end to end project broadly. Then the company should go to more granular level in next step of implementation, with expected solutions in sight.
- This is also required to demonstrate the reason for transition approach chosen - Fully Retrospective

Approach (FRA), Modified Retrospective Approach (MRA) or Fair Value Approach (FVA)

- Since business requirements may change every year, due to new products, new systems, or other changes, the same need to be customized.
- Decision on whether to use Multi models – for different years in past (for eg. Previous versions of Prophet software during past, data compatibility of past RPTs), or Single model for all years. Single model may require substantiate amount of time to align the data for all years running at once, however, that will save time later for multiple iterations, if required.
- Availability of actuarial data for performing Analysis of movement, or calculating Risk Adjustment for past years
- Allocating expenses by cohort level or product level in past, and reconciliation of chart of accounts.
- Issues on VFA cash flows such as Fund management costs (FMC) not stored at policy level.
- How to perform onerous cohort classification (cohorts turning onerous due to Risk free Rates (RFR), or high expense allocations)

Technological & Testing challenges faced:

- Defining and documenting clear business requirements. Start early!
- Procuring historic data both transaction and snapshot. This is time consuming and may also have infrastructure constraints.
- Ensuring enhancements in source systems do not impact historic data.
- To build standard process to address various changes over the years, viz. changes in valuation data, accounting data methodology, different data formats and fields
- Data gap assessment is required. Flexibility to build tools to extract past data. One tool for all years may not work (due to changing formats). Manual process may also be used.
- Database platform and data transformation tools to have enough capacity to run for many years, aligned with company's technology architecture (For example, Informatica, Talend, Microsoft SSIS, cloud-based Azure, AWS, etc.)
- Based on gap assessment, new infrastructure for restoration might be required for back up data.
- Manual adjustments done on accounting ledger or policy admin systems in pasts may result in failing reconciliations.
- Transition tools do not use correct logic to process some past transactions (one off transitions, special customer program, etc.)
- Establish a team that has technical and business knowledge and include functional and technology subject matter experts, including data engineer skill sets.
- Define a clear scope for each test (unit test, system test, system integration test, UAT). Agree on what will and what will not get tested.

Creating IFRS 17 Solution design and challenges

Being an inter-departmental project (Actuarial, Accounting, and IT), there exists high chances of mis-communication of common terms across teams.

Clear documentation of requirements is very important, to avoid re-work at later stages, saving crucial time and efforts.

Primary challenges around creating Solution are related to Data availability and transformation (eg. Policy level details of business done till date, general ledger and details of all past years, etc.). Conducting a data gap assessment initially can give good leverage to the insurer. It is important to identify all data sources and design the data model and flow. Designing enhancement of source system during implementation stage will require extensive resources (time, money and skills), but may provide significant advantage later for smooth data generation and better quality. Adequate data quality checks must be built in the solution at all steps.

While designing the "To be process" for IFRS 17, it is important to design it in a way that it meets work day time table for financial reporting. IFRS 17 reporting will need to have mapped actual expenses at policy level, and the process should merge the actuarial expected cash flows and actual financial data in IFRS17 solution system. It must factor all system and manual processes that provide the data input. It is advisable to keep some buffers in work day timetable for worst scenarios (like data issues in source system, issues during extraction, etc.). The companies can look for automation of processes (eg. Expense allocation, claims data from TPA, reinsurance data, reducing run-time etc.), in order meet reporting timelines.

Testing process can be done in phases, like doing test on mock data first, and then on full volume production data. It should be agreed at start on what to test and what not to test for efficiency of the phase. Also, materiality of errors that is acceptable in test results must be decided. Testing of results vs. reported metrics should be done. Actuarial, accounting and IT teams can decide together on mechanism of how to test sub-ledger.

Some key things to take care of may include:

- Complicated expense allocation drivers to ensure

group of contracts do not become onerous

- The vast amount of data creates processing and storage concerns.
- Modeling of Reinsurance treaties including multiple treaties for same contract. The company may decide to merge few treaties for operational simplification and disclosure requirements.
- One to one mapping of policies is required between Chart of accounts of current reporting and IFRS 17 reporting to help reconciliation.

What will help in successful implementation?

Approach the implementation as technology project, not only Actuarial or Accounting project

A strong project management is required, to deliver incrementally and iteratively. Implementing IFRS 17 is a cost-intensive exercise, and hence managing budget and careful use of resources is very important. Company can prioritize spending in terms of good to have vs. must have. Proper governance structure must be established for adequate decision making and delivery management.

Adequately skilled resources for IFRS 17 project may not be available in the market, and hence early training of own resources should be planned. A core cross-functional team (including Actuaries, accountants, and IT resources) should be made at initial stage. It must have good mixture of existing employees (who are well known with internal processes) vs. new staffs + consultants/ contractors. It is important to prepare Scope of Solution which includes end-to-end process from data sources, transformation and reporting. Designing and testing of processes and controls for running the solution is required. Testing can be done in multiple phases to mitigate risks (unit test, system tests, system integration test, UAT, performance test)

Question & answers

Q. How much the standard interpretation has changed today since you started implementation of the standard?

Aditya: The interpretation has changed by almost 30-40% since we started, mainly due to technicalities of doing VFA eligibilities at policy level, contract separation etc. We took decisions, learnt and moved on, and hopefully we are in a stable position to do UAT and prepare Balance sheet next year. Given India is implementing a little later; there will be information already available from regional partners, global insurers and consultants during implementation stage.

Q. How should we allow for (in terms of expense allocation) certain transactions that occur before issuance of contract?

Aditya: IFRS-17 allows for some "pre-coverage cash flows", for eg. One-time Expenses for some Banca deal as a business transaction. These expenses can be recognized and spread over 5 years (eg.) of the business sold through the channel (depending upon trajectory of growth expected). It is also required to test every time, whether the pre-coverage expenses still remain. And if actual business growth is not as expected, then the insurer must realize the loss in the same year. Unallocated premiums can be adjusted in closing BEL or Unit fund value for simplification.

Q. What would be the effect of IFRS 17 on other reportings that currently insurers do?

Aditya: I think that people may check if IFRS 17 gives us so many detailed disclosures, then by doing a few adjustments, will we be able to get information for other reporting requirements? It may be too early to say that, since everyone has not implemented the new standard, and it will take time to stabilize the results. Also, it is important to see how the regulators and tax authorities see this. Implementation of RBC and IFRS17 should go hand in hand. If the tax calculation remains on Book value basis, then IFRS17 cannot be the main reporting standard, and a parallel reporting according to local and new standard may continue to happen for a while. It is a good standard to have, as it gives many disclosures, and is more transparent. It also gives information to investors of about the loss-leading products and numerous sensitivities of results of the company.

The Webinar was concluded with Vote of Thanks from the Harshida Shringarpure on behalf of the Advisory Group on IFRS-17, IAI.

Written by

Nidhi Pandey

nidhi.pandey@bhartiaxa.com

Nidhi Pandey is currently working with Bharti AXA Life Insurance.

4th Webinar on Banking, Finance & Investments

Date: 14th August 2021; Saturday Time: 15:30 - 17:00 IST

Chair: Subhendu Kumar Bal, President, IAI

Moderator: MSVS Phanesh, Chairperson, Advisory Group on Banking, Finance, and Investments, IAI

Speakers: Yash Ratanpal, Member, Advisory Group on Banking, Finance, and Investments, IAI

Chinnaraja Pandian, Secretary, Advisory Group on Banking, Finance, and Investments, IAI

Introduction

The Basel committee on Banking Supervision (BCBS) regularly sets out and updates various guidelines to strengthen the global banking system. The 4th IAI webinar on Banking predominantly focused on understanding and measuring the Interest rate risk in the Banking Book, which is one of the major risks identified by the BCBS.

The webinar started with the IAI President giving a brief snapshot of the initiatives undertaken by the institute during the last few months. The President appreciated the role of the Advisory group in increasing the focus on wider fields like Banking, Data science, Asset management, corporate finance etc.

Chinnaraja Pandain started the discussion by highlighting the relevance of the topic and suggesting that the topic may offer insights for banking as well as to non-banking audience equally.

Overview of the Banking Business model

Yash Ratanpal started with an overview of the new banking business model identifying the key businesses contributing to the revenue. While business activities like Trading, Investment banking and Transaction banking have grown significantly over the years, these remain ancillary to the core business model which consists of borrowing through creating liabilities, and lending to create assets. The speaker briefly covered the multitude of risks that Banks face including Credit, Market, Operational, Liquidity, Profitability, New age risks etc.

The discussion then focused on the Banking book and the associated Interest rate risks on the banking Book (IRRBB). Banking Book being an important revenue driver and risk emanator, BCBS has been focusing and regularly updating the relevant guidelines to measure and model the risk.

IRRBB- The current and the prospective Risk to the bank's Capital and its earnings arising from the impact of adverse movements in Interest rates on its Banking Book

At a high level, the net interest income of the Bank is the difference between the interest earned on its Assets and the interest paid on its liabilities. This difference is dependent on the way the assets and liabilities are segregated into Fixed and Floating rate linked.

Contributors and Impact

1. Gap Risk: Different rate reset timings for assets and liabilities
2. Basis Risk: Correlation risk on benchmark instruments borrowed and lent in
3. Option Risk: Automatic and Behavioral option risks embedded in deposits and advances

Two important measures of IRRBB risk are the change in the value of assets and liabilities impacting the balance sheet (EVE-Economic value of Equity) and change in interest income and expenditure (NIM).

Latest Basel guidelines

The current guidelines are the Revised standards (2016) and have the following Seven components:

1. Risk Governance and Oversight
2. IRRBB measurement and modeling
3. Stress testing framework
4. Model risk management
5. Capital adequacy assessment
6. Reporting and disclosures
7. Supervisory reviews.

An illustrative case study was employed to explain the various concepts in greater detail.

Key learnings and the way forward

The webinar helped draw parallels between the uncertainties associated with the maturity of Bank assets and liabilities with the survival models in the Insurance Industry. The enhanced requirements for modelling capabilities on interest rates and Balance sheet projections, Data integrity and Model risk management were identified as some areas of opportunities for actuarial skill set applications.

The Webinar was concluded with a Vote of Thanks by MSVS Phanesh on behalf of the Advisory Group on Banking, Finance, and Investments, IAI

Thank You

Written by

Gaurav Nautiyal

gaurav_nautiyal@yahoo.com

Gaurav Nautiyal is associated with the Banking industry for the last 16 years with experience in Trading, Structuring and sales of Forex and Fixed Income derivatives.

India Covid 19 Predictions using Box-Jenkins Model & Correlation analysis using Panel Regression & Person's Co-efficient

Introduction:

The Covid 19 is an ongoing global pandemic caused by severe acute respiratory syndrome coronavirus 2. This pandemic has resulted in severe global and, economic disruption, including global recession. It has led to widespread shortages, disruption, panic buying and deaths in large numbers due to one disease. It has also caused job losses, increased poverty, and general decrease in quality of mental and physical health among majority of the population.

A research was conducted by me on the India state wise COVID19 related data (Confirmed cases, Death Cases, Testing cases and Vaccination Cases) available from source https://api.covid19india.org/. The data used for this research is for the period 30th Jan 2020 to 8th July 2021 – a total of 17.5 months or 525 days for confirmed cases, death cases and testing cases. The vaccinated data is used for the period 16th Jan 2021 to 8th July 2021

Objectives:

1) Predict the weekly incidences of Covid confirmed cases, Covid Deaths and Testing for an 8-week period post 8th July 2021 using time series model from the data available for the period 30th Jan 2020 to 8th July 2021 – a total of 17.5 months or 525 days and compare with actual data.
2) Establish correlation using Panel Regression and Pearson's Coefficient between covid confirmed Cases & Testing, Covid Deaths & Testing, Covid Cases & vaccination, Covid Deaths & Vaccination independently.
3) Establish correlation using Panel Regression between combined effects of Covid confirmed Cases, Covid deaths and vaccination.

Data & Resources

- The dates starting from 30th Jan 2020 to 8th July 2021.
- 30,752,108 confirmed cases ,405,967 deaths and 458,914,056 over a 17.5 month period .
- Vaccinated data from 16th Jan 2021 to 8th July 2021, a total of 353,617,202 cases

Data Transformation

- The 3 data sets were first converted to daily non-cumulative data using formula and checks. Null data was set to the previous value or zero depending on the formula and checks
- All the data was first filtered state wise, copied and then transformed to usable data for running the R model
- The 3 data sets were aligned and made consistent such it was sorted date and state wise.
- After all the steps above, the daily data was converted to weekly data as it made future predictions easier ,
- Also when comparing the vaccination data with confirmed cases and death cases – a 3 month lag was used.

Analysis and Results

Analysis 1-8 weeks Covid Confirmed Cases predictions using Box Jenkins model-based vs actual data published

	Week 0	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
	08-07-2021	15-07-2021	22-07-2021	29-07-2021	05-08-2021	12-08-2021	19-08-2021	26-08-2021	02-09-2021
Confirmed Cases - Projected (using the Box Jenkins Model)	30,752,108	31,041,733	31,349,299	31,712,893	32,121,777	32,580,156	33,134,435	33,750,871	34,424,745
Actual Published Data	30,752,108	31,025,878	31,291,706	31,571,299	31,855,787	32,117,067			
% variance	0.00%	-0.05%	-0.18%	-0.45%	-0.83%	-1.42%			

Conclusions: The Week 1 confirmed cases from the model and the actual numbers are very close with a variance of only -0.05% . The week two is also seeing a variance of -0.18 % and week 3, 4 & 5 at -0.45%, -0.83% & -1.42 % respectively. The time series is usually best in predicting the numbers closer to the period.

Analysis 2-8 weeks Covid Death Cases predictions using Box Jenkins model-based vs actual data published

	Week 0	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
	08-07-2021	15-07-2021	22-07-2021	29-07-2021	05-08-2021	12-08-2021	19-08-2021	26-08-2021	02-09-2021
Death Cases - Projected (using the Box Jenkins Model)	405,967	411,599	418,012	424,901	432,472	441,589	451,308	461,975	474,507
Actual Published Data	405,967	412,563	419,502	423,842	426,785	430,285			
% variance	0.00%	0.23%	0.36%	-0.25%	-1.31%	-2.56%			

Conclusions: The Week 1 death cases from the model and the actual numbers are close with a variance of only 0.23%. The week two is also seeing a variance of 0.36 % and week 3, 4 & 5 at -0.25% -1.31% & -2.56% respectively.

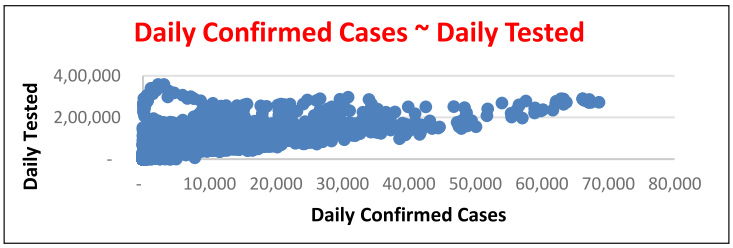
Analysis 3 -8 weeks Covid Tested Cases predictions using Box Jenkins model-based vs actual data published

	Week 0	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
	08-07-2021	15-07-2021	22-07-2021	29-07-2021	05-08-2021	12-08-2021	19-08-2021	26-08-2021	02-09-2021
Testing Case - Projected (using the Box Jenkins Model)	427,016,605	439,812,405	453,256,506	467,362,417	482,258,985	498,043,300	514,877,816	532,831,520	552,113,765
Actual Published Data	427,016,605	440,023,239	452,939,545	464,650,723	476,533,650	489,470,779			
% variance	0.00%	0.05%	-0.07%	-0.58%	-1.19%	-1.72%			

Conclusions: The Week 1 testing cases from the model and the actual numbers are close with a variance of only 0.05%. The week two is also seeing a variance of -0.07 % and week 3 , 4 & 5 at -0.58% -1.19% & -1.72% respectively.

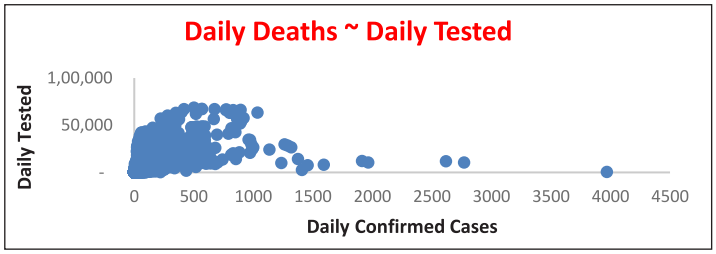
Analysis 4 - Correlation using Panel regression analysis and Pearson's correlation coefficient between Covid confirmed cases and testing

Using Panel regression analysis at 5% level of significance, (α=5%) , the Pr(>|t|) < 0.05 and the Pearson's coefficient comes to be **0.62** . Both the tests states that there exists a strong positive correlation between Covid Confirmed Cases and Testing.
The scatter plot below also confirms the existence of correlation between the parameters.



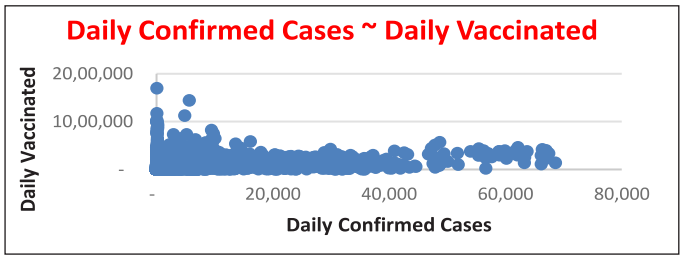
Analysis 5 - Correlation using Panel regression analysis and Pearson's correlation coefficient between Death cases and testing

Using Panel regression analysis at 5% level of significance, (α=5%) , the Pr(>|t|)<0.05 and the Pearson's coefficient comes to be **0.57**. Both the tests states that there exists a strong positive correlation between Covid death Cases and Testing .
The scatter plot below also confirms the existence of correlation between the parameters.



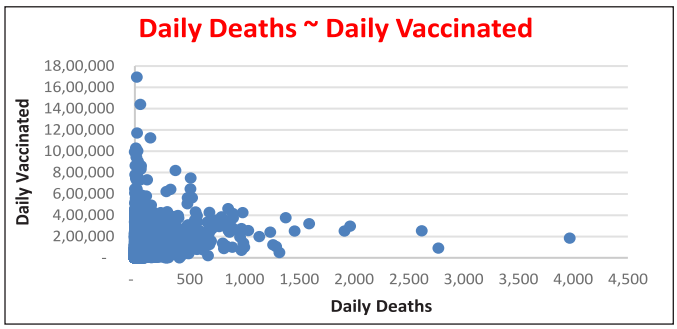
Analysis 6 - Correlation using Panel regression analysis and Pearson's correlation coefficient between Confirmed cases and Vaccination with a three month lag

Using Panel regression analysis at 5% level of significance, (α=5%) , the Pr(>|t|) > 0.05 and the Pearson's coefficient comes to be -0.12 which states that there exists no correlation between Covid Confirmed Cases and vaccination with a lag of 3 months. We can conclude that sufficient data is not available to establish correlation between covid confirmed cases and vaccinations.
The scatter plot below also confirms the nonexistence of correlation between the parameters.



Analysis 7 - Correlation using Panel regression analysis and Pearson's correlation coefficient between Death cases and Vaccination with a three month lag

Using Panel regression analysis at 5% level of significance, (α=5%) , the Pr(>|t|) > 0.05 and the Pearson's coefficient comes to be 0.1259 which states that there exists no correlation between Covid Death Cases and vaccination with a 3 month lag. we can conclude that sufficient data is not available to establish correlation between covid confirmed cases and vaccinations.
The scatter plot below also confirms the nonexistence of correlation between the parameters.



Summary Conclusions

An 8-week prediction post 8th July 2021 is arrived at for confirmed cases, death cases and tested cases using Box Jenkins model (ARIMA). The actual data was compared until 12th August 2021 with the predicted values. The variance for confirmed cases is between -0.05% to -1.42%, variance for death cases is between 0.23% to -2.56% , variance for testing cases is between 0.05% to -1.72%. The time series is usually best in predicting the numbers closer to the period. However, the variance in this case is very minimal and can be useful to understand the number of cases to make an action plan to combat the future cases.

Panel Regression analysis and Person's correlation coefficient was used to establish correlation if any between Confirmed cases, Death cases , Tested Cases and Vaccination. While it was possible to establish positive correlation between Confirmed cases and Tested cases, Death Cases and Tested Cases using both the Panel Regression analysis and Person's correlation coefficient, there was no correlation established between confirmed cases and vaccinated cases with a 3-month lag and Death Cases and Vaccinated cases with a three-month lag using both the methods. This may be due to the fact the vaccination started in full force only in the middle of the 2021, the effects of vaccination will be seen post June 2021. A scatter plot was also drawn to validate the results.

Written by

Suraj Jayasimha

surajjayasimha@gmail.com

Suraj Jayasimha is studying in 12th Grade at Dhirubhai Ambani International School, Mumbai.

CYBER risk – "Can You BE Real?"

Standing in 21st century, technology is an integral part of our lives. The new generation is 'mobile first' generation and is extremely dependent on internet in their day to day lives. From usage of online services including banking activities, significant growth in e-commerce, increase in number of connected devices, extensive use of social media and low cyber security literacy had exposed the world to a known yet unknown unique risk of cyber security. Compounding the issue is the Covid 19 which has accelerated digital transformation. Many organizations are still unprepared from vulnerabilities caused due to digitalization and remote working.

As a peril, cyber risk can be defined as any risk emerging from the use of information and communication technology that compromises the confidentiality, integrity or availability of data, systems or services.

Recently, IBM Security released the 2021 X-Force Threat Intelligence Index highlighting how cyberattacks have evolved in 2020. The Threat Intelligence Index is based on insights and observations from monitoring over 150 billion security events per day in more than 130 countries. One of the key finding of the report was that **India was the second most attacked country in the Asia Pacific.** Attacks on India made up 7% of all attacks X-Force observed on Asia in 2020. Finance and insurance was the top attacked industry in India (60%) and Ransomware was the top attack type, making up roughly 40% of attacks.

Cyber risk has undergone multiple episodes of change and development in its relatively short history, but nothing quite so impactful and fundamental as the events over the last year.

According to Data Security Council of India, there has been an increase in cyber insurance policy base by 40% since 2017 in India. India's yearly premium is around INR 80-100CR (USD 11 - 14Mn). It is expected that India's cyber security market will grow 1.5x the global market growth rate.

Pricing Cyber risk

To price a premium, insurers must accurately quantify the risks to which their clients are exposed. Pricing actuaries and underwriters would consider multiple characteristics to arrive at a premium. For example -

- Potential financial and reputational damage a cyber-attack may cause
- The organization's 'security posture' - overall cybersecurity strength and how well it can predict, prevent and respond to ever-changing cyberthreats
- The organization's ability to effectively respond a breach

These variables are difficult to ascertain. Conventionally, premiums are generated using modelling past events. However, 'data' is the biggest challenge in this sphere. The data available are mostly in respect of non-cyber losses. Previously, companies were reluctant to (voluntarily) disclose breaches due to potential reputational damage. Only recently it became mandatory for breached entities to disclose details of their cyber security breaches.

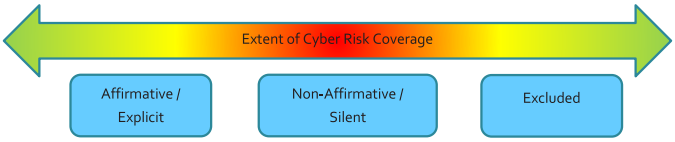
In addition to quantity and quality of past data, there are challenges in incorporating future outlook.

IT industry is rapidly developing. The interconnectedness of the technology means that the upside latent of the loss is huge and there is higher incidence of 'clash claims' due to correlated vulnerabilities. There is also a challenge of accumulated and aggregated losses which may not be defined within a geographic boundary or a specific industry. Furthermore, the threat landscape is evolving, and it has high likelihoods of new attack methods or new perils. There is uncertainty around how the risk will shape up. One such example has been observations on tail of these lines. Cyber is typically classified as a long-tailed line. However, with increasing proportion of cyber extortion claims in recent past, such claims are becoming much larger proportion of expected losses thereby indicating shortening of tail. It is also interesting to note that majority of the cyber crimes are due to human error or are intentional activity. There is a big element of human behavior in predicting cyber risk, which is difficult to observe and model.

Silent Cyber - "the known unknown"

2017 witnessed one of the costliest cyberattack in history - NotPetya. The NotPetya attack withered a range of businesses from shipping ports and supermarkets to ad agencies and law firms, by encrypting their master files and demanding a Bitcoin ransom to restore access to those files. Most victims were based in Ukraine, but several global corporations were also infected - including shipping giant Maersk, advertising firm WPP, pharmaceutical outfit Merck, and FedEx's TNT Express division. NotPetya resulted in *losses on non-cyber lines of business for various insurers*. In a report published by Wired, a White House assessment attached the total damages brought about by NotPetya to more than $10 billion.

These policies did not have any explicit exclusion on Cyber hence were silent on cyber but covered losses that might originate from a cyber-related incident.



That makes us talk about the type of exposure which exists. "Affirmative/Explicit" are the cyber exposure coming from insurance policies that explicitly include coverage for cyber risk.

The standard coverages available in stand-alone/add on cyber policy include -

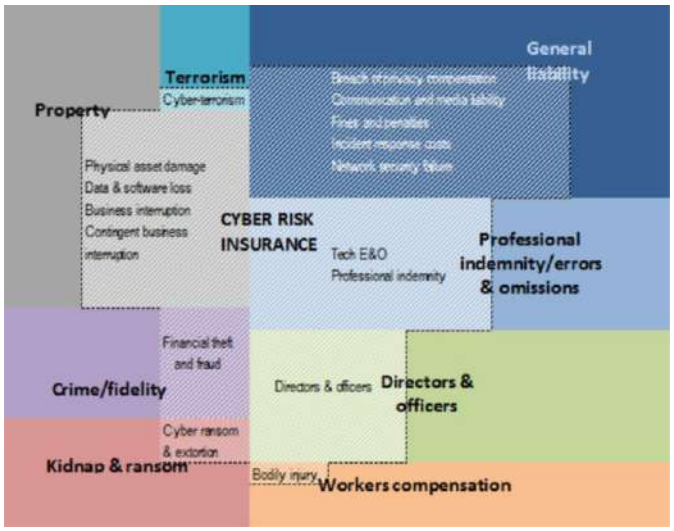
- first party coverage - business interruption, cyber extortion, data restoration costs etc.
- third party liability coverage - privacy /data breach liability, media liability, regulatory fines or defense costs etc.
- Crisis management cover including public relations costs

"Non-affirmative" are from the insurance policies that do not explicitly cover cyber risk. These are called 'silent' or 'unintended' and usually are cause of losses in the conventional insurance policies which were not designed to cover cyber risks at the first place. Silent cyber creeps into the policies where cyber exclusions are not exhaustive.

Some examples -

- Imagine a cyber attack on a digital controlling system of a factory. Malware attack scrambles the data which triggers a fire and damages the insured's property or causing machinery breakdown. This is typically covered under the Fire/SIR policy.
- Imagine the above case, the fire being so severe that it causes an explosion in the industrial plant and flying sparks cause inadequately secured hazardous goods on neighboring sites to explode and potentially causing human casualties. Here the claim will be paid out from a liability cover.
- Similarly, professional indemnity claim can be triggered if a firm lost its client's data and gets sued for breach of confidentiality or negligence in protection of the data.

Because cyber risk is now a pervasive threat to all operating entities, it impacts practically every line of commercial insurance. Yet, it remains unaddressed in many lines of insurance.



Source: AIR

Understanding the exposure is the biggest challenge in assessing silent cyber. The actuaries and underwriters must incorporate expert-derived security and industry specific intelligence and implement cutting-edge technology like machine learning.

Typically, actuaries incorporate a margin or a contingency/catastrophe loading while rating the policies. The cyber loss modelling market has developed tremendously over the past years but still lacks consensus (as e.g. CAT modelling has gained) in forecasting, for example, 1-in-200-year losses. Various suppliers are working globally to put together sophisticated views on the market and portfolio loss potentials.

A more detailed framework which has been suggested by IFoA Working party and is also being adopted by various reinsurers or Cat modelers revolves around *generating potential bespoke scenarios and applying to the exposures derived using policy wordings analysis*. This solution includes assessing 'contract confidence' for policy wordings for individual policies (or a sample within a segment) and assessing strength of current exclusions. This is done in conjunction with consultation

with a Subject Matter Expert or legal/claims department. An exposure value (e.g. Probable Maximum loss or anything appropriate) is estimated using contract confidence and then run through the scenarios to come up with an indication of potential silent cyber loss.

Reinsurance

The key strategy for an Insurer to mitigate its risk is Reinsurance. Two common types are – a) Proportional which relates to a model where the reinsurer and insurer share the risks with agreed split (such as for example 50% of each and every loss) from ground up and b) non-proportional which refers to a type of reinsurance where the reinsured retains a loss of certain amount and the reinsurer agrees to pay for losses exceeding the amount.
The proportional reinsurance has been the dominant instrument in the genesis of the cyber reinsurance marketplace. As the exposure modelling capabilities are still developing, it has been considered fair to share the risk from the ground up. Furthermore, advanced modelling adopted by the Reinsurers automatically radiates in the prices of direct insurer. However, it becomes particularly challenging for the brokers to arrange large capacities required for the larger firms and diminishes the risk-reward for high excess carriers. There exists a significant gap in economic vs. insured losses and often the losses blow through the whole layer. Some reinsurers have adopted XoL structures where the under-insurance problem apparently seems to decline.

Cyber is a young class of business and its imperative that Insurers and reinsurers work together. They share an interest in better understanding the exposure in order to design products, underwrite the risk transfer and ensure appropriate capital for the portfolio of risks. Combining the knowledge of the reinsurers and insurers benefits the policyholders as pricing becomes more accurate and insurance market solvency is secured in case of a grand cyber catastrophe.

As an aside, there is an issue of concentration within the reinsurers at present. Recent data from Swiss Re shows that "the total limit of aggregate excess of loss cyber reinsurance placed (excluding retrocession) increasing from USD 1,500m to USD 2,000m from 2019 to 2020, an increase of about a third, year over year. This follows a 100% increase between 2018 and 2019." There are only a few reinsurers in the market and hence the capacity is concentrated.

The future

Cyber insurance is a potentially huge, but still **largely untapped opportunity** for insurers and reinsurers. Businesses across all sectors are beginning to recognize the importance of cyber insurance in today's increasingly complex and high-risk digital landscape. In turn, many insurers and reinsurers are looking to take advantage of what they see as a rare opportunity to secure high margins in an otherwise soft market.

Cyber insurance could soon **become a client expectation** and insurers that are unwilling to embrace it risk losing out on other business if cyber products don't form part of their offering.

Regulations for cyber insurance will be more mature, and more regulatory bodies across the globe will begin to enforce a higher standard of data collection and require regular reporting about cyber risk exposure. The data requirements will evolve in line with the regulatory understanding of cyber exposure analysis and as the risk itself evolves. We will also see an increase in regulations that require certain types of businesses to purchase mandatory cyber insurance, potentially starting with financial institutions and healthcare.

Presently, cyber insurance policies vary significantly in limits, features, coverages, and terms and conditions. The variation is not fully intentional and is part of the evolution of cyber policies. However, it causes difficulty for policyholders as well as reinsurers. Model policy terms have been suggested previously, but the soft market has impeded take up by insurers. The hardening of the market will enable terms to be revised to remove ambiguity and move toward a more common market wording and **standardized covers. Reinsurance capacity** will also become less concentrated as more carrier will enter the market.

Cybercrime is a costly, hard to detect and difficult to combat threat. From an insurance perspective, while analogies are often made with terrorism or catastrophe risks, cyber risk is in many ways a risk like no other.

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Written by

Manisha Sharma

mani31103@gmail.com

Manisha Sharma is a Senior Actuarial Manager, P&C Insurance (Accenture).

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