Institute of Actuaries of India

the Actuary INDIA

INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest

JANUARY 2013

VOL. V ISSUE 1

www.actuariesindia.org

THE MAGAZINE OF THE INSTITUTE OF ACTUARIES OF INDIA

Pages 32

₹20

2013 AGFA & 15th Global Conference of ACTUARIES

Waves of Reforms...
Oceans of Opportunities

Topics...

- IAI Students Event & 2013 AGFA
- Inaugural and Plenary
- Concurrent Sessions: Life Insurance
- Concurrent Sessions: General Insurance
- Concurrent Sessions: Health Care Insurance
- Concurrent Sessions: Pension, Employee Benefits and Social Security

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WHY ATTEND 15 GCA? ... TEASERS FROM SOME SPEAKERS...

Global Perspective on Retirement Systems

A revie Zo Iretire Pents syste Ps internationally an Gn t Ie Asia Paci Æ region.

Costs, risks and the impact of improved longevity. Retirement income products and the management of longevity risk.

the future Actuary and role of Actuarial Education

Michael Sherris, Australia

The Role of Reinsurers in Health Insurance Management

Almost all insurers who offer Health insurance products in Asia are not specialized in this complex line of business, but are multi – line insurers. Given that Health insurance and private provision of care is growing rapidly as the middle class expands and Governments look to limit their role in the provision of healthcare to citizens, how can reinsurers help insurers make this line of business not only a success, but a stable and signi Æant contributor to Underwriting results "

C1: Concurrent Sessions on Health Care Insurance

Rob Leonardi, Singapore

Global trends in actuarial computing

As insurance products and insurance regulations have become more complex, producing reliable information quickly can be burdensome. Imagine being able to monitor economic capital requirements in real time – understanding the implications of management decisions, market changes, and macro economic changes with a high level of con Ædence. How are companies using technology to gain real competitive advantage.

Plenary Session [P5] Global trends in actuarial computing

Patricia Renzi, US

Practical issues covering valuations of Indian life insurance companies

After more than a decade of opening of the life insurance industry for private sector participation, many promoters / shareholders are already evaluating their businesses to unlock the value created. However, given the rapidly changing external market environment and strategies adopted by insurers, there continue to be signi Æant challenges faced by insurers in carrying out realistic valuations of their businesses. This presentation aims to analyse various such practice issues faced by insurers.

C3: Concurrent Sessions on Life Insurance

Sanket Kawatkar, India

Product Design

Product design is all about knowing what the customers as well as distribution partners want and at times what the customers want versus what the partners want maybe in con Áct. The attempt is to elucidate statistical techniques that ensure a product design process creates products that while maintaining the pro Æability of general insurance companies gains immediate acceptance from both customers and partners.

C4: Concurrent Sessions General Insurance

Amarnath Ananthanarayanan, India

Professionalism and the Practicing Actuary

: hy is it important " : hat does it mean to be a Profession " : hat are some of the tools and rules that guide is in our practice of actuarial science.

C4: Concurrent Sessions General Insurance

- Gary Josephson, US

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Printed and Published monthly by Gurura Mayak, Administrative Of Àer, Institute of Actuaries of India at AC 0E PAC .S AN ' PRINTS IN 'IA PRIVATE LI 0ITE ', A Wing, Gala No. 55, Ground Floor, Virwani Industrial Estate, Vishweshwar Nagar Road, Goregaon E , 0umbai- 3. for Institute of Actuaries of India : 302, Indian Globe Chambers, 142, Fort Street, Off ' N Road, Near CST VT Station, 0umbai 400 001. ‡Tel 1 22 4 3325 / 4 3333 Fax 1 22 4 3330 ‡Email : library #actuariesindia.org Webside : www.actuariesindia.org

FROM THE DESK OF CHAIRPERSON - LIYAQUAT KHAN
ADVISORY GROUP ON HRD, ADMIN AND FINANCE

actuary Bkhan #sify.com

nteresting to read the script that I wrote for someone else in October, 2010 !

Immediately after assuming the responsibility as President in September, 2010, I went on to constitute a sound governance structure that can provide a base for any President to optimise functioning of the Institute. Advisory Groups/Strategic working Groups came out of such a vision, then 15 and now 1 , the Advisory Group on Off-shored Actuarial Functions added on by my successor President, .arunanidhi.

The Advisory Group on HR ', Admin and Finance (AGHAF was one of the Àteen to be chaired by my predecessor, President G N Agarwal. The script that I wrote in consultation with Agarwal to be actualised by him, remains as it is, now in my lap courtesy President .arunanidhi who asked me to chair the Advisory Group. Let us look at it;

Functions of the Advisory Group on HRD, Admin and Finance (AG HAF)

- Assist the Council in developing the Institute as a service organization that provides quality service to members: good member administration system, publish turn-around-time for responding to member queries,
- 'evelop road map for Institute to have its own premises and take steps to acquire a suitable plot in the immediate.
- High level integrity in Àancial systems and controls,
- Ensure high level of staff motivations, adequate compensation and career path.
- Take a view on staf Àng matters and advise the President accordingly.

I also inherit the team that was put in place for my predecessor;

0ayur Ankolekar

Subhendu Bal

N .alpana, and

Bharat Venkataramani

0uch that this Advisory Group achieved in advising the President was covered in many of my columns and those of the IAI members who have open mind, eyes & ears can feel the same.

The AGHAF in smooth succession moves on with immediate focus on;

1. The IAI's own Property: a long haul, however, touch wood previous two month's fantastic achievements are likely to close the subject within this Àancial year.
2. The ne[t step in MTS: Having gone on-line just about all member services, time is now to build up protocol of system changes/ authorisation and strengthen the system integrity including IT staff accountability. IT Advisor has already been advised to work on these aspects.
3. ACET and E[amination processes/ systems integrity: It was a challenge to set things in place on which a dedicated team within of Àce and the leadership team of Examination Advisory Group under Varun Gupta and Puneet Nayyar as Chair and Secretary respectively produced wonders. It is for AGHAF now to ensure that systems are strengthened and processes move on with clock-work precision. Better said than done, however commitment and passion for e [cellence is what that makes things happen. After all who could imagine that ACET will be a reality with as many as 41 examination centres (as against 12 for years around India!
4. The 3S: A sprout out of ACET and a dream come true for many of us, came to fruition after more than a year of hard work, the Students Support Scheme aimed to facilitate IAI examination study for economically disadvantaged students. Courtesy Council decision, the administration of the 3S has fallen in the lap of AGHAF. Announcement has been made and applications have started coming in. In AGHAF we take it as a great privilege to administer the 3S and ensure that monitory assistance reaches those who deserve and are entitled for.

An exciting path ahead for AGHAF and self-motivating too.

Time is too slow for those who wait,
too swift for those who fear,
too long for those who grieve,
too short for those who regjoice,
but for those who love, time is eternity.

FROM THE DESK OF CHAIRPERSON - TANIA CHAKRABARTI ADVISORY GROUP ON RESEARCH AND PUBLICATION

Tania.Chakrabarti #royalsundaram.in

Friends,

Wishing you a very happy and prosperous new year!!

Let me start my article with a small story..

A little girl came home from school, excited. In her Àst, carried a handful of seeds. Carefully, the young girl dug up the ground and planted those seeds. She watered the ground with love. The girl was excited about growing her Àst plant! The next day, the girl went expectantly to the site where she had planted seeds and found nothing there. A few days later she went back, hoping to see a little plant grew; but nothing had came up so far.

In tears, she went to her father, ´ 'addy, I've planted the seed, and I've waited and waited. Nothing seems to be happening. What do I do " µHer father smiled and said, "You've planted that seed, you've watered it every day, now all you have to do is, wait. You see, you think nothing is happening, because you can't see your plant grow, but actually, the little seed has already burst open underground, it's growing strong little roots. And once that's done, it will break through the mud and touch the sky µTaking her father's advice, the little girl waited. And soon enough, tender little shoots broke through the mud, and the girl was delighted.

Oftentimes, we're looking for a quick À or we are impatient for results. But instead of getting ruf Éd up, and unnecessarily worried about things, let's take the time to breathe in deeply, wait in peace for our efforts to bear fruit.

The story sums up the feelings of the AGRP!!

The AGRP is entrusted to constitute, mentor and develop a research team in the Institute and to guide for its functional activities targeting "To promote research to advance actuarial science/ application µas one of the missions of the Institute.

In August 2012, the AGRP got its Vision and 0ission statement and strategy for reaserch approved by the Council.

The research strategy for AGRP is as follows:

1. To identify subjects for research, to encourage working parties and individuals to undertake research, and disseminate research Àndings within the profession, academia and external bodies. All the projects would be anchored under the research dept of IAI and 0 0IC
2. To be responsible for putting in place and reviewing an institutional system of commissioning research project every year under IAI. The group would be guiding the 0 0IC and research dept under the IAI on various research related matters.
3. To identify key / emerging issues across all practice areas which may require research and insights in the coming months / years by the actuarial profession
4. To identify subjects for research, to encourage working parties and individuals to undertake To be in touch with the research groups of other actuarial bodies of U ., Australia, US etc to seek opportunity to engage in collaborative research projects
5. To participate in the seminars organized by each practice area group and present either the research work done by the group or talk about some emerging issues relating to the practice area
6. To advise the Institute on any regulatory or market issues that potentially may affect the status of the profession.

Based on feedback received from all advisory groups, on the topics where research is a priority in their practice area, expression of interest for undertaking research work was invited for the following topics:

I. 0edical cost calculation in India- Possibilities and Proxy methods
II. Trends in Salary escalation rates in India-Ways and 0eans for projections
III. Withdrawal rates for Pension scheme valuations-Practices and prudent approaches
IV. Crop Insurance- Product design and Implementation
V. Co-variance risk and capital modelling in 0icro Insurance
VI. Building price index for Fire, 0arine, Engineering, 0otor and Individual Health- Identifying Underwriting cycle
VII. In Ático Indices- Construction costs and 0otor spare parts
VIII. Economic Scenario Generator- Understanding needs and requirements of Indian 0arket
IX. Critical Illness- Indian experiences vis-j-vis CIBT 3 rates

Response from members to our call for "expression of interest µ for the above subjects was not encouraging. It came to us as a surprise than shock to note that no entries received from any of our quali Às ed members, especially young actuaries in Fellow/Associate group. Those who expressed their interest in some of the subjects carried no actuarial experience and/or quali Às ation to get the project awarded. We could award only one subject out of all above. It's unfortunate, but true.

The research team has identi Às ed one out of remaining subjects to undertake as an in-house project and working on it, though this initiative slightly deviates from the strategy of AGRP. They are also exploring possibilities of taking up another research subject which require data inputs from insurers/re-insurers. I would appeal to all Appointed Actuaries and Chief Actuaries of Insurance companies to support the research initiative by sharing data with the research team.

Since all the projects have been selected with speci Às inputs from the various advisory groups, I would also like to appeal to all the members of the Advisory groups to come forward and volunteer for the projects which were not taken up and also projects offered in the future. We have started identifying more subjects in our efforts to take the activities and to meet our strategic objectives.

In the meantime, the research department in IAI has completed a survey on Institutions into the actuarial off-shoring work in India and the report is ready to be presented in 15th GCA.

The research team is also working on another survey on Employee Bene Às. The survey report is expected to be ready in the coming days and would be presented in 15th GCA depending on its merit and outcome.

We have a busy schedule for the year ahead and with cooperation from all of you we can make really good progress in the research activities.

See you all at GCA!!

FROM THE DESK OF CHAIRPERSON - AVIJIT CHATTERJEE

LIFE INSURANCE ADVISORY GROUP (LIAG)

avijit.chatterjee #iciciprulife.com

Since I last shared the view from my desk, much has changed or is in the process of changing. In particular, we are all coming to understand the effects of the regulatory changes implemented in September 2010 on policyholders and on our businesses.

The most important effect appears to me to have been in the treatment of expense and persistency risks in unit linked business. Firstly, the extent of expense risk was increased as charges came to be limited, and secondly, persistency risk was largely allocated to companies rather than to policyholders.

We are now in a position where the risks arising from expenses and persistency are largely allocated to policyholders in conventional savings business, and to the company in unit linked business. In both cases, it is imperative that the underlying issue of poor persistency be addressed if the industry is to prosper.

Expenses and persistency are of course, to a great extent, two sides of the same coin: a level of expense that can comfortably be borne in a 10-year policy can appear egregious if applied to a 5-year policy. So the solution must be twofold: Àstly to become more ef Àient, in particular in distribution, and secondly to improve policyholder persistency. The principal dif Àculty in reaching such a solution is in improving the quality of sales, so as to generate higher policyholder persistency, while simultaneously reducing their cost.

To help us see a solution through these dif Àculties, at this year's GCA, in the sessions devoted to life insurance, we have scheduled some time to focus on the problem of persistency. The session will be chaired By 0r Sudhin Roy Choudhury, 0ember (Life , IR 'A, and will comprise presentations from a range of domestic and international experts followed by a panel discussion.

The session will be followed by detailed consideration of the Indian life insurance market from an international perspective and with some prognosis of its future. To help disperse any lingering cloud, we shall then turn to the potential growth area of disability insurance. Lastly, two eminent 0anaging 'irectors of Indian life insurance companies will share their ideas on the future for their companies and for the industry.

Turning from the GCA, the activities of the LIAG have continued unabated over the course of the year, principally in three areas:

1. We have recommended to Council of the Institute revisions to existing guidance notes or practice standards in respect of peer review and disclosures to be made in an IPO, as well as recommending two brand new guidance notes;
2. We have provided feedback on proposed regulatory changes when the profession has been consulted by the Regulator, in particular in matters of product design; and
3. We staged a successful and stimulating seminar on Current Issues in Life Assurance (CILA in November. Wide-ranging discussions covered product and reinsurance regulation, risk-based capital, the role of the appointed actuary, etc.

If you are interested in participating in LIAG's activities, please get in touch, as there is more than enough work to go round.

I look forward to hearing from you,

WHY ATTEND 15 GCA? ... TEASERS FROM SOME SPEAKERS...

(mployee%neÀs &onsulting Professional&onduct Issues

- Concept, Connotations and Current framework
- 0arket Practices and Asymmetries
- Global Best Practices
- Blueprint for the Future

C2: Concurrent Sessions on Pension, Employee Bene Às & Social Security
K. Subrahmanyam and K. Sriram, India

General Insurance concurrent session

In the wave of regulatory changes related to insurers' solvency, insurers worldwide are considering the usage of Economic Capital (EC models to calculate the amount of capital they need to set aside for contingencies. EC models help companies to identify and measure the risks they are facing, as well as, promote a culture of risk management within the organization. While building a fully integrated EC model may require expensive modeling tools, General Insurance Às in India may think of low cost excel/R based risk aggregation techniques as a Àst step towards building EC models.

C4: Concurrent Sessions General Insurance Charles Cicci and Arijit Das, India

FROM THE DESK OF CHAIRPERSO

MEHUL SHAH
ADVISORY GROUP O
GENERAL INSURANCE

0ehul.Shah #tinsurance.com

It gives me great pleasure to connect with all the IAI members, introduce our Advisory Group on General Insurance and also provide an update on some of the key areas of activity that the Advisory Group is focusing on in near future.

The responsibilities of the advisory group are similar in nature as that of other advisory group in terms of ability to in Áuence, shape and further the development of actuarial practice in the Åld of general insurance industry by providing IAI's view to various regulations released by the regulator, formulate guidance notes and actuarial practice standard etc. The members may visit IAI's website for the exact details on the group's responsibilities. (http://www.actuariesindia.org/sub 0enu.aspx 'id 1 &val Advisory Groups .

Given the shortage of actuarial talent within the General Insurance domain, one of the prominent mandates of the group is to develop or enhance the relevant technical skills which are genuinely valued by the employers. The need for building actuarial capacity is further accentuated in recent times by the changes brought in by new regulations which have increased the roles and responsibilities of actuarial function. The group has already conducted 3 Capacity Building Seminars in last one year and has plans to do such exercise on regular basis in the coming years.

I would also like to draw your attention to General Insurance Concurrent Session at the 15th GCA. True to its name, i.e. Global Conference of Actuaries, we have 3 international speakers deliberating on topics as wide as Role of an actuary, Risk management and economic capital modeling in General Insurance. CEO's of two eminent Indian general insurers are adding diversity to the list of speakers by sharing their Perspectives on product development and Evolution of Indian General Insurance Industry. Furthermore, R. Chandrasekaran, Secretary General of General Insurance Council is going to speak on the future of non-insurance and 'FA tools.

Looking at the list of speakers and topics being covered by them (for more details you may visit http://gca.actuariesindia.org/ , I am sure the General Insurance Con-current session is going to be an interesting session at the 15th GCA.

Looking forward to see you at the 2013 AGFA & 15th GCA

9th January, 2013

NOTIFICATION FOR INVITING APPLICATIONS FROM ELIGIBLE IAI STUDENTS SEEKING ASSISTANCE UNDER STUDENT SUPPORT SCHEME (VER. 1.0 DEC 10TH DECEMBER, 2012)

This is to notify that the Council, within the powers vested in it under Section 1 (1 and 1 (r of the Actuaries Act 200 , has introduced Students' Support Scheme (3S to support economically disadvantaged students.

The scheme aims to provide Åancial support to student members of IAI with the potential to become an actuary, who may otherwise Åd it dif Åcult to mobilize Åancial resources to pursue the examinations. 'etails about the scheme and procedure for making application are available on the IAI Website at http://www.actuariesindia.org/sub 0enu.aspx 'id 245&val Students B Support_Scheme

The applications should be sent by courier (and in no other way to nodal person as under;

Ms. Khushnum Rao
ACET Team
Institute of Actuaries of India
302, Indian Globe Chamber, 142, Fort Street, Off '.N. Road, 0umbai -400 001
Board line: 1 22 4 33 33 _Fax: 1 22 4 3330 'irect: 1 22 4 3355
E mail: acet #actuariesindia.org

Before sending the application it should be ensured that the applicant satis Às all the criteria as stipulated in the scheme and the application form and all the requirements are met. 'ecision on the application will be taken within reasonable time and communicated. It should be ensured that no approach is made to any one for the purposes of in Áencing decision including any staff member of IAI.

The applications will be entertained on on-going basis and are not linked to any one Examination 'iet. It is emphasized that the material on the website is complete enough to answer any query that a prospective student may have, however clari Àcations by e mail may be obtained from .hushnum Rao. It is further emphasized, that no persoonal enquiry directly or indirectly is expected.

Gururaj Nayak
Head -Operations

Visit us at: www.actuariesindia.org

FACE TO FACE WITH

OFFSHORED ACUTRIAL WORK IN INDIA - SUCCESS STORIE

ALEXANDER JOHN

GLOBAL RETIREMENT DIRECTOR,
AON HEWITT (INDIA)

alexander.p.john #aonhewitt.com

Alexander John works with Aon Hewitt in Bangalore and manages the Retirement team. This is a 200 member strong team working out of Bangalore and NCR. He has been with Aon for about years. He is from 0umbai but enjoys working & living in Bangalore.

PERSONAL

What jobs and e[periences have led you to your present position?

I started working with Aon in 200 and have been with the organization since this business was set-up. I'm a Bachelor of Commerce degree holder from Bombay University with over 20 years of work experience. 0y experience includes working in banking & Àancial services and telecommunications.

Describe your current roles and responsibilities?

I am the Global Retirement 'irector for Aon Hewitt in India. In this role I manage the offshore Actuarial team supporting Aon employees in the US, U . and Canada. Our business ensures high quality work is delivered to Aon employees globally, in a timely and ef Àient manner. 0y responsibilities include stakeholder management, new opportunity identi Àation, cost management, meeting delivery objectives, building and developing teams and guiding the business to meet its Àancial objectives.

What are the key qualities required in your position?

0y key skills are ensuring support businesses are set up correctly and managing ongoing operations for success. The skills required to be successful in this role include quick thinking and making decisions that will help us stay ahead of our competition at all times. As this is still a nascent Àeld, bold decisions need to be made to achieve business objectives

PROFESSION

Please describe a typical day at work?

On a daily basis, our team strives to learn new skills from seasoned colleagues across regions. This gives our employees an opportunity to understand new ways of working and delivering results. Our teams have the capability and the skills to Àin within any geography and perform. Within our business, there have been employees who have been absorbed within the larger organization as a result of their high quality outputs.

How much demand is there for people in this occupation? How rapidly is the Àeld growing?

There a large number of Actuarial students in India. 'espite the numbers, there is a huge shortage in the workforce, especially for candidates with three to Àve years of experience. This gives the illusion of skill shortage and also drives increased costs.

How do you think IAI can support better its members?

I Àrmly believe that the Institute of Actuaries of India needs to work with students and businesses to de Àne a common ground which is mutually bene Àcial. By liaising with businesses and understanding actual requirements and skills needed, the Institute can be a game changer, driving quality education and setting realistic expectations. Today, students are provided guidance in a haphazard manner which leads them to making a decision that they may regret in the long term. The Institute is in an ideal position to provide advice and guidance to workforce entrants that is realistic.

INSURANCE INDUSTRY IN INDIA

What trends do you see for this industry in the ne[t 3 to 5 years?

As mentioned earlier, our students have the skill to perform under various conditions. This is the good news. This sector has been perceived as slow on the uptake, it is picking up. For global businesses, this is an opportunity to move some of their most expensive skills to India and expect the same quality of output. I'll not be surprised if the number of employed Actuarial students double in the next 3 to 5 years. Actuarial services are an area which corporations keep very close to their heart. There is a change in thinking happening globally. India, and our students, stands to gain tremendously with this change.

What are the top three issues facing the Financial sector, Pension provision & Insurance sector in India.

The F 'I increase in Insurance and Pension is a long-awaited decision. It will be interesting to see how this changes the landscape. While there have been some reactions to the news, it appears quite muted compared to the pre-F 'I announcement days.

OFFSHORED ACTUARIAL WORK IN INDIA

What are your views on such work being carried out within India: its volume, spread over countries, its challenges etc.?

Today, a student gathers experience by changing jobs or on the basis of anecdotal feedback. This is not a good sign for both students and organizations. Any facility which helps the student decide his preferred professional alliance before they pursue this course will be immensely helpful.

Any speciÀc challenges facing actuarial workers in this area of employment within India?

If we look at the variety of offshore work happening in India, you'll notice that it almost covers the globe. Students have the opportunity today to pick an area of interest and pursue the same. What is lacking is appropriate guidance and counseling opportunities for students to identify their focus areas.

Suggestions for the IAI which can support better such work in India?

The Institute has been forthcoming and forward thinking in its views. This will help the profession move to the global arena. This profession has the potential to be the next big thing in India. 'ecisions made over the next couple of years will determine our path. The Institute needs to lead the profession in one common direction and all related businesses, including Aon Hewitt, play a critical role in charting that path. I wish the Institute and all its members the very best for the future.

OFFSHORED ACTUARIAL WORK IN INDIA - COMPANY PROFILE

Tomorrow•s results require commitment today.

Aon plc is the leading global provider of risk management, insurance and reinsurance brokerage, and human resources solutions and outsourcing services. Our key advantage is our broad view of two of the most important issues in our economy today: risk and people. With an employee base of 62,000 people working in more than 120 countries, we can anticipate how changes in one sector impact another.

Risk. Reinsurance. Human Resources. Empower Results'

AON

CAREEROPPORTUNITY

Oliver James Associates was established to provide a fully comprehensive search & selection recruitment process to the financial services sector on a permanent and contract/interim basis.

Oliver James Associates has taken a unique approach in enabling each experienced recruitment consultant to develop an enviable knowledge base around their chosen specialism. Whether it be within Finance, Risk, Internal Audit, Compliance, Actuarial, Tax, Legal or Project Management we will be able to offer client and candidate alike, a knowledge of market movements, trends and availability, that will be invaluable to both.

We currently recruit throughout the UK, Ireland, Continental Europe and Asia.

Chief Actuary & CRO

Job Description

Our client is a Re-Insurer based in the Middle East with operations across Asia. We are looking for a qualified actuary to come on board as the Chief Actuary and Chief Risk Officer and form part of the leadership team.

With a regional remit, this person will manage the actuarial team and take responsibility for reserving, pricing, capital, risk and ad-hoc projects which will work with underwriting, claims and external consultants.

We are looking for a qualified actuary with at least 7 years of experience, preferably within re-insurance, though it should be noted that there is no ceiling on experience.

I can share much more information with suitable candidates so please apply via e-mail; toby.weston@ojassociates.com

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OFFSHORED ACUTRIAL WORK IN INDIA - SUCCESS STORIES

NEIL NARALE

LEADER OF THE ACTUARIAL OFF SHORE TEAM
MERCER (INDIA)

neil.narale #mercer.com

Neil Narale is the Leader of the Actuarial Off-Shore Team for 0ercer (India . He has over 15 years of experience in the employee bene Às actuarial industry. He has been with 0ercer since 2003 and started his career as a Retirement Consulting Actuary in Toronto, Canada. He is a Fellow of the Society of Actuaries (US and a Fellow of the Canadian Institute of Actuaries.

PERSONAL

What jobs and e[periences have led you to your present position?

Let me start by telling you a bit about my background Às. I am of Indian decent (my parent's were born and raised in India , however I was born and received my actuarial training from Canada. In Canada, the actuarial profession is quite established and well known. Actuarial science was a Åeld I came across in high school in fact, and as I was strong in mathematics and economics, I naturally decided to pursue becoming an actuary when I applied to college. 0y Às job was as an intern at the age of 20 for a company called Sedgwick Noble Lowndes in Toronto, Canada, mainly performing actuarial bene Às calculations. I also helped develop their excel based valuation program which was later used to run their simple pension valuations. This was probably one of the best experiences of my professional career. Lastly, I completed my exams at the age of 2 and became a Fellow of the Society of Actuaries (US and Fellow of the Canadian Institute of Actuaries.

Describe your current roles and responsibilities?

I currently lead the off shore actuarial team for 0ercer (India . 0y responsibilities include overseeing of the operations and ensuring a strong stakeholder connection with our on shore counterparts. To run our business effectively, it also important that I have a deep understanding of our actuarial services. As such, I do involve myself in some of our challenging high risk projects to better ensure smooth service delivery. Lastly, it is key as on off shore organization we develop the best service delivery platform. I spend my time Åinding better ways to improve quality, turnaround time, risk reduction, ef Åiencies and standardization of our processes.

What are the key qualities required in your position?

The best way to describe my role is to have the right balance of being a business leader combined with strong technical actuarial skills. 0y role ultimately is to lead the team and manage our operations. However, I more often than not get involved with many technical aspects of our actuarial services, especially if we are faced with a challenging situation where I might need to respond to our on-shore counterparts. Lastly, I would say strong communication and presentation skills are key. A big part of my role is to be on calls speaking to our stakeholders, presenting in person our value proposition and dealing with issues as they arise. This requires not only a thorough understanding of our service delivery, but the right communication style to ensure clarity and no misunderstanding.

Challenges that you faced on the route to becoming an Actuary?

I was fortunate in my career to have completed my exams and qualify as a fellow actuary at the age of 2 . I did of course Åind the entire exam process and balancing studying with my job very challenging. What I focused on was ensuring I made the right investment in studying up front so that there was a high probability of a passing. I rarely went into an exam underprepared, and planned well in advance before the exam. This meant studying sometimes 4 to 5 months in advance. I also was not married while writing exams. 0y strong advice to all those that are young and single is, spend the time now studying while it is much easier to do so. Once you get to a point where you have more responsibilities, you simply do not have as much time, and studying only becomes that much harder.

PROFESSION

Please describe a typical day at work?

About 0 of my day comprises of meeting and connecting with our on-shore stakeholders, be it related to a routine status call or dealing with a speci Às situation. I spend the remaining time connecting with the team on day to day operations as well as getting involved in any technical aspects where the team requires my support.

How much demand is there for people in this occupation? How rapidly is the Åeld growing?

The actuarial off shore industry in India as it relates to employee bene Às is currently a growing Åeld. The de Åned bene Às industry in the mature markets continue to face challenging times, as most plans are underfunded and require support from our actuaries on how to deal with substantial funding de Åits and plan volatility. The off shore model provides a strong labour pool to assist in many interesting projects that are coming up as result of our current economic situation. In addition to pension valuation services, clients are off shoring other actuarial services such as assistance in de-risking solutions, assumption modeling and experience studies.

OFFSHORED ACTUARIAL WORK IN INDIA

Your current area of responsibility is managing employee bene Às actuarial services. Can you e[pand on this?

The main actuarial services we support are related to pension and non-pension retiree medical valuations. In addition, our teams prepare accounting disclosures under each country's

speci À accounting standards (as well as IAS . We also provide other client services like government reporting, special studies and assistance with assumption modeling.

- What are your views on such work being carried out within India: its volume, spread over countries, its challenges etc?

0y views are extremely positive about India supporting off shore actuarial services. Having come from Canada where the actuarial market is very mature, I have been very impressed at the level of talent and high work ethic that exists in the Indian market today. We have hired and trained a talented team at 0ercer that performs pension actuarial services for many clients and countries globally and has done it at the same level of service delivery before the work was ever off shored. The main challenge we face is we would like to do more, but need more experienced staff and those with more exams passed. I do expect this to be a temporary situation and in the next 5 years the Indian market to substantially mature.

- Suggestions for the IAI which can support better such work in India?

As the off shore industry in India has now expanded so largely, it will be important for the IAI to cater its support activities to this new and unique Æld of play. I was impressed last year seeing topics being presented at the GCA on “India as a Global 'estination µ I would strongly suggest this type of thinking continue to expand with more focus on the technical actuarial work currently off shored to India. Lastly, I would recommend the IAI connect with other actuarial bodies beyond the IoA (U . and develop bilateral agreements with them on fellowship designations. As more and more students from India pursue exams with actuarial bodies from countries other than India, it will be important for the IAI to ensure they remain an active member in the off shore actuarial space.

OFFSHORED ACTUARIAL WORK IN INDIA - COMPANY PROFILE

is a global consulting leader in talent, health, retirement and investments. Mercer helps clients around the world advance the health, wealth and performance of their most vital asset – their people. Mercer is a wholly owned subsidiary of **Marsh & McLennan Companies** (**NYSE:MMC**), the parent company of **Marsh**, **Guy Carpenter** and **Oliver Wyman**.

Mercer provides strategic, administrative and compliance-related retirement services to clients with an emphasis on financial management of retirement programs. **Gurgaon** & **Noida** are our largest, fastest growing Retirement Service Centers (RSCs). They employ over **300** actuaries who support clients across USA, Asia, Latin America, Australia, Canada and UK.

Mercer actuaries assist clients with developing, enhancing and financially measuring their retirement benefit programs. This includes analysing client data to establish correlation between employment trends and clients' retirement benefit programs and funding. Mercer actuaries also ensure updates to clients upon regulated/legislated changes that affect ongoing administration of their retirement benefit programs.

Over 20,000 employees	Serving over 40 countries	Annual Revenue > $10 billion	Serving since 1937	Number of Mercer RSCs

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WHY ATTEND 15 GCA? ... TEASERS FROM SOME SPEAKERS...

Global Round Table

Guess what the global actuarial leader of 'eloitte has to say about the new emerging trends in the global market « is India impacted "

Dave Foley, US

ACET TOPPER DECEMBER 2012

UMANG MAVANI

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Tell us about yourself, your educational background and your hobbies

I am currently studying Economics at Indian Institute of Technology, .haragpur and have just completed my 1st semester. I have completed 12 years of my schooling from Birla High School, .olkata in 2012.

I have participated in various mathematics and cyber olympiads and have a keen interest in 0athematics and Statistics.

I spend most of my time listening to music, playing the synthesizer and playing cricket.

How did you come to know about the ACET?

I came to know about ACET from my elder brother who looked upon the website to enquire about the profession of Actuaries. He encouraged me to take up this course. After acquiring information about the course, I decided to sit for the entrance exam.

What has motivated you to take up Actuarial professional course.

I found the Actuarial professional course very interesting. It involves subjects of 0athematics and Statistics which involve a great deal of application techniques. It majorly requires use of simple logic and understanding which attracted me towards it. Also while studying Economics, I feel this could be a great addition to my educational quali Àcation.

How many hours of study on average per day did you put in to top the ACET result where in 1,663 candidates appeared?

I believe that regular studies are more effective than putting up long hours of learning effort. I feel that quality matters more than quantity and it is the complete understanding of the subject that leads to successful results. So I dedicated 2 hours of regular studies everyday including a 10 minute revision period at the end of each day.

How do you think you can add value to the Actuarial Profession?

The Actuarial profession involves application of mathematical techniques to study the past and shape the future. With great interest and understanding in 0athematics, I believe that I can provide a wide range of ideas to solve critical problems, analyse complex relationships and effectively manage the risks involved in all situations.

Any message for the students wanting to take up the ACET in future?

I would like to advise the future applicants of ACET to involve a great deal of understanding of each concept involved in the syllabus of the exam. Also periodical revision of the same is required to set up a strong base. The study material provided by the institute is very effective and must be followed thoroughly. Sample papers and the question bank provided should be solved for self-assessment and for building self-con Àdence.

Any comments on your e[perience with ACET process.

0y experience with ACET was a great one as I enjoyed studying for it. The topics involved in the syllabus were very interesting and easy to pick up. Also the experience of giving an online exam was fun as it involved giving importance to one question at a time which required an ef Àcient management of time. I appreciate the quick release of results, which were displayed within 10 days of the exam.

ANNOUNCEMENT

To
Student and Associate 0embers,

'ear All,

This is to inform you that due to issues with IAI old member tracker software (which has now been scrapped , we had to rebuild member's subject pass data from scratch from physical records available with IAI.

The information of subject passed/exempted/credit is now available in your member's login page under Examination tab. We would request you to examine correctness and accuracy of the data.

If you Ànd any discrepancy in the examination history, you are required to bring it our notice supported by proper evidence by writing to 0r. Sandeep 0ahajan at sandeep #actuariesindia.org

Gururaj Nayak
Head - Operations
Institute of Actuaries of India

Institute of Actuaries of India

INSTITUTE OF ACTUARIES OF INDIA

Invitation to donate

This appeal is for seeking donation so as to have enough funding on on-going basis for awarding the "TOPPERS" in various subjects listed as under;.

CT1 - Financial Mathematics
CT4 - Models
CT6 - Statistical Methods
CA3 - Communication
ST7 - General Insurance – Reserving and Capital modeling
ST8 - General Insurance – PricingS
A3 - General Insurance
SA5 - Finance

Who will be entitled to get the award?
Candidate scoring highest mark in each of the examination diets.

Who can donate for the Prize fund?
Donation can be given by i) individual members of IAI, ii) Insurers, ii) reinsurers iii) actuarial Consulting firms and other iv) employers of the members of IAI.

How much amount of Donation is required to create Prize Fund ?
The amount of donation should be a minimum of Rs. 2,50,000/- and the prizes will be given out of interest earned on the same.

How much amount of Prize will be given?
The prize amount will be minimum of Rs. 5000/- for each candidate in each examination diet.

The Income Tax status of the Donation amount.
Donor will receive benefit under section 80G of Income Tax Act.

Naming the Prizes
The donor can name the Prize.
The acceptance of the offer to donate and the naming of the Prizes will be subject to acceptance by the Institute.
The Institute may have reason/s for not accepting the offer of donation without giving reasons.
If you are interested in creating the award,
please contact
Mr. Sandeep Mahajan at 6784 3304 or at **Sandeep@actuariesindia.org**

18TH IFS REPORTAGE

by Ritobrata Sarkar and Hardik Thakkar

Organized by : Institute of Actuaries of India
Venue : Hotel Orchid, Mumbai
Date : 13th & 14th December 2012

The aim of the India Fellowship Seminar (IFS of the Institute of Actuaries of India (IAI is to provide insights into Professionalism and ethical issues and Professional Conduct standards expected from an Actuary. The Seminar is attended by newly and nearly quali Æd actuaries, who are required to present to a jury for ful Æling requirements for their admission as Fellow 0embers of the Institute. Existing Fellow 0embers also attend to get credit for CP '. The seminar offers an excellent platform to deliberate on various professional and topical issues relating to actuaries in India.

The seminar began with a welcome address by Chandan Khasnobis Chairperson - Advisory Group on

Chandan .hasnobis

Professionalism, Ethics and Conduct. He set out the purpose and objectives of the course and emphasized the importance of professional and ethical behavior in actuarial work as well as a requirement of actuaries to work in public interest.

The Æst session was a case study on pension transfers in a sale and purchase situation by Simon Herborn assisted by Anurag Rastogi under the guidance of .irti .othari. The presenters highlighted the key themes around professionalism that the actuary should bear in mind if he has relationships with both the buyer and the seller. The case study focused on the challenges relating to con Ácts of interest and considered options that are available to the actuary to retain both advisory roles through the transaction process. While the presenters were of the view that it is possible to advise both parties, for example, with Chinese Walls in place, sections of the audience expressed concerns with this and mentioned that it is more appropriate to use two different Æms.

This was followed by a project on the Balance sheet impact of employee bene Às liabilities by Ritobrata Sarkar assisted by Hardik Thakkar under Liyaquat .han's guidance. The speakers presented data relating to bene Às liability and assumptions being used by the BSE Top 100 companies in India. In particular, the session highlighted the inappropriate assumptions being used by Public Sector Banks and the long term risks that they are exposed to. Several members of the audience were of the view that actuaries have a bigger role to play in setting assumptions and there should be appropriate discussions with the management and the auditors prior to conducting an actuarial valuation.

1 TH IFS PARTICIPANTS

The next session was on General Insurance comparing the regulatory framework of India and Australia presented by Anurag Rastogi and assisted by Simon Herborn with .irti .othari as the guide. The presentation was very thorough covering the Prudential Regulation Standards and Financial Services Regulations of Australia along with relevant Regulations, Guidelines, Circulars and Orders of IR 'A. The presenters also talked about the roles and responsibilities of Appointed Actuaries operating in the general insurance industry in the two countries.

This was followed by an interesting case study on inappropriate investment advice by Hardik Thakkar assisted by Ritobrata Sarkar under the guidance of Liyaquat .han. The case study was about an actuary working in an investment consulting Æm who has recently taken over from another consultant. The presentation dealt with the options that the actuary might consider after having found out that the advice provided by his predecessor was inappropriate. Hardik

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presented a well-designed decision tree setting out the possible action plan available to the actuary.

The following session was a case study on capital injection in a U. life insurance company with a non-Ànancial parent based in the Far East presented by .hushwant Pahwa and assisted by Ankur Bassi under the guidance of V Rajagopalan. The case study dealt with the statutory role of the Actuarial Function Holder / Appointed Actuary as well as the non-regulatory role of the Head of Actuarial function in a situation when the insurance company requires capital to maintain a competitive free assets position. The presenters covered the possible reasons why capital may be required and the options available to the actuary. The session was interactive with sections of the audience discussing the role of the CEO in an insurance company.

This was followed by a project on the pricing challenges in the Indian Health Insurance market by 0adhura 0aheshwari assisted by Shuchi Jindal under Richa Gupta's guidance. Lack of credible data, fraudulent activities, anti-selection, high expenses / commissions and selective lapsing were identiÀed as the primary factors that lead to pricing challenges in the industry. The presenters also covered a few mitigation measures for data challenges, in particular, the importance of pooling data and the need for building additional and more effective databases.

The next project was on employee beneÀts design issues faced by corporates by 0anoj .umar and Sunayana 0ahansaria with Saket Singhal as the guide. The presenters covered the key principles of the Actuarial Control Cycle that actuaries should bear in mind while designing beneÀts schemes. They also dealt with the key beneÀts provided by employers in India and the ethical issues that they need to consider while introducing or amending the same.

The th session was a case study on effects of poor investment. This was presented by Suchi Jindal, with help from 0adhura 0aheshwari under the guidance of Richa Gupta. This was an interesting study about an actuary working as a Fund 0anager for a pension fund who lands in trouble after an investment suggested by

18TH IFS PARTICIPANTS

the Chief Executive of the Company goes bad. The case study was well presented with key emphasis on four professional issues, viz. knowing your client, conÁict of roles, terms of employment and conÁict of interests. Suchi touched upon Professional Conduct Standards applicable in the case study as well as gave some pointers as to how the actuary in question may have dealt with the situation.

The Ànal session for the day was a case study on investments by Sunayna 0ahansaria assisted by 0anoj .umar and guided by Saket Singhal. This case study was pertaining to the issues an investment actuary might face when

Rajneesh Sharma

advising a new client. This particular case study was riddled with many interesting twists and turns, not least among them a previously Àred investment consultant, an overeager chairman who wants the new consultant to immediately attend an important meeting and a potential conÁict of interest for the new consultant. This case study was broken down into its individual aspects and each of Àner points examined against the relevant sections of PCS by Sunayna. It gave a very balanced view of the case and was subject to lively discussion by the members present.

The evening guest lecture was delivered by Rajneesh Sharma, 'irector Risk Consulting at .P 0G on Corporate Governance. 0r. Sharma talked about the key reasons for corporate governance failures and the role of the Board in driving good governance, stressing on the importance of implementation of the governance structures.

The Àrst session of second day was a general insurance case study by Yogita Arora, assisted by Jatin Arora and guided by Satyan Jambunathan . The case study was about a consulting actuary to a medium sized insurer faced with data of questionable quality, exit of many key personnel, market rumors about the health of the company and, interestingly, auditors who do not seem to have much of a problem with all that. Yogita gave an Indian context to this case study, covering regulations applicable to general insurers in India where data quality is concerned. At the end, a decision tree for the actuary involved in the case was presented and the presentation ended with lively discussion on the data issues currently facing the Indian insurance industry.

Session 12 of IFS was a project on changing product dynamics in the Indian markets. This was presented by Ankur Bassi and .hushwant Pahwa under guidance of Rajagopalan V. Ankur gave the audience a quick walkthrough of the history of life insurance products in India in the last 12 years. Ankur also covered the recently popularized "non par g-sec linked µproducts as well as proposed regulations on conventional products. The last leg of the presentation was future looking, with a look at use of internet as distribution channel and how Indian insurance companies have utilized it, as well as a suggested path forward for actuaries. Later in the Q&A session, there was a healthy "cause vs effect µdebate about the regulatory changes and products.

The final student session of the IFS was a project on Hedging Options for Life Insurance business by Jatin Arora, assisted by Yogita Arora and guided by Satyan Jambunathan. Jatin first gave some practical examples from product and risk management point of view where need for hedging arises for life insurers. He then introduced some common methods of hedging and typical instruments/arrangements used. He then went on to present a short case study of Variable Annuities in the US. The next leg of the presentation was on the regulatory framework and accounting practices that apply when hedging, internationally as well as in India. An interesting Q&A session followed.

The penultimate presentation for the day was "IAI Disciplinary Process" by Gururaj Nayak and Yogesh Pandit. They took the audience through the disciplinary powers conferred upon the Institute through "The Actuaries Act 2006". There was a lively debate among the audience regarding the limits of these powers, particularly for offenses which might not necessarily be professional in nature. As with such debates, new insights were gained by all present which will no doubt help shape the framework for the profession in the future.

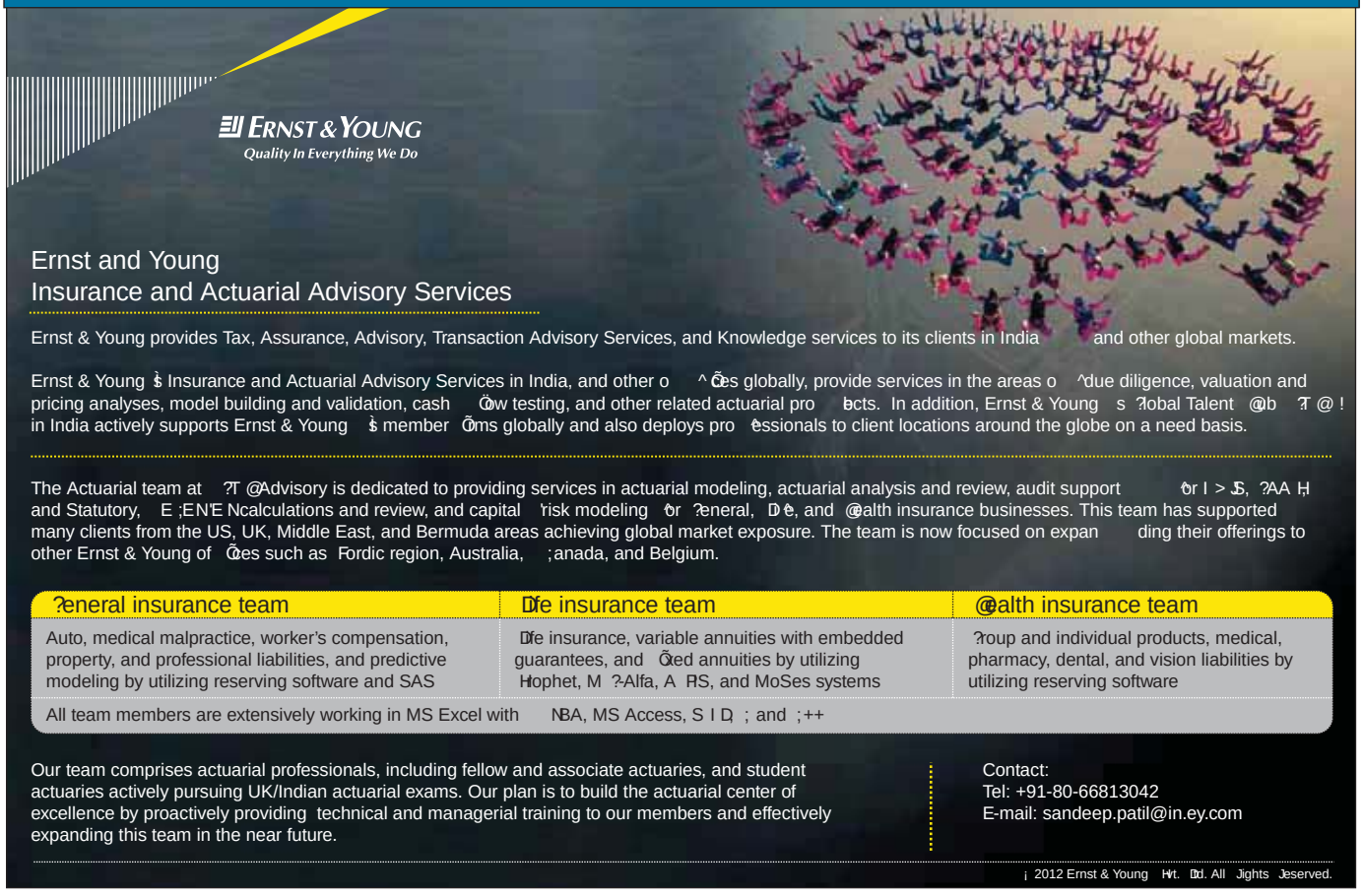
1st IFS PARTICIPANTS

For the last presentation of the IFS, Vandana Nagpal of Institute of Chartered Accountants of India (ICAI) was invited to speak about the disciplinary process in ICAI. This was a very interesting presentation where the audience got to learn about the processes followed in ICAI. Talking points from the previous session gave the audience a good set of benchmarks to ask Vandana about processes in ICAI to which she expertly complied.

Vandana Nagpal

Abhay Tewari, Secretary of Advisory Group on Professionalism, Ethics and Conduct closed the session thanking everyone for their contributions and making IFS a success.

OFFSHORED ACTUARIAL WORK IN INDIA - COMPANY PROFILE



LEADERSHIP DEVELOPMENT PRO

by Ritobrata Sarkar and Hardik Thakkar

Organized by : Institute of Actuaries of India
Venue : Hotel Orchid, Mumbai
Date : 15th December 2012

You know what they say about extrovert actuaries. That they look at the other person's shoes! Of course jokes are hyper exaggeration of nuggets of truth. But there is a general perception that communication skills of actuaries had some room for improvement. This is not necessarily the case anymore as in today's dynamic, competitive business environment soft skills are as important as technical ones.

The Institute has also recognized this importance of soft skills for actuaries of the future and there are now some soft skills programs embedded in the path to Fellowship. The Leadership 'evelopment Program (L'P which takes place just after the Indian Fellowship Seminar (IFS is one of them.

The L'P for 1 th IFS was conducted by Nimesh Rathod and the topic was

Nimesh Rathod

Negotiation Skills. Nimesh has been associated with a few other soft skills initiative of the Institute and thus was a familiar face for many attending.

The Àst half of the program was an ice breaker with various discourses on communication peppered with group exercises. This helped bring about the comfort level in the room which is necessary in such programs.

In the second half, a very interesting case study based on a true incident that happened in India was discussed at length. There were various stakeholders in this case study, including a Company, its employees, environmental activists and local politicians. There were many key takeaways to be learnt from how the Company dealt with a potentially dangerous situation and bene Àted the society as a whole.

This was followed by a role playing exercise, which gave the participants a feel of what it felt like to be in a situation where their negotiation skills are put to test. By the time the program ended, the participants had each learnt some important lessons in negotiation.

Here's a summary of comments made by participants post the program,

- "I have attended many training workshops this year, but I would say this one had the most takeaways for the time allotted!!! µ
- "It gave me data points which I will use for most of my life. This was excellent. Thank you µ
- "Thought points presented in a very simple and effective manner, these should help in improving my weak points... µ
- "Training was really helpful to me in understanding my day to day issues and given me a direction to solve them... µ
- "I feel it was a great workshop. I've attended a few communication related workshops earlier as well, but the content of this one is very different. Especially – Position V/S interest part... µ

As possible improvement, there were suggestions to increase the workshop time from 1 day to 2/3 days, allowing more time for table discussions and activities. Photographs of L'P seminar are available at https://picasaweb.google.com/10502 32 0 510 5 /L'P_Photos "authkey Gv1sRgC 0Xlyfq jNmFvAE

18TH IFS PARTICIPANTS

About the Authors

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MONTE&ARLO INTEGRATI PART II

Part 1 of this article has beem published in Actuary India December Issue

by Aseem .umta

Determining value of the Integral deterministically:

Say, we have a $y=f(x)=x^2$ function we want to evaluate the integral $\int f(x)dx$ with an upper bound of 5 and a lower bound of 0. That is, we want to evaluate the integral:

$$I=\int_2^0 x^2 dx$$

When you Ànd the value of an integral, you are essentially Ànding the area under the curve traced by the function. In the above case, the integral I gives the area under the curve in a XY plane given by $y=f(x)=x^2$ in the domain [0, 5]. Another way of looking at an integral is to think of it as an average value. Finding an integral is like averaging over the function in that domain. The area under such a curve can be approximated by the function A where

$$A = \sum_{i=1}^{N} f(x_i) * \frac{(b-a)}{n}$$

The value of the above integral can be found out using the mean value theorem.

Determining the value of the integral stochastically:

Consider the above integral. 'raw a random variable h in the interval [a, b], i.e. h [a,b], where a is the lower bound of the integral and b is the upper bound of the integral. The curve starts from a (on the axis and ends at b (again, on the axis . In our example here a is 0 and b is 5.

Note that the random variable h is drawn from a known probability distribution (such as uniform or Gaussian which has a known density function ø(. . Then if we consider the estimator $\mu = \frac{f(x)}{\phi(x)}$, the "expected value µof the integral can be represented as:

$$I = \int_a^b \left[\frac{f(x)}{\emptyset(x)}\right] * \emptyset(x)dx$$

As we see, the problem has now become stochastic (random but tractable because we can sample from a known probability distribution and estimate the value, even though that would not be an exact value. The estimator —helps in preserving the sampling probability distribution. Here, without knowing anything about the analytical behavior of the function f (x we are able to evaluate the integral, $\int f(x)dx$ and Ànd the area under the curve. This is the essence of 0onte Carlo Integration.

0C integration is a special case of Importance Sampling, which we shall see later.

An easy example would be to be compute the area under the standard normal curve between 0 and 1.

The integral would be of the form.

$$I = \int_0^1 \frac{e^{-\frac{1}{2}x^2}}{\sqrt{2\pi}}\, dx \ .$$

If we use the standard normal tables this value should be 0.34145.

Here is a code to calculate the value using 0C integration in Visual Basic in Excel.

```
Sub montecarlo_int_gauss()
Dim counter As Integer, i As Double,
j As Double, total As Double, z As
Double
counter = 0
For counter = 1 To 1000
i = Rnd()
z = Exp((-i ^ 2) / 2)
total = total + z
Next counterd
ActiveCell.Value = (total / counter) /
(2 * Application.WorksheetFunction.
Pi()) ^ 0.5
End Sub
```

Below are the tabulated values for different number of runs of random numbers and its closeness to the actual values.

No. of random number generated	Tabulated Values	10	100	1000	10000
Values	0.341344 4	0.2 111	0.3350 2	0.33 02	0.34214
' eviation from table		5.2	.1	.32	100.23

What we have essentially done above is randomly generate numbers within the given limits (0,1 using a uniform (0,1 , evaluated the value of the function at each of the discrete points, summed up the values of the function and divided by the size of the interval i.e. the number of random points generated.

What are the bene Às of 0onte Carlo (0C (or Stochastic Integration over other Numerical 0ethods:

1. This method is easy to implement. There are only minimal requirements that make the method applicable to very dif Àult integration problems. The evaluation requires only the ability to sample random points x and evaluate f(x for these points.
2. The standard error does not depend upon the dimensionality of the integral whereas most techniques of numerical integration—such as the trapezoidal rule or Simpson's method—suffer from the curse of dimensionality.
3. One of the key features of the 0C Integration is that in higher dimensions one need not generate points from each dimension to evaluate the answer which makes it so different from other numerical integration techniques such as the Simpson's rules or the Gaussian Quadrature i.e. for 0 dimensions we would only need 'n' random numbers using 0C method whereas other numerical methods would require 0^n random numbers.

However this method suffers from its own limitations such as:

1. It must be decided in advance on the number of points we plan to choose. Once the number of random points are chosen all those sample points should be completing. With a grid it is not convenient to "sample until µ convergence or termination criteria are met.
2. The 0C method converges slowly. The convergence rate —how quickly the error decreases with the number of samples—of basic 0onte Carlo integration is proportional to 1/ sqrt(N . This means that to halve the error, four times as many samples are needed.
3. The error bound does not re Áect any additional regularity of the integrand.

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METHODS OF IMPROVING SIMULATION PROCESS – VARIANCE REDUCTION:

The ef Àciency of simulation, ease of computation and accuracy are de Àne requirements for any simulation run. Ef Àciency in terms of programming ensures expedited execution and minimized storage requirements. "Statistical ef Àciency µis related to the variance of the output random variables from a simulation. If we can somehow reduce the variance of an output random variable of interest without disturbing its expectation, we can obtain greater precision.

The following are some of the commonly used techniques for variance reduction:

1. Antithetic Variables
2. Common Random Numbers
3. Control Variates
4. Conditioning

A) Antithetic Variables.

Antithetic variables make use of the fact that if U is uniformly distributed over (0,1 then so is 1-U. and that U and 1-U are negatively correlated. The idea is that if, W_1 and W_2 are the outcomes of 2 successive simulation run, then

$\text{Var}\left(\frac{W_1+W_2}{2}\right) = ¼(\text{Var}(W_1) + \text{var}(W_2) + 2\,\text{Cov}(W_1,W_2)$

Hence, in the case that W_1 and W_2 are negatively correlated the variance above will be lower than if the 2 outcomes were independent. The question remains how we can achieve that the outcome of two successive simulation runs will be negatively correlated. From the fact that U and 1 î U are negatively correlated, we may expect that, if we use the random variables U_1 «.U_m to compute W1, the outcome of the Àst simulation run, and after that 1 î U_1 «..1 î U_m to compute W_2, the outcome of the second simulation run, then also W_1 and W_2 are negatively correlated.

This method however, is not used much in the Ànance world. However, this is useful for modeling reliability systems, and studying queuing systems.

B) Control Variates:

The idea of control variates is to simulate the value of one random variable, say X (which might be dif Àcult to simulate using the simulated output of another variable say Y, which we can simulate and is correlated with X. In other words we use the generated values of Y_i's as "control variates µfor X_i's.

Let's say we have E(X) = $\tilde{X} = \sum_{i=1}^{n} X_i/n$, but are able to simulate only for Y which is correlated with X and E(Y) = $\tilde{Y} = \sum_{i=1}^{n} Y_i/n$. In both cases let $\tilde{X}$ and $\tilde{Y}$ be the unbiased estimators of E(X and E(Y respectively and that E(Y is known. The proposition is that due to the preceding, for any constant c the quantity $\tilde{X} + c(\tilde{Y} - E(Y))$ is also an unbiased estimator of E(X .

So we have the formula:

$\text{Var}(\tilde{X} + c(\tilde{Y} - E(Y)) = \text{var}(\tilde{X}) + c^2\text{var}(\tilde{Y}) + 2c\,COVAR(\tilde{X},\tilde{Y})$

And we need to identify c = c' such that the above quantity is minimized. Simple calculus shows that

$c' = -\,COVAR(\tilde{X},\tilde{Y})/var(\tilde{Y})$.

Unfortunately, the quantities COVAR $(\tilde{X},\tilde{Y})$ and var $(\tilde{Y})$ are usually not known beforehand and must be estimated from the simulated data. The quantity $\tilde{Y}$ is called a control variate for the estimator $\tilde{X}$.

To see why the method works, suppose that $\tilde{X}$and $\tilde{Y}$are positively correlated. If a simulation results in a large value of $\tilde{Y}$ (i.e. $\tilde{Y}$ larger than its mean E(Y then probably also $\tilde{X}$ is larger than its mean E(X and so we correct for this by lowering the value of the estimator $\tilde{X}$. A similar argument holds when $\tilde{X}$ and $\tilde{Y}$ are negatively correlated

1. Conditioning

Conditioning relies on a similar thought process as Control Variates. However, its primary logic arises from the fact that E(X E(E(X/Y and Var(X E(Var(X/Y Var(E(X/Y ! Var(E(X/Y , Hence, we conclude that the random variable E(X/Y has the same mean but a lower variance than the random variable X.

So if we let E(X be the performance measure that we want to estimate and if Y is a random variable such that E(X/Y y is known, then the above formulas tell us that we can better simulate Y and use E(X/Y than that we directly simulate X.

2. Sampling:

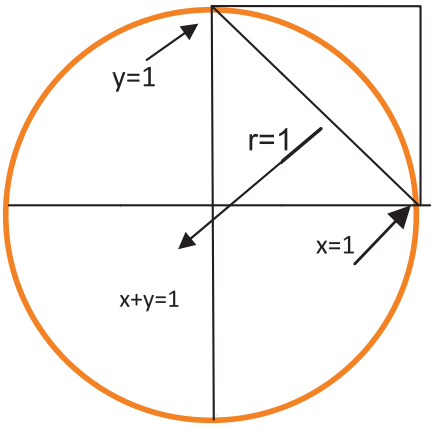
0C logic requires the generation of large number of random variables to be able to completely cover the region of integration or area we are interested in. The accuracy in this case is directly proportional to the number of random numbers generated. For large scale multi dimensional problems there might be issues with computational time and power for generating the random numbers, plugging them into the functions/ equations of interest and then obtaining the output. This may not suit the need of say algorithmic trading desks working on complex derivative structures or for valuation of annuities having multiple embedded long dated options.

A large number of methods have evolved to reduce run times by reducing the number of random numbers generated to À the original function we want to approximate/ evaluate. We will discuss 2 of these which are relatively simpler.

A) Strati ¿ed Sampling:

Strati Àed sampling as the name suggests tries to divide the sample domain into some partitions and sample in each domain separately. The partitions are so chosen such that we have a relatively "better µidea of some regions and try to estimate only in those which we have less information.

Let's relook at the example of calculating the value of pi we discussed in the Àst example. We were generating the points within the unit square, and accepting it if satis Às the region within the unit circle. Consider the line x y 1. This line divides the unit square into 2 triangles of equal area (as shown in Àgure below .



We know that the area of each triangle 0.5 units. Hence we have already estimated that region of the circle lying below x y 1. To generate the value of the circle in the remaining half of the triangle all that is needed is to generate random points to the right of this line and check whether they fall within the region of the circle. The value of pi so calculate 4 (1/2 number of random points in the circle to the left of the line/ total number of random points to the left of the line

You may use the following algorithm for calculating using sampling methods.

```
Function pivalsample(num As Long)
As Double
Dim i As Long
Dim x As Double, y As Double,
sumCircle As Double
sumCircle = 0
For i = 1 To num
x = Rnd()
y = Rnd()
If (x + y) < 1 Then
```

```
x = (1 - x)
y = (1 - y)
End If
If ((x) ^ 2 + (y) ^ 2) < 1 Then
sumCircle = sumCircle + 1
End If
Next i
pivalsample = (sumCircle / num) * 2
+ 2
```

End Function

Using this technique it can be observed that our values so obtained are much closer to the actual value of pi, with the variance between 2 or more runs being lower than what we would have observed under naïve sampling.

A comparison of ten values generated (with 10,000 random numbers for each run is given below along with the mean and variance of the sample.

S. No.	Pi value – naïve	Pi value - sampled stratifying region sampling region
1	3.115	3.1322
2	3.14 2	3.143
3	3.150	3.13
4	3.122	3.13
5	3.14	3.1 14
	3.15	3.133
	3.12	3.141
	3.1 32	3.1412
	3.135	3.1454
10	3.143	3.15
Average	3.141 4	3.1432
Variance	0.0002 5 1	0.0000 2 3

You will observe that the variance is much smaller in the sampled simulation, with the mean value also being closer to actual value of pi.

B) Importance Sampling :

Earlier the method of stochastic integration was covered, which was based on generating points from distribution which we understand to be denser in areas where we the function is more concentrated. The key feature of importance sampling is to generate random numbers from those regions that we believe contribute to the most to the solution while avoiding low contribution regions. This type of sampling is called "Importance Sampling µ

As before, the difference between simple sampling and importance sampling for estimating an integral can be demonstrated as such:

$$I_{standard} = \frac{1}{N}\sum_{i}^{N} f(x_i)$$

$$I_{importance} = \sum_{i}^{N} f(x_i)/p(x_i)$$

In the later case, each point is chosen in accordance with the anticipated importance of the value to the function and the contribution it makes weighted by the inverse of the probability (p of choice. Unlike the simple sampling scheme, the estimate is no longer a simple average of all points sampled but it is a weighted average.

Application of Sampling to Valuing Financial Assets (Simulating a plain vanilla call option on a stock with European Strike :

Intuitively speaking simulating paths of an asset from an initial time t to T, is a case of discretizing the path into smaller intervals, each path taking a value that can be described by a density function, which remains the same across the paths.

Let the value of a call option is given by E[h(S] where the expectation is calculated under the density f(S . We are able to identify another density g(x which is denser in the region of our interest, than our simulation process can be much more ef Àient. Our expectation under the new density will now be given by [h(S f(S /g(s]. This can be represented as follows:

$$\int h(S)f(s)ds = \int h(s)\frac{f(s)}{g(s)}g(s)ds$$

We will be using the stochastic process followed by dS_t to simulate the terminal value of the stock and arrive at the terminal pay off using both naïve sampling as well as importance sampling. Under the naïve method we simulate assume f(dS_t aN(mu dt, sigma (dt Á whereas under importance sampling we use another distribution g(dS_t aN(r dt, sigma (dt Á , to simulate values of the stock.

Essential as is seen above, importance sampling is simply the trick of changing the measure, more commonly known as the (application of Radon-Nikodym derivative.

Provided below is the framework of simulating the option price using naïve sampling under the risk neutral measure.

a. Generate the incremental stock price in a descretized period using the stock prices process equation: dS_t S*(r * dt + $\sigma\, dw$)
b. Calculate the terminal payoff of the stock price using the above simulated value
c. Record the value and repeat the simulation exercise for a predetermined number of times. .eep summing the terminal values so obtained.
d. Average out the sum so obtained and discount it at risk free rate for the present value.

We will be making use of the following assumptions.

Risk free rate p.a 5
Annual Volatility (standard deviation 20
Current stock price Rs 100
Strike Rs 150
Time to expire 3 5 days (1yr
' rift under real world scenario 30

Algorithm to simulate option price using standard (naïve Sampling:

```
Dim S As Double, sigma As Double,
r As Double, dS As Double
Dim t As Long, counter As Long,
times As Long
Dim K As Double, Payoff As Double

t = 365
S = 100
sigma = 0.2
r = 0.05
K = 150
Payoff = 0

For times = 1 To 1000
For counter = 1 To t
dS = (r / 365) * S + (sigma / Sqr(365))
* S * BoxMueller_x(Rnd(), Rnd())
S = S + dS
Next counter
Payoff = Payoff + Application.
WorksheetFunction.Max((S - K), 0)
S = 100
Next times
optionpayoff = Payoff * Exp(-1 * r) /
times
```

End Function

Provided below is the framework of simulating the option price using importance sampling technique. The idea is to generate paths from the real world scenario and scale them to values from the risk neutral path using the Radon-Nikodym (RN derivative.

a. Generate the incremental stock price in a descretized period using the stock prices process equation: dS_t S*(mu * dt + $\sigma\, dw$).
b. Scale the paths using the RN factor.
c. Calculate the terminal payoff of the stock price using the above simulated value

d. Record the value and repeat the simulation exercise for a predetermined number of times. .eep summing the terminal values so obtained.
e. Average out the sum so obtained and discount it at risk free rate for the present value.

Algorithm to simulate option price using Importance Sampling:

```
Function optImpsampling()
 Dim S As Double, sigma As Double,
P As Double, TotalP As Double, K As
Double
Dim r As Double, dS As Double, mu
As Double
Dim t As Long, counter As Long,
times As Long
Dim OptPrice
t = 365
S = 100
sigma = 0.2 / Sqr(t)
r = 0.05 / t
mu = 0.3 / t
K = 150
TotalP = 1
OptPrice = 0
For times = 1 To 1000
For counter = 1 To t
dS = mu * S + sigma * S *
BoxMueller_x(Rnd(), Rnd())
P = Exp((((r - mu) / sigma ^ 2)) * dS /
S + ((r - mu) ^ 2) / (2 * (sigma ^ 2)) * 1)
TotalP = TotalP * P
S = S + dS
Next counter
OptPrice = OptPrice + Application.
WorksheetFunction.Max((S - K), 0) *
TotalP
S = 100
TotalP = 1
Next times
OptPrice = OptPrice * exp(-1*r) /
times
optImpsampling = OptPrice
End Function
Box-Muller Function:
Function BoxMueller_x() As Double
BoxMueller_x=Sqr(-2*Application.
WorksheetFunction.Ln
(1- Rnd ())) * Sin (2 * Application.
WorksheetFunction.Pi() * Rnd())
End Function
```

Output we obtain in 10 different runs consisting of 1000 simulations as per algorithms above and its comparison versus the B-S equation is given below.

As you might notice, the convergence levels are not exactly satisfactory – generally a difference of more than 5 from the analytical value would require model improvisations. But, you will notice that the simulation under importance sampling provides much better results than naïve sampling.

Disadvantages of Variance Rediction Measures:

1. The method of applying Variance Reduction Techniques requires a complete understanding of the model as well the method of variance reduction technique that suits best for this type of model.
2. It may not be possible to know the extent of variance reduction before completion of the run, hence.
3. Some VRT's may be computationally expensive and might require some trade off versus the statistical ef Àiency we may obtain.

Conclusion:

0C methods provide us a fast and ef Àient way to value prices of various derivative securities. It is highly useful in case of path dependent securities such as options with Asian and Barrier type strikes. 0oreover, 0C can also be computationally quicker while calculating expected pay-off's where we know the distribution function, but it has no tractable solution. The other methods of solving for complex contracts would be to model the asset/liability price process through (partial differential equations (P'E and solve for them. In most cases such complex P'Es either does not have closed form solutions and require the use of Àite difference methods. However, the complexity of setting up algorithms for Àite differences and their (possible lack of stability of the solutions are issues of concerns. The last code in C that I saw for solving a P'E using explicit Àite-difference method was around 4 pages. On the other hand 0C algorithms are relatively less complex to code in. Hence, these methods have found of lot of interest among Àancial engineers and actuaries involved in pricing complex contracts and asset liability management.

Black-Scholes Value		0.3596298
Run No.	Option_Simple	Option_In
1	0.455 1 2	0.3 01253
2	0.51 004322	0.3 4 21 4
3	0.4 02 412	0.3 2 5 41
4	0.51 31	0.3 521 52
5	0.3020 3	0.33 12024
	0.323123523	0.40 54 1
	0.34 15	0.3 1 3 4
	0.2 5134322	0.3 42 351
	0.5 4 05	0.4015 0131
10	0.3 4	0.3 5 134 4
Average	0.41 5 0	0.3 523
Var	0.0100 41	0.0004 3314
'iff from B-S	1 .3 3 3	4. 5 3 3

However, like drawback on any other modeling system, 0C also has its own share. Very similar to other models, 0C also suffers from the issues of distribution of underlying variable. So if we have assumed the underlying to follow an incorrect distribution, the results of 0C would also be incorrect.

It also may not be easy to judge how close the 0C values are to the actual "fair value µof the assets we are trying to model. Where closed form analytical solutions do not exist (and these are the most cases where 0C is used it becomes a judgmental call to decide on the number of simulation runs required and underlying distribution of variables. Output values may be different from actual fair values, and it remains in the hands of modelers to determine whether the suf Àient convergence is adequate or not.

0oreover, simulation runs are technologically heavy. For example an annuity AL 0 exercise may require close to million simulations to ascertain fair values of assets and liabilities simultaneously due to complex correlation structures between the balance sheet components. The codes by themselves may be lengthy and complex and can add rigidity to the algorithm. While there has been a lot of effort to develop quasi 0C techniques to reduce run times signi Àantly, these are quite impossible to understand both intuitively as well as theoretically as these algorithms interact with the computer processors through machine language.

All said and done it still remains an extremely powerful tool in the hands of todays actuaries and Àancial engineers to price and value complex contracts and to manage risks.

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À aNQRUGOXQ PF PF QF SGI

ANALYSIS OF SURPLUS - USAGE PE&ULIARITIES IN INDI&N CONTE,T

by Hardik Thakkar

Analysis of Surplus (AoS) is one of the more time tested methods used for understanding of the emergence of profits of an insurance company. Its usage goes back to times when there were limitations on computing power and embedded value concepts had not gained prominence. With arrival of these two focus on AoS has reduced, nevertheless it remains one of the key actuarial reports in many companies and is also a statutory requirement in many countries.

In this article, I will be covering standard methods to perform AoS and then brie Áy outline the particular considerations for Indian market.

What is AoS

The company's gross pro À (or surplus arising over any given period is the movement of excess of its assets over liabilities during that period. Formulaically:

(Surplus Arising $_{t\,to\,t\,1}$ $(A_{t\,1} - L_{t\,1}$ - $(A_t - L_t$

Where A_t Assets at time t

L_t Liabilities at time t

This movement can be divided into two categories, that attributable to existing business and to new business. The existing business liabilities will "unwind µ leading to surplus or de Èit depending upon the experience compared to the assumptions used in liability computation. The new business will contribute new business strain and initial months' cash Áws. The aim of the AoS exercise is to break down these surpluses to individual factors, like expenses, surrenders, business strain, etc.

Since the statutory liabilities have a degree of built-in prudence in form of 0argin for Adverse 'eviations (0A ' , it is common to analyse the surplus in two steps. The Èst step being surplus due to release of 0A 's and the second is the surplus in addition (or lower than the expected 0A ' release. (In a perfect world where all experience is as per Company's best estimates, the latter part would be zero.

Common sources of surplus are:

- Surplus due to deviations in experience from expected : 0ain factors are mortality, morbidity, investment returns, expenses and persistency. As explained above, this may be further broken down to separate implicit 0A 's
- Surplus due to restatement of assets and/or liabilities : This could be due to change in regulations, models, change in methodology, recti Àation of errors / provisional numbers, etc
- Surplus due to writing new business

Why perform AoS

Signi Àcance of AoS exercise from analytical point of view:

- Helps understand the Àancial impact of writing new business
- Improves understanding of drivers of surplus
- We can gauge the Àancial impact of deviations in actual experience from expected
- Aides in experience investigations and assumption setting

Some of the operational aspects where AoS adds signi Àcant value include:

- Checking of the valuation process
- Checking on the quality of data used for assessing the liabilities
- Reconciliation between opening and closing position's statutory liabilities

(The above goals can only be truly achieved if the AoS process is independent of the valuation process.

Having a detailed breakdown of the statutory pro À as afforded by AoS can help an actuary strengthen the case for actuarial advice given. For example, quantifying one time sources of surplus within statutory pro À will aide in advice given suggesting lower statutory pro Às in the future.

In lines of business which have a "cash bonus µ component, AoS helps ensure that one-off sources of surplus are identi Èd and appropriately handled to avoid potential issues of policyholders' reasonable expectations.

Methods of performing AoS

Iterative Approach

The basic step for performing AoS is to start from the Asset and Liability position at the beginning of the time period of interest and have a model to project these to the end of time period. The resultant Asset and Liability position at the end of time period should then be adjusted for new business impact and restatements (like change in regulations, models, etc . The order of the above steps can be changed as long as it is done so consistently.

If the above mentioned projections are performed entirely on actual experienced rates, the resultant surplus arising should be, by de Èition, equal to the statutory pro Èability. (This is in fact the "check on methodology and data µ mentioned above .

Our aim is to break this surplus down to various factors, this can be done by performing multiple such projections. The Èst one entirely on assumptions underlying liability calculations (valuation assumption and then truing up the assumptions to actual experience one by one in each of the future projections. To summarize with a simple example,

Table 1 Assumptions schedule in a hypothetical AoS exercise

	Factor A	Factor B	Factor C
Run1	Valuation	Valuation	Valuation
Run2	Actual	Valuation	Valuation
Run3	Actual	Actual	Valuation
Run4	Actual	Actual	Actual

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For the purpose of quanti Àcation of 0A ' s, this exercise may be done Æst to true up the given factor to the best estimate basis and then to the actual experience, the difference in surplus between the two being excess of surplus over and above 0A ' s. So, if we were to term valuation assumptions stripped of 0A ' as "Best Estimate(BE µassumptions, the above exercise will follow the following assumptions schedule,

Table 2 Above example with quanti Àcation of surplus due to 0A ' release

	Factor A	Factor B	Factor C
Run1	Valuation	Valuation	Valuation
Run2	BE	Valuation	Valuation
Run3	Actual	Valuation	Valuation
Run4	Actual	BE	Valuation
Run5	Actual	Actual	Valuation
Run	Actual	Actual	BE
Run	Actual	Actual	Actual

Formula Approach

There can be potentially large save in time and expenses if instead of projecting the company position multiple times based on various factors the actuary writes appropriate formulae in the model to extract out surplus on account of various factors. The paper "A 0odi Àcation of the Traditional Analysis of Surplus Formula µby Jim Farmer provides a good starting point for writing such formulae (needless to say the standard formulae presented in the paper have to be modi Æd for the features particular to one's models, products, company methods and regulatory constraints, among other things .

A limitation of usage of Formula Approach is that in most actuarial modelling software the time step is not simple to change, consequently the "true up µof assumptions will occur at every unit of time (generally months . The numbers from this approach and iterative approach may then differ.

(Simple) Mathematics behind AoS

While breakdown of surplus as explained above is intuitive in its own, below is simple mathematics involving regrouping behind it.

(Surplus Arising $_{t\ to\ t\ 1}$ ($A_{t\ 1}$–$L_{t\ 1}$ - (A_t– L_t

($A'_{t\ 1}$ – $L'_{t\ 1}$ - (A_t – L_t NBSurp

The "NBSurp µabove is surplus generated from new business written between time t and t 1. The remainder term, ($A'_{t\ 1}$ – $L'_{t\ 1}$ - (A_t – L_t , can then be considered surplus due to existing business as of time t.

(Surplus Arising $_{t\ to\ t\ 1}$ EBSurp NBSurp

Assuming that this hypothetical company is affected by variations in expense, investment, mortality and persistency surplus, we can state:

(Surplus Arising $_{t\ to\ t\ 1}$

$EBSurp_{t\ 1}$ ($EBSurp_{exp\ inv\ mort\ persis\ t\ 1}$ – $EBSurp_{exp\ inv\ mort\ persis\ t\ 1}$ ($EBSurp_{exp\ inv\ mort\ t\ 1}$ – $EBSurp_{exp\ inv\ mort\ t\ 1}$ ($EBSurp_{exp\ inv\ t\ 1}$ – $EBSurp_{exp\ inv\ t\ 1}$ ($EBSurp_{exp\ t\ 1}$ – $EBSurp_{exp\ t\ 1}$ NBSurp

Where $EBSurp_{exp\ inv\ t}$ Surplus computed projecting existing business as of time t on actual expense and investment assumptions and other assumptions on valuation basis.

And so on for other terms.

Regrouping the above,

(Surplus Arising $_{t\ to\ t\ 1}$

[$EBSurp_{t\ 1}$ - $EBSurp_{exp\ inv\ mort\ persis\ t\ 1}$] [$EBSurp_{exp\ inv\ mort\ persis\ t\ 1}$ – $EBSurp_{exp\ inv\ mort\ t\ 1}$] [$EBSurp_{exp\ inv\ mort\ t\ 1}$ – $EBSurp_{exp\ inv\ t\ 1}$] [$EBSurp_{exp\ inv\ t\ 1}$ – $EBSurp_{exp\ t\ 1}$] [$EBSurp_{exp\ t\ 1}$ – $EBSurp_t$] NBSurp

We now de Æne the terms,

[$EBSurp_{exp\ t\ 1}$ – $EBSurp_t$] Expense Surplus

[$EBSurp_{exp\ inv\ t\ 1}$ – $EBSurp_{exp\ t\ 1}$] Investment Surplus

And so on; to get the following

(Surplus Arising $_{t\ to\ t\ 1}$ Expense Surplus Investment Surplus 0ortality Surplus Persistency Surplus New Business Surplus

Analysis of Surplus, then, hinges of appropriately projecting the business based on required mix of actual and valuation assumptions. This brings us to following important considerations,

Important Considerations

Feeding the actual experience to your model

Following are common considerations to be taken account of for feeding the actual experience;

Rate based v/s 'ata Based experience for persistency and mortality

Experienced persistency and mortality rates can be fed into the model by the way of providing experienced rates or through Ægging change in policy status at the data level.

The advantage of using rate-based experience is that it acts as an additional layer of check that the derivation of experienced rates is consistent with their usage in the model. On the Æpside, this approach will lead to average pro Æe (in terms of demographics, fund values, etc of closing position to deviate from the opening position, leading to an "unexplained µreminder.

Conversely, using the data based approach is a more airtight process as far as opening and closing positions are concerned but does not help in validation of process deriving the rates used in projection.

Actual Rate of Return

Considerations need to be given on use of time weighted or money weighted approach for calculation of actual rates of return.

Smaller units of time for measuring the rate of return are likely to lead to more accurate Ægures but would come at the cost of complexity and time to calculate. An appropriate balance between level of accuracy and time to calculate needs to be struck.

Order of calculations

The split of surplus between various factors will depend upon the order in which we true up the assumptions. A general rule of thumb is to consider the most important factors affecting the business at the start. Consistency of orders across various years of calculation is extremely important; failing this comparison of the results between various years will yield misleading conclusions.

Some line-of-business related peculiarities

Unit Linked:

While it must be clear by now that AoS exercise is sensitive to the order of factors while "truing up" because of compound effects of various factors, this is especially so in unit linked business where the unit fund value affects ancillary cash flows. For example,

a 0ortality surplus v/s Investment surplus

In products where death bene fit is higher of the fund value and a given sum assured, the mortality pro fit pro file will change post application of actual unit fund growth rates.

b "Rebase surplus" v/s Investment surplus

Unless the models are rebasing the unit fund at every unit of time some surplus will start arising from second unit of time owing to different unit funds in valuation and projection calculations.

In above and related cases the actuary must take a conscious call about attribution of surplus. It is important that whatever decision is taken is consistent with the understanding of the target audience of the AoS analysis and they have been apprised of such decisions appropriately.

With Pro fits:

The surplus due to increase in bonus liability should offset by those sources of surplus which are being shared with the policy holders. Quantifying the bonus liability surplus and comparing it with surpluses being shared with policyholders is an additional level of check on the bonuses being declared.

AoS and the Indian statute

The Assets, Liability and Solvency 0argin Regulations (2000 require the liabilities to be floored at higher of surrender value or zero at a contract level. As a result, even if all actual experience were to be in line with the assumptions used for liability calculation some surplus may arise. Let us call this "Expected Valuation Surplus" (EVS for the time being.

For example, consider a hypothetical policy of one year where all future in flows exceed out flows by amount "c" on reserving basis. The statutory reserve held towards this policy will be zero, not a negative number. So, even if all experience is as per reserving basis there will be a surplus of "c" (this would have been zero if the reserve was a negative amount .

Failure to recognize the role of EVS in generating a surplus may lead stakeholders to overestimate the financial soundness of the company. It is therefore very important that this component of surplus is appropriately accounted for and explained to all stakeholders.

Final words

0any Indian insurers have started publicizing their statutory pro fits. These numbers are closely observed by many stakeholders in the economy. Statutory pro fit remains one of the most commonly used measures of financial performance. An AoS report is likely to aide in the understanding of stakeholders interested in statutory pro fits of the company.

ANNOUNCEMENT FOR MEMBERS OF IAI

The Actuary India Scheme of Awards for Best Article & Reportage for the Calendar year 2012 and thereafter till amended

The objectives: recognition of the efforts put in and encourages members to write for the Actuary India magazine either in the form of Articles and/or reportage for various IAI events.

Process of selection: Three member Selection Group will be appointed by the President in 'ec. 2012 and every 'ecember thereafter to set parameters for selection and recommend best two Articles and best two Reportages in order of merit.

The Awards and recognition: Based on the Selection Group's recommendations, the following rules shall apply;

a The awards will be given by the Chief Editor during the AGFA held immediately after the end of the calendar year 2012. The awards will be in the form of cash prize and recognition plaque.

b The three member selection Group will send its recommendation by January each year based on editions published in a calendar year 2012 and each Calendar year thereafter.. Every member of the selection Committee will come out with his/her own list of best five articles/reportages. Thereafter, the Group will meet in the second week of January and come out with a commonly agreed upon best two. In the event there is no unanimity the Selection Group will decide on how to select the best two (e.g. going by majority view, draw of lots from the five best drawn by each or any other . This list, along with justifications, will be sent to the President well in time for him/her to announce.

c The Author/s of first best Article and Reportage will receive a prize of Rs. 10,000/- for the Article and the Reportage and the next best will receive Rs. 5,000/- accordingly. In case there are more than one Authors, the amount will be allocated equally, however the recognitions plaques will be given to each.

d In order to qualify each article/reportage should meet the following minimum criteria;

I. at least about 500 words.

II. should not be reproduced from articles elsewhere (while sending the article the author should give a declaration to this effect.

III. Should be written by a member of the IAI (in the case of joint authors, all should be members of the IAI at the time the article is published.

IV. Reportage should be based on event organized by IAI only.

e The award winning authors along with the Selections Groups key points on selection will be published in the March issue of the Actuary India each year.

Liyaquat Khan

CAREEROPPORTUNITY

Requires

$ & 7 8 $ 5 <

National Insurance Company invites Applications from resident India Citizens for the post of 'Appointed Actuary' on Full time basis or on Consultancy Basis

Name of the Post	Appointed Actuary
No. of Post	1 post
Age (as on 01/12/2012)	The candidates should preferably be less than 65 years
4 Xa O La Ft Fons	The candidate should be a "Fellow" of Actuarial Society of India /Institute of $ F W X D U L H V R I , Q G L D D Q G K H V K H W W K R X E H G L E H Regulations No.3 sub regulation 2 of IRDA (Appointed Actuary) Regulations, 2004.
([Se Ueb Fe	The candidate should have minimum 5 years experience in a senior position in Financial Services Industry such as Banks, Financial Institutions, Insurance Companies, Surveyors, IT etc. Preference will be given to people with experience in General Insurance Industry.
(mo OnXents an G%ene Às	Negotiable. Please indicate your expectations.
Duties and obligations	As per Regulation 8 of IRDA (Appointed Actuary) Regulation, 2000.
6e UiYFe Fonditions	Should be resident of India. After appointment he is not expected to act as an Appointed Actuary of any other Insurance Company nor work in any other capacity in any General Insurance Company.
6ele Ftion P Id Fedu Ue	The selection procedure shall be by personal interview.
How to apply	Complete application on foolscap paper neatly typed or handwritten in CAPITAL LETTERS, along with a recent photograph & copies of requisite F H U W L ¿ F D W H V G Fea X Fo Flow Vg Vk Box Ga addressn or before 21/01/2013.The envelope be super-scribed on the top corner "NICL – Appointed Actuary"

General Instructions :-

1. Company reserves the right to restrict the number of candidates to be called for interview.
2. 7 K H G H F L V L R Q R I W K H & R P S D Q \ Z L W H U E H ¿ Q D O D Q G E L Q G L Q J L Q D O O
3. , Q F D V H L W L V I R X Q G D W D Q \ V W D W H R H U V F U X W R H Q W K H D W O L E E D furnished any incorrect/false/incomplete information or has suppressed any material fact(s), the candidature will stand cancelled. If any of these shortcomings are noticed even after appointment his/her services are liable to be terminated I R U W K Z L W K % H I R U H D S S O \ L Q J I R Q V D X Q \ H S W K D W K H V F D Q G L G ¿ D W H W K H R mentioned in this advertisement. The decision of the Company in respect of matters concerning eligibility of the candidate, the stages at which such scrutiny of eligibility is to be undertaken, the documents to be produced for the S X U S R V H R I F R Q G X F W R I L Q W H U Y L H Z L Q H O W H F W L H F Q X L Q G P I R Q K H Z L candidate.
4. The company shall not entertain any correspondence or personal enquiries. Canvassing in any form will disqualify the candidate.

GENERAL MANAGER (P)

INSTITUTE O& FU ARIES OF INDIA

STUDENT SUPPO &NE 3EVER. 1.00 08TH DE &EMBER 2012

by Prerana Sadarangani

Part – I

INTRODUCTION

1.1 The Council makes this Scheme called Student Support Scheme within the powers vested in it under section 1 (I and 1 (r of the Actuaries, Act. 200 and is a result of one of the conclusive action points of the Strategy Initiative Programmes that was carried out during the year 2011.

1.2 This Scheme meets with broad framework of the Vision, 0ission and Value statement of the Institute as adopted by the Council in its meeting on 24th August, 2012.

1.3 This Scheme is a Scheme to support economically disadva-ntaged students. It is an expression, among others, of the IAI's social responsibility and aims to create an enabling infrastructure to reach out to economically disadvantaged students. The Scheme aims to provide Ànancial support to student members of IAI with potential to become an actuary, but who might otherwise Ànd it dif Àcult to mobilize Ànancial resources to pursue the examinations.

Part – II

ELIGIBILITY

2.1 The scheme applies to all students, out of ACET stream or Existing Block,

2.2 The candidate must be citizen of India though not necessarily resident in India during the time span over which the Scheme applies to him/her.

2.3 The candidate must apply for the entitlement under the Scheme as and when such applications are solicited by the IAI.

2.4 The candidate shall not be a bene Àciary at any time under any other scheme meant for the same purpose and has the obligation to disclose voluntarily to the IAI if he/she is bene Àciary of such other scheme/s.

2.5 Not more than two members from a family can be bene Àciaries under the Scheme. Family consists of Parents and unmarried children.

2. The candidate must be a student member of the Institute at the point of application and continually thereafter. The Scheme applies for examinations for the subjects of CT1 to CT to be taken from IAI only.

2. The candidate must not be employed, at the point of application and continually thereafter to avail the bene Às under the scheme.

2. The current annualised family income at the point of application and continually thereafter should not exceed Rs. 200,000/- (Rs. Two hundred thousand . Income certi Àcate issued by the sub-divisional magistrate/circle of Àcer/ block development of Àcer or an equivalent State Government Authority in whose jurisdiction the candidate resides shall be a valid document as a proof of income of income through all sources. The candidate shall be required to provide such income certi Àcate every Ànancial year latest by 30th April for the bene Às to continue.

2. Continuity of the bene Às: At least two subjects should have been passed in the immediately preceding three examination diets for the bene Às to continue.

2.10 The funding:

a The funding shall come out of the surplus generated from ACET admission fee, a percentage of which surplus shall be earmarked for this fund. Such a percentage shall be decided by the Council in respect of each Ànancial year after the Financial Statements have been approved by the Council. 'ecision of such percentage will have considerations factored in to such as i estimate of requirements over current and next at least three years, ii burden on the surplus to fund other educational and examination process improvement activities, iii fund required to market ACET, besides any other aspects that Council may consider relevant.

b An initial corpus of Rs. 10 Lakh to be created from General Surplus. Thereafter, program shall be funded through 15 of surplus generated through ACET Exam.

Part – III

SELECTION PROCESS

3.1 The Advisory Group on HR, Admin & Finance will scrutinize the application and decide on eligibility within the framework of this Scheme.

3.2 Appeal by the candidate to reach the IAI within 30 days of the decision having been communicated shall rest with the Education Committee. The Education Committee shall decide on each application within 30 days and the decision with reasons shall be recorded and communicated.

Conduct and 'isciplinary Processes: If any candidate has misrepresented his / her income, produced false documents/ evidence or indulged in to activities such as bearing pressure on decision making or any other, the candidate shall be subject to 'isciplinary process and penalties as applicable to students generally. Such penalties shall include besides debarring from the applicability of the Scheme, debarring from appearing in examinations for period speci Àed and others.

Part IV

SCHEME BENEFITS

4.1 Funding of annual membership subscription fees.

4.2 Funding of study material cost supplied by the IAI.

4.3 Funding of examination fee for a maximum of two attempts per subject.

4.4 Funding of Coaching or Counselling charges conducted by the Institute, if any.

Part – V

CHANGES TO THE SCHEME

5.1 The Council may at any time make changes to the Scheme including its termination for existing bene Àciaries as well as for the future students.

Part – VI

APPLICATION PROCEDURE

.1 Application shall be in prescribed form, to be downloaded from the Web-site of the IAI (http://www.actuariesindia.org/sub 0enu.aspx "id 245&val Students_Support_Scheme .

SEBI UNHAPPY WITH GOVT MOVE ON LIC HOLDING

Business Standard, ' ecember 1 , 2012

Regulator fears the insurer may get away without making an open offer

Samie 0odak & 0 Saraswathy / 0umbai

' ec 1 , 2012, 01:1 IST On the heels of the insurance regulator raising concern on the government move to allow Life Insurance Corporation (LIC to own up to 30 per cent in a Àrm, the securities market watchdog has expressed displeasure over the step. The Securities and Exchange Board of India (Sebi feels the move could lead to violation of the country's takeover laws.

According to the latest takeover rules, an entity acquiring 25 per cent or more in a Àrm has to make an open offer to buy an additional 2 per cent from public shareholders. That means, if LIC's investment in a Àrm exceeds 25 per cent, it would have to buy another 2 per cent from non-promoter shareholders. If the open offer is fully subscribed, the insurer would end up holding as much as 51 per cent, breaching the cap of 30 per cent.

The thinking within Sebi is that LIC — the biggest domestic institutional investor — might get away without making an open offer, even if it purchases beyond the permissible limit.

HIGH STAKES Currently, LIC holds more than in Àrms

Company Name	LIC shareholding (%)
Corporation Bank	25.49
TCM	23.72
Simplex Realty	22.92
Gloster	22.50
Standard Battery	20.89
Modella Woollens	19.47
MTNL	18.81
L&T	17.70
PTC India	15.75
Tata Steel	15.00

Source &apitaline &ompiled by BS Research Bureau

"Though LIC has been allowed to buy up to 30 per cent, there is no clarity on what happens if open offer is triggered,µ says a senior Sebi oÀcial on the condition of anonymity. It is, however, unclear whether Sebi has oÀcially conveyed its displeasure to the Ànance ministry.

The step has also met with criticism from the Insurance Regulatory and ' evelopment Authority (Irda, which thinks high exposure to a stock, is "imprudent µ Earlier, LIC, too, was governed by the insurance Act, which says no insurer can invest more than 10 per cent of the fund or 10 per cent of the Àrm's stake, whichever is lower.

An Irda oÀcial said the issue of takeover code violation as a result of the step was raised before the Ànance ministry. "The ministry was apprised of the risks in letting LIC pick up to 30 per cent in a company. The possibility of an open offer trigger getting breached was also discussed. However, the ministry went against our recommendations,µ said a senior Irda oÀcial who didn't want to be named.

A senior LIC oÀcial indicated the insurer might seek an open-offer exemption from Sebi in the event of open offer being triggered. "We would not go and invest 30 per cent in all companies. However, if we decide to raise our stake in a Àrm in the future, we will see how to go about it. Sebi had made some exceptions when we decided to invest 2 per cent in a public sector bank. I believe exceptions have been made and could be made in future in speciÀc cases.µ

The market regulator had exempted LIC from making an open offer when its shareholding had breached the threshold limit in Corporation Bank.

Securities law experts say, under the current takeover laws, LIC cannot be exempted from the open-offer obligation and it will have to ensure its shareholding in listed companies stays below 24. per cent.

"LIC getting an exemption in the case of Corporation Bank was justiÀed. But, if an open offer gets triggered in case of a private company, getting an exemption from Sebi would be diÀcult, µ says Pavan Vijay, founder, Corporate Professionals.

Echoing Vijay, Siddharth Shah, partner and head of funds practice, Nishith ' esai Associates, says: "The move to allow LIC to buy 30 per cent stake in a company may have arisen out of the banking regulations. That doesn't mean you are exempted from an open offer. LIC will have to monitor how much it picks up in a company. Practically, it has to remain below 25 per cent.µ

Sebi could exempt LIC from making an open offer for banks as voting rights in banks are capped at 10 per cent.

"The underlying objective of the takeover code is control. As no single shareholder in a bank can have more than 10 per cent voting rights, Sebi has no problem giving such exemptions in case of banks. But, if the voting rights are removed in future, these entities may have to make an open offer,µ Shah adds.

Somasekhar Sundaresan, partner, J Sagar Associates, says, even as the rule gives LIC the leg room to buy up to 30 per cent, it doesn't mean it will go to that level.

"The move could only be an enabling resolution. It might do it in case of unlisted Àrms, µ he says.

■■■

OBITUARY

Mr. Devaraja Ramakrishna Iyer, 82, fellow member of the Institute expired on 14th January 2013 Actuary India expresses deep condolences.