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Serving the Cause of Public Interest

19th Global Conference of Actuaries

30th & 31st January, 2018
at
The Hotel Renaissance,
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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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Message From The President



Dear Readers,

In my last two columns I have touched many items like support of our senior actuarial professionals to the younger generation, designing of various seminars, successful conduct of examinations despite of some hurdles, preparations for the 19th GCA, assistance for the examination etc. I am firm believer that if our senior professionals for the development of our profession contribute even a fraction of time, it can make big difference for our millennial members and students. I would like to reiterate that it's our duty and responsibility to make some contributions to our profession to which all of our fellow members including me owe.

The festival season has taken a temporarily pause now after big bang celebrations like Mahanavami and Lakshmi Pooja, rejuvenating all of us with fresh energy and vigour. In the middle of festival season, we had conducted two ambitious programs in October viz., Capacity

building seminar on Embedded Value and Young Actuaries Connect program both conducted at two locations - Mumbai and Gurugram. Both the Capacity building programs have seen overwhelming response in participation from both fellow members and students aside quite a few non-members also attended at our platform. The grand success of these programs once again proved that, we have the needs of up skilling our members and at the same time we have a pool of volunteers with expertise in such emerging topics of relevance to the market. The profession can only grow with the support of such volunteers. I personally express my whole-hearted gratitude to all those who have contributed for the success of both these programs at both locations. I was surprised to see that number of delegates at Gurgaon center in both the programs was as many as in Mumbai.

The registration for our Flagship event **"19th Global Conference of Actuaries"** scheduled on 30th & 31st

of January 2018 already opened and all its activities picking up momentum at a fast pace. The theme of this year's conference is **"Actuaries, through Crystal Ball"**. I suggest each one of our members to visit <http://www.19gca.org/home> to get all the information related to this event. In case you not yet registered, do so to avail early bird discount. I take this opportunity to thank all the volunteers who are giving there precise time supporting this cause of the profession.

For our students for the March 2018 diet, the registration for online coaching has already opened and the classes have also started recently. I encourage students to register early to facilitate early planned preparation. During the last diet over 500 students did register for online coaching and got benefit of the same. It has been proved to be a very effective supporting mechanism to students who require guidance in preparation of the exam. We have many plans in the pipe line for our students; please regularly check the IAI website.

In order to cope up with more and more requirements and support to our members, we have started expanding the IAI team; all such full-fledged teams would be in place by the end of the financial year.

There are many activities on professional front. On 9th and 10th November, we have India Fellowship seminar followed by the capacity building seminar one each in Health Insurance and General Insurance in December 17.

Message From The Chief Editor



While planning to write message, I was thinking what could be some of the major non-economic challenges that insurer in India and globally facing. Not able to bring Innovative solutions seems to be one of the emerging challenges that companies may be facing. We have come across various examples of innovative solutions in many other industries. If we look at the banking Industry, almost all of the banking services now can be taken online. Digital banking accounts like 811 by Kotak Bank, Pay TM, Airtel digital banking are classical example of innovations in the banking Industry. In transportation industry, Ola and Uber have really made the life of people extremely convenient. E-commerce activities have increased manifolds demonstrating the comfort of the customers in doing online transactions. Telecommunication Industry has utilized adhar card to issue the pre-activated Sim cards instantly.

So what is stopping insurance

Industry globally to come out with Innovative solutions? Well, insurance companies write risks on their books and therefore they tend to be risk averse by nature. If we look at the cost structure of the insurance companies, most of the cost of the insurance companies is people cost, Travel and paper contract Costs. There is a significant potential for insurers to automate many of the processes to not only cut down the cost but also better services to customers. Since the companies by nature are risk averse there is natural tendency for experienced senior management to resist innovative ideas. Is there need for a culture change? There is always struggle to define what innovation is; does it need to be disruptive or it can be incremental? Companies may not necessarily always have disruptive innovation; there is a pretty strong case for insurers to invest in innovation.

Insurance Industry globally is highly regulated for obvious reasons. There

is a greater need for the Insurance Industry councils to lobby with the government to ease some of regulations to enable and offer more freedom for insurers to offer innovative solutions to the customers.

It's a known fact that innovation spends in the annual budget always remains at low priority as there are so many other expenses provisioned for fire fighting which needs to be incurred to ensure budgeted topline are achieved. Having said that companies really need to have dedicated budgets for innovative strategies and invest in necessary training and up skilling of the staff and management to align the culture of the organization towards innovation.

Actuaries are the back bone of insurance Industry and therefore actuaries have a major role to play in this journey and turn insurance industry from traditional processes to innovation solutions.

Capacity Building Seminar on Embedded Values

Organized By: Advisory Group on Risk Management, IAI
Venue / Date: The PIlazio Hotel , Gurgaon - 11th October 2017
 Hotel Sea princess, Mumbai - 13th October 2017

The seminar on Embedded Values (EV) was held at two cities of Gurugram and Mumbai catering to insurance professionals at both locations. A good number of 200+ registered participants from 35+ employers comprising practicing actuaries, distributors, risk professionals, finance professionals and web aggregators participated in the seminar. The seminar was both informative and ignited diverse thoughts around the relative merits of different approaches used for embedded value computations.

Opening address by Mr. Sanjeeb Kumar, President, IAI



The day started with a welcome address by **Mr. Sanjeeb Kumar**, President of IAI. The seminar really was envisioned with efforts from IAI to build capacity within actuarial profession. Given the diverse participation at the seminar, he called upon speakers to customize their communication on a technical topic like embedded value so that all

participants can appreciate the ideas presented without much difficulty. At Gurugram, we had the august presence of **Mr. Liyaquat Khan**, past president of IAI, who was invited to share insights from his valuable experience with the audience.

Address by Mr. Liyaquat Khan (at Gurugram), past President, IAI

Mr. Liyaquat Khan shared his first tryst with embedded value which dates back to 1993, when he left LIC to join a private group/company in Middle East. He continued to share that even though the company was primarily writing general insurance business, they still had some group life business that needed to be valued as it was being transferred to a separate entity owned by the same shareholder. He emphasized on importance of professionalism when calculating & reporting embedded value figures for shareholders / owners of business.

Session : Brief Introduction: What is EV?

Speaker: Mr. Kunj Maheshwari, Director, Willis Towers Watson's



Session was conducted by **Mr. Kunj**

Maheshwari, who is a Director with Willis Towers Watson's Insurance Consulting and Technology business, based in India. He is a Fellow member of IAI and IFoA and has significant experience in determining embedded values using a range of techniques (including TEV, EEV, MCEV and IEV) for various purposes - including stakeholder reporting; determining management incentives; mergers and acquisitions and IPOs.

He began the session with an illustration of how the profit from manufacturing cars and selling them differs from selling life insurance policies. The true profits from selling the latter are now known till all policies have not gone off the insurance company's books. Embedded Value provides a measure to know how well have you done by selling the policies before the actual profits emerge over the policies' lifetime. He then talked about how the regulatory requirements of holding prudent reserves leads to profits that get realized over future time period and this release of prudence margins leads to EV.

He shared the interesting story of why companies started computing and reporting EV to their shareholder. We today know that EV is widely used as a measure to determine the value of its in-force book and use it to drive appraisal value for amalgamations and transfers. However, EV computation was undertaken initially for the exact opposite reason - to fend a takeover bid by an external party. The original

intent of EV computation was to inform the existing shareholders of the value of their holding by calculating the future profits that would accrue to them instead of using traditional accounting approach of difference between assets & liabilities.

He concluded the first session, by drawing attention of the audience to the fact that market value of an insurance company is not just its embedded value. The structural value, often referred to as franchise value, that consists of the future growth in new business (and associated profitability) from existing infrastructure, brand and scale is also considered while computing the appraisal or market value. He also highlighted the importance of sufficient disclosures and cautioned actuaries to follow best professional standards, a thought well seconded by Mr. Sanjeeb Kumar.

Session 2: Traditional Embedded Value (TEV)

Speaker: Mr. Kshitij Sharma
Executive Director, Ernst & Young LLP



Session was conducted by **Mr. Kshitij Sharma**, Executive Director at Ernst & Young LLP. He is a Fellow member of the IAI and IFoA, UK. Having worked for a number insurance markets globally, he has extensive experience of life insurance valuations in India being involved with the calculation and review of the economic value of many life insurance companies.

After discussing about the genesis of EV reporting by companies, this was the first session setting the tone of

technical sessions for rest of the day. He organized the presentation on Traditional Embedded Value (TEV) into three parts:

Components of Traditional EV

Traditional EV can be broken into its two constituent components namely Adjusted Net Worth (ANW) and Value of In-force business (VIF) i.e. $EV = ANW + VIF$.

ANW can be computed directly off the company's balance sheet as Assets less Liabilities and hence valuation of assets and liabilities are influenced by the accounting norms / principles used in producing financial statements. Care needs to be exercised to ensure that liabilities considered are consistent when used in ANW and VIF. Another alternate is to look at ANW as sum of Free Surplus (FS) and Required Capital (RC) i.e. $ANW = FS + RC$.

Future profits emerge from the release of prudent margins as the emerging experience (mortality, lapses, expenses and investment returns) turn out to be better than that assumed in the reserve computations by the company. The Present Value of Future Profits (PVFP) is calculated by discounting the future profits at Risk Discount Rate (RDR) assuming immediate distribution of full surplus arising.

Insurance Regulatory and Development Authority of India (IRDAI) mandates insurance companies to keep aside assets to the tune of Solvency Margin to protect the interest of policyholders from extreme scenarios in which even reserves may be insufficient. The Cost of (holding this) Capital (CoC) is deducted from PVFP to compute the Value of In-force (VIF) i.e. $VIF = PVFP - CoC$.

Computation of Time Value of Financial Options & Guarantees

The idea behind Time Value of Financial Options and Guarantees (TVFOG) was presented in a simple and effective manner. He emphasized that TVFOG may or may

not be allowed for explicitly in Traditional EV but is mandatorily required in European Embedded Value (EEV). If allowed for in TEV, it is typically computed using stochastic simulations as

TVFOG = Average EV over stochastic scenarios - EV over average scenario

The idea behind symmetric and asymmetric risk from insurance company's perspective was explained very well. TVFOG captures the impact on shareholder value due to asymmetric risks from financial options and guarantees.

Analysis of Movement in Embedded Value

Once embedded value is reported by an insurance company, the process is repeated in subsequent years with movements in EV analyzed using Analysis Of Movement (AOM) using a waterfall diagram. Component wise, waterfall diagram shows movement in EV from starting period EV to ending period EV with movement items as follows:

- **Opening Adjustments:** Impact of any model changes or regulatory provision changes is incorporated.
- **Unwind:** Impact of one year less discounting, earnings on ANW and profits emerging on in-force business are incorporated through this item.
- **New Business Contribution:** Impact on EV of new business written during the year i.e. increase in VIF (assuming profitable terms used for writing new business) coupled with reduction in ANW (new business strain).
- **Operating Variance:** Impact on EV due to actual operating experience being different from assumed experience (operating experience include likes of mortality, morbidity, persistency, expenses). These include non-economic items that are within company's control to a large extent. Impact of economic variance is separately captured as it is

influenced largely by the economic environment in which the insurance company operates.

- **Operating assumption changes:** Impact of changed operating assumptions, if any, at end of EV reporting period v/s beginning of reporting period are captured here.
- **Economic Variance:** Impact on EV due to economic experience being different from assumed experience (investment income).
- **Economic assumption changes:** Impact of changed economic assumptions, if any, at end of EV reporting period v/s beginning of reporting period are captured here.
- **Closing adjustments:** Impact on EV due to any shareholder transfer in or payout to shareholders (dividend distributions) is incorporated here.

He concluded the session with highlighting the subjectivity inherent in risk assessment and its allowance using RDR; this being a significant limitation of TEV. Traditional Embedded Value had been used in many countries for many years; however there has been a movement towards Market Consistent Embedded Value to make comparisons across companies more credible.

Session 3: Market Consistent Embedded Value

Speaker: Mr. Kunj Maheshwari, Director, Willis Towers Watson's

Session was conducted by **Mr. Kunj Behari Maheshwari**, he explained the reasoning behind industry's transition from TEV to MCEV. In an ideal world, a company's MCEV should equal the difference between market values of assets and liabilities. However, since an active market for an insurance company's liabilities does not exist, market value of liabilities needs to be derived as a reasoned estimate using principles of risk neutrality, diversification, replication and no-arbitrage.

Under MCEV methodology, adjustments are made to future profits to allow for the risks which are not diversified away.

$$\text{MCEV} = \text{PVFP} + \text{ANW} - \text{FC} - \text{TVFOG} - \text{CRNHR}$$

Where PVFP = Present value of future profits (discounted at risk free rate)

ANW = Net worth
FC = Frictional cost

TVFOG = Time Value of Future Options and Guarantees

CRNHR = Cost of Residual Non Hedgeable Risk

We have already discussed computation of PVFP in TEV, except that in MCEV, the discounting is done using reference rates guided by risk-free rates. Similarly ANW allows for market value of Adjusted Net Worth and TVFOG is already discussed above. Other items are explained below.

- **Frictional cost (FC):** Frictional cost is the implicit cost which occurs because of the difference between earning and discount rate. In MCEV, as the earn rate and discount rate are the same, frictional cost arises

due to investment management expense and taxes only.

- **Cost of residual non-hedge able risk (CRNHR):** Separate allowances are made by Cost of Residual Non Hedgeable Risks under MCEV for risks not explicitly allowed for in the calculation of PVFP or TVFOG. While there is no prescribed methodology for its computation, he explained a step by step procedure to identify the risks and their cost under this head in a systematic manner. He also contrasted that these risks are only allowed for implicitly in TEV through the usage of Risk Discount Rate.

A very pertinent question was put forward by a delegate in Gurugram - While TEV captures the risk in Risk Discount Rate, MCEV makes multiple allowances, many of which are subjectively allowed for; So how does one say MCEV is better than TEV? Mr. Kunj appreciated the question and clarified that MCEV provides for separate risk identification for each risk and allows for them individually while the subjectivity in TEV vide RDR may be higher. This question actually helped in setting the tone for the comparative session on similarities and differences between TEV and MCEV next.

Session 4: TEV and MCEV Comparison

Speaker: Mr. Kshitij Sharma, Executive Director, Ernst & Young LLP

After discussing about the movement to MCEV, **Mr. Kshitij Sharma** summarized the key differences between TEV and MCEV in this session. The components of each of the method are:

TEV = ANW + PVFP - CoC (TEV does not mandate TVFOG to be reduced further)

MCEV = ANW + PVFP - FC - TVFOG - CRNHR

Cash flows are discounted at the risk free rate and risk is allowed for explicitly in MCEV calculations. In contrast, TEV computations involve implicit allowances for risk in the Risk Discount Rate.

The key variances discussed are summarized in the table below:

ANW	TEV	MCEV
PVFP	Usually consistent with accounting practice	Uses market value of assets
CoC / FC	IR driven by asset returns; RDR discounting	Risk-free rates used for earnings/discounting
TVFOG	CoC includes S/H expected returns in excess of risk-free post tax returns	FC allows for cost of investment expenses and taxes only
CRNHR	Optional in TEV	Required in MCEV
	Not allowed explicitly; implicitly allowed via RDR	Included for risks not already allowed for in PVFP or TVFOG

While concluding, Mr. Kunj pointed out that with the introduction of SII and IFRS, MCEV will eventually become less relevant; hence insurers should keep this in mind before deciding on switching from TEV to MCEV basis.

Session 5: India Market Practice - Indian Embedded Value / Market Consistent Embedded Value.

Speakers: Mr. Sanket Kawatkar Principal and Consulting Actuary, Mr. Philip Jackson, Consulting Actuary, Mr. Shamit Gupta, Consulting Actuary, Milliman India

Mr. Sanket Kawatkar is a principal and consulting actuary at Milliman India. He is a fellow of both IFoA & IAI and is based in Mumbai office. Prior to Milliman, he has worked at Watson Wyatt and also AIG group in Singapore. He has been involved in a number of assignments including IPOs / M&As and EV of life insurance companies, strategy reviews, business planning, peer review and Independent Actuary on With Profits Committees.

Mr. Philip Jackson is a consulting actuary in Milliman's life insurance practice in India, based out of Mumbai. He supports projects in India and Asia-Pacific region. He is a fellow at IAI and IFoA and his work experience in Asia has covered the entire insurance value chain.

Mr. Shamit Gupta is a Consulting Actuary with Milliman's life practice, based out of Gurgaon. He is a fellow of both IAI and IFoA and has been extensively involved in embedded / appraisal valuations in the Asia Pacific region.

Mr. Sanket commenced the session by positioning the relevance of Indian Embedded Value (IEV). He mentioned that it is a mandate for companies planning to bring an Initial Public Offer (IPO) and other companies, which have no plans of IPO use IEV to facilitate comparisons by their shareholders and potential investors against competitors. After laying the background, he broke down the rest of his presentation into three meaningful parts:

Problems faced by investment community



Mr. Sanket shared that during his meetings with investors and analysts who advise their clients on investments into life insurance companies, he came across three common concerns.

- **Difficulty in understanding Embedded Value disclosures:** Reasons for this include lack of understanding of actuarial concepts, difference in treatment of similar items across companies and general lack of disclosures by companies reporting embedded value financials.
- **Generally changes are disliked:** Reasons for this include changes made from year on year by the

same company, different companies using different underlying methods / conventions and varying degrees of disclosure from companies operating in the same market.

- **Credibility of assumptions often questionable:** With companies often changing their assumptions, possibly due to emerging experience or changes in economic environment, or unexplained variances still meaningfully high, this often leads to loss of credibility in investor's eyes.

Given that there may not be a single right answer or approach to address these questions, he shared his perspective that these can be solved by making more disclosures and educating the users of the EV results.

Comparison of Indian Embedded Value (IEV) and MCEV

Given that most of the day had seen detailed description of TEV and MCEV, Mr. Sanket then moved to explain how IEV compares with MCEV. IEV is same as MCEV, but with the following differences allowed for:

- Materiality limits are applied in IEV computation (this is not a requirement under MCEV)
- No productivity gains of expense efficiencies can be taken credit for after valuation date
- Auditors are required to carry out data checks under IEV framework
- IEV requires a large number of sensitivity runs, with more disclosures and detailed analysis of movement

Operational issues in Implementation

Mr. Sanket also mentioned about operational issues faced by companies during IEV implementation based on his wide experience including, but not limited to, pre/post IPO disclosure requirements, treatment of global reserves, historic tax losses, and computation of allowance for illiquidity premium.

Mr. Philip took the session forward with a quantitative flavor with an analysis of reference rates used in EV computations. Given the flexibility allowed in the IEV standard of either using swap rates or government bond rates, this question gains prominence in the EV implementation. Given that data of either swaps or government bonds can be used to determine risk-free yield curve, G-secs are preferred because swaps data is available only up-to 5 years duration and trade volumes of swaps are lower than that for government bonds. Given the multiple market participants need to hold government bonds based on their requirements, often yield curves show kinks at nodal durations - resulting in differences in market prices of bonds as computed from yield curve and observable market price of bonds. He also touched upon how asymmetric risks held by companies by offering minimum guarantees often leads to TVFOG such as minimum guarantee on participating funds and unit linked funds wherein minimum investment guarantee is offered.

Further, **Mr. Philip** and **Mr. Shamit** also discussed the minimum disclosure requirements under APS 10 for sensitivities performed on Indian Embedded Value. They briefly touched upon how is analysis of movement different under IEV as compared to traditional approach.



Conclusion: The seminar, being very topical, invited the interest not just from the actuarial community but finance, risk and distribution communities. The presenters did an excellent job by modulating their communication to connect with the diverse audience in attendance. The result was evident in interactions and numerous questions that were raised by the delegates during the day. Everyone agreed that actuaries should reach out to different stakeholders having interest in EV numbers and should be able to provide the reasonable explanation to non-actuaries about the EV numbers. The president thanked all the speakers for their efforts in making the seminar a great success and also thanked all delegates for their active participation.

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(Feedback of Embedded Value Seminar - Page 34)

6th Young Actuaries Connect

Organized By: Advisory Group on Examination and Education, IAI

Venue: Hotel Fortune Select Exotica, Navi Mumbai

Date: 14th October, 2017

Welcome Address

Speaker: Mr. Sanjeeb Kumar,
President, IAI

positively, since on failing, the student has another opportunity to infuse the concepts more intensely, thereby helping in the long term.

adjustments, Marketing and Competition studies, etc.

- ♦ **Regulatory Reporting:** Estimates of policyholder liabilities, Solvency Calculations, Regulatory Submissions, etc.

- ♦ **Shareholder Reporting:** Value of New Business Reporting, Embedded Value Reporting, Financial Analysis, etc.

- ♦ **Risk Management:** Risk Assessment, Reporting Economic Capital, Asset Liability Management, Capital Management, etc.

- ♦ **Experience Analysis:** Investigating mortality experience, persistency experience, expense experience, etc. and feedback of the investigation into pricing and valuation.

He also concisely described on broad categories of actuarial employers namely, Direct Companies, Consultancy, Reinsurers and Knowledge Process Outsourcing (KPO). Further he succinctly explained the nature and type of risks faced by the companies in Life, General and Health insurance industry. Also he mentioned the skills required and the tools used in day to day actuarial work and concluded with a quote, to signify the importance of being prepared, which is as follows; "Success occurs when OPPORTUNITY meets PREPARATION."



The 6th Young Actuaries Connect inaugurated with the welcoming speech by Mr. Sanjeeb Kumar along with the introduction of speakers. He told about the intention of the IAI to develop more capacity building seminars for students in coming years and also explained the importance of ethics and professionalism and how negatively it can impact the profession if not aptly followed.

He also mentioned the recent achievements and initiatives of the institute, especially on the efforts made by the entire team in conducting the examinations appropriately on 20th September, 2017 in Mumbai to support those students who were reaching late due to heavy rains, reflecting one of the objectives of the IAI which is to promote public interest. He concluded by describing the journey of passing the actuarial exams, especially on how to take failures

Session 1: Opportunity in Insurance areas (Life, General, Health)

Speaker: Mr. Sandip Goenka, Head - Financial Planning & Analytics Team, Tata AIA Life Insurance

The aim of the session was to give an overview of the insurance industry in India, the background of actuarial work and to encourage students to keep up with the developments in the industry.

The session started with a quiz, based on general knowledge about the insurance industry, which helped the students to cultivate valuable insight about the industry. The session progressed with the introduction to modelling and its importance in various parts of actuarial work as follows:

- ♦ **Pricing:** Product development, Product management, Premium

Session 2: Opportunities in wider fields outside traditional areas

Speaker: Mr. Sunil Sharma, Appointed Actuary & Chief Risk Officer, Kotak Mahindra Old Mutual Life Insurance Limited



This session was intended to encourage the students to explore the opportunities that lie outside the traditional areas where actuaries currently work. Mr. Sunil Sharma started by giving an overview of the increasing number of members of IAI over the years and showed how important it is for the members to look out for opportunities in wider fields as the current expected number of members employed in traditional areas are around 2000 to 3000. Further he described some of the wider fields where actuaries can contribute in various functions:

- ♦ **Banking and Finance:** Enterprise wide Risk Analysis, Capital management and its allocation, Credit Risk Analysis, Potential Derivative Structuring, Structured Finance, Valuation of illiquid assets and Rating Agencies
- ♦ **Enterprise Risk Management:** Risk Management, Risk Mathematics, Tools and Techniques, Applications and Aggregation, Risk Control and Mitigation Mechanism, etc.
- ♦ **Wealth Management and Financial Planning:** Senior Role in Banking, Head of Wealth management arm of Major Bank and Director of Trustee
- ♦ **Social Security:** Projection of Population, Advice on

development of Social Security and Government policies, Provision for the long term care of Senior Citizens, etc.

- ♦ **Government:** Ministry of Finance - Planning & Budgeting/ Health Ministry/ Welfare
- ♦ **Data Scientist/ Analytics/ Mining:** Analysing big data to find useful pattern and frame rules, Fraud Detection, Churn Prediction, Customer Segmentation, Claim Analytics, etc.

Further he threw light upon the increase in demand for data scientist and data engineers as per a paper published by Burning Glass Technologies. He also added the high level of difficulty associated with filling position along with the high level of growth in the coming years for these position. Also he briefed about where other positions like Statistician, Risk Consultant, etc. lie in the scale of difficulty of filling positions and projected growth in the coming years. He then showed the similarities along with the differentiation in the skills required for a Statistician and Data Scientist. Also he further discussed on how actuarial students can increase their skills such as Programming and Visual Representation Skills to fill in the shoes of the data scientists.

He concluded by giving a brief summary of initiatives taken by IAI some of which includes Formation of Wider Fields Committee, Launching IAI Job Portal and Educating potential employers about the value that actuaries can add to their business.

Session 3: Moving between markets - opportunities and challenges

Speaker: Mr. Akshay Dhand, Appointed Actuary, Canara HSBC Oriental Bank of Commerce Life Insurance Company Limited

The session aimed to create an awareness of the opportunities and challenges faced while transitioning



between the markets. Mr. Akshay Dhand commenced by giving an overview of the nature of actuarial profession and how the mutual recognition of various actuarial institutes plays a vital role in making the profession a global one, thereby allowing mobility as per the demand across the world. He then talked about the type of movements that can happen and the nature of opportunities that are available.

Further he put across the advantages of getting an opportunity to work in another country which includes Better lifestyle, Experience of multiple markets helping in rapid career progression and so on. Further he continued on the considerations that should be kept in mind before relocating abroad some of which includes:

- ♦ Thoroughly researching the job and the company you are planning to relocate to
- ♦ Do you meet the requirements of the role especially roles related to statutory?
- ♦ Understanding of how actuarial profession works in the destined country
- ♦ Understand the cultural aspects of the country both from work perspective as well as everyday life
- ♦ Visa requirements for you and your spouse/ kids
- ♦ Cost of living differences
- ♦ Tax rates
- ♦ Various components of compensation being offered

Amidst opportunities lies challenges, and so the session continued on

addressing the challenges faced while transitioning. Some of the challenges that one may face are Difference in Culture at work, HR policies, Regulatory regime, State of the industry & maturity of the market and Settling in issues both on work and home front. Also, the challenges may vary depending upon whether one is moving to a more or less developed market as compared to India. Also when deciding to move back in India, one must be aware of the developments happening in Indian industry and should also consider points (mentioned earlier) while relocating back in India.

This session was also associated with pre-recorded videos of Ms. Priya Dwarkanath (VP & Senior Transactions Actuary, Swiss Re, New York), Mr. Akash Gupta (Head of Life and Health Asia Valuation Planning and Delivery, Munich Re, Singapore), Ms. Samreen Asif (Chief Actuary - Gulf Metlife Alico, Dubai) and Ms. Peuli Das (Appointed Actuary, IndiaFirst Life, Mumbai) sharing their experiences regarding the transition from one country to another.

Session 4: IAI Examinations - Process, Techniques and Common Mistakes

Speaker: Mr. Subhendu Kumar Bal, Appointed Actuary, SBI Life Insurance Company Ltd.



The purpose of the session was to give an insight on Examination system, What examiners expect and Techniques and common mistakes made while preparing for examination and during examination to help students in tackling the exams. The session started with a

brief history of the actuarial profession and the foundation of many International Actuarial Societies.

He then talked about the examination process where he explained how the mix of questions requiring bookwork, application and higher skills varies within Core Technical (CT) Series, Core Application (CA), Specialist Technical (ST) and Specialist Application (SA) series. He also justified for the extra reading time not given for CT series as the mix of questions in CT series are more weighted towards book work, whereas in other series the mix is more weighted towards higher skills and application. He then also described how an actuarial exam is different than other academic examinations where it requires a lot of hard work and time management along with self-motivation to fuel the determination required to pass these exams. He also gave an insight on the expectations of examiners and elaborated on the examination systems. The following are some of the important points mentioned regarding examination system:

- ♦ There are more than one examiner to set the papers for actuarial exams
- ♦ Examiners also prepare the indicative solution by themselves to check the applicability of marks and time required to answer them
- ♦ After setting the papers by the examiners, the review examiner also checks the question papers which is then reviewed by external examiners
- ♦ The mark distribution of the questions would be as per the answer expected
- ♦ At least two examiners or Associate Examiners check the copies
- ♦ All border line cases are examined several times by three examiners
- ♦ The Examiners are always kept out of reach about the identity of any candidates

Further, he shared techniques for better preparation some of which are “Starting early and not to wait for the exam result”, “Not leaving a chapter untouched for long”, “Start practicing mock exams at least 20 days before examinations”, “Advantages of acronyms” and so on. He also shared techniques to use during exams some of which are “Make the order in which you'd like to attempt the paper”, “Try to attempt at the speed of 1.5 minutes per mark to account for prudence”, “Be specific to the question”, “Think of the chapters the question relates to and recollect the snapshot”, etc. He further gave advice on how to overcome failures.

He concluded with an inspiring video along with a quote as follows: “The more you sweat in practice, the less you bleed in war”.

Session 5: Cracking the recruitment and selection process

Speaker: Ms. Latha Raghu, Vice President and HR Head - Distribution, Kotak Mahindra Old Mutual Life Insurance Limited

Ms. Sudha Krishnamurthy, Deputy Vice President, Kotak Mahindra Old Mutual Life Insurance Limited



The session aimed at developing perception of the students to look from the viewpoint of the interviewer and giving approaches on preparing for the

interview.

This last session began by putting students in a situation where they had to describe on how they will pick the best of mangoes from the stock of alphonso mangoes. On getting the answer, the speakers showed on the similarity between picking best mangoes and hiring a suitable candidate. Further, they revealed the funnel of selection process for a typical recruitment and showed how it is identical to finding a needle in a haystack. They also mentioned that 93% of employability is determined by preparation but only 1 in 10 candidates spends 2 hours or more while preparing.

In addition to this, they gave various steps on getting prepared for the interview which are as follows:

- ♦ **Get as much information as you can:** Through company's website or getting connected with ex-employee, etc.
- ♦ **Prepare your presentation pitch:** Should include Knowledge, Attitude, Skills, Habits (KASH)
- ♦ **Anticipate questions that you are likely to be asked:** Questions can be General, Situational and Behavioural and be prepared with a detailed situation exhibiting your nature, wherever required
- ♦ **Think about the image that you want to portray:** How we walk in

interview, Maintain eye contact, Not having a bad posture and so on.

- ♦ **Prepare documents / materials required for interview:** CV, Photo, ID proof, Educational proof, Work experience proof, etc.

They advised students, after completing the interview, to follow up with company for any updates and to connect with the interviewers with the help of various websites like LinkedIn. The session concluded with students gaining insights on how to answer various tricky questions asked in interviews.

Conclusion: Overall, the Young Actuaries Connect was a perfect mix of topics which helped the students to get an overview of the industries where actuaries are currently employed along with the motivation to explore wider fields where actuaries can practice, receive guidance on how to tackle actuarial examinations and most importantly, for fresher nowadays, how to crack the recruitment process. Also this event helped students to increase their network within the profession and learn from other people's experiences and background knowledge. The event concluded with a vote of thanks and token by **Mr. Dinesh Khansili** (Executive Director, IAI) to all the speakers for taking out their valuable time to contribute in the development of the students.



About the Author



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“Om is a student member of IAI and currently working as Actuarial Executive in M/s K. A. Pandit Consultants and Actuaries in the area of Life insurance.”



- 1 Great Experience, Good to meet other students. Speakers were engaging. Liked Subhendu Kumar Bal session the most
- 2 Learn a lot about the profession, examination process and future opportunities. Looking forward to attending future seminars and programmes. Thank you for organising seminars and putting in huge amount of efforts for the members
- 3 Further insights are required into employment of actuarial fresher's
- 4 I would have liked some more detailed information about opportunities in wider fields outside traditional areas in terms of how to go about it.
- 5 Liked Sandip Sir's presentation that started with facts. It connects well with facts and real life cases.
- 6 In depth sessions on opportunities within each broad area of opportunities within each board area of opportunity, viz, life ERM, etc. from experts within this domain
- 7 Required certificate course or 7-15 days training program for R-software, Excel, etc
- 8 The seminar could have one session about the recent & major updates in the profession. Specific requirement from the perspective of employers & expectation from the candidates. Otherwise, the overall session was very productive and knowledge oriented.
- 9 Thanks for the great interaction for students

Interaction with an Actuary - Mr. Dinesh KD Pant

1. You joined as the Appointed Actuary of the prestigious organization, LIC of India recently. Please share your experiences in the journey to become the AA.

It has been a long pleasant journey for me in LIC as I took over the responsibilities of Appointed Actuary of LIC of India at the beginning of this year. Since my initial attempt into the Actuarial profession was in the nature of foray to some adventure, I count myself privileged to have gained a variety of experience on the way and now being able to shoulder the critical Actuarial responsibilities of such a reputed and large insurance organisation like LIC of India.

Coming from the background of engineering education and profession, to me, my entry into LIC of India 28 years back as a Direct Recruit Officer at that time was perhaps not the final destination as I was not sure if I would continue to be in the field of insurance for long. However, soon I started liking the insurance profession. More so because even from my initial years in LIC of India, I was given some very challenging responsibilities including the early opportunity to head the leading branch offices, which at that time used to be considered very prestigious. I also started to feel that as a god sent opportunity to serve people and integrate professional work with the scope for serving the society. It really felt great to help and serve the customers and sort out their problems. I literally started to love this work as nothing felt more satisfying than seeing people return happily from our offices after their problems getting resolved. Along the way, out of my interest in academics and in the quest for some more knowledge, I completed graduation in law and Masters in Business Administration and passed exams of Insurance Institute of India. However, the introduction of special scheme for Actuaries in LIC sometime at the start of this century and my selection into the Investment Research Cell of the Corporation encouraged me to start Actuarial studies in the year 2003. Though my entry to Actuarial exams came quite late, yet thank God it came when I still had some steam left to complete it!



Frankly, while being engaged in the marketing assignments and in various operations of the insurance business, I used to see the Actuaries with awe and adore. I used to think of Actuaries as some kind of super genius people and repository of insurance wisdom. However, out of my habit of trying for professional adventures, I thought of testing myself with actuarial exams, in the best hope of passing some papers and consider that as a great achievement. Once into the actuarial examination system, despite the pains and pressures of writing exams and waiting for results, I actually found it to be a real value addition in my day to day work and doable. Slowly, it became a sort of passion for me to keep going for the papers one after the another, despite the ups and downs of the examination results and the emotions and scrutiny attached to it. At times, my very young kids used to tell me not to watch the television with them and rather study for the exams, even when I used to return from office after long hours. More than the pressure of passing or failing in exams, real challenge at times used to be about how to reveal the results to the kids and juniors in office in the event of failing! However, all these challenges forced me to focus on the completion of the qualification, as best as I could.

In the year 2007, I went for an overseas assignment as General Manager and Head of Life Operations of Kenindia Assurance Company Limited, a joint venture composite company in Kenya and continued my studies there too. I had a great exposure in that assignment as the Head of Life Operations, being the only expatriate officer in Life business of that company. It was a challenging yet fulfilling assignment and the Actuarial studies and learnings from there have been of great help to me. In the year 2012, on my repatriation back to India, I joined as the Actuary for our International Operations. In perhaps the most challenging times for the Life insurance companies from product design point of view, I had the challenge (which perhaps now I can diplomatically term as an opportunity), to lead the Product

design and Pricing team of LIC of India as the Product Actuary. It was a great experience on how to learn from challenges and the success that we got in achieving the time bound results, in coming up with the new products was possible, only because of the exceptional contribution and teamwork of our Actuarial resources and support of our management and the Regulator.

At the start of this year, when I was entrusted the assignment of being the Appointed Actuary of LIC of India, I took the responsibilities with great humility and with a determination to contribute to the best of my abilities for the organization, profession, and the industry. I see each moment in my current role as a great and unique opportunity to learn and contribute. I am privileged to have the confidence of my seniors and commitment of my esteemed team of Actuaries and other colleagues in the conduct of my assignment. As the Appointed Actuary my endeavour is to use this office to encourage actuaries and actuarial students, create a better understanding of the profession, strengthen the actuarial works in my organization and create greater trust between actuarial and other functions of my organisation. My conviction is that each step in the path that we tread should be with the aim of delivering better value for the policyholders and all the stakeholders and to strengthen their trust in the organisation and the industry.



2. The role of actuaries in LIC; Past, Present, and Future.

In my view, the roles and responsibilities of Actuaries are bound to increase many folds in future. LIC has a glorious history of producing the best actuaries in the history of India. Their invaluable contribution is difficult to emulate. Many of the Actuaries, currently working in private insurance companies and in the regulatory office have been connected with the LIC of India at some point of time. Actuaries in LIC have always had a special place. Currently, LIC encourages actuarial

profession in a big way by running a special in-house scheme for Actuaries to support them, in a structured manner. There are special groups of Actuaries which form the Core Actuarial Group covering all the technical actuarial areas and they are involved in critical functions of valuation, product design and pricing for Individual as well as Group business. Actuaries are also involved in areas of Investments, Risk Management, and Information Technology etc. Our organization recognizes their role and importance even in unconventional areas from the actuarial points of view, such as Personnel department. Actuaries are involved in core actuarial as well as assignments related to data and other analysis.

I am sanguine that Role of Actuaries in future is going to be seen in a much wider spectrum and much bigger canvas. Recognition of the imminent need to move towards the risk-based capital and solvency framework and with the time-bound implementation of new Financial Reporting standards being necessitated, Actuaries will be in much greater demand. We, therefore, attach significant importance to greater internal and external resourcing and professionalization of Actuaries to meet the emerging challenges.

Current Chairman of our esteemed organisation always emphasises the very critical role of actuaries in coming times. In the past also the actuaries of the Corporation have acquired various top positions of responsibility including the positions of Managing Directors and Chairman. The coming times are going to be full of challenges as well as opportunities for both insurance industry and Actuaries. However, the academic knowledge gained through actuarial studies would need to be backed by strong all-around exposure and experience. We expect involvement of actuaries in areas going beyond conventional fields and look forward to actuarial resources learning and contributing not only at the corporate level but also in operational functions.





3. What is the extent of actuarial resources and services used and utilised in the organization?

LIC of India has adopted the dual strategy for the growth of actuarial resources both through direct recruitment from the open market and also by encouraging and supporting employees with a flair for such education to undertake these examinations. We facilitate them opportunities for greater exposure in actuarial functions. We have a good number of Fellows, Associates and other studying actuaries with lots of work experience who are near to completion of Fellowship. We have a good pool of officers and employees undertaking actuarial examinations and who are at different stages of actuarial qualification.

Our Actuaries even at very senior levels are making a contribution not only within India but for our overseas operations also. Besides the Corporate Office, we have staff pursuing actuarial exams in our Zonal Offices and even in Divisions and Branch Offices. These employees, after gaining the exposure in operational units and after acquiring a higher level of qualification, can serve as the future resources for Corporate Office and for detailed technical actuarial functions. They are also engaged in different projects and analysis work to groom their actuarial competency. We continue to fine-tune our strategy in this regard as per the needs of the situation.



4. Actuarial students are among the best resources who can be put to any type of job in Insurance companies; being the largest recruiter in the Insurance business, how LIC can utilize this potential group in the days to come?

I believe that Actuarial exams are a great value addition for development of professionals in the financial sector. The rigorous actuarial examination system lays the foundation for academic and professional competency required for insurance and financial related

technical assignments.

Sharing from my personal experience, when I joined the Investment research group of my organisation some fifteen years back, I felt quite odd to be one rare officer in the group without much expertise in accounts and finance. That gave me the reason to pursue the Actuarial studies. Today, I am happy to admit that studying for the Actuarial exams apart for the examination nightmares, gave me lots of inputs and understanding of the insurance business and of finance. Passing in every exam gave me the confidence and I ultimately headed teams, handling some of the most critical investment functions. Therefore, there is no doubt that the Actuarial knowledge is very important not only for our organisation and insurance industry but for the entire financial sector. However, future would demand not only qualified actuaries but ones with better connect and comprehensive understanding of even other operations of the insurance business and financial sector.

Somehow, the common view has been that the Actuarial and Marketing people are something like North and South Pole. Actuaries have enjoyed the privilege of being treated with respect for their unique specialization and knowledge and I would wish that perception to continue. Our study material and examination system train us to think about most complex situations from various angles. However, in the real world, it is not only the diagnosis and analysis which matters but the ability to make decisions. I am of the firm view that at the top corporate level the real challenge and responsibility is to make decisions. In that context, I trust the necessity of Actuarial professionals having the actual feel and exposure of operational areas as well. Whenever I get the chance, I would love to see the actuaries being subject to real operational

experiences as a part of their development regime, so that they can learn about the practical battlefields of insurance operations including marketing and operations. That would really help to bridge the gap between actuarial and operating professionals and help the industry grow with people working in similar, even if not the same wavelength. While I advocate a perfect mix of all-around experience and knowledge for the real value of an actuary, on a lighter note having undergone the tough grilling of the Actuarial examination system, I won't mind people continue to believe actuarial profession as something out of this world, at least till my lifetime!

LIC of India has a very well laid policy to encourage Actuarial resources within the organisation. LIC provides lots of space and opportunities for the actuaries to expand their knowledge base. There continued exposure to various internal and external professional training is also ensured. As an organisation we see a special role for all Actuaries in different areas of work, ranging from core technical areas to other noncore areas. I would also like to see all our Actuaries well equipped and trained to undertake all challenging assignments with competence and poise. Actuaries in future though should also be prepared for greater scrutiny and challenges including from the technology and would need to demonstrate greater adaptability to the needs of the times. There is an old saying that "What we hear we forget, what we see we remember and what we do, we know." Hence, for all actuarial students is to important to appreciate that being Actuary is not just passing the exams and getting the Fellowship. The real success is about applying and utilizing the leanings from qualification and education in practice and discharging the responsibilities in most professional and ethical manner.

THANK YOU

About us

ICICI Prudential Life Insurance Company Ltd. (ICICI Prudential Life) is a joint venture between ICICI Bank Ltd., one of India's largest private sector banks, and Prudential Corporation Holdings Limited. ICICI Prudential Life began its operations in fiscal year 2001 and has consistently been the market leader* amongst private players in the Indian life insurance sector.

ICICI Prudential Life is the first private life insurer to attain assets under management of **₹1 trillion**** and In-force sum assured of over ₹3 trillion. ICICI Prudential Life is also the first insurance company in India to be **listed on NSE and BSE**.

Life @ ICICI Prudential Life

As an organization we aim to offer our colleagues a meaningful long-term career proposition by providing a **Supportive work environment**, creating a platform for their **Learning & Growth**, fostering **Meritocracy** and ensuring **Fairness** in all our actions.

Career opportunities

As one of the leading life insurance companies in India, we offer a long term career through challenging roles & diverse experiences. We are currently looking to hire mid-level members for Actuarial Function with below mentioned credentials:

- **Candidates with 3-6 years of experience in life insurance domain**
- **Minimum 8 paper pass required**
- **Strong technical and actuarial modelling skills**
- **Knowledge of Prophet modelling will be an added advantage**

If you are keen to make a long term meaningful career in the life insurance domain, kindly share your resume with snehlata.shukla@iciciprulife.com

Please mention subject line as "Application for Actuarial Department" while sharing your profile

*on a retail weighted received premium basis (RWVP)

**Company had Assets Under Management of Rupees One Lakh Crore as on February 19, 2015. Past performance is not indicative of future performance





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Time Series Analysis of the SENSEX returns

Introduction

Understanding the behaviour of the stock markets is one of the essential aspects of any financial analysis. Asset Valuation, risk management, product design, portfolio construction relies heavily on the movement of stock markets. The indices exhibit different behaviours at different points in time. In this article we will apply different types of time series analysis to the daily stock Index returns (Sensex returns) data and understand the behaviour of SENSEX data. The data considered for this purpose is the five year daily closing values of the SENSEX from 17-Sep-2012 to 16-Sep-2017 (5 years). Daily returns are computed as $\log(P2/P1)$ where P1 and P2 are the closing values of Sensex at the end of Day 1 and Day 2 respectively.

Basic Plot of daily Sensex returns over the past five years

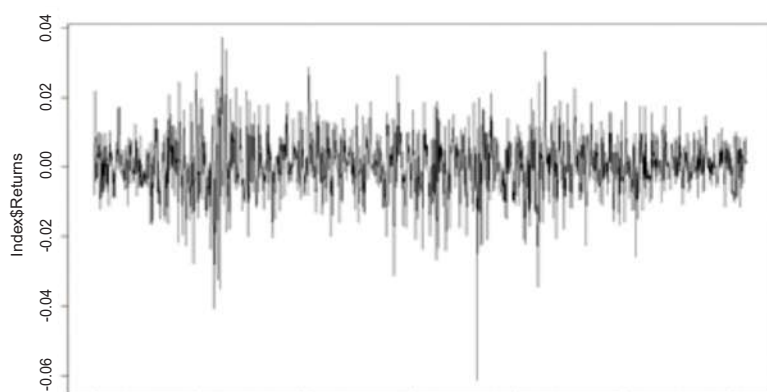


Figure 1: Basic Plot of daily Sensex returns over the past 5 years

Testing for the normality of Sensex returns

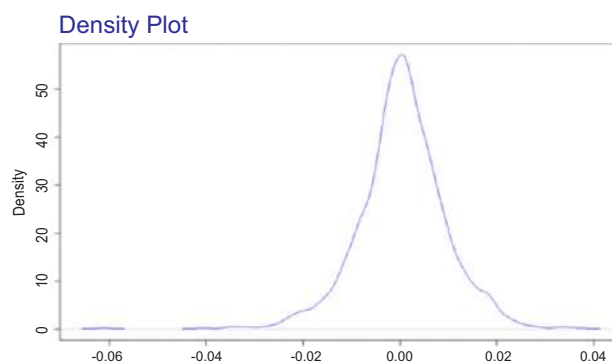


Figure 2: Density Plot of the Sensex Returns

Density plot shows that there are a few extreme values on the left thus making the distribution of returns, not normal.

Descriptive Statistics of daily returns

Mean Return	0.0449%
Standard Deviation	0.9068%
Minimum Return	-6.12%
Maximum Return	3.70%
Median Return	0.0595%
Coefficient of Skewness	-0.3696
Coefficient of Kurtosis	2.89

From the above observations, we find that though the mean and median returns are slightly positive, the distribution is slightly left skewed (Negative coefficient of skewness). Even the worst case fall (6.12%) is much higher than the best case increase (3.70%). Similarly, Coefficient of Excess Kurtosis is much above zero (2.89) indicating that the tail is much fatter than a normal distribution.

Shapiro Wilk Test (Shapiro-Wilk test, n.d.)

This test is used to test the null hypothesis that the index returns come from a normally distributed population.

Shapiro Wilk Statistic	0.97374
p-value	3.477 E-14

p-value of less than 0.05 suggests that the null hypothesis can be rejected at 95% level of confidence thus concluding that the index returns are not normally distributed.

Quintile - Quintile Plot (QQ Plot) for Normality

This is a visual plot of normality of the data. A q-q plot is a plot of the quantiles of the index returns data set against the theoretical quantiles of the normal distribution. If the data comes from a normal distribution, all the points should fall on the 450 straight line.

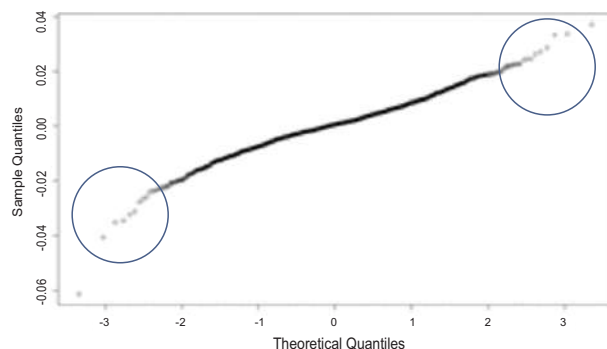


Figure 3: Q-Q Plot of Normality for Index returns

Haphazard points in the tails suggest that the data does not come from normal distribution.

Jarque Bera Test for normality of Index Returns

Jarque Bera- test is a joint statistic using skewness and kurtosis coefficients. It is a goodness-of-fit test of whether sample data have the skewness and kurtosis matching a normal distribution. It tests the null hypothesis of the returns come from a normal distribution vs. an alternate hypothesis of they do not.

Jarque Bera Statistic	460.69
p-value	2.2 E-16

A very small p-value indicates that null hypothesis can be rejected at 95% confidence level, thus concluding that the index returns are not normal.

Overall using various methods listed above, we are able to assess that the Sensex returns do not follow a normal distribution. Distributions of daily returns are rather symmetric about their means, but the tails are fatter.

Testing for independence of daily returns

Understanding the independence of daily returns will influence the type of methods that need to be used for predictions and forecasts. There are different tests to accomplish the same. One of the most popular tests in this regard is Box-Pierce or Ljung-Box test

Box-Pierce or Ljung-Box test

This test examines the null hypothesis of independence in a given time series. These are sometimes known as 'portmanteau' tests.

Ljung-Box test statistic	8.5941
p-value	0.003373

As the p-value < 0.05, null hypothesis can be rejected at 95% confidence and hence it can be inferred that the index returns are not independent. The current day's returns are definitely influenced by the returns of earlier days. This gives rise to the usage of Auto regression models for estimating the current period returns.

Testing for stationarity¹ of the time series

Augmented Dickey Fuller Test (ADF test) (Augmented Dickey - Fuller Test, n.d.)

This is one of the most important statistical tests that is performed on a time series data to check whether the series is stationary or does it exhibit unit root. The null hypothesis of the series having a unit root is tested against the alternate hypothesis of the series being stationary. A regression equation with a constant and a linear trend is used and the t-statistic for a first order autoregressive coefficient equals one is computed. The lag is taken as the cube root of one less than the sample size (Sample size-1)^{1/3}

Dickey Fuller Statistic	-11.022
Lag order Tested	10
p-value	0.01

As the p-value of the statistic is less than 0.05, we reject the null hypothesis at 95% level of confidence and conclude that daily Sensex returns are stationary.

KPSS test

Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test (KPSS test, n.d.) evaluates the null hypothesis (the time series data is either trend stationary or level stationary) or not at all stationary (has a unit root).

Test for Level Stationarity	
KPSS level Statistic	0.066813
p-value	0.1
Test for Trend Stationarity	
KPSS trend Statistic	0.063683
p-value	0.1

p-values of the above tests are greater than 0.05 indicating that the null hypothesis of stationarity cannot be rejected. Hence it can be inferred that the index returns are level stationary as well as trend stationary.

¹ A time series is said to be stationary if its statistical properties (Mean, Variance etc.) do not change with time. Joint probability distribution with any time lag remains constant.

Phillips-Perron Unit Root Test

Null hypothesis for this test also is that the time series has a unit root and is not stationary. This is tested against the alternate hypothesis indicating the stationarity of the index returns. The general regression equation which incorporates a constant and a linear trend is used and the Z(alpha) statistic for a first order autoregressive coefficient equals one are computed.

Dickey-Fuller Z(alpha)	-1054.6
p-value	0.01

p-value of less than 0.05 indicates that the null hypothesis can be rejected at 95% confidence level. Hence it can be concluded that the index returns are stationary.

Modelling the Index returns

Fitting an ARMA (p,q) model

If the time series is stationary, we can characterize its value of the current period using Auto regression² and Moving Average³. p and q indicate the number of lag periods used for Auto regression and moving average respectively.

$$y[t] = a[0] + a[1]y[t - 1] + \dots + a[p]y[t - p] + b[1]e[t - 1] + \dots + b[q]e[t - q] + e[t].$$

As it is observed that the Sensex returns are stationary, we can try to fit the best possible ARMA (p,q) model for the Sensex returns. The following ARMA models are fitted to the data.

Model	Equation	AIC
ARMA (1,0)	$y[t] = 0.00041 + 0.08343 * y[t - 1]$	-8108.77
ARMA (0,1)	$y[t] = 0.00045 + 0.09546 * e[t - 1]$	-8109.97
ARMA (2,0)	$y[t] = 0.00045 + 0.0888 * y[t - 1] - 0.0671 * y[t - 2]$	-8112.15
ARMA (0,2)	$y[t] = 0.00046 + 0.0937 * e[t - 1] - 0.0708 * e[t - 2]$	-8113.71
ARMA (1,1)	$y[t] = 0.00073 - 0.7192 * y[t - 1] + 0.8094 * e[t - 1]$	-8116.96
ARMA (1,2)	$y[t] = 0.0008 - 0.7311 * y[t - 1] + 0.8304 * e[t - 1] + 0.0112 * e[t - 2]$	-8117.15
ARMA (2,1)	$y[t] = 0.00079 - 0.7178 * y[t - 1] + 0.0084 * y[t - 2] + 0.8159 * e[t - 1]$	-8120.12
ARMA (3,0)	$y[t] = 0.00042 + 0.0915 * y[t - 1] - 0.0677 * y[t - 2] + 0.0129 * y[t - 3]$	-8115.26
ARMA (0,3)	$y[t] = 0.00044 + 0.0962 * e[t - 1] - 0.0699 * e[t - 2] + 0.0154 * e[t - 3]$	-8116.98

From the above models fitted, it appears that the Akaike Information Criteria⁴ is the lowest for ARMA (2,1) model and hence we can infer that we can model the returns of tomorrow by using the returns of today and the returns of yesterday along with the error in the estimate (Difference between predicted and actual values) of today.

² Linear regression with Current period's value as the predictor variable and the previous one or more period's values as the explanatory variables.

³ Linear Regression with Current period's error as the predictor variable and the previous one or more period's error as the explanatory variables

⁴ It is a measure of the relative quality of statistical models for a given set of data. It deals with the trade-off between the goodness of fit of the model and the complexity of the model. Lower value indicates a comparatively better model.

Auto correlation Function (ACF) and Partial Auto Correlation Function (PACF)

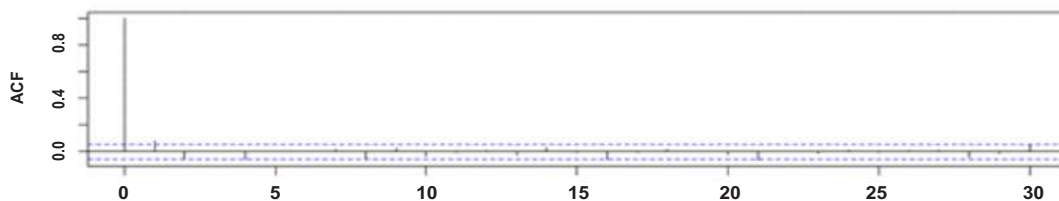


Figure 4: ACF Plot for Index returns

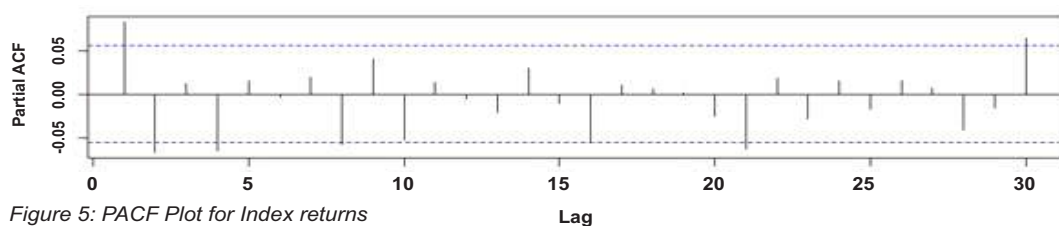


Figure 5: PACF Plot for Index returns

PACF shows significant spikes at lag 1 and lag 2 and lag 4, but not at lag 3. Hence Auto regression of second order seems to be an appropriate fit for the data. Similarly, ACF shows a significant spike at lag 1 only suggesting Moving average model of order 1 would be model appropriate. Hence ARMA (2, 1) is a more reasonable model to forecast the index returns.

Way Forward

By now, we understand that the index returns are not normally distributed. They are also not independent and identically distributed (i.i.d). They have a dependence on previous historical values. However, the index returns look more or less stationary. Hence a few cyclical based models like ARMA (p,q) can be fitted to predict the future returns based on current returns. However, the volatility of these returns is also not constant. So to model the series better, deeper understanding of the volatility of the index returns is also needed. Different techniques to model volatility of the index returns will be taken up as a next article.

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UPCOMING SEMINARS



Title	Event Date	
5 th Capacity Building Seminar on Health Care Insurance	4 th Dec, 2017	Advisory Group - Health Care Insurance Venue - Hotel PLLazio Location - Gurugram CPD Hrs - 6 -Technical
11 th Seminar on Current Issues in Health Care Insurance	5 th Dec, 2017	

The Actuary India wishes many more years of healthy life to the fellow members whose Birthday fall in November 2017

**MR A GHOSAL
MR K J PRADHAN
MR M G DIWAN**



Sweeping trends in Human Capital Management

Globalization can succeed only through effective human capital management. But a movement to tap talent and value human capital is often lacking. Talent strategies that incorporate diversity are not very common. Progress in elevating more women to leadership positions is tardy. In managing human capital, a strategic view is important.

Managers need to understand cultural differences and adjust their styles, communication and rewards to fit within each culture. Human capital development will lead to better educated, more capable people for the workforce of tomorrow.

Investments in early childhood development are investments in a society's future human capital.

The relevance for human capital is that from society's perspective, investments that take place to develop human capital through training programs yield lower returns than investments in human capital at the earliest stages. Similarly, when women are not suitably represented in the top echelons of organisations, it reflects the debilitating presence of systemic barriers.

A sound diversity strategy is a talent strategy and a market place strategy. There are four business goals of a diversity strategy

- Identifying, attracting and retaining the best people
- Creating a workplace culture where performance can be maximized
- Understanding who your customers are and what are their needs

- Use external focus to eliminate societal disadvantage and increase the diversity of talent pools.

Diversity is inevitable because demographic changes are altering nations' populations and their ethnic and religious compositions. This affects the types of customers and employees that companies will be trying to attract. In future, commitment to equal opportunity, diversity legislation and language education will be priority areas. Life work integration and balance is essential. Global companies need to think about managing workforces consistently across geographies.

Attracting talent is a local market activity; likewise is managing human capital. Different cultures produce employees with different values. To succeed, leaders must accept that there is not a global workforce with common values or motivations. Leaders must create a management team of people from diverse backgrounds who will interpret the company's goals. Messages have to be communicated across cultures with lot of sensitivity.

Unlike a product or service, human capital can't be managed in globally standardized ways. Attempting to do so will make the workforce less productive. In future, managing the human capital is going to be the biggest challenge for organizations.

Key trends in human capital management

Recurring recessions at frequent intervals has led to a shortage of skills to fill the talent pipeline. Low employee engagement and wage inflation in some markets are other challenges. Emerging markets are on

the radar of multinational corporations due to the massive business opportunities they present.

It is important to know the nature of emerging markets and workforce management. One has to understand the role of diversity and trust. The organizations that will stand out from the crowd in the next few years will be those that extract every drop of value from their investments in human capital. Thinking far more carefully about where your people will come from, what they will do and how they contribute to performance is important. No strategic planning can ever be complete without plans to managing human capital well.

Role that HR can play in the transition from HRM to HCM

The HR function has to take a more strategic approach to recruitment and selection. Look at ways to improve productivity. Design methods to capture the ROI on human capital. Organisations should not rush into a hiring spree after recovery from economic recession. The workforce concerns in emerging markets may not be the same.

Data analytics will play a huge role to support decision making. Workforce diversity will become a necessity. The trust between employee and employer is crucial to building workforce value. When employees are encouraged to exploit their creative potential to the hilt, it indicates the beginning of an organisation's journey in the right direction.

Doing same with less has to be replaced with doing more with the same. Job cuts during recession have had a severe impact on employee

engagement among the younger generation. Good talent decisions must be based on knowledge, understanding and analysis - on human capital metrics.

Best organizations are using analytics to predict talent supply and inform their hiring and talent management decisions. But it is not enough to just use metrics. Revenue per FTE [Full time Employee] often rises in the early stages of a recession, simply because the workforce is depleted. By recruiting more efficiently, matching people carefully to their roles and encouraging greater productivity by paying attention to employee engagement and training, high performing organizations outstrip their competitors as they exit a downturn.

Suggestions

Align human capital strategy with business growth strategy. Review KPIs for talent pool, mobility, progression and attrition. Track employee engagement trends. Review performance measures.

Encourage a culture of adaptability within the organisation. Consider how automation is changing future talent needs. Look outside your new sources of talent supply. Develop the right skills to encourage innovation and creativity. Smart use of analytics is essential to predict potential problems.

An organization is more likely to predict consumer preferences if it has a workforce that mirrors its customer base. Workforce diversity brings greater innovation and creativity, a reduction in groupthink and improved governance.

To sum up

In a globalized world, it is important to treat employees as assets and motivate them. Nurturing employees by suitable reward and recognition schemes is vital. Employees should be given developmental opportunities to improve their skill sets and competencies so that they can aspire to grow in the organisation. Performance-linked pay is important to ensure a

productive work force. Talent management as a separate discipline by itself is gaining popularity so it is important to discard old ways of working and embrace the new order. Technological advances will make their way into the talent management function as well and so companies have to be geared to meet this change/ challenge.

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Obituary

Mr. S R Mehta - 1928- 2017



With deep regret, this is to inform that Mr. S. R. Mehta, MA, FIII, FIAI, passed away on 29 September 2017 at Mumbai. He was 88 and single.

A true academician, Mr. Mehta taught Statistics at Sydenham College of Commerce Economics, Mumbai. He became Principal of the College in 1985-86 and then of Elphinstone College, Mumbai 1986-88. He contributed to the activities of the Institute Society as well as the Insurance Institute of India, in setting marking of examination papers. His unassuming demeanour, selfless dedication and geniality will be remembered by his students and colleagues.

May his soul rest in eternal peace.

By Mr. S. T. Gadiwala, AIAI

PFRDA Planning Aggressive Growth

India's pension regulator PFRDA plans to increase compensation for financial institutions and post offices to boost enrolment - **Gireesh Chandra Prasad**



PFRDA chairman Hemant Contractor

New Delhi: Financial institutions and post office branches will soon get paid better for enrolling people for pension schemes as the Pension Fund Regulatory and Development Authority (PFRDA) is set for an aggressive expansion of subscriber base to counter the socioeconomic challenges of an ageing population.

The regulator wants pension coverage to go up significantly over the next four-five years as only about 60-70 million people, a small fraction of the country's 500 million working population, are covered by any form of formal pension system, PFRDA chairman Hemant Contractor said in an interview.

The urgency to get more working people to sign up for retirement benefit schemes arises from the trend of elderly population growing at twice the pace of the general population in the last decade, pointing to serious socio-economic challenges to the government in the future, including the need for stepping up health spending.

Contractor said the regulator currently pays agencies that enrol people for pension schemes ₹ 120 for every new account in addition to ₹ 20 for every transaction by the subscriber.

"It is a matter of debate if what we pay is enough or not. They always feel it is not enough. We are taking a relook at the incentive structure to make it a bit more attractive," said Contractor.

He declined to specify the quantum of increase the regulator will finalize after discussions.

"Our pension penetration is very poor (about 14% of the working population) because of the fact that the informal sector accounts for a large part of the labour market. The challenge is to reach out to the informal sector," he said.

"NPS (National Pension System) is a low-cost, post-retirement benefit scheme with very attractive returns but awareness about the scheme is low. It is a good idea to give further fiscal incentives to the subscribers and also encourage banks and other institutions to enroll more people into NPS as they have a large customer base," said Gopal Kumar, actuary and economist at actuarial consulting firm Radgo & Co.

According to a 2016 report by the Central Statistics Office (CSO), the elderly population of 60 years or more expanded at the rate of 35.5% in the 2001-2011 period, while the growth rate in the general population was slower by half at 17.7%.

The report pointed out that 8.6% of the total population of 1.21 billion—104 million people—were at 60 years or above. Slightly less than three-fourth of them live in rural areas, where pension coverage is also poor. At the age of 60, the average remaining length of life is 17 years, the report said citing the 2011 population census.

The population of elderly citizens is forecast to reach about 180 million by 2026, the PFRDA chairman said.

"With so many old people and low pension coverage, we could be faced with a problem. That is why we have been asking banks to step up enrolment so that these people do not face any hardship in their old age. Fifteen years ago, average life span of the population was 62.5 years. Now it is 68 years," he said.

NPS, introduced in 2004 by PFRDA for government employees and opened to every citizen in 2009, now has a corpus of ₹ 2 trillion with a subscriber base of over 16 million people.

The subscriber base includes central and state government employees and members from private sector enterprises including the informal sector. The Atal Pension Yojana, a scheme launched in 2015 for unorganized sector workers, is part of this subscriber base with about 5.8 million beneficiaries accounting for a corpus of about ₹ 2,500 crore.

The government contributes to the pension corpus.

First Published: Sun, Jul 30 2017. 11 39 PM IST

Equity Release – Valuation Part 6: Expense assumption, Securitization and ALM

Equity Release valuation depends upon choice of valuation model, assumptions and customer data. This article is sixth in the series of articles on actuarial valuation of Equity Release. This article covers discussion on expense assumption, securitization and ALM using ER asset. First part describing product features and valuation model was published in May 2015. Second part describing longevity assumptions was published in June 2015 along with its youtube link covering discussion on its contents. Third part was published in February 2016 along with link for youtube covering discussion on lapse assumption. Fourth part was published in August 2017 covering discussion on Property value projection and house price index. Fifth part was published in October 2017 covering discussion on valuation of no negative equity guarantee.

Equity release is a financial contract that allows elderly people, who may not have enough liquid cash to access the equity in their home. Equity release is also known as reverse mortgage or home equity conversion loan. Equity release is a means of retaining use of house (or object which has capital value), along with obtaining a lump sum or a steady stream of cash inflow, from value of such house. The equity release provider must be repaid later with interest, usually when policyholder dies or goes in for long term care from sale proceeds of home. Equity release is particularly useful for seniors who do not intend or are not able to leave a large estate for their heirs when they die. Such elderly persons must be of minimum age (which is country specific, for US 62, UK 55) and live in their own home to sign equity release contract.

Expenses: Generally, expenses to be loaded in pricing vary by provider. Provider's own empirical data of costs and business plans should be taken into consideration while determining expense loading in pricing.

Initial: Expenses involved in bringing an Equity Release product to market can be considerable. Expenses involved in bringing product to the market include marketing, sales and distribution expenses. Initial property valuation expenses are directly charged to the customer. These are generally measured as a percentage of loan in pricing.

Administration: In addition to fixed expenses, each contract generates direct acquisition expenses and ongoing administrative expenses. The ongoing administrative expenses can be reduced where

- The administrator has an efficient method for establishing continued home occupation by the legitimate occupier and
- That ongoing annual property insurance is being maintained.

There will be the ongoing accounting and actuarial expenses involved in running a well-managed portfolio. These are generally included in administration fee.

Property management: From time to time it may be necessary to inspect the property and/or to perform a valuation. The cost of re inspections will depend very much on the providers' practices. It is safe to assume that costs for a provider who re inspects properties only as needed to cover very specific situations e.g. complaints handling will be lesser than cost for providers who operate a programme of sampling or systematic periodic revaluations then costs may be significantly higher.

Termination: When the homeowner eventually exits his home, there will be some additional activity. Market practice vary by provider as to whether the expenses of the property sale and any other expenses incurred directly in relation to the sale (e.g. legal fees) are deducted from the proceeds of the property (which could have incremental impact on the cost of the NNEG) or whether such expenses remain the responsibility of the estate and therefore do not impact the NNEG.



Here are key expense heads within Equity Release line of business:

- Distribution and sales
- Marketing
- Administration
 - Initial
 - In force
 - Termination
- Property management
 - Initial valuation
 - Re - inspection and maintenance
 - Property sale
- Funding: Measured as a percentage of cost of funds
- Expense inflation: Measured as a percentage of CPI or RPI

For startup operations in particular, there will always be a risk that the business will not grow to a critical mass. This will cause a potentially significant expense overrun and a small block of business to run off or sell.

A customer accessing the product through a broker channel may also have to pay an additional advice fee.

Securitization: Asset securitization involves pooling of individually illiquid assets with the intent of obtaining third party financing on the strength of the cash flows generated by these assets. Mortgage-Backed Security (MBS) is a security created by pooling a group of individual equity release loans with similar characteristics. Periodic payments from the Equity Release pool are then passed through to investors in the mortgage security. Finance is obtained by issuing asset backed debt securities. These securities are primarily serviced by the cash flows created by the pooled set of Equity Release loans.

Receivables on Equity release assets are normally securitized by insurers. Receivables are transferred to special purpose vehicle (SPV). SPV issues bonds which are serviced and repaid using the proceeds of Equity release future inflows. SPV is structured to be “bankruptcy

remote”, so that in the event of default by SPV, investor has no recourse to assets of the Equity Release provider.

Key differences between conventional mortgage-backed securitization and ER backed securitization are the following:

1. ER based mortgage has materially greater exposure to long term property market performance.
2. Longevity risk also is transferred to investors in the package of ER mortgage.

Features of the equity release backed bonds:

- These are normally issued in multi-tranche format, e.g. senior, mezzanine and equity.
- Credit rating and / or credit default protection is obtained for (at least) major tranches from a credit rating agency.
- Tranches are repaid in order of rating, with actual timing of repayment dependent on underlying assets, early repayments and any default losses and recoveries.
- Any excess remaining collateralization is returned to the insurer or is kept by bond holders.
- Equity release backed securities are structured in this way so as to package up risks and returns in way that most appeals to different types of investors and hence investor's preferences are taken care of. This minimizes cost of borrowing to the insurer.

Reasons why Equity Release issuer prefers raising money via securitization as opposed to straightforward bond issue:

- Securitization results in crystallization of future profits in ER contract. Without securitization cash flows occur when contract terminates.

Crystallized profits can then be invested in other profitable opportunities.

- Bankruptcy-remote securitized bonds do not appear in the balance sheet of the issuer. They are booked in the Balance Sheet of special purpose vehicle. So gearing (i.e. debt/equity) is not increased. Hence, securitization results in off Balance Sheet funding.
- Securitized bonds may appeal to investors who want exposure to particular subset of issuer's assets.
- Multi-tranche format enables default and prepayment risks to be structured in way that most appeals to range of different investors.
- Securitized bonds may obtain better credit rating than straight bonds secured on general assets of issuer.
- These factors may enable the issuer (i.e. the insurer) to borrow more cheaply than via normal bond issue.

Nominal Swap curve or gilt curve:

Equity release loans disbursed by an insurer are the assets to be reported in its financial statements. These assets should be appropriately valued for financial reporting purpose. Projected Equity release expected cash flows are discounted using nominal risk free rate (mostly treasury) plus spread over risk free rate. These rates are available on the Bank of England website here for current date:

<http://www.bankofengland.co.uk/statistics/pages/yieldcurve/default.aspx>

and past data is available here: <http://www.bankofengland.co.uk/statistics/pages/yieldcurve/archive.aspx>

Spread over risk free rate: Yield on securitized bonds is used for computing credit spread. Liquidity premium is a part of credit spread.

Yield is computed by equating present value of cash flows with the market value of such securitized bonds. Market value of securitized bonds can be obtained from Bloomberg or Statestreet or any other portal which normally is based on actual trades on stock exchange. Weighted average yield computed from the risk adjusted yield of each such bonds based on their market value can be used for discounting expected loan repayments.

Normally following difficulties are faced in determining credit spread:

1. Equity release backed bonds may be less frequently traded and as a

result available market value may not be reliable.

2. Equity release backed bonds may not be listed and therefore publically available market value may not be handy.

3. In case of bonds with put option there is prepayment risk in case bond holder redeems them early and therefore determining credit spread becomes difficult.

4. There may be two versions of market value to be taken for computing yield - bid price or ask price

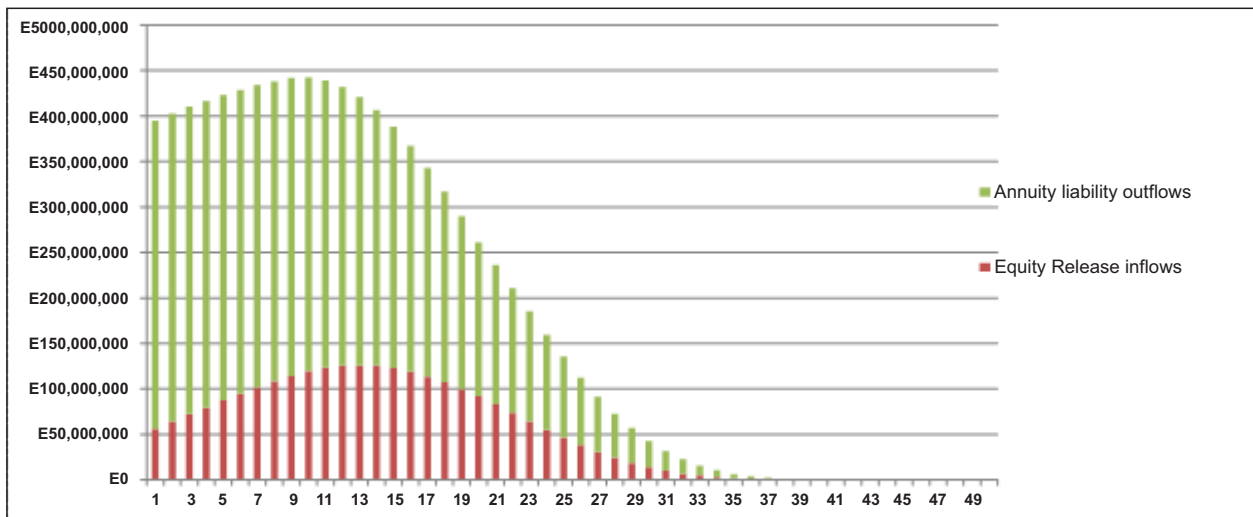


Suitability of Equity Release to back up annuity liabilities: Equity Release assets can be used by life companies to back annuity liabilities. This can be an alternate to securitization. In case of securitization, cash flows generated from Equity Release contracts are used to service repayment to investors in securitized bonds.

Matching of Equity Release and annuity liabilities:

Features	Annuity	Suitable Assets	Why match with Equity Release?
Security	Annuities are normally guaranteed fixed cash outflows	Timing and amount for annuity cash out flows are certain	Timing and amount for cash inflows can be closely approximated. However, i. Security of cash flows generated by provider also depends on no negative equity guarantee which is embedded in the contract ii. Cash flows may occur earlier than expected due to early repayment and fluctuations in mortality
Yield	Fixed yield	Fixed income	Equity release assets provide fixed income to match fixed yield on annuities
Term	Uncertain duration dependent on life expectancy of the annuitant	Long-dated	Equity release assets are Long-dated and cash flows from them are dependent on life expectancy of the policyholders
Liquidity and marketability	Highly illiquid though in last decade buy out and buy in market has developed in the UK	Relatively illiquid as there is no active market.	Liquidity matching is not an absolute requirement and through securitization of equity release receivables this can be managed.
Key risks	Exposure to fall in interest rates and longevity risk thereby increasing liability	Assets which are capital efficient in terms of risk /return trade-off	Equity release receivables are capital efficient in terms of risk / return trade-off. However, Equity release in assets portfolio also brings in additional operational risks

Backing Annuity cash outflows with Equity Release cash inflows:



Traditional fixed income assets (bonds) do meet the characteristics to match annuity cash outflows. However, investment in bonds is constrained by lack of supply at times and leads to large concentration of credit risk. This concentration of credit risk can be diversified where Equity release portfolio is also used to back annuity liabilities. Here is a feature wise comparison between Corporate Bonds and Equity Release assets.

Features	Corporate Bonds	Equity Release
Timing of Cash Flows	Term is defined. Callable bonds may get redeemed earlier than defined term	Like annuity cash outflows equity release cash inflows are linked to life expectancy of the borrower
Probability of default	Dependent on credit rating and is variable	Low to medium dependent upon Loan to Value ratio (LTV)
Loss on default	Depend on size of the investment and is medium	Low to medium dependent upon Loan to Value ratio (LTV)
Skewness of losses	Medium	Low
Diversification achievable	Limited	High
Liquidity	Medium	Low though using securitization it can be managed
Degree of longevity hedge for annuity liabilities	None	Some
Operational Risk	Low	Medium

Effect of Equity Release assets on annuity liabilities and economic capital (Individual Capital Assessment - ICA):

When annuity liabilities are backed by Equity Release assets along with usual 'A' rated bonds there is reduction in liability value of annuities. This is because Equity Release assets increase the weighted average risk adjusted yield used for discounting liabilities.

When annuity liabilities are backed by Equity Release assets along with usual 'A' rated bonds there is reduction in economic capital (ICA) requirement. As a result surplus capital increases. Here are the reasons:

1. Equity release assets reduce portfolio level credit risk due to increased diversification. This results in less strenuous credit risk stress.
2. Equity release assets result in better matching with annuity liabilities. Mortality stress as a result becomes less strenuous.
3. Greater diversification benefit when Equity Release assets are combined with credit risk of corporate bonds.

With increase in weight of Equity Release assets in overall asset portfolio, liability valuation and economic capital (ICA) fall. This effect of reduction in annuity liabilities and availability of free capital holds for both Pillar 1 and Pillar II results.

Investment in Equity Release creates impact mentioned above because liquidity risk is not material in short term for annuity fund. This is because annuities are long term liabilities. The illiquid nature of the liabilities hedges asset liquidity risk. However, excessive backing of annuities with Equity Release can increase liquidity risk and hence capital requirement due to liquidity risk.



Equity release is a long term fixed rate, illiquid asset with some unique risks which meet many requirements for matching annuity liabilities.

1. In the current UK market, annuity providers are the largest providers of Equity Release contracts.
2. The Equity Release asset has characteristics which are likely to be helpful to many funds in terms of diversifying risk
3. Risk adjusted yields are generally attractive compared to traditional alternatives. This is because lending rates are considerably better than yield on 'A' rated bonds. This is despite of the administration costs involved with Equity Release assets.

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“ Saket Vasisth is involved in ALM for life insurance. He is a student member of IAI and works for AIG.”

Obituary

Danny [Dhanasar] Ramjit - 1952-2017



I regret to announce the demise of Danny on 17th Oct, 2017. He was FSA and FIAI. He was survived by his wife and twins boy and girl .

He was the first appointed actuary of Max New York Life Insurance Company Ltd. in year 2000. He used to actively participate in the meetings of the Actuarial Society and the first two GCAs. Before coming to India in year 2000, he worked in New York Life in Hong Kong. He used to help the National Insurance Co. and United Insurance Company for design of health insurance products, recently. Before his death, he used to work in Thailand. He died in Boston, USA, due to cardiac arrest.

A nice human being. He had many friends including me in India and used to be in regular touch till his death.

May his soul rest in peace. Sincere condolences to bereaved family members.

*By K. Subrahmanyam.
Council Member.*

Effective Crop Insurance: A Success or a Myth????

India being an agrarian economy, constitutes to around 17.32 % of the total GDP which is significantly higher than the world's average (6.1%). Being an agriculture driven workforce economy, developing protection against the contingent and uncertain losses to the crops has been a primitive motive of the government. In this regard, "Comprehensive Crop Insurance Scheme" was developed way back in 1985 which was replaced by "National Agriculture Insurance Scheme" (NAIS) in the Rabi Season of 1999-2000. The need of mitigating the hardships of farmers against the adverse weather impact, "Weather Based Crop Insurance Scheme" (WBCIS) was piloted in the Kharif 2003 season. To meet the increasing demand of modifications in the existing NAIS, "Modified National Agriculture Insurance Scheme" (MNAIS) was proposed and piloted in the Rabi Season 2010-11 which provided better indemnity level, more diversified unit area of Insurance (penetrated to village/village panchayat level for major crops), setting up of catastrophic fund at the

national level and many other advancements over NAIS. Finally, when Modi government came into power, to facilitate the motive of "One Nation, One Scheme" and to oust the shortcomings of the previous schemes, "Pradhan Mantri Fasal Bima Yojana" (PMFBY) was launched to replace the existing Crop Insurance Schemes (NAIS and MNAIS). It came up with the following salient features:

- ♦ Premium capping of farmers' share at 2% for Kharif crops, 1.5% for Rabi crops and 5% for horticulture crops.
- ♦ No upper Limit on Government Share of premium (i.e. no capping on Government Subsidy).
- ♦ No reduction on claim amount to farmers (as premium capping has been removed on government share of premium).
- ♦ Exemption of Service Tax/GST on the scheme.
- ♦ Use of remote sensing and other modern techniques for claim assessments.
- ♦ Compulsory for Loanee Farmers and optional for Non-Loanee

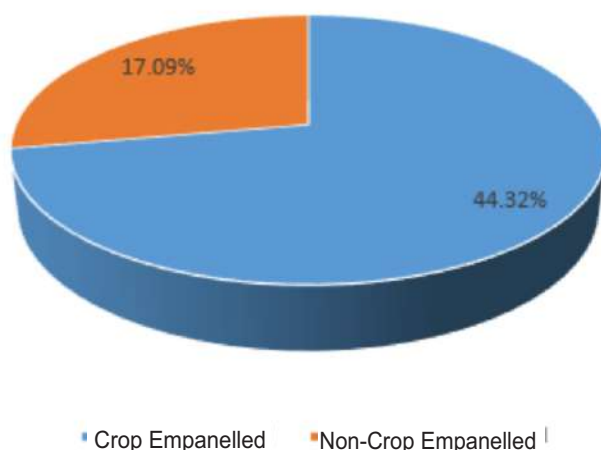
Farmers.

The evolution of PMFBY instilled a golden era for all the empaneled crop insurance companies (Tata-AIG, Reliance General, IFFCO-Tokio, ICICI-lombard, Bajaj Allianz, HDFC ERGO General, Chola mandalam, Future Generali, Universal Sampo, SBI General, AIC) whereby they easily met their topline as well as bottom line targets. As per the flash figures report released by Insurance Regulatory Development Authority of India, the private non-life insurance sector (Excluding specialized insurers and standalone health companies) gross written premium had a whopping increase of 40.5% to Rs. 60,727 Crores in FY 2016-17 from Rs 43,213 Crores in FY 2015-16. Emphasizing on the growth of crop empaneled companies, there was a significant increase of 44.43% on the Gross Written Premiums as opposed to 17.09% for other private insurers. The premium raised from PMFBY is expected to ₹ 15,891 Crores (Final Figures Awaited) combined for all the companies.

Gross Written Premiums (Source:IRDAI)

Insurer	2016-17	2015-16	% Increase
Tata-AIG	4,167.90	2,958.60	40.87%
Reliance General	3,935.35	2,791.56	40.97%
IFFCO-Tokio	5,485.00	3,691.33	48.59%
ICICI-lombard	10,725.19	8,090.71	32.56%
Bajaj Allianz	7,633.28	5,832.15	30.88%
HDFC ERGO General	5,840.19	3,379.55	72.81%
Chola mandalam	3,133.18	2,452.00	27.78%
Future Generali	1,815.50	1,555.26	16.73%
Universal Sampo	1,287.79	903.80	42.49%
SBI General	2,604.48	2,039.84	27.68%
AIC	7,064.13	3,509.20	101.30%
Total (Crop Empaneled Companies)	53,691.99	37,204.00	44.32%
All others	7,035.09	6,008.49	17.09%
Total	114,419.07	80,416.49	42.28%

%Increase



One of the principles of Insurance is Indemnification of Losses i.e. there should be no profit from any losses occurring, similarly the insurance provider, according to the government should not enjoy "excessive positive" bottom line figures especially when it comes to insuring the economically weaker class i.e. the farmers.

According to the "Report of Performance Audit of Agriculture Crop Insurance Schemes" presented by Comptroller and Auditor General of India (CAG) in Parliament in June, 2017 insurance companies had benefitted around ₹ 10,000 Crores cumulative profit due to low number of claims reported as compared to the premium charged. The report also conveyed that the Actuarial premium charged by the empaneled companies under PMFBY was on an average a high of 12.55 per cent, much more than earlier schemes.

This increased premium although reduced the burden on the farmer (by capping premium rates), but had a significant upward impact on the government exchequer. Also, the threshold yield levels fixed by respective state government for determination of the claims was much lower than required, hence leading to lower claim settlements.

The Weather and Crop Insurance schemes have not been a favorable benchmark for the farmers related welfare schemes in the past. According to the CAG report, around ₹ 32,000 Crores has been paid as premium subsidies and claims reimbursement to insurance companies in the past five years under the old crop/weather insurance schemes by the government owned Agriculture Insurance Company (AIC) which might would have not been reached the intended beneficiaries because there was no recorded data for it.

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<http://www.financialexpress.com/economy/crop-insurance-claims-seen-soaring-to-rs-13000-cr-in-2016-17/674868/>

Delay in claim settlements is another challenged faced by the scheme making all the schemes more ineffective. As per the CAG report, the unpaid claims rose to 37% in 2015-16 from 14% in 2014-5 for NAIS, MNAIS and WBCIS Schemes. This figure was recorded at 32% for the newly launched scheme PMFBY (2016-17). The primary reason for delay in claim settlement can be directly related to the delay in receiving premium subsidies from the respective state governments.

The welfare/insurance plans for the agriculture sector have always been a key part of the planning commission for several governments in the past. Despite of the ineffective implementation of the crop insurance scheme PMFBY in the last financial year 2016-17, the central government estimates a further increase in the target premium of ₹7,100 Crores to achieve a total premium of ₹ 23,000 Crores in the current financial year. Also, the central governments aims to insure minimum 50% of the farmers by 2019. Based on the report submitted by CAG, the government would need to pour in better and effective changes to the guidelines to ensure a "Successful Crop Insurance Scheme."

About the Author



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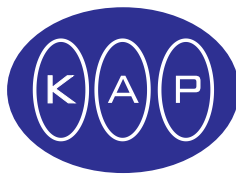
“Sarthak is student member of IAI and working as Actuarial Associate in Swiss Re India Global Pvt Ltd.”



Photo Features of Capacity Building Seminar on Embedded Values - Mumbai and Gurgaon

Feedback of Capacity Building seminar on Embedded Values in Mumabi & Gurugram

- 1 Very useful content covering the entire EV Methodologies well chosen & organised seminar content
- 2 The program gave a very insightful summary of a topic of importance in the actuarial industry. The specific sections taking one through practical challenges was especially useful.
- 3 Have helped to fill up some knowledge gaps (the prime purpose of working)
- 4 Please continue to organise more such events, specially in Gurgaon suggested topics could be Solvency II, IFRS 17, Stochastic, Dynamic Modelling, Financial Modelling, Asset - liability, Projection model, etc.
- 5 The discussions could have been more detailed. May be too much crunched in single day. Real life scenarios should have been used to put forward the points more effectively
- 6 I think it is a great initiative to educate the actuaries & would-be-actuaries on the trending topics & addressing their questions, engaging in discussion, so that we can come together to provide / take accurate & informed calculations / decisions.
- 7 The session were theoretical but it would be really great if we have a workshop - perform the calculations in teams & present the case based on some case study
- 8 Good session over all
- 9 Such session should be conducted very often. Mainly the practical aspects & how to calculate MCEV, EV through practical workshop
- 10 The seminar was one of the few, where speakers were very well prepared. Encourage that seminars in future also select speakers carefully
- 11 The last session on IEV was not as engaging as it seemed a repetition / too generic as many questions were already answered. TVO4/ RFR session was good & useful. Philips session had to be rushed though they were very relevant & good. The seminar can be split into two days.
- 12 Thank you for conducting this seminar. It would be great if we have IFRS -17. Seminar on same line, as well as risk identification etc, (ERM)
- 13 We should conduct customised session for non -actuarial Insurance Profit



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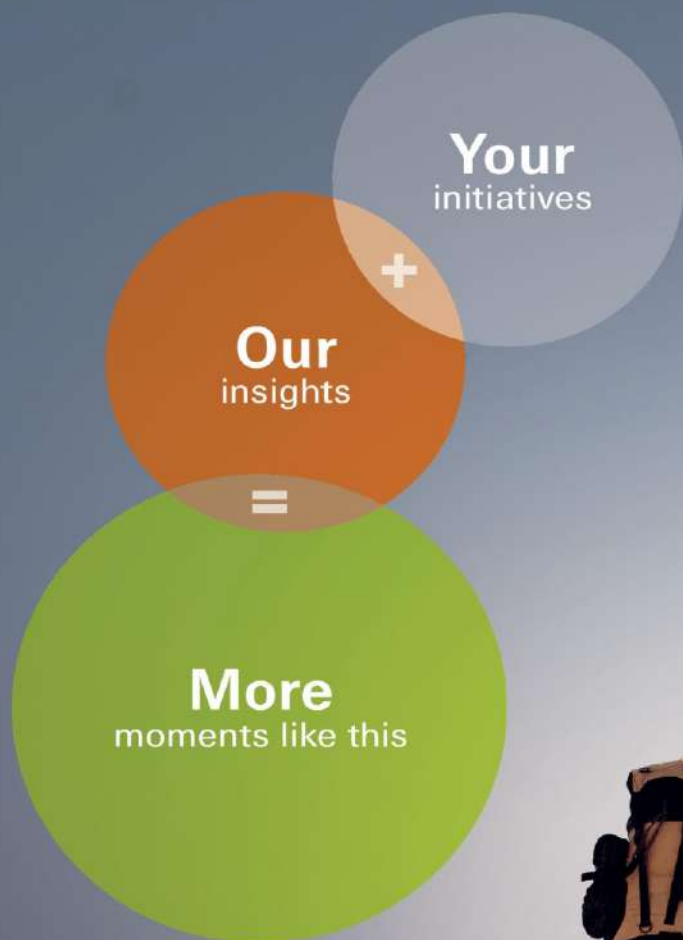
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