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INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest





नेशनल इन्श्योरेन्स कम्पनी लिमिटेड
(भारत सरकार का एक उपक्रम)
'National Insurance Company Limited'
(A Govt. Of India undertaking)

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5. For detailed advertisement, refer to recruitment section of our website: www.nationalinsuranceindia.com

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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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Obituary



Shri Jagdish S. Salunkhe was born in July 1938. After his schooling in Chikitsak Samuha Shirolkar high school in Girgaon, Mumbai, he joined the Sydenham College for graduation in Commerce with specialization in Actuarial Science.

After graduation he joined the services of LIC. He qualified as a Fellow of the Institute of Actuaries in 1966 at a relatively young age. With his dedication and commitment, he rose through the organization to head the Institution in the end of 1993 as its Chairman. He served as Chairman of LIC from 1993 to 1996.

During his service in LIC, in 1980 he was deputed to LICs subsidiary in Malaysia in United Oriental. During that tenure he displayed brilliant performance as an Actuary. In 1984 United Oriental sent him as a delegate for the International Conference of Actuaries held in Opera House, Sydney, Australia. There he joined LICs own delegation. He brought cheer to the LIC delegation by his ready wit, alertness and quick thinking.

In LIC he later on headed the Personnel Department and developed policies that ensured that all classes of LIC employees were contented and happy, thus avoiding any conflict and organized action by the employees.

He also developed a system of collection of data at the source and updating it online so as to ensure accuracy. This action of his has led to the data for LIC 1994-96 Mortality Investigation being more accurate and representative.

With his skilled liaison with the Ministry of Finance he was able to get tax relief for the premium paid on Jeevan Akshay policies at the time of payment of premium by way of total exemption from tax without waiting for the cumbersome process of claiming relief under 80C of the Income Tax act.

He was a Director of several companies in the Financial and Manufacturing industry. One such Company was Ken India Life Insurance Company. He sent a junior Actuary as its DGM and Actuary and gave him total support as a Director.

He also contributed to the development of National Insurance Academy (NIA), Pune and Insurance Institute of India at Mumbai with the same zeal that he worked in LIC and Institute of Actuaries of India.

After his tenure in LIC he joined the Mercers after the insurance field was opened for competition. Junior Actuaries who worked with him in Mercers were greatly benefited by his guidance.

While he was working at Mercers that he experienced a major health problem which led to his brief hospitalization. He came out of it with great effort and determination. He was very regular about his daily walking exercises for years thereafter.

Apart from his professional engagements Shri Salunkhe also contributed to the field of Education. His childhood friends requested him to join Vidya Prasarak Mandal, Dahisar and guide the institution. The trust had founded a school in Dahisar, Mumbai, which catered to nearly 5000 students from all strata of the society. Shri. Salunkhe, with his goodwill among the corporates, helped the school raise resources and the school could construct a 78000 Sq.Ft. building without borrowing a single rupee. In a span of nine years while he was associated with the school and also during his recuperating post-illness, he instituted many a quality reform and led the school through a phenomenal transformation.

He was also an active member of the local residents association. He contributed immensely with his valuable guidance and leadership in these activities of social service.

Unfortunately he left for his heavenly abode on 16th June 2018.

It is the hard work and dedication of individuals like Shri Salunkhe that has led to the success of LIC as an organization. His visionary leadership and endearing personal qualities will continue to inspire the people whose lives he touched.

May his Soul Rest in Peace!



Submitted by **Mr. M G Diwan**



It is heartening to know that one of the major manufacturers of Mobile Phones is setting up largest mobile phone manufacturing plant in India. This is going to generate good amount of employment in country, reduce imports and increase exports. India has been doing quite good in software and services industry but manufacturing was completely missing. India needs many more of such manufacturing units in various categories. I wouldn't mind saying desh badal raha hai (**India is changing!**). India has been ranked 11th in the Global FDI Confidence Index 2018, making it the 2nd highest ranked emerging market for FDI.

India has become the most attractive emerging market for global partners' investment for the coming 12 months, as per a recent market attractiveness survey conducted by Emerging Market Private Equity Association (EMPEA). Annual FDI inflows in the country are expected to rise to US\$ 75 billion over the next five years, as per a report by UBS.

The World Bank has stated that private investments in India is expected to grow by 8.8 per cent in FY 2018-19 to overtake private consumption growth of 7.4 per cent, and thereby drive the growth in India's gross domestic product (GDP) in FY 2018-19.

While all this looks great, we must really look at what is happening in Life Insurance in India. In FY 18, the overall Life insurance new business premium grew by 11% from 1.75 lac crore to 1.94 lac crore. Private Life Insurance new business premium grew by 18% from 0.50 lac crore to 0.59 lac crores. Over all the number of policies written has grown by 6% from 2.01 cr to 2.13 cr. For Private life insurers the number of policies have grown by 8.5% from 63.2 lacs to 68.6 lac crore.

It is astonishing to see that number of policies written by Indian Life Insurers is greater than population of world's 77 countries put together. Further, there are at least 176 countries whose population is less than the number of new policies written in FY18.

Despite all these numbers and performance, the challenges of optimisation of acquisition cost remains. Nevertheless, the potential to cover large uninsured population in India is immense. Actuarial Profession can play a vital role to help Insurers to explore this untapped potential by introducing solution to meet the needs of masses.

Latest opportunities before the profession are emerging in the area of implementation of IFRS 17. This accounting standard is very complex for accountants and will change the way financial reporting for insurance company to be done. Performance reporting will look more like MCEV than the current revenue and P&L account. Insurers will require actuarial resources in the accounting and finance team to manage these reporting. This would put a lot of onus on the profession to provide necessary skills to the actuarial resources to take these challenges.

While profession will conduct workshops and seminar in this area, I will sincerely encourage members to familiarise themselves with the standard and actively participate in such events. Let's use this opportunity to the fullest.

With this message I would like to sign off.

Organized By: Advisory Group on Professionalism Ethics and Conduct, IAI.

Venue: Hotel Sea Princess, Mumbai

Date: 1st – 2nd June 2018

Day 1

WELCOME & INAUGURAL ADDRESS



The seminar began with an address by **Mr. Anil Kumar Singh**, Chairperson of Advisory Group on Professionalism, Ethics and Conduct, who welcomed the attendees of the 29th Indian Fellowship Seminar. He spoke about the need and the importance of professionalism and ethics for actuaries and wished the participants good luck for their presentations. He advised them to adhere to the timelines and to ensure that they left enough time for discussions and questions and answers. He also urged senior actuaries to actively participate in the discussions and share their experiences.

Mr. Sanjeeb Kumar, President, IAI, welcomed everyone to the 29th Indian Fellowship Seminar. He observed a good blend, in terms of seniority, of actuaries attending the seminar and hoped that the discussions will be helpful for the young actuaries. He also urged the newly qualified actuaries to proactively contribute towards the profession.



Ms. Pournima Gupte, Member Actuary, IRDAI, thanked the institute for inviting her to the seminar for sharing her thoughts. She congratulated all the young and recently qualified actuaries on their success and also thanked experienced actuaries for continuously contributing to the profession by taking responsibility to mentor young actuaries. She appreciated the programme schedule mentioning that the topics chosen for the presentations are very relevant and topical for the industry. She also urged the young actuaries to understand the importance of “Professional Conduct Standards” and “Actuarial Practice Standards” issued by the institute and fully comply with these standards.

Session : Reinsurance- Life post Registration & Operations of branches of foreign reinsurers (Regulations 2015) - (Changing approach to Product pricing, Business plans, Solvency management)

Chairperson: Mr. Richard Holloway

Presenters: Mr. Sabyasachi Das, Mr. Pradeep Kumar G, Mr. Vipul Aggarwal, Mr. Deepesh Vaid



The group started the presentation highlighting the evolution of important reinsurance regulations culminating with the recent “Exposure draft IRDAI (Reinsurance) regulation, 2018”. The team first compared the scenario of the reinsurance market pre and post announcement of IRDAI (Registration and Operation of Branch Offices of Foreign Reinsurers other than Lloyd’s) Regulation, 2015. First Amendment, 2016. They reiterated the important rules and regulations to be followed by Indian and Foreign reinsurers prescribed in the new reinsurance regulation.

The team spoke about the overarching objectives of IRDAI with regard to reinsurance such as maximizing the retention within India, securing best reinsurance arrangement within India etc. The discussion also touched upon the major operational changes that happened post the implementation of the new reinsurance regulation “**IRDAI (Registration and Operation of Branch Offices of Foreign Reinsurers other than Lloyd’s) Regulation, 2015 First Amendment, 2016**”. The team highlighted the broad impact of the regulation on pricing, solvency, service standards, taxation and capital requirements of the Foreign Reinsurance Branches (FRBs) operating in Indian market.

The team opined that the latest reinsurance regulation, which is currently at draft stage, will provide numerous growth opportunities for reinsurance business in India. They concluded the presentation with highlighting future business growth opportunities for insurance and reinsurance market in India.

Session : Pradhan Mantri Health Insurance Scheme: - Understanding the product, potential, issues and impact on experience

Chairperson: Mr. Liyaquat Khan

Presenters: Ms. Lakshmi Ramaswamy, Mr. Som Kamal Chatterjee, Mr. Ashok Kr Singh Kushwaha



Mr. Khan introduced the team and highlighted the role of a guide in mentoring a team. He also emphasised the importance of professionalism.

The team began their presentation by outlining the features of the “Pradhan Mantri Health Insurance Scheme (PMHIS)” and how it is expected to operate in the insurance market once it is launched. A comparison of the scheme with the existing government sponsored health insurance scheme named “**Rashtriya Swasthya Bima Yojna (RSBY)**” was also provided by the team.

The team then explained the key challenges related to the pricing of PMHIS covering areas such as competitive environment, difficulty in ensuring financial viability of premium, management pressures and regulatory requirements. The social as well as business potential of the scheme for the health insurance industry in India was highlighted.

To actively engage the audience, the team conducted an informal and quick survey and took feedback from the Appointed Actuaries working in health insurance companies operating in India. Views were taken on the short, medium and long term issues attached to PMHIS and how they are planning to deal with these issues.

Lastly, the team touched upon likely impact of PMHIS on 1) Health insurance market, 2) Health service providers, 3) Target population and 4) Regulatory mechanism.

In conclusion it was agreed that “**Ensuring financial viability of premiums to be charged for the scheme and careful monitoring of experience of the scheme are key factors to ensure success of this scheme**”

Session : Current Issues with Health Insurance - Coping with Frauds, High Claims Ratio, Low level of consumer awareness

Chairperson: Mr. R. Arunachalam

Presenters: Mr. Kunal Bansal, Mr. S Sabareesh, Ms. Shreya Bagrodia



The team started with the introduction to the Indian health insurance industry supported by statistics related to classification of health insurance business and a comparison of share of major states in total health insurance premium. The team provided interesting insights into the 3 major current issues prevailing in the Indian health insurance market i.e. frauds, high claims ratio and low level of customer awareness.

The following aspects related to each of the above issues were covered:

- ❖ **Fraud:** Types of fraud, parties involved in fraudulent activities, examples of fraud seen in practice, current actions available against fraud, IRDAI guidelines against fraud and various ways of managing frauds.
They alluded to a recent survey conducted by the Insurance Institute of India, which pegged false claims at 10%-15% of the total claims!!!
- ❖ **High claims ratio:** Definition of claims ratio, major issues resulting from high claims ratio, statistics covering claims ratio of all the Indian health insurance companies, trend analysis related to high claims ratio and suggestions to manage high claims ratio.
It was observed that the claims ratio of public sector companies is worse than the claims ratio of private sector companies.
- ❖ **Low level of customer awareness:** Definition of customer awareness, low market penetration, statistics comparing the level of spending on health insurance by customers in the year 2010, 2016 and forecast in 2021, were presented and the effects of low customer awareness and possible solutions to deal with this situation were considered.
The team was optimistic about the future since the "overall spending on health insurance has increased in 2016 as compared to 2010 and expected health insurance to increase at a good pace in 2021".

Session : Participating Funds - Most appropriate management & governance framework to ensure fairness to policyholders and the global practice.

Chairperson: Mr. Bikash Choudhary

Presenters: Mr. Anupam Sharma, Mr. Siddarth Narayanan, Mr. Sunny Aggarwal



The team started their presentation by providing an overview of participating products covering the broad structure, history and proportion of par business considering a few private Indian life insurance companies.

The detailed framework of management of participating products by every life insurance company was explained. This included:

- ♦ appropriate asset share calculations,
- ♦ selection of appropriate bonus structure,
- ♦ fair allocation of expenses and charges,
- ♦ good investment policy,
- ♦ adopting smooth benefit growth policy,
- ♦ meeting PREs, and
- ♦ Setting up a With-Profit Committee (WPC) in each life insurance company.

The team also explained the broad governance framework of with-profit business in India covering APS, GNs and Regulations which are applicable for with-profit business. To conclude the session the team shared practices from other global markets for managing participating funds.

Session : Development of new technologies and e-commerce - to what extent life insurance business is exposed to disruptions and how to get ready for that?

Chairperson: Ms. Madhura Maheshwari

Presenters: Ms. Pallavi Pathak, Mr. Krishna N Venkata, Mr. Vinay Gupta, Mr. Ramnath Shenoy

To set the tone for this session, the team began their presentation by explaining how emerging technologies,



such as Machine learning, Artificial Intelligence, E-commerce & Social Media and Block-chain, are impacting the financial sector. The current as well as expected impact of all these new technologies on insurance products, marketing, pricing, underwriting, distribution channels and claims were discussed by the team.

The team emphasised that digitalisation and innovative technology is rapidly changing and will continue to change the existing insurance structure in Indian market. The team also presented some interesting statistics and examples related to the adoption of new technologies within the insurance world. The group indicated that *“68% of the insurers are expected to adopt Block chain as part of their production system or process by 2018.”*

The group also considered some serious challenges emerging due to new technologies such as regulatory concerns, data privacy, impact on resources, inherent challenges of AI etc. The Indian regulatory framework relating to E-commerce and Data protection was explained.

Finally, they summarised their presentation by emphasising the need for life insurers and actuaries to be ready for the growing digitalisation in the life insurance industry while taking appropriate steps to avoid disruptions to be caused by these innovations.

Session : Is Risk Based Capital the way forward, adaptability to Indian Context? Comparison of various market consistent measures.

Chairperson: Mr. Srinivasa Rao

Presenters: Mr. Rakesh Kumar, Mr. Niraj Kumar Atreya, Ms. Neelasree Deb

Mr. Srinivasa Rao introduced the team. The team set the ball rolling by explaining the current solvency regime applicable to Indian insurance companies. They discussed important advantages of RBC over the current solvency regime in terms of:

- ♦ Better risk management
- ♦ Better information on financial strength of the insurer

- ♦ Facilitate early and effective intervention by Authority, if necessary, and
- ♦ Enhanced protection to policyholders



They highlighted the main drivers responsible for transformation to RBC regime and also shared updates on the progress of implementation of RBC regime so far.

The aspects related to adaptability of RBC regime by Indian insurance companies were explained including:

- ♦ The Method of valuation - Liability & Assets
- ♦ The Method for Risk Capital Assessments
- ♦ RBC Committee recommendation on implementation
- ♦ The Corporate Governance and ERM
- ♦ The Changes in legislation/Regulation
- ♦ The Resources -Financial/Technical, and
- ♦ Other considerations

Finally, the team compared the solvency regime existing in various markets. For the comparative study the team picked “the EU solvency regime”, “Singapore RBC regime”, “Hong Kong RBC framework” and “China C-Ross regime”.

Session : ULIP - Evolution of products and changing landscape in last decade, where do we go from here?

Chairperson: Mr. Pradeep Kumar Thapliyal

Presenters: Ms. Arpita Jetha, Mr. Ashik Salecha, Mr. Deepak B V



The team started their presentation by discussing the basic features of ULIP products and how these products have been evolved in Indian insurance market. The team

journeyed through the changing landscape for ULIP products over the last decade by considering 3 major time frames:

- ♦ **Pre 2009:** The prevailing regulatory environment for ULIP products till 2008 (No specific regulations for ULIP products) was discussed. Issues relating to high surrender penalty, information asymmetry, falling stock market etc. were highlighted.
- ♦ **2009 - 2012:** The team discussed the circulars issued by IRDAI in 2009 and 2010 to guide the life insurance companies for the better management of ULIP products.
- ♦ **2013:** Referring to the “IRDA (Linked Insurance Products) Regulations, 2013” as the third phase of major regulatory changes for ULIP products, the team highlighted the principal impact of these regulations on the operation and growth of ULIP products. They also presented data related to the growth in ULIP premium for Indian insurance industry since 2013.

The discussion then veered to the known challenges faced by insurance companies in selling ULIP products and suggested some useful solutions to increase growth of ULIP business in India. The session concluded with the group sharing some of the recommendations made on ULIP products design by the “Products Regulations Review Committee, 2017” constituted by IRDAI.

Session : Selling of Products through alternate channels, tech giants. How far can we go?

Chairperson: Mr. K S Gopalakrishnan

Presenters: Mr. Jean Cloutier, Mr. Yeun Yeung, Mr. Ruan Rensburg



The team commenced the session by discussing alternate distribution channels apart from traditional distribution channels. They highlighted that whilst smart phones, social media etc. are few alternate distribution channels for selling insurance products there are already indications of the industry moving towards more advanced and innovative channels such as AI, IoT, Robo advisers etc.

The team explained the major advantages of each of these channels in insurance industry as well as in other industries. Interesting practical examples were shared where Artificial Intelligence (AI), Internet of Things (IoT) and Robo advisers are being used for customer care solutions and selling products to the end customers.

“Zhong An - China's 1st digital insurer” was one of the very good examples of how AI is changing insurance penetration.”

The team also reminded the audience on how some of the “Tech giants” such as Google, Apple, Amazon, Tesla etc. are entering into insurance market and creating a buzz in the industry. They highlighted the pros and cons of such market disruption.

Various advanced analytical methods which can add value at different stages of the modelling process for pricing and underwriting were also explained. These included:

- ♦ Advanced decision trees
- ♦ Neutral networks
- ♦ Penalised regression, and
- ♦ Boosting mechanisms

In conclusion, the team also touched upon the limitations of using advanced technologies and highlighted the moral & ethical challenges associated with this new innovative era for insurance industry. They emphasised the importance of cautious decisions to be taken by Actuaries to ensure that industry as a whole benefits from these innovative techniques.

Session : Pre-Dinner Address on Professionalism and Ethics

Speaker: Mr. Shailesh Sheth



The proceedings for the day were brought to a close with a pre-dinner address by **Mr. Shailesh Sheth**, Advocate and Founder of SPS Legal. He spoke at length about the importance of professionalism and work ethics. He shared real life incidents to explain his points around what makes a good professional. He shared his views on integrity, professionalism and ethics and explained the importance of these in the area of actuarial work. In doing so, he narrated shlokas from *“The Bhagwat Geeta”* and explained the applicability and relevance of these in our day-to-day professional life.

Day 2

The second day of the seminar began with Mr. Anil Kumar's opening remarks. He briefly set out the schedule for the day before welcoming **Mr. Sumit Ramani**, a guest speaker in the seminar, to present on the topic named "Blockchain in (Re) insurance".

Session : Blockchain in (Re)insurance

Presenter: Mr. Sumit Ramani



Mr. Ramani started the session by introducing the concept as well as the structure of Blockchain and describing how it works. He explained that most of the Blockchain being used for insurance applications are private and protected thus it is not the same as the Blockchain applications being used in bitcoins which are not protected. Types of distribution ledger and smart contracts being used in Blockchain were also discussed in the session.

He then highlighted a few Blockchain applications which can help insurance industry to grow further including:

- ♦ Parametric health insurance
- ♦ Tradable life insurance policies
- ♦ Commercial insurance platform
- ♦ Pay-as-you-go motor insurance
- ♦ Personalised home insurance, and
- ♦ Peer to Peer insurance

Overall, it was an interactive session which left the audience with a message that *"Blockchain is not just a buzzword but it solves real life problems"*

Session : General Insurance companies - Understanding key performance measures, Benefits and limitations in listing GI companies

Chairperson: Mr. Khushwant Pahwa

Presenters: Ms. Shubhanjali Gupta, Ms. Richa Gupta, Mr. Rohit Singhal, Mr. Charchit Agrawal

The team commenced the presentation with an introduction and overview of the general insurance



industry in India. They presented the statistics showing market share of both public as well as private GI players in the Indian market. The market share of major GI products was also presented with statistics which indicated that Motor and Health insurance products dominate the market.

They also shared data on the growth of Indian GI market since 2007 to 2016 highlighting that although there has been a significant increase in premium growth but insurance penetration is still volatile. The team then touched upon key performance measures being used in GI market. Premium growth, Underwriting results and Solvency ratios were the measures discussed by the team.

The team then discussed the benefits of listing an insurance company from the perspective of various stakeholders e.g. the organisation, policyholders, investors and other stakeholders. They also shared data on the stock market performance of GIC Re and ICICI Lombard, 2 companies that recently launched their IPOs. To end the session some key challenges faced by an insurance company while listing on stock market were discussed. These included:

- ♦ Difficulty in valuation of stock
- ♦ Excessive reliance on investment income
- ♦ Low insurance penetration
- ♦ Higher costs, and
- ♦ Price sensitive market

Session : Issues with pricing and reserving of Crop Insurance, Challenges in meeting increasing demands of Agro Insurance.

Chairperson: Mr. Chandra Shekhar Dwivedi

Presenters: Mr. Arun Kurian, Mr. Ashok Kumar Lahoti, Mr. Ananthanarayanan C, Mr. Siddesh Ramasubramanian

The presentation began with an overview of crop insurance in the Indian market covering the definition of crop insurance and its evolution over the time. They briefly touched upon the salient features of the "Pradhan Mantri Fasal Bima Yojana (PMFBY)". The team explained the challenges and issues faced by insurance

companies in pricing and reserving for crop insurance.



Excessive reliability on past data to determine future trends, risk of missing data as data being shared by “gram panchayats”, lack of credible and reliable models, tender process for quotation, lack of persistency, anti-selection etc. were some of the pricing challenges discussed by the team. Lack of good quality data, highly volatile claims experience, delays in data collation at state level, risk cover is heterogeneous and seasonal in nature etc. were identified as some of the reserving challenges highlighted by the team.

Besides the above, attention of the audience was also drawn to some of the general challenges which the insurers have been facing in meeting increasing demands of Agro insurance in India. The challenges discussed by the team include:

- ♦ State-level policy
- ♦ Issues with premium rates
- ♦ Limited resource capacity of insurance companies
- ♦ Issues with assessment of crop loss
- ♦ Inadequate and delayed claim payment to farmers
- ♦ Revenue based insurance

Session : Current Annuity Products - How suitable are they to provide a right income solution to retiring Indian population..?

Chairperson: Mr. K K Wadhwa

Presenters: Mr. Jayesh Pandit, Mr. C.P. Chittarasu



The team provided a broad introduction of retirement system in India to kick start their presentation. They introduced the 3 pillars or sources of retirement income

covering:

- ♦ Government funded retirement benefits
- ♦ Employer-sponsored retirement benefits, and
- ♦ Self-sponsored retirement benefits

They discussed features of various retirement products currently available in the Indian market such as ULIP pension plans, immediate annuities, Pradhan Mantri Vaya Vandana Yojana (PMVVY), Atal Pension Yojna etc.

The team also highlighted the key differences between “*Pure annuity products*” and “*Accumulation based products*” as retirement solutions. *The Indian market has very limited range of retirement products mentioned by the team.*

The suitability of various products available in the market in accordance with specific income needs of retiring population in India was then deliberated. Life time annuities, joint life annuities, increasing annuities etc. were some of the products discussed by the team. The team spoke about the general challenges relating to penetration for retirement benefits in Indian market.

In conclusion, the team proposed some retirement benefit products which can be explored by Indian insurance market to provide better benefits to retiring population. These include:

- ♦ Income Draw down
- ♦ Annuity with Medical Cover
- ♦ Reverse Mortgage
- ♦ Indexed Annuity, and
- ♦ Personalized annuity to take care of special needs

Session : Review of recent insurance IPOs, Stock growth prospects of Indian Insurance companies, comparison and contrast with international markets.

Chairperson: Mr. Subhendu Kumar Bal

Presenters: Mr. Gaurav Nautiyal, Ms. Rajeshwarie VS



The team commenced the session with a discussion on the need for IPOs in Indian insurance market and evaluating the benefits of the same for Insurance

industry in India.

The benefits highlighted by the team comprised the following:

- ♦ Improved disclosure standards and their periodicity
- ♦ Optimum price discovery for cost of capital
- ♦ Improved Capital adequacy of companies
- ♦ improved Marketing and publicity insurance awareness, and
- ♦ Insurance seen as additional “uncorrelated asset class”

The team also deliberated on the guidelines and regulations issued by IRDAI relating to IPO of an insurance company. *“It is mandatory for an insurance company to seek IRDAI's approval for issuing IPO before approaching SEBI”* The team briefly discussed the approval conditions imposed by IRDAI and the listing requirements set out by SEBI.

The team then considered the role and responsibilities of an actuary in listing of an insurance company, including:

- ♦ Embedded value calculation
- ♦ Accounts verification
- ♦ Liability Valuation
- ♦ Supporting due diligence
- ♦ Risk disclosures, and
- ♦ Capital requirements assessment

The team also presented statistics tracking the performance of the stock market prices of all the insurance companies which recently launched IPOs. They also discussed the expected future growth prospects of stock prices of the listed insurance companies.

The team concluded the presentation by sharing a high level comparison of Indian insurance market with the global markets. They mentioned that *“As per the Economic survey of India 2018, even with 17% of the world's population, the Indian insurance market accounts for less than 1.5% of the world's total insurance premium”*

This further drove home the point that low insurance penetration in Indian market is still an issue and insurance companies have lots of opportunities to grow insurance business in India.

Session : IAI Disciplinary Process: Group Discussion on Video Case Studies - Part 1 & 2



In total 12 groups made presentations at the seminar. The last of the presentations were completed around 3PM on Day 2.

Following the presentations, **Ms. Anuradha Lal** and **Mr. Heerak Basu** led the next session i.e. “Group discussion on video case studies”. Ms. Lal explained that the focus of the videos was on work ethics and professionalism. The videos provided situations that gives rise to questions that we as actuaries may face in our day-to-day work place. Our response to these situations is crucial from the perspective of professionalism and ethics.

The participants were divided into 12 groups and questions were asked by the moderators to each member of the group to ensure equal participation from all the groups. There were two videos shared at the seminar on which questions were raised by the moderators. The participants were expected to analyse the situations and to share their views on professionalism, integrity and ethics.

Overall, the videos demonstrated the importance of strict adherence to the Actuaries' codes for an Actuary. All the groups actively participated in the discussion and a range of insightful views were shared for each case study.

To bring the seminar to a close, **Mr. Anil Kumar** presented the IAI disciplinary process. He provided detailed information about the Actuaries Act, 2006 and discussed the relevant sections and the procedure for disciplinary process regarding complaint of professional misconduct against any fellow actuary.

The seminar was concluded by a vote of thanks by **Mr. Anil Kumar**, who thanked the participants, the senior actuaries and the organisers for a lively, insightful and meaningful seminar.

Written by



Ms. Harvinder Kaur



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“ Ms. Harvinder Kaur is currently working as Senior Actuarial Manager, Research and Pricing in Munich Re.”

FEEDBACK

In the present seminar wider subjects like government various schemes, subjects like big data analytics, blockchain etc. may be continued with latest inputs

It might be better to get an actuary for the talk on professionalism or use the videos. Videos and the discussion was amazing

Since its IFS program, the professional issue in a effective situation should be highlighted by the participants

Institute can assign topics, however group should be allowed to choose their own topic if they feel they can add more value in a topic chosen by them.

Professionals should cover more on creating situations where presenters uses his/her judgement while recommending or suggesting/ giving advice mentioning of relevant professional standards conducts involved while suggesting anything in the presentation

The Actuary India wishes many more years of healthy life to the fellow members whose Birthday fall in July 2018

Mr. A D Gupta
Mr. A K Garg
Mr. H L Jain
Mr. K K Wadhwa

Mr. K N Vishwanathan
Mr. K.V.Y Sastry
Mr. Michael Joseph L.Wood
Mr. R Srinivasan

1st Seminar on Data Science & Analytics

Organized by: The Working Group on Wider Areas of Actuarial Science

Date: 21st July, 2018

Venue: Hotel Marriott, Whitefield, Bengaluru

Background

Seminar on Data Science & Analytics is an event of the Institute of Actuaries India, scheduled on 21st July, 2018, in Bangalore. It is the second seminar being organized by the 'Working Group on Wider Area of Actuarial Science' of the Institute.

This is the first of its kind seminar conducted in India focusing on Actuarial applications in the Data Science and Analytics domain by IAI. The objective of the seminar is to create awareness among the actuarial members and anybody interested in the field of Data Science, Analytics, and disruptive technology on the convergence of actuarial science with data science. Actuaries have long been viewed as Insurance and Pension specialists. However Actuaries are professionals with multi-dimensional skillset like mathematics, statistics, accounts, modeling and business. Actuaries can also be called as the earliest data scientists who have been applying modeling and analytics on data and deriving business insights. The advent of Big Data Analytics and Data Science domain coupled with technological revolutions like machine learning, artificial intelligence, etc have enabled the exponential possibilities for actuaries to contribute beyond the traditional domain.

This one-day seminar will help participants to understand and appreciate the current developments in the field of Data Science and analytics in various domains and enable them to apply actuarial knowledge with a novel touch. The participants will have an opportunity to interact with Industry experts, practitioners and technology experts working in leading organizations. The content, in large parts is non-actuarial, non-technical and hence of relevance to the non-actuarial audience as well.

Seminar Topics & Speakers:-

- ~ Democratizing Data Intelligence – **Subhas Chandra**, Singular Labs Inc, Ex- Google, SAP, IBM
- ~ Unconventional applications of Actuarial Analytics – **Sumit Ramani**, Actuarial Consultants
- ~ Disruption ahead in assessing risks in life and health insurance – **Balachandra Joshi**, Swiss Re
- ~ The Art of Data Science: how its changing now and shaping future – **Khushwant Pahwa**, KPAC
- ~ The Changing Landscape of Actuarial Profession – **Mahidhara Davangere V**, Pramatha
- ~ Data Science and emergence of a Multidisciplinary Professional (Panel Discussion)
- ~ Case study and break-out sessions – (Working Group Team Members)

Who Should Attend?

Actuarial Students, Qualified Actuaries, data analysts, engineers, HRs, CEO's and anybody wishing to enter or update the knowledge the field of Data Science and Analytics

General Points:-

- ~ **Registration Fees (Excluding 18% GST):**
 - Students & Associate Members: ₹ 2,000/-
 - Other IAI Members: ₹ 4,000/-
 - Non – Members: ₹ 4,800/-
- ~ **CPD Credit for IAI members:** 6 hours Technical (As per APS 9 - Rev. Ver 2)
- ~ **Dress Code:** Business Casual
- ~ **Point of contact:** Ambreen@actuariesindia.org
- ~ **For Registration, kindly visit:** <http://www.actuariesindia.org/index.aspx> – Seminars – Upcoming Seminars – Seminar Registration

Introduction

In recent years the certain buzz words like Big Data analytics, data science, artificial intelligence, data mining etc. are roving around. In 19th Global Conference of Actuaries held in Mumbai there was considerable excitement about data analytics and process automation. With the digital penetration and usage increasing on an exponential scale on daily basis availability of data on a real time basis is on the rise and data analytics have become a buzz word now. But how does that interact with what actuaries do and how actuaries can be benefitted by getting trained in the data analytics techniques are some of the points discussed below.

What is big data analytics?

There is no fixed definition but one used widely is by Gartner 2012 is

“Big data is high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation”

In layman's terms big data analytics examines large amounts of data to uncover hidden patterns, correlations and other insights. With today's technology, it's possible to analyse your data and get answers from it almost immediately - an effort that's slower and less efficient with more traditional business intelligence solutions.

The new benefits that big data analytics brings to the table, however, are speed and efficiency. Whereas a few years ago a business would have gathered information, run analytics and unearthed information that could be used for future decisions, today that business can identify insights for immediate decisions. The ability to work faster - and stay agile - gives organizations a competitive edge they didn't have before.

It deals with the five parameters of volume, variety, velocity, veracity and value extracted and not just volume as one might mistakenly tend to believe.

How does this impact insurance and more so actuarial areas?

Below is an excerpt from the article by Margaret Resce Milkint (in Stepping Stone, SOA May 14 Issue 54) which lays the story-

“The use of predictive analytics in the property/casualty (P/C) industry reaches as far back as the early 1990s, when companies began using analytics for rating and

underwriting.

Today, analytics is a vital part of the ever-growing P/C industry, permeating into marketing, underwriting and claims functions. This embracing of analytics and big data has led to greatly improved efficiency and consistency, particularly in its revolutionary application to marketing and claims.”

Life and Health companies are now increasing using the predictive modelling techniques now to analyse the risk matrices in a much better way. US insurers have been using the predictive modelling techniques for quite some time but the same is not the case here in India.

It must be seen now that the world (and insurance) is going digital. Increased segmentation of business due to increased availability of data on real time basis. Customised solutions can now be possible as big data analytics can provide insights which hitherto the insurance companies did not have. Acquisition expenses related to medical underwriting from remote locations will reduce as these will be managed digitally (part of analytics) and premiums rates calculated on a real time basis. Discussions on these lines are already taking place within the industry (refer discussion in 19 GCA).

Since actuaries with their will be in the fore front of any customised business solutions (these solutions will require a better understanding of risks and correlations and actuaries by training are the most suitable resources to tackle those), so big data analytics will directly impact the work done by actuaries. Various experts agree on the sole point that 'actuaries are the data scientist of the insurers’.

Latest trends internationally

The work has begun in many countries. A few are Australia | Canada | France | France | Singapore | Thailand | UK | USA, etc.

In UK **IFoA and Royal Statistical Society** have teamed to form MAID (Methods, Analysis and Insight from Data. This is a recent development.

Similarly, the **Australian Actuaries Institute** is endeavouring to increase the penetration of actuarial talent in the data area by making Actuaries aware, engaging in Short, Medium and long term qualifications and CPD requirements and better understanding of the needs of the employer. It has established a data analytics working group in 2015.

In **South Africa** as part of the Wider Fields / Business Intelligence Forum of the Actuarial Society of South Africa one of the objectives is to investigate the need for analytics in the actuarial syllabus.

Canadian Institute of Actuaries has identified predictive analytics as a key element of the associateship curriculum. A predictive modelling Committee has been formed to promote research and education in this area.

In **US, The CAS Institute** is a new subsidiary under the Casualty Actuaries Society with below objectives / initiatives - Provides credentialing and professional education to quantitative specialists in selected areas Predictive Analytics / Data Science credential launching in 2016-2017 For actuaries and non-actuaries Offerings in other analytics and quantitative specialties.

In **France Waypoint** on past and future actions of Big Data Committee under Institute Des Actuaries. The Big Data Committee was established in 2014.

In **Singapore, the Singapore Actuarial Society** launched Big Data Working Party initiative in 2015 to explore the future of big data, analytics and unstructured data in Asia and what actuaries need to do to have the right skillsets that will be in demand for such work. The working party is made up of actuaries and data scientists based across Asia from diverse range of industries.

SWOT analysis

The following are the key strengths of Actuaries but still gaps are there which need to be filled in in relation to data science;

Core strengths	Gaps
Core training - Recognised and professional actuarial bodies (FoA, IAI, SOA, FSA, CERA etc.) Impart systematic training with rigorous professional standards which are monitored. Actuarial training equips actuaries with the necessary starting points to deal with data analysis in a better manner than data scientists but tools may not be the same.	For data scientists in most cases it is not imparted by an accredited professional body with a clear roles and responsibilities as for Actuaries. In most cases there is no signing off or regulatory responsibilities imparted or expected of them. They are consultants in a limited space where consultancy is within to other professions.
Are actuaries equipped with dealing with unstructured and unrelated data on large scale?	Actuaries have limited skills to deal with unstructured data. The truth is that the training does not even give a glimpse to you as to how do deal with it. In Indian context the exposure is also few and far between in the domestic business areas due to regulatory restrictions on product designs and lack of credible data.
Tools used - Actuaries are proficient with usage of Actuarial software Prophet, Moses, MG Alfa etc. and also uses SAS, Excel VBA and SQL.	A data scientist is probably more programming savvy than an average actuary and generally have solid command of C++, R, Python and NoSQL databases (Hadoop, etc.) apart from SQL. While actuaries may fall short of in terms of programming ability within the data analytics zone now, it is likely that in near future actuaries will be able to develop the skill sets.
Communicating within the business - Actuaries need to communicate routinely within the business as they by virtue of domain expertise will be the people to provide technical solutions to risk and other complex problems.	Actuaries are yet to use big data as the need to do so as the focus on health insurance and protection businesses where the actuaries can use the big data is still not evident in the Indian market. Online sales and segmentation of business is still at an early stage.
Actuaries are found primarily in the insurance and pensions industry, where they focus on pricing, reporting and modelling the possibility of loss, estimating the cost of that loss, cost of guarantees and proposing prices to charge that will allow the insurer to cover that loss and still make a profit. In Pensions industry it is primarily the valuation of long term liabilities and find management which are of importance.	A data scientist, conversely, can be found in virtually any industry and would be tasked with a much wider array of problems to solve. Consequently they are much widely exposed to various types of intricate data issues will lack the connective domain knowledge as how these get used to solve the business needs. Actuaries can be the bridge there.

How to close these gaps and exploit opportunities?

- ◆ Work with data scientists to improve the gaps in the data analytics .Better still from a cost optimisation point (as both data scientists and actuary are expensive and scarce resource) actuaries can get trained in the relevant areas of the data areas. As already discussed above actuarial curriculum needs to be changed.
- ◆ Actuaries need to branch out to other wider fields even within the same business e.g sales, operations and marketing and business intelligence so as to get a wider exposure on the data skills and understanding of how these processes interact. With the core domain knowledge actuaries can then provide solutions to the business processes. Business intelligence unit is one area which uses data analytics in a much wider scale. Even use of artificial intelligence is not unknown even within Indian market
- ◆ This will enhance actuarial presence in areas other than insurance and pensions and create more job opportunities.
- ◆ Actuaries need to use these skills to provide innovative solutions to businesses. Typical mind set of an actuary is a historical looking back type one where we tend to look at past data and experiences too much to arrive at some conclusions. Data analytics training can get the focus back on the real time present data and there is always a possibility of getting better results. The confirmation bias suffered due the over indulgence of past tried and tested methods hinders us at times to look at out of box solutions.
- ◆ Customers' expectations in the dynamic digital landscape is changing rapidly. People want insurance policies delivered online without hassles as for any e-retailing business with the customisation that he/she wants. In some cases people are willing to pay. All these will need out of box thinking from actuaries and data will be a key to sort these issues. Products hitherto unknown and not considered viable will become viable as customers awareness increases. Actuaries should be in a position to deal with the data challenges to meet those needs.
- ◆ Create a working party within the Institute which can then engage with Indian Statistical Institute or some reputed statistical or body engaged in data science in collaboration to develop a course which can be included as an option.
- ◆ The working party will come up with a roadmap for implementation of the ideas and have discussions to provide direction for assimilation of data science in the actuarial fold.
- ◆ Seminars and online discussions can be arranged to create awareness for the linkage between data science and actuarial science. The primary objective is to find the courses relevant for integration with the actuarial needs.
- ◆ A diploma can be awarded for members completing a data science course, relevant minimum 4/5 CT series subjects, CA series and 1 ST subject. Such people can be conferred diploma. Their professional responsibilities can be defined. This will create a captive pool. People can then have the option to pursue and complete Fellowship /CERA etc.
- ◆ To impress upon all existing Fellows to at least pass a data science course as recommended by the Institute. Some mandatory data science training may require before conferring Fellowship as otherwise this will not be taken seriously.
- ◆ Encourage insurers to invest in the data science along with actuarial talent trained in it so that they help out in finding good out of the box business solutions.
- ◆ Encourage members to see data science along with actuarial expertise as a means to work in a much wider areas than the conventional Life, GI and Health areas.
- ◆ Engage with international actuarial bodies regularly to update our knowledge as data science is an ever changing dynamic field
- ◆ Conduct capacity building seminars on a regular basis.

A suggestive way forward - Indian context

While pondering over the gap analysis following suggestions are in hand which can be debated and course of action taken. We need to be a bit more proactive as it seems internationally other actuarial professional bodies are almost 2/3 years ahead of us. With the growing integration of actuarial services (e.g. IFRS 17) we need to be in step with international practices as quickly as possible. Given the context where the Indian actuarial profession is not growing the way it should in terms of creation of jobs for young professionals, this is one area

which can infuse fresh enthusiasm within the fold. This is extremely important as any profession needs to grow. Below are the suggestions

Written by

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“Mr. Rajiv Mukherjee is an Associate member of Institute of Actuaries of India. He is currently working as Vice- President of ICICI Prudential Life Insurance Company Ltd.”



6th Capacity Building Seminar in Health Care Insurance (6th CBHCI)

Advisory Group: Advisory Group on Health Care Insurance
Date: 2nd August, 2018 **Venue:** The Pllazio Hotel, Gurugram

Background

The focus of this Capacity Building Seminar is on covering various topical aspects of Health Insurance Industry in India. As in the past, Advisory Group on Health Insurance is determined to promote actuarial talent to meet the growing demand in this field and current seminar is a step in that direction. The participants can benefit with the vast experience of the presenters who would cover global trends and how those can be put to use in Indian context.

Seminar Topics:-

1. Critical Illness Product Pricing - Global Trend and Techniques to derive incidence rates when data is sparse
2. Health Inflation Index - Practical and Technical aspects
3. Health Saving Account - Global Practices and Learning for India
4. Panel discussion of Standalone Health Insurance Appointed Actuaries on latest issues faced by Health Insurance Industry
5. Technical Note on Product Pricing - Best Practices.
6. Global Experience of implementing RBC
7. Review of Health Insurance Portfolio

Presenters: Experienced professionals with number of years of experience in health insurance industry would be participating in this capacity building seminar and sharing their experiences and insights with the audience.

Who Should Attend?

- ∞ The seminar is open to all who wish to enhance their skills in Health Insurance domain.
- ∞ Non-members are welcome to attend.

General Points:-

∞ Registration Fees (Excluding 18% GST):

Students & Associate Members:	₹ 2,500/-
Affiliate & Fellow Members:	₹ 5,000/-
Non-Members:	₹ 6,000/-

∞ CPD Credit for IAI members: 6 hrs. Technical (As per APS 9 - Rev. Ver 2)

∞ Registration last Date: 27th July, 2018; Admission on first come first serve basis

∞ Dress Code: Business Casual

∞ Point of contact: Ambreen@actuariesindia.org

∞ For Registration, kindly visit: <http://www.actuariesindia.org/index.aspx> - Seminars - Upcoming Seminars - Seminar Registration

Introduction

A key focus of the insurance regulatory authorities across the globe has been the protection of policyholder interest, resulting in greater emphasis on product governance and product life-cycle management. The insurance directive (Insurance Distribution Directive¹) launched under the EU insurance law has issued guidelines for the insurers to embed product oversight and governance into their risk management frameworks.

Product governance covers arrangements to ensure that products offered to customers are relevant to their needs, characteristics and objectives. A robust product governance process can help reduce mis-selling and complaints, and increase policyholder confidence in the market. It also ensures internal and regulatory compliance for the products offered by the insurer.

Core components

A robust product governance policy encompassing a detailed review of all the stages of the product life cycle will allow the insurer to have a more focused approach to creating a valued product, thereby ensuring high customer satisfaction.

The key components of a robust product governance process are:

- ♦ **Product governance policy:** A well-implemented product governance framework involving the key stakeholders to review the product's life-cycle management will help ensure compliance, high standards of conduct and fair customer outcomes.
- ♦ **Product development:** Processes and procedures in place to identify the target market and its needs to develop a product that meets those needs, along with a product approval process taking into account the considerations and conflicts of all the stakeholders involved, with key focus on policyholder interest.
- ♦ **Pricing and value:** Processes and procedures in place to ensure the adequacy and competitiveness of premiums and that the proposition is of value to the customer.
- ♦ **Distribution and sales:** Distribution arrangements to provide appropriate distribution channels, adequate sales training, relevant sales and marketing material and regular sales monitoring to ensure that a product is sold to the identified target market only.

♦ **Legal, compliance and risk management:** Processes that should be in place include legal sign-off of products and involvement of compliance departments to ensure product development processes have been followed.

♦ **Ongoing assessment of the product:** Regular product review will help the insurer identify events that have a material impact on the features and risk coverage of the product. Any changes that reduce cover could be detrimental to consumers and need to be understood by the insurer, the consumer and the regulator. One such example can be seen in the recent change in Insurance Regulatory and Development Authority (IRDA) regulations to cover genetic disorders as a part of the health insurance policy. Previously, they had been a part of the policy exclusions.

Conclusion

Insurers with well-established product governance frameworks embedded within their operational and risk management structures will not only safeguard the policyholder interest, ensure internal and external compliance and help identify key risks and appropriate mitigation procedures, but will also help achieve expected business volumes and profitability. Milliman has subject matter experts who have helped insurers across the globe to develop product governance strategies in accordance with their internal policies and regulations, giving due consideration to the consumer interest.

"Directive (EU) 2016/97 of the European Parliament and of the Council with regard to product oversight and governance requirements for insurance undertakings and insurance distributors."

Written by



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"Ms. Neha is an associate actuary at Milliman."

Ms. Joanne Buckle



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"Ms. Joanne is a consulting actuary and heads the health actuarial team at Milliman."



1st Capacity Building Seminar on Enterprise Risk Management (1st CB ERM)

Advisory Group: Advisory Group on Risk Management
Date: 10th August, 2018 **Venue:** Hotel Sea Princess, Mumbai

Background

Enterprise Risk Management (ERM) is becoming an integral part in helping organization take risk-based decisions where risks are identified/envisaged and mitigation/monitoring/control actions are planned in advance. This helps in taking informed decision and reduces the strain on the capital.

As a second line of defense, Risk Management is an enabler to the business. Risk function role is different from Audit function. With increasing cost of compliance, financial frauds, data privacy concerns and cyber risks, the roles of ERM has been expanding within the organization.

As the world and the Indian market is embracing the Risk Management to enhance the risk-based capital, IAI is preparing to answer some of these question related to the ERM and organizing 1st Capacity Building Seminar.

Seminar Topics:-

- ☞ ERM a value creator for the business
- ☞ Practical applicability and challenges faced
- ☞ Implementing ERM
- ☞ Case studies

Presenters: Chief Risk officers, Actuaries, Consultants, industry experts in Life, General, Health Insurance sectors; Reinsurer, Intermediary etc.

Who Should Attend?

- ☞ Delegates working in risk management domain in their organisation
- ☞ Delegates interested in understanding the roles and responsibilities of ERM function and how it works
- ☞ Actuaries at mid and senior level working closely with ERM or interested in working in ERM
- ☞ Non-members are welcome to attend.

General Points:-

☞ Registration Fees (Excluding 18% GST):

Students & Associate Members: ₹ 2,500/-
Affiliate & Fellow Members: ₹ 5,000/-
Non-Members: ₹ 6,000/-

☞ CPD Credit for IAI members: 6 hrs. Technical (As per APS 9 - Rev. Ver 2)

☞ Registration last Date: 6th Aug, 2018; Admission on first come first serve basis

☞ Dress Code: Business Casual

☞ Point of contact: Ambreen@actuariesindia.org

☞ For Registration, kindly visit: <http://www.actuariesindia.org/index.aspx> - Seminars - Upcoming Seminars - Seminar Registration

While going through this article, keep the Excel File "CASHFLOW-ENDOWMENT" open. The **hyper link** to this file is given below. Click on this Link, keeping the "**Ctrl**" key pressed. The Excel File will get downloaded from the Web Site. But you **may not be able** to navigate within the Excel Sheets. On top of the Excel Sheet displayed, you will **find a box with the Caption, "Open With" and a downward arrow. Click on the arrow and choose the Option "Google Sheets"**. The Excel File will open again and you would be able to navigate within the file.

The Excel file, "CASHFLOW-ENDOWMENT", is in MS Office format. Till now, this format was being accepted in the Google Blog. It appears that now the format has to be either Adobe or Google Sheet. So, the file "CASHFLOW-ENDOWMENT" has to be first converted to Google Sheet format.

<https://drive.google.com/file/d/1RnpAMlcoyoNoVKXAzIGiXRfVXvTYDqir/view?usp=sharing>

Example 3: Analysis of the Surplus at the end of Second Year

44) It is assumed that the actual experience during the second year will be the same as the valuation basis used for valuing the liability at the end of first year. For estimating the liability as at the end of second year too, the same valuation basis has been used. The surplus at the end of second year is ₹12.16 (Cell O17). Let us determine the values of the components of this surplus.

45) Surplus or deficit emerges because of difference between the actual and expected values. When the actual experience during a year is the same as the valuation basis used at the end of previous year for estimating the liability, the actual and expected values will be the same.

i) Premium Income

46) The number of survivors at the end of first year, after providing for mortality during year 1, is 0.998613. So, The expected premium income during Year 2
 $= 0.998613 * 51.45 = ₹ 51.38$

Since the actual experience during second year is given to be the same as the valuation basis used at the end of first year, the actual premium income will also be = ₹ 51.38
 So, Contribution of **Premium Income to Surplus**
 $= (\text{Actual} - \text{Expected}) = 0$

47) Since it has been assumed that no lapses or surrenders will occur, the only way by which a policy can become an exit is by death claim. In the case of death

claim, any outstanding premium due during the policy year will be recovered from the claim amount. So, the full annual premium will be received in respect of all policies in force for full sum assured as at the beginning of second year.

ii) Commission Outgo

48) As per valuation basis premium based expense is uniformly 5% of premium for all years from 2nd year onwards. So,
 The expected commission outgo = 5% of expected premium income
 $= 5\% * 51.38 = ₹ 2.57$

Since actual experience during second year is given to be the same as the valuation basis used at the end of first year, the actual commission outgo will also be = ₹ 2.57.
 So, contribution of **Commission Outgo to Surplus = 0**

iii) Outgo in respect of Administrative expenses

49) As per valuation basis, the administrative expenses are ₹ 6 per policy and the rate of inflation is zero. The number of policies at the end of year 1 is, 0.998613. So, expected outgo in respect of administrative expenses during Year2
 $= 0.998613 * 6 = ₹ 5.99$

Since the actual experience during second year is given to be the same as the valuation basis used at the end of first year, the actual administrative expenses will also be = ₹ 5.99

So, contribution of **Expense Outgo to Surplus = 0**

iv) Outgo in respect of death claims

50) At the beginning of Year2, the age is 36 and mortality rate at age 36 is q_{36} and is equal to 0.001482 (Cell Y52) as per actual experience and, 0.001482 (Cell Z52) as per valuation basis,
 As per valuation basis, the expected amount of death claim at age 36 is =
 $q_{36} * \text{number of lives} * (\text{Sum assured} + \text{Vested bonus} + \text{Interim bonus})$
 $0.001482 * [0.998613 * (1000 + 20 + 20)] = ₹ 1.54$

Since the actual experience during second year is given to be the same as the valuation basis used at the end of first year, the actual claim outgo will also be = ₹ 1.54
 So, contribution of **Claim Outgo to Surplus = 0**

v) Investment Income

51) As per the valuation basis, the amount of interest expected to be earned in the second policy year is equal to,

$[(\text{valuation rate of interest} \times \text{liability as at the end of first year}) + \text{interest at the valuation rate of interest on the cash flow during the year}]$

In the valuation formula for determining the liability at the end of each year, it has been implicitly assumed that the full annual premium will be collected at the beginning of each policy year, the expenses for the year will also be incurred at that time and the claim outgo will occur at the end of the year. So, claim outgo is not expected to affect the investment income for the year. Similarly, since it has been assumed that the outgo in respect of tax and shareholders' share of surplus will also occur at the end of the year, they too will not affect the investment income for the year.

Liability at the end of Year1 = 6.84
 Expected premium income during Year 2 = 51.38
 Expected amount of marketing expenses = 0
 Expected commission outgo = 2.57
 Expected outgo in respect of administrative expenses = 5.99
 Expected investment income = $[6\% \text{ of } 6.84] + [6\% \text{ of } (51.38 - 0 - 2.57 - 5.99)] = 0.41 + (0.06 \times 42.82) = 0.41 + 2.57 = 2.98$
 The actual investment income is however = 2.82 (Cell J17)
 So, contribution of **Interest Income to Surplus = (-0.16)**

52) What is the reason for the actual investment income to be lower than the expected investment income? While calculating the actual investment income, the Cumulative Unappropriated surplus as at the end of previous year (i.e. **-2.67**) has been taken into account. This **reduces** the investment income by, (0.06×2.67) , i.e. by 0.16

vi) Effect of Lapses

53) This will be Nil, since it has been assumed that there are no lapses.

vii) The Value of bonus to be declared at the end of the year

54) As seen earlier (under Question 2), the rated up (for tax and shareholders' share of surplus) value of new bonus to be declared at the end of second year, multiplied by the number of survivors at the end of the year, will emerge as surplus. Its value is,
 $[7.24 / [(1 - 0.141625) \times (1 - 0.05)]] \times 0.997133 = 8.85$

By adding up all the components we get,

$$0 + 0 + 0 + 0 + (-0.16) + 0 + 8.85 = 8.69$$

But, the surplus that has emerged is 12.16; i.e. higher by 3.47. How to explain this difference? The same is explained under the next item.

viii) Impact of elimination of negative value at the end of First Year

55) Liability at the end of second year, before allocation of bonus, is 38.77 (Cell N17). Liability at the end of first year, before allocation of bonus, if the negative liability

had not been eliminated, was **(-3.27)**.

Liability at the end of first year, after allocation of bonus = **(-3.27) + 6.84**

So, increase in liability during second year
 = Liability at the end of second year, before allocation of bonus - Liability at the end of first year, after allocation of bonus

$$= 38.77 - [(-3.27) + 6.84] = 38.77 - 3.57 = 35.20$$

Because we took the negative liability as zero, the Increase in Liability during second year became $38.77 - [0 + 6.84] = 31.93$

Due to elimination of negative liability in the first year, the "Increase in liability during the second year" decreased from 35.20 to 31.93

Revenue Surplus = $(51.38 + 2.82) - (0 + 2.57 + 5.99 + 1.54)$
 = $54.20 - 10.10 = 44.10$

Valuation Surplus = Revenue Surplus - Increase in Liability

= $44.10 - 35.20 = 8.90$ if negative liability had not been eliminated in the first year and

= $44.10 - 31.93 = 12.17$ if negative liability had been eliminated in the first year

Due to elimination of negative liability in the first year, the valuation surplus during second year increased from 8.90 to 12.17 (an increase of 3.27). Almost the same as the decrease in Valuation surplus in the first year (see the Note under Question 5). One year interest, at the valuation rate of interest, on the decrease in surplus in first year will be,
6% of 3.27 = 0.20
3.27 + 0.20 = 3.47

The same as the figure we got in paragraph 54.

56) So, the elimination of negative liability will reduce the Valuation Surplus in the first year and increase the Surplus in the Second Year. The amount by which the Surplus is increased in second year will be equal to, (Amount by which the surplus was decreased in first year + One year's interest, at the valuation rate of interest, on this decrease)

57) One more aspect has to be taken note of. Effect of elimination of negative liability lasts only for one year and will not extend to third year.

Justification for Elimination of Negative Liability

58) It was seen that the additional expense incurred in the first year (and also in 2nd and 3rd years) is collected from the policyholder, in equal instalments, over the entire term of the policy. Because of the resultant increase in premium, the value of "future premiums receivable" gets increased and this results in negative liability. The basic assumption involved here is that, all premiums receivable in future will get collected. If a policy lapses resulting in non-receipt of premiums

receivable in future, a part of the additional expenses incurred in the first year remains unrecovered. The fact that, about 50% of the policies lapse before the date of maturity, will give an idea of the extent of non-recovery of the additional expenses incurred in the first year.

59) It is not fair to expect the insurance company to pay tax on the increased surplus based on the assumption that no policy will lapse. The company does not try to reduce the valuation surplus, and hence the tax, by eliminating Negative Values. The difference between the Tax due and Tax payable is paid, with interest, in the following year provided the policy does not lapse during the second year.

Suppose Tax is charged also on the amount of negative value eliminated. Then from the Surplus emerging at the end of second year, we have to deduct the negative value eliminated at the end first year, with interest.

This would answer the objection raised by the Revenue authorities; (see paragraph 42)

Example 4: Impact of Lapses

60) Let us introduce one change in Example-2. The actual experience will be the same as the assumptions in the premium basis, except that there will be some lapses at rates given below.

61) Lapse Rates:

First year – 0%; Second Year – 10%; Third Year – 5%

- ♦ It has been assumed that the mode of payment is yearly. So, there cannot be lapses in the first year.
- ♦ It has also been assumed that, a policy will not lapse after the third year. That is, a policy will not lapse after acquiring paid-up value (i.e. after payment of premium for three years).
- ♦ It has also to be noted that no lapses have been assumed in the premium basis.

62) To determine the effect of lapses, we have to first determine the different components of surplus that can get affected by lapses and also ensure that no double counting takes place.

Now Refer to the Screen "Case-C" of the Excel File, "CashFlow-Endowment".

First Policy Year

63) The valuation surplus at the end of first year is, Interim Fund - Liability before allocation of bonus = M16 - N16
 $= 5.11 - 0 = ₹ 5.11$. We have to analyse this surplus. The liability at the end of the year is actually (-3.28) and has been taken as zero in order to eliminate negative liability. So, the real surplus is,
 $5.11 - (-3.28) = 8.39$.

64) Though the actual experience is the same as the assumptions, **due to the effect of lapses**, the actual and

expected values of some of the components of surplus will differ. Let us now consider each component.

i) Premium Income:

The expected premium income during Year1 is ₹ 51.45. Since it has been assumed that there are no lapses in the first year, the actual premium income will be the same as the expected premium income.

So, contribution of Premium Income to Surplus will be zero.

ii) Marketing & Commission Outgo

The first valuation is being done only at the end of first policy year. So, valuation basis will only pertain to second and subsequent years. During the first year, the expected values are to be determined on premium basis. The expected marketing and commission outgo is,
 Expected Premium Income x (marketing and commission percentage)
 $= 51.45 \times (15\% + 40\%) = 28.30$

Since actual and expected premium incomes are same, the Actual outgo in respect of marketing and commission will be the same as Expected outgo.

So, the contribution of Marketing & Commission outgo to Surplus will also be zero.

iii) Administrative Expense outgo

Expected Outgo = Number of policies x Expense per policy
 $= 1 \times 17 = 17$

Actual Expenses = 17

So, contribution of Expense Outgo to Surplus = 0

iv) Outgo in respect of death claims

At the beginning of Year1, the age is 35.

As per valuation basis, the expected death claim at age 35 is =

Mortality Rate at age 35 x Number of lives x (Sum assured + Vested bonus + Interim bonus)

$q_{35} \times \text{number of lives} \times (\text{Sum assured} + \text{Vested bonus} + \text{Interim bonus})$

$0.001387 \times [1.00 \times (1000 + 0 + 20)] = ₹ 1.41$

(The value of q_{35} can be taken from the Cell Y51)

Since there are no lapses during the first year,

The Actual Claim outgo will also be ₹ 1.41

So, the contribution of Mortality Outgo to Surplus will also be zero.

vi) Investment Income

The valuation basis has been taken as the same as premium basis. The amount of interest expected to be earned in the first policy year will be,
 [(valuation rate of interest x liability as at the end of previous year) + interest, at the valuation rate of interest, on the expected cash flow during the year]

In the valuation formula for determining the liability at the end of each year, it has been implicitly assumed that

the full annual premium will be collected at the beginning of each policy year, the expenses for the year will also be incurred at that time and the claim outgo will occur at the end of the year. So, claim outgo is not expected to affect the investment income for the year. Similarly, since it has been assumed that the outgo in respect of tax and shareholders' share of surplus are also expected to occur at the end of the year, they will not also affect the investment income for the year.

Expected premium income during the year = 51.45

Expected marketing & commission outgo = $(15\% + 40\%) \times 51.45 = 28.30$

Expected outgo in respect of administrative expenses = 17.00

Liability at the end of previous year (that is, liability at the beginning of Year1) = 0

Expected investment income = $[6\% \text{ of } 0] + [6\% \text{ of } (51.45 - 28.30 - 17.00)] = 0 + (0.06 \times 6.15) = 0.37$

Actual investment income will also be = 0.37

So, contribution of Investment Income to Surplus will be Zero.

viii) The Value of bonus to be declared at the end of the year

As seen earlier, the rated up (for tax and shareholders' share of surplus) value of new bonus to be declared at the end of first year, multiplied by the number of survivors at the end of the year, will emerge as surplus, provided there had been no lapses. The number of survivors would have been 0.998613 if there had been no lapses. So, the rated up value of new bonus is, $[6.84 / \{(1 - 0.141625) \times (1 - 0.05)\}] \times 0.998613 = 8.38$

Adding up all the components, the Expected Surplus will be,

$0 + 0 + 0 + 0 + 0 + 8.38 = 8.38$

But, the Available Surplus is only 5.11

The liability per policy at the end of first year is (-3.28).

The actual number of policies in force at the end of first year is only 0.998613. So, the liability in respect of these 0.998613 policies is,

$= (0.998613 \times (-3.28)) = -3.275 = -3.28$

If the negative liability had not been eliminated, Cell N16 would have been -3.28 and the Actual Surplus (Cell O16) would have been,

Interim Fund - Liability before allocation of bonus
 $= 5.11 - (-3.28) = ₹ 8.39$

So, Available Surplus = 8.39 and is almost the same as the Expected surplus

Second Policy Year

65) The valuation surplus at the end of second year is, Interim Fund - Liability before allocation of bonus
 $= 45.91 - 34.89 = ₹ 11.02$. We have to analyse this surplus. The rate of lapse during the second year is given as 10%. Though the actual experience is the same as the assumptions, **due to the effect of lapses**, the actual and expected values of some of the components of surplus

will differ. What would be the impact of lapses on valuation surplus?

Effect of Lapses:

66) Due to the effect of lapses, there is

- ♦ reduction in premium income (negative contributions to valuation surplus)
- ♦ reduction in investment income (negative contributions to valuation surplus)
- ♦ reduction in outgo in respect of marketing & commission expenses (positive contribution to valuation surplus)
- ♦ no reduction in outgo in respect of administrative expenses (so, no contribution to valuation surplus)
- ♦ reduction in amount of death claims (positive contribution to valuation surplus)

So, while determining the contribution of lapses to valuation surplus, the above five contributions should not be considered again.

What else can be the impact of lapses on the valuation surplus?

67) The valuation surplus was defined (in Paragraph 1) as the difference between **Revenue Surplus (net of Provisions made) and (Increase in Valuation Liability)**

The five components mentioned above affect the Revenue Surplus and hence the Valuation Surplus. The lapses will affect the Valuation Liability and hence the Valuation Surplus. Lapses affect the valuation liability since, when a policy lapses without acquiring paid-up value, the liability under the policy becomes zero. Even when a policy lapses after acquiring paid-up value, the liability under it may be lower than it would have been had it been in force. (The reverse too can happen)

i) Premium Income:

The expected premium income during Year2 =

Number of lives $\times$ Premium = $0.998613 \times 51.45 = ₹ 51.38$

It is given that mode is yearly and 10% of the policies will be lapsing during second year. It means that premium will be received only under 90% of the policies during the second year. So, the actual premium income will be = 90% of 51.38 = 46.24 and is less than the expected by $(51.38 - 46.24 = 5.14)$.

So, contribution of Premium Income to Surplus will be negative and equal to (- ₹ 5.14)

ii) Marketing & Commission Outgo

As per valuation basis, the expected premium based expenses during second year is 5%. So, expected expenses in respect of marketing and commission, during second year = 5% of 51.38 = ₹ 2.57

As per cash flow assumptions, premium based expenses during second year is 5%. So, actual expenses = 5% of 46.24 = ₹ 2.31

Actual outgo in respect of marketing and commission will therefore be less than the expected outgo by $(2.57 - 2.31 = 0.26)$

So, the contribution of Marketing & Commission outgo to Surplus will be positive and = ₹ 0.26

iii) Administrative Expense outgo

Expense per policy is ₹ 6, both as per valuation basis and actual experience. Inflation in expenses has also been taken as zero under both.

Expected Outgo in respect of administrative expenses =
Number of policies x Expense per policy
 $= 0.998613 \times 6 = 5.99$

Though 10% of the policies lapse during the second year (without paying any premium in second year) some expenses will be incurred under these policies too for sending reminders and lapse notice. It has therefore been assumed that the actual expense per policy will be ₹ 6, whether or not the policy lapses.

So, Actual Outgo in respect of administrative expenses =
Number of policies x Expense per policy
 $= 0.998613 \times 6 = 5.99$. This is the same as the Expected expenses.

So, contribution of Expense Outgo to Surplus = 0

iv) Outgo in respect of death claims

At the beginning of Year2, the age is 36.

As per valuation basis, the expected death claim at age 36 is =

Mortality Rate at age 36 x Number of lives x (Sum assured + Vested bonus + Interim bonus)

$q_{36} \times \text{number of lives} \times (\text{Sum assured} + \text{Vested bonus} + \text{Interim bonus})$

$0.001482 \times [0.998613 \times (1000 + 20 + 20)] = ₹ 1.54$

(The value of q_{36} can be taken from the Cell Y52)

Since 10% of the policies lapse during second year,

The Actual Claim outgo will be

$= 0.001482 \times [(90\% \text{ of } 0.998613) \times (1000 + 20 + 20)] = ₹ 1.39$

(As per present practice, even if a policy has lapsed, the claim will be admitted if it occurs during the days of grace; i.e. within one month of the due date of first unpaid premium. This concession has been ignored here}. So, actual outgo in respect of death claim will be less than the expected outgo by $(1.54 - 1.39 = ₹ 0.15)$.

So, the contribution of Mortality Outgo to Surplus will be positive and = ₹ 0.15.

v) Investment Income

As per the valuation basis, the amount of interest expected to be earned in the second policy year is equal to,

[(valuation rate of interest x liability as at the end of first year) + interest, at the valuation rate of interest, on expected cash flow during the year]

In the valuation formula for determining the liability at the end of each year, it has been implicitly assumed that the full annual premium will be collected at the beginning of each policy year, the expenses for the year

will also be incurred at that time and the claim outgo will occur at the end of the year. So, claim outgo is not expected to affect the investment income for the year. Similarly, since it has been assumed that the outgo in respect of tax and shareholders' share of surplus are also expected to occur at the end of the year, they will not also affect the investment income for the year.

Expected premium income during the year = 51.38

Expected marketing & commission outgo = (5% of 51.38)
 $= 2.57$

Expected outgo in respect of administrative expenses = 5.99

Liability at end of first year (i.e. liability at the beginning of Year2) = 6.84

Expected investment income = [6% of 6.84] + [6% of $(51.38 - 2.57 - 5.99)$] = $6\% \times (6.84 + 42.82) = 2.98$

As per actual experience, the amount of interest earned in the second policy year is equal to,

[Actual Yield on investment x (liability as at the beginning of second year + Cumulative Unappropriated Surplus as at the end of first year) + (Actual Yield on investment x Cash flow during the year)]

$= 6\% \text{ of } (6.84 - 2.67) + 6\% \text{ of } (46.24 - 2.31 - 5.99)$

$= 6\% \text{ of } 42.11 = ₹ 2.53$

The Actual investment income is less than the Expected investment income by $2.98 - 2.53 = ₹ 0.45$

So, contribution of Investment Income to Surplus will be negative and equal to (- ₹ 0.45)

vi) Value of bonus to be declared at the end of second year

The rated up (for tax and shareholders' share of surplus) value of new bonus to be declared at the end of second year, multiplied by the number of survivors at the end of the year, will emerge as surplus. The number of survivors would have been 0.997133 if there had been no lapses. So, the rated up value of new bonus is, $[7.24 / [(1 - 0.141625) \times (1 - 0.05)]] \times 0.997133 = 8.85$

vii) Impact of Lapses

The liability per policy at the end of second year is 38.88 (Cell AA17). The liability at the end of second year is given by,

(Number of policies as at the end of second year x Liability per policy)

$= (0.897420 \times 38.88) = ₹ 34.89$

If 10% of the policies had not lapsed during the second year, the number of survivors as at the end of second year would have been,

Number of survivors as at the beginning of second year x $(1 - \text{mortality rate during second year})$

$= 0.998613 \times (1 - 0.001482) = 0.997133$

The liability at the second year would then have been $(0.997133 \times 38.88) = ₹ 38.87$

The reduction in liability due to lapses = $38.87 - 34.89 = ₹3.98$

Reduction in liability will lead to increase in surplus.

So, contribution of lapses to Surplus will be positive and = 3.98

Adding up all the components, the Expected Surplus will be,

$$-5.24 + 0.26 + 0 + 0.15 - 0.45 + 8.85 + 3.98 = 7.55$$

But, the Actual Surplus is 11.02 (Cell O17)

The balance to be explained is $11.02 - 7.55 = 3.47$

The liability per policy at the end of first year is (-3.28).

The actual number of policies in force at the end of first year is only 0.998613. So, the liability in respect of these 0.998613 policies is,

$$= (0.998613 \times (-3.28)) = -3.275 = -3.28$$

By treating this as zero, the liability was increased by 3.28 and the Valuation Surplus at the end of first year was decreased by 3.28. This reduction, with interest at the valuation rate of interest, will emerge as additional valuation surplus in the second year. This additional surplus will be $[3.28 \times 1.06 = 3.477]$, which is almost the same as the shortfall observed above.

68) In all the four Examples, 1, 2, 3 and 4, considered so far, it was implicitly assumed that, in each year, the valuation basis will be the same as the premium basis. Such an assumption was made just to illustrate certain principles, viz.

- ♦ Impact of elimination of negative liabilities on analysis of surplus of that year.
- ♦ Impact of elimination of negative liabilities in one year on analysis of surplus of the following year
- ♦ Impact of lapses on the analysis of surplus

69) In all the above examples, both the expected and actual values were calculated and the difference between the two determined. The method presented above may be different from the one given in text books. In the text book method each component of surplus is assumed to occur at the middle of a year and its value at the end of the year will be obtained by multiplying it by $(1+i)^{0.5}$, where i is the valuation rate of interest. In the examples given in the preceding sections, the multiplication by the factor $(1+i)^{0.5}$ has not been done. Instead, the half year interest on each component of surplus has been taken indirectly under "Surplus in Investment Income".

70) This deviation has one advantage. One of the objectives of analysis of surplus is to study, over a period, the trend in the value of each component of surplus. Just because there is an increase each year in the contribution to surplus by a component, say administrative expenses, it cannot be said that the Company is able to effectively control its expenses. The increase in the contribution to surplus may be just due to increasing volumes. If the value of this component's contribution to surplus depends also on the valuation rate of interest i , it would only make the study of trend more difficult.

71) In a gross premium (i.e. Bonus Reserve) valuation, when there is significant increase in the yield on investments, the increase in the valuation rate of interest will also be quite significant. In the case of LIC of India, between 1983 and 1993, the yield on investments increased by almost Five Percentage points and the valuation rate of interest too rose in step. In a net premium valuation, there will not be any significant rise in the valuation rate of interest corresponding to an increase in the yield on investments. So, under Indian conditions, it is better not to make Expense, Mortality, etc. surpluses dependent in any way on the valuation rate of interest.

72) At the same time, one has to understand also the disadvantage of this method. The true value of interest surplus will get distorted in this method. The half year interest (positive/negative) on the surplus/deficit contributed by each component, viz. premium income, marketing & commission expense outgo, administrative expense outgo and the outgo in respect of claim, would have got added to (or subtracted from) the real contribution of the interest component to the surplus.

73) Whichever method is adopted, it is better to stick to the same method each year so that the conclusions arrived at by the study of trends are meaningful.

(To be continued)

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“Mr. R Ramakrishnan is a Fellow member of the Institute of Actuaries of India. He is retired in October 1993 as the Chief Actuary of LIC of India, in the cadre of Executive director.”

“Actuaries acquire vast knowledge through the rigorous examination system and build well blended skills for business, finance, investments & risk management. I firmly believe that aside from traditional roles in Insurance, Investments and pensions, an Actuary's role can be leveraged to take the lead in the emerging needs of the enterprise for risk management, ranging from designing the enterprise risk management framework to provide for interdependencies between key risks and assess Future Financial conditions of financial Institutions. Further, building on business skills along with existing core Actuarial skills can prove to be extremely valuable for leadership roles in other sectors of financial services.”

– Mr. G Murlidhar, CEO, Kotak Life Insurance

Understanding customer segmentation in digital marketing will enable organizations to reach targeted segments with the right marketing message.

Segmentation - the traditional way

The classic approach to segmentation is to segment based on demographic, psychographic, geographic or behavioral. Demographic segmentation segments markets based on age, gender, income. Geographic segmentation defines potential markets based on their location. Customers can be segmented based on region, nation, urban/ rural, population density.

Psychographic segmentation is segmentation by customer personality traits, values, attitudes, interests and lifestyles. Behavioral segmentation is all about segmenting the potential market based on behaviors of different customer types. For example, customers can be classified as cost conscious customers, solution oriented customers and sophisticated customers.

Review customer behaviors when they interact with the application - past clicks, views, frequency of usage, value of past purchases, time spent, bounce rate, click through rate and conversion rate. Segmentation based on lifestyles can be useful too - customers with similar set of hobbies and entertainment needs can be clubbed to explore the niches.

Objectives of Segmentation in Digital Marketing

- ❖ Use a personalized approach to address customer needs
- ❖ Understand who your valuable customers are
- ❖ Create targeted campaigns for customers who will value them
- ❖ Effective utilization and screening of data

How to Segment in the Digital Age

In the digital world, no two customers are similar. Digital marketing is as much about personalization as much as it is about measurement. Digital marketing tools, platforms and strategies are all about reaching out to customers through digital media like smart phones. Each customer touch point is based on a set of preferences.

Segmentation in digital marketing can be based on the stages in the buying process. For example - customer can be segmented based on their position in the purchasing cycle - for instance, active leads who are likely to become customers, prospects who are still not sure about their decision and all others who may not be interested in the value proposition. Needless to add, marketers have to focus on greater efforts on the first two segments.

Other ways of segmentation exist. But again this depends on the organisation.

Industry based segmentation will be successful if industry-specific content is created and addresses the needs of that particular industry. In some cases, segmentation is based on company size but here the focus has to be on the value proposition for the customer. Segmentation based on employee roles may sound far-fetched but in cases where the solution proposed is going to be used by employees at different levels, their buy-in becomes inevitable. For example, if you are proposing a software solution, this must be something that is scalable across the functions seamlessly. The value proposition for each function needs to be differentiated in an engaging fashion.

Understanding the channel through which customers can be accessed can be rewarding in the long run. Digital marketing benefits from an integrated approach - some degree of trial and error in understanding the right channel/media is not a bad idea after all. This exercise will ensure that digital marketing efforts are relevant to the targeted audience. Segmentation can also be done using digital channels as the bases but here the challenge is that customers may be spread across multiple digital channels.

Summary

The right approach to segmentation will lead to better targeting efforts. Campaigns can be related to individual customers based on their behaviors, likes and attributes. Retargeting is important in digital marketing because the insights from earlier campaigns can be used to enrich future campaigns. This will also pave the way for re-selecting customers for a new marketing activity. This involves not only breeding customer loyalty in the long run but also ensuring that customers repeat their purchases in the shorter term.

Market research experiments have revealed that the right segmentation and targeting leads to conversion rates that are ten times higher. It is essential to note that segmentation, targeting and retargeting are ongoing processes that add value to the marketing strategy. Every insight garnered from previous campaigns can be used to refine future campaigns. Digital marketing firms are also analyzing past purchase behavior to make sense of data. They are also viewing how the content gets consumed. It is always interesting to analyze which content is more popular so that similar content can be created.

As technology makes tracking behavior and segmentation easier, these concepts are worth exploring annually. Understanding the sales funnel is a sure shot way of addressing the needs of prospects and achieving success in digital marketing.

References

<https://www.targetmarketingmag.com/post/5-effective-audience-segments-for-digital-marketing/>
http://www.advantex.com/blog/how-digital-marketing-is-redefining-customer-segmentation?hs_amp=true
<https://www.digitaldoughnut.com/articles/2017/august/all-you-need-to-know-segmentation-and-targeting>

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Photo Features of Student's Orientation Program (Life Insurance) and Employment Mela on 19th - 23rd June 2018



Background

Risk-Based Capital (RBC) Framework aims to ensure that each insurer maintains a capital adequacy level that is commensurate with its risk profile at all times.

Monetary Authority of Singapore (MAS) is the Regulator of insurance sector in Singapore. Earlier insurance companies were facing greater challenges in their businesses, particularly in terms of volatility of assets and diversity of insurance risks, as well as keener competition from other financial institutions. While the existing statutory solvency framework, which relied on undisclosed margins and approximations, had served its purpose well, it was not sufficiently transparent or risk-focused to adequately reflect the true financial conditions of the insurance companies in the new environment.

To address these inadequacies, the Singapore Authority first adopted RBC Framework in year 2004 and adopted the risk-focused approach to assessing capital adequacy and to reflect the relevant risks that insurance companies face.

The first consultation paper on the roadmap of the RBC review was issued in June 2012. Consultation Papers are specific proposals for the proposed changes in methodologies and regulations. The second consultation paper on RBC review was issued in March 2014. It was set out for specific proposals, including the proposed calibrated risk factors and a matching adjustment feature for life business.

Now, MAS has issued its third consultation paper on Risk Based Capital Framework on 16th July 2016. This consultation paper sets out the revised proposals, considering the feedback received from the second consultation paper on MAS' review of the RBC framework in 2014, as well as the subsequent engagements MAS had with the industry. This briefing note summarizes some of the key updates proposed in the third consultation paper.

Developments to the RBC Framework

Assets are valued at market value, or Net Realizable value in the absence of market value. MAS has prescribed the method for valuation of the following asset classes: Equity Securities, Debt Securities, Land and Buildings, Loans, Cash and Deposits, Outstanding Premiums and agent's Balances, and Reinsurance recoverable. No major changes have been proposed to

the asset valuation methodology.

Policy liabilities shall be the sum of Best Estimated (BE) reserve and Provisions for Adverse Deviation (PAD). Where BE Reserves is the projection of future cash flow using assumptions based on insurer's own experience and then discounting it back, and the PAD reflects the uncertainty in BE assumptions. PAD is basically an explicit amount to make provisions for uncertainty in an asset or liability. The PAD to be determined using more conservative assumptions to buffer against fluctuations of the best estimate experience.

Currently, regulation requires reserve for each Universal Life policy to at least be equal to its Surrender Value. MAS has proposed to remove the surrender value floor in the third consultation paper.

For discounting of policy liabilities, MAS has proposed to use the 30-year SGS (Singapore Government Securities) yield for duration of 30 years, keeping the yield flat after that. Currently, the 20-year SGS (Singapore Government Securities) yield curve is being used for this purpose.

Introduction of Matching Adjustment (MA) and Illiquidity Premium (IP) is another proposed change to the discount rate used in valuation of policy liabilities. MA and IP are the parallel upward adjustments applied to the risk-free discount rate used in valuing eligible policy liabilities for life business. These adjustments would enable insurer to use a higher discount rate, wherever certain eligibility criteria are met.

Negative reserves: For life business, policy liability is derived policy-by-policy by discounting the best estimate cash flows of future benefit payments, expense payments and receipts, with allowance for provision for adverse deviation. It is possible for the discounted value to be negative when the expected present value of the future receipts (like premiums and charges) exceed the expected present value of the future outgo (such as benefit payments and expense payments), resulting in a negative reserve.

In the earlier consultations, MAS had proposed to recognize part of the negative reserves as a form of positive regulatory adjustment under financial resources. This has the effect of improving an insurer's capital adequacy and fund solvency positions. In the second consultation, MAS had proposed that the

amount of negative reserves to be recognized for solvency purposes would be determined by applying a further reduction of 50% to the total amount of negative reserves computed after applying all the applicable C1 insurance shocks under RBC. In the third consultation paper MAS proposes to remove the reductions. In other words, insurers will be able to recognize the full negative reserves as a form of positive regulatory adjustment after applying all the applicable C1 insurance shocks.

Minimum Fund and solvency Requirements: Minimum fund for licensed insurer is 10 million SGD, for Reinsurer is 25 million SGD, and for writing specific lines of business it is 5 million SGD. No changes have been proposed to the Minimum Fund Requirement in any consultation paper.

Under the current RBC framework, insurers must maintain a minimum of **100% CAR** (Capital Adequacy Ratio) at company level and fund level For Capital Adequacy Requirement. MAS has proposed following two intervention levels:

PCR (Prescribed Capital Requirement) level is set at **120% of CAR (capital adequacy Ratio)**. If the insurer's capital falls below its PCR, the insurer will need to submit to MAS a plan to restore it within a specified time limit. MAS will have the flexibility to allow an insurer more time to restore its position.

MCR (Minimum Capital Requirement) is set at **100% of CAR (capital adequacy Ratio)**. If the insurer's capital falls below its MCR level, then MAS will take its strongest supervisory actions, such as stopping new business, directing a transfer of portfolio to another insurer or withdrawing the license.

Capital Adequacy Ratio (CAR) is the ratio of Financial Resources (FR) to Total Risk Requirements (TRR)

$$\text{i.e. } \text{CAR} = \frac{\text{FR}}{\text{TRR}}$$

Financial Resources is the sum of Tier1 capital, Tier2 capital, and Allowance for Provisions for Non-Guaranteed Benefits (APNGB).

Tier1 Capital: These capital resources are of the highest quality. These capital instruments can absorb losses on an on-going basis. They have no maturity date, and if redeemable can only be redeemed at the option of the insurer. Examples of this capital is paid-up ordinary share capital, irredeemable and non-cumulative preference shares etc.

Tier2 Capital: These capitals are applicable only to locally incorporated insurers and consist of capital instruments that are of a lower quality than Tier 1

resources. Examples of these instruments include redeemable or cumulative preference shares and certain subordinated debt etc. Tier 2 resources should not be more than 50% of Tier 1 resources.

Allowance for Provision for Non-Guaranteed Benefits (APNGB): APNGB is applicable only to insurers that maintain a participating fund. As the APNGB is only available to absorb losses of the participated fund, the allowance is adjusted to ensure that the unadjusted capital ratio of the insurer is not greater than its adjusted ratio, where the adjusted capital ratio does not include the financial resources and TRR, relating to Participating Funds.

Total Risk Requirement is the sum of four components that are Insurance Risk (C1), Asset Portfolio Risk (C2), Concentration Risk (C3), and Operational Risk (C4).

Insurance Risk (C1): Insurance Risk is the risk undertaken by an insurer in carrying out the insurance business, and is sum of three components, namely Policy Liability, Insurance Catastrophe, and Surrender Value Conditions. Policy liability risk requirement is split into the various components (namely, mortality, morbidity, disability, dread disease, other insured events, expense, lapse, and conversion of options risk requirement). The risk charges for these components are calculated by applying shocks to policy liabilities. These shocks are prescribed by MAS. The shocks are used to assess the extent by which the cash flows are expected to change in response to insurance shocks, which is used as a proxy for predictability.

Surrender value condition risk is the risk associated with the aggregate surrender value of the policies in the fund being more than the policy liabilities and total risk requirements of the fund.

Catastrophe risk is new component proposed in third consultation Paper, and the risk requirement for this component will be 1 death per 1000.

MAS has prescribed correlation matrix to allow for diversification between risk modules of C1 components.

Asset Portfolio Risk (C2): Asset portfolio risk is risk inherent in the asset portfolio of insurer, and is the sum of the following six components:

Equity investment: is the risk of economic loss due to changes in the price of equity exposures.

Interest Rate Mismatch: is the risk arising from changes in market interest rates, which affect the prices of debt securities and policy liabilities where the valuation of policy liabilities requires discounting of

future policy liability cash flows using the market yield of the relevant yield curve.

Credit Spread: is the risk of change in value due to movements in the market price of credit risk.

Property Investment: is the risk of economic loss due to changes in the price of property exposures.

Foreign Currency Mismatch: is the risk of economic loss due to adverse movements in the value of foreign currencies against the Singapore dollar.

Counterparty Default: is the risk of economic loss due to unexpected default of the counterparties and debtors of insurers.

Most of the charges in this section are either unchanged or softened. MAS has introduced a correlation matrix between asset classes to consider the diversification benefits.

Diversification benefit is recognised between insurance risks and asset portfolio risk. The diversified C1 and C2 requirements is to be calculated as follows:

$$\sqrt{C_1^2 + C_2^2}$$

Concentration Risk Requirement (C3): This component covers the risk due to concentration of assets in certain asset classes, counterparties or group of counterparties. It is proposed to not include this charge to give the total risk requirement. Instead, the C3 risk

charge will be deducted from the available financial resources. Due to reorganization of the C3 risk charge the impact from it on the capital adequacy ratio will be softened.

Operational Risk (C4): Operational risk refers to the risk of loss arising from complex operations, inadequate internal controls, processes and information systems, organizational changes, fraud or human errors, (or unforeseen catastrophes including terrorist attacks). This component was introduced in second consultation paper, and is calculated by using a factor based formula. The third consultation paper proposes the formula to be revised, to make the operational risk charges less onerous.

Inference

The proposed changes may result in higher RBC capital adequacy ratio for companies in Singapore. The increased allowance for diversification may be one of the key drivers for this. In addition, the proposed changes to the financial resources for negative reserves and APNGB may further help to improve the RBC solvency metrics. The removal of the surrender value floor in policy liability valuation of the Universal Life policies, introduction of Matching Adjustment and Illiquidity Premium may also contribute to improving the Capital Adequacy Ratio.

The impact of these changes may vary from insurer by insurer depending on their business models. It may be noted that this framework is still under revision and the timeline for implementation has not yet been published.

References

RBC 2 Review - Third Consultation by Monetary Authority of Singapore (2016).

Review on Risk Based Capital Framework for Insurers in Singapore ("RBC 2 Review") - Second Consultation by Monetary Authority of Singapore (2014).

Review on Risk Based Capital Framework for Insurers in Singapore ("RBC 2 Review") - Monetary Authority of Singapore (2012). Insurance (Valuation and Capital) Regulations (2004).

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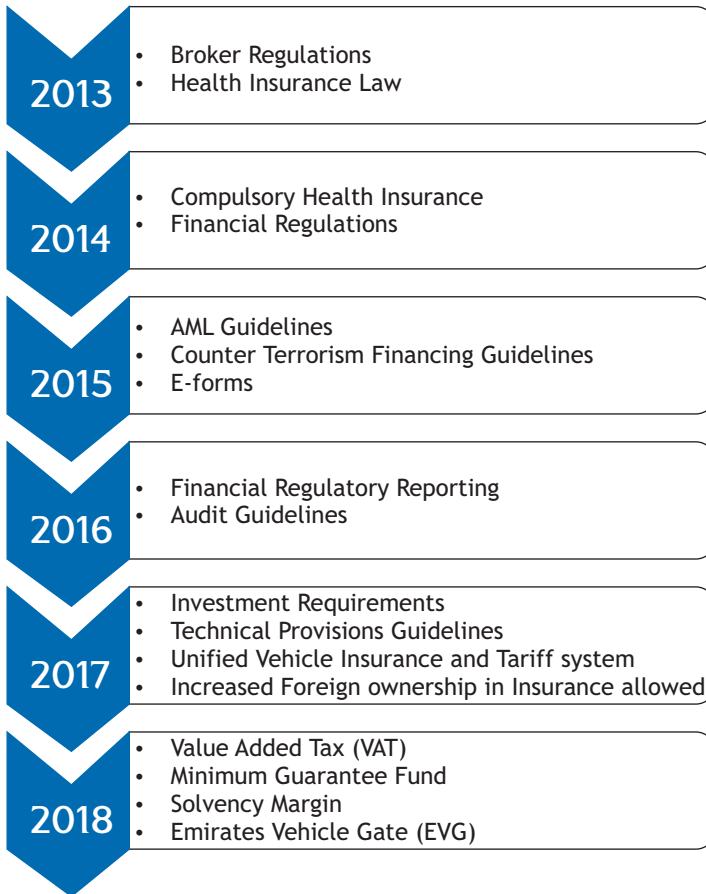
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UAE - Key Regulatory Developments



In this edition of country report for United Arab Emirates (UAE), I present the regulatory developments over the last 5 years in the UAE insurance market and the journey going forward.

Insurance market in the Middle East has been quite resilient despite the economic slowdown and lower oil prices. UAE is among the largest insurance market in the region.

Insurance Authority (IA) of UAE oversees the insurance sector in the country. There are 58 insurance companies and with the introduction of new regulations over the years, the journey looks towards implementation of a Solvency II framework avoiding some of the complexities whilst introducing many of its core principles.

The new regulations over the years have posed challenges for the insurers and small insurance companies could find it difficult to comply due to cost and resource constraints.

There have been few multi-nationals who have exited the

business in the country and few who have merged.

Synopsis of Regulatory Developments

2013 - Introduction of mandate health insurance coverage guidelines. These were to be implemented in phases with a target of 3 years to have every resident covered under a health insurance program.

Insurance authority also brought out brokerage regulations setting restrictions on collection of commissions and permitted activities.

2014 - Insurance Authority issued Financial regulations for all insurance companies. Regulations touched upon 7 sections to be implemented in phases which regulate the financial, technical, investment and accounting operations of traditional and takaful insurers operating in the UAE.

Phase 1 for health insurance coverage comprised of all institutions employing more than 1000 employees.

2015 - Anti Money Laundering (AML) and Counter Terror Financing guidelines were introduced in Insurance activities with requirements of record keeping, inspections and penalties introduced for non-compliance.

E-forms (electronic financial forms) introduced by IA to ensure optimum application of the instructions and boost supervision and oversight over the insurance sector according to the best practices applicable worldwide.

E-forms include analysis of financial data, investments, insurance premiums, commissions, expenses, technical provisions, reinsurance, receivables and transactions with related parties, as well as analyses related to the operations, which help in decision making at all levels.

Phase 2 for health insurance coverage comprised of all institutions with 100-999 employees.

2016 - Insurance authority made it compulsory for companies to appoint an Actuary registered with the insurance authority, external auditor, internal audit and compliance officer.

The increasing role of actuaries in the market shows the regulators' inclination towards technical aspects

of reserving, solvency and pricing capabilities.

Further guidelines on financial reporting were published.

2017 - Tightening of regulations on investments and technical provision calculations. Introduction of annual investment risk analysis report and technical provision report followed by quarterly sign-offs on provisions.

Foreign ownership in insurance companies was allowed to be increased from 25% to 49%.

Unified Motor policy wordings and tariff system introduced (minimum and maximum rates). Separate provisions issued for third party liability only and comprehensive policies.

Final phase 3 for health insurance coverage introduced for all companies with less than 100 employees and all other individuals. Entire population covered under health insurance.

2018 - Main highlight of 2018 was the introduction of Values Added Tax (VAT) of 5% in the country. VAT would be levied on most goods and services with few exceptions. All companies transitioned smoothly to the VAT regime effective Jan 1, 2018 with little or no disruption seen in the market.

Financial Condition report was introduced for all companies to be prepared by the actuary.

Guidelines on minimum capital requirements and assets to be invested in accordance with the 'prudent person' principle. It's expected that the assets covering the SCR, MCR & MGF shall be invested in a manner to ensure

security, quality, liquidity and profitability of the portfolio as a whole.

Expectations going Forward

The market has seen quite a few regulatory changes over the last few years with the latest being introduction of Values Added tax (VAT).

Motor tariff minimum premiums and mandatory health insurance drove the premiums in the market over the last 2 years. IA has allowed few discounts on the minimum tariff premium and thus the growth would not be the same as last year in motor business.

Further developments are expected from IA in 2018 on some of the exposure drafts becoming regulations this year.

UAE is undertaking a lot of initiatives to boost business in the country and some of them would certainly impact the insurance sector as well.

Few of the reforms in sight are 100% foreign ownership for firms, sweeping changes to employment and visa rules and announcing an economic stimulus package.

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