Institute of Actuaries of India
www.actuariesindia.org

INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest

the Actuary INDIA

THE MAGAZINE OF THE INSTITUTE OF ACTUARIES OF INDIA

VOL. V • ISSUE 8 **AUGUST ISSUE** Pages 32 • ₹20

For Private Circulation Only

Actuarial Experts

XL Group
Insurance
Reinsurance

We solve today's complex risks to drive tomorrow's innovation.
We see our careers with XL as a chance to unleash our potential globally.
Cultivate expertise. Collaborate constantly. Analyze deeper.
Dream harder!

UNLEASH your potential

Our India based Actuarial team is looking for Actuarial experts that are looking to help move the world forward.

Actuarial Analyst – Candidates with a minimum of 1 year of actuarial work experience may apply.

Education and Skills – Strong academic background with at least 5 CT Series Exams from Institute of Actuaries of India / UK or at least 2 CAS Exams. Working knowledge of ResQ and proficiency in SAS/VBA/SQL is desirable.

Sr. Actuarial Analyst – Candidates with General Insurance Pricing/ Reserving/Capital modeling/Solvency II experience of 3 and more years can apply.

Education and Skills – Strong academic background with all CT Series Exams and any one of the ST,CA1 or SA Exams from Institute of Actuaries of India / UK or at least 5 CAS Exams. Candidates are expected to handle projects independently including management of communication with Actuaries across the globe, finance professionals, underwriters and senior management. Candidates with prior people management experience will be preferred.

DISCOVER your future

XL Group plc (NYSE: XL), through its subsidiaries, is a global insurance and reinsurance company providing property, casualty, professional and specialty products to industrial, commercial and professional firms, insurance companies and other enterprises around the world.

If you believe you're the right person for either of these positions then email your application to our local HR Manager, Aditi Dattatrey at aditi.dattatrey@xlgroup.com

To learn more about us, visit xlgroup.com

MAKE YOUR WORLD GO

the Actuary INDIA
www.actuariesindia.org

Chief Editor
Taket, Nick
Email: nicktaket@gmail.com

Editor
Sharma, Sunil
Email: sunil.sharma@kotak.com

Puzzle Editor
Mainekar, Shilpa
Email: shilpa_vm@hotmail.com

Marketing Manager
Rautela, Binita
Email: binita@actuariesindia.org

Librarian
Damre, Akshata
Email: library@actuariesindia.org

COUNTRY REPORTERS

Krishen, Sukdev
South Africa
Email: Krishen.Sukdev@absa.co.za

Frank Munro
Srilanka
Email: Frank.Munro@avivandb.com

Pranshu Maheshwari
Indonesia
Email: Pranshu.Maheshwari@aia.com

Smith, John Laurence
New Zealand
Email: Johns@fidelitylife.co.nz

Sharma, Rajendra Prasad
USA
Email: rpsharma0617@yahoo.com

Cheema, Nauman
Pakistan
Email: info@naumanassociates.com

Leung, Andrew
Thailand
Email: andrew.leung@iprbthai.org

Balgobin, Vijay
Mauritius
Email: Vijay.Balgobin@sicom.intnet.mu

For circulation to members, connected individuals and organizations only.

CONTENTS

ENQUIRIES ABOUT PUBLICATION OF ARTICLES OR NEWS

Please address all your enquiries with regard to the magazine by e-mail at library@actuariesindia.org.
Kindly do not send it to editor or any other functionaries.

Printed and Published monthly by Gururaj Nayak, Head - Operations, Institute of Actuaries of India at ACME PACKS AND PRINTS(INDIA) PRIVATE LIMITED, A Wing, Gala No. 55, Ground Floor, Virwani Industrial Estate, Vishweshwar Nagar Road, Goregaon (E), Mumbai-63. for Institute of Actuaries of India : 302, Indian Globe Chambers, 142, Fort Street, Off D N Road, Near CST (VT) Station, Mumbai 400 001. • Tel +91 22 6784 3325 / 6784 3333 Fax +91 22 6784 3330 • Email : library@actuariesindia.org Webside : www.actuariesindia.org

FROM THE EDITOR'S DESK

With the June edition of our magazine, we touched upon briefly the issues confronting health insurance industry. Everyone would agree to this fact that we are in the midst of an incredibly exciting time for healthcare industry in India. Our country is boldly taking place as one of the leading healthcare markets of the world and is expected to be one of the top ten pharmaceutical markets by 2017.

One of the influential areas of this rapidly evolving market is Health Insurance, which forms the second largest segment of Indian non-life insurance industry and is expected to grow at a CAGR of around 32.5% during 2013-14. With almost close to 70% of the healthcare related expenses funded from own pockets, health insurance as a market holds strong growth potential. This growth has been fuelled by increasing healthcare costs and awareness, attributable primarily to demographic changes (prospering middle class, changing lifestyle and increasing population).

Until only a few years ago, health insurance was almost never proactively bought by individuals; instead it existed only as a critical illness rider amidst basic life insurance policies, or within group policies directed at corporations to be included as part of an overall benefit package for employees. Changing paradigm has created demand for new products in the market with optimal pricing. Preventive care, out patients' coverage and long term needs of the population have led way to move beyond conventional products. Insurance companies are gearing up to manage emerging expectations of the insured population and words like product innovation, data analytics and disease management have made their way into health insurance management language.

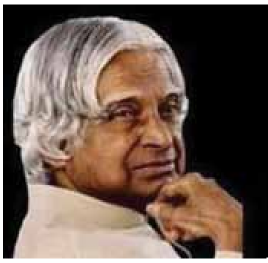
With the introduction of its new health insurance guidelines, the regulator (Insurance Regulatory and Development Authority of India) has taken the next step after portability to promote standard processes and definitions to aid end users' understanding of the insured benefits.

Government has also influenced this sector in big way by initiating central and state sponsored health schemes or incentives programmes, like Rashtriya Swasthya Bima Yojana which has already created a success story for itself at the world level. All these initiatives have helped to increase penetration and reach of health insurance. Also, the recent Cabinet's approval of a bill to increase the foreign investment limit indicates that the government recognises the industry's needs. Increased foreign direct investment in the sector would bring in much-needed capital to fund changing needs, competition and efficiency. Experience of international players would help to improve the way the in which insurance company underwrites, manages claims and analyses actuarial data.

We (the actuarial fraternity members) are eagerly waiting to see the positive results of all these changes! The recently held seminar on current issues facing health insurance was a fruitful initiative in this direction from IAI's side where the different stakeholders were brought on the same platform to discuss their respective concerns and build a relationship of trust to make this journey a successful one. We would keep on supporting these initiatives and efforts as an important member of rapidly evolving Indian Insurance System covering all areas of insurance (whether its life or non-life) and playing role of a proficient partner!

In the future editions of our magazine, we are initiating an effort to highlight emerging and changing landscape of Indian Insurance Industry. Each future edition of our magazine would be focussed on a particular theme where the key articles would be centred on that theme. Request you all to join in this collective effort to help us in taking this initiative forward by contributing relevant articles and write-ups. We would soon be releasing the theme calendar to all the members!

Yours sincerely,
Raunak Jha



The best brains of the nation may be found on the last benches of the classroom.

- APJ Abdul Kalam

8TH SEMINAR ON CURRENT ISSUES IN HEALTHCARE INSURANCE

Organized by: Advisory Group in Healthcare Insurance • Venue: The Orchid, Mumbai • Date: 11th and 12th July'13

Session 1: Introductory Note by Biresh Giri, Chairman Healthcare Advisory Group

In his address he gave brief journey of the Healthcare Insurance Seminar, which was earlier conducted in collaboration with Milliman. He mentioned that currently Advisory Group Healthcare conducts two seminars the other being "Capacity Building in Healthcare". He highlighted that Healthcare industry is growing in at health pace and the growth is across all sectors viz: Retail, Group, RSBY, Govt. Scheme etc. He emphasized the need of regular meeting at industry level to address emerging challenges and issues faced by the industry. The key note address set the tone for the seminar which covered wide range of topic related to Indian and International Healthcare Insurance industry, which were presented by distinguished speaker in the sessions that followed.

Biresh Giri

Dr. Shreeraj Deshpande, Alam Singh, Jagbir Sodhi, Kenneth Cunningham, Segar Sampath, Dr. Nayan Shah

Session 2: Panel Discussion on Fraud Management initiative at the industry level, outcomes, challenges, way forward. Panelist: Dr. Shreeraj Deshpande, Alam Singh, Dr. Nayan Shah, , Kenneth Cunningham, and Segar Sampath. Chaired by Jagbir Sodhi

The discussion focused on various common frauds prevalent in Healthcare insurance industry and how they can be mitigated. It was discussed that "Abuse" rather "Fraud" is more prevalent in Indian context. The Fraud Detection mechanism is not robust at industry or company level in India. Kenneth Cunningham (VP, LexisNexis Risk Solution) gave perspective of fraud control mechanism at international level and compared the same with India. The discussion also highlighted that unethical behavior by provider or doctors increase the fraud, this was supported by specific examples and industry level studies. Another point was shared that large pharmaceutical companies tie up with provider and provide discounts on implants and drugs, benefit of which are not passed to patient or insurance company. The initiative to reduce abuse can be: effective network management, healthcare management or clinical guidelines, considering of co-morbidities by the industry, medical education to insurance industry etc. Discussion also emphasized that periodic analytics with well defined action can support fraud detection at various levels viz: provider, geographical area, underwriting, TPA, insurance company employee etc, so that right message goes to the person involved in fraud. To achieve good results from analytics improvement data quality, close interaction at industry level, resolution to take strict actions against the culprit and create deterrent for the potential fraudster are required. Alam Singh (Independent Advisor) mentioned about Working Paper on Health Insurance Fraud by FICCI. He mentioned that the paper cover topics like, process improvements or modifications, industry collaboration/ intervention, government or regulatory interventions and Indian Penal Court System and Indian Contract Act can be a good starting point for insurance companies and industry. The session was concluding by panelist agreeing that fraud impact the honest customer and onus is on insurance company or industry to fight against the fraud.

About the Author

Irvinder.Kohli@maxbupa.com

Irvinder is a member of IAI with over 8 years of experience in General Insurance and currently working in Max Bupa as Chief Manager.

Session 3: Presentation on Micro Insurance by Dr. Nishant Jain and Dr. Siddarth Kachroo. Chaired by Sanjay Dutta.

Dr. Siddarth (Head-Health Business Development, Munich Re India Services) presented a holistic overview on Health

Dr. Siddarth Kachroo

Micro Insurance in India. He started by comparing the health expenditure as compared to GDP for various countries, which ranged from 4.1% for India to 17.9% for USA. He presented Micro Insurance Models prevalent in India viz: Partner Agent Model, Community Based Model, In-house or Full Service Model and Provider Model. A comparison of various schemes run by government and other entities on the scale of subsidy and profitability was presented which concluded that a scheme can be successful, if it premium have some proportion towards profit and is supported by subsidy to make it affordable. Statistics related to RSBY Scheme at pan Indian level was presented along with role of various stakeholders in the scheme and benefit structure of the coverage offered to beneficiary. An overview of an end to end enrollment process and challenges faced by stakeholder insurance companies in implementation of the scheme and run it profitably was also presented.

Second presentation on the same subject was done by **Dr. Nishant** (Deputy Program Director, GIZ). He presented an overview of availability of RSBY data and experience of the RSBY scheme. The RSBY process is electronically controlled

Dr. Nishant Jain

which provides quality and detailed data which is available with government and related agencies. A trend in experience of RSBY scheme by comparing data from 2008 to 2012 was presented, which concluded that average premium is decreasing over year, which can be due to improved experience or increased confidence by insurance companies or competition. The enrollment ratio and average family size had been consistent over year, while hospitalization ratio has increased over years and is currently over 5% for districts in their third year, which is alarming given the low average premium. Average claim size is in same range over years, with over 60% of claims are of less than 5000 and 60% of patient have length of stay 2 days or less. Profits are reducing for insurance companies which are in third renewal due to low premium charged and high utilization rate. Average family size is less than 5 for majority (83%) of enrolled families and female as a head of family is increasing over years. Over 60% claims are for age less than 40 with General Ward hospitalization account for 30% of claims followed by Cataract (26.4%) and Hydrocele (5.3%). 80% of Cataract are for age-band 51 - 80 and 14% for age-band 41 – 50, which indicates that most of the claim are genuine. He also presented various statistics about insurance companies operating in RSBY scheme viz. proportion of RSBY share and number of districts held by each insurance company, average premium, conversion ratio, average family size, burnout ratio. He presented way forward on RSBY emphasizing that deeper analysis of data is being done now and dashboards are being developed to help government analyze data. The presentation was concluded by mentioning the impact RSBY scheme has made to India, hospitals are setup by private players in remote areas, public hospitals competing with private hospital which is improving service standard, regular updation of BPL list by government, increased utilization by women, awareness of Health Insurance has increased and the issue is long term sustainability of the model and profitability of insurance companies.

Session 4: Presentation on Group Health Insurance Experience – Recent Trends by Raunak Jha and Pawanjit Dhingra. Chaired by Segar Sampath, GM NIC.

This session had two presentations giving the different perspective to the topic. It was an interactive session with active participation from audience.

Raunak Jha

Raunak (Sr. Consultant, Tower Watson) started the presentation by defining stakeholders for a Group Insurance Product viz: Insurance Company, Employer, Employees, Healthcare Providers and TPA's, discussing the challenges faces by each stakeholder and expected future trends. Insurance Companies face challenges related to change in disease pattern, medical inflation, increased diversification of insured profile, new product features etc and to sustain they should reduce cross subsidies across line of business, increase premiums to outpace medical inflation etc. Employers have to balance between cost of coverage and attractiveness of coverage, focus on wellness and associated cost, redefining CTC of employee etc. In future Employers may increase flexibility in choosing the benefits to attract talent. Employees have increased demand for quality of care, flexibility of coverage, increased awareness etc and in future employees will expect coverage post retirement or active employment. Healthcare Providers are coping up with development in medical technology, increase focus on luxury care rather healthcare which is adding to cost. In future provider have to increase capacity due to increase awareness of healthcare and have to be competitive on prices and service due to increased competition. TPA are required to provide efficient processes and analyze data by employer, provide wellness services, increased hospitality to certain employees. In future insurance companies may incentivize them for profitability and it might be required to provide rate of each procedure instead of package rates. A possible scenario based on self retention model was presented, in which employer retains the risk and provides flexibility of benefits, insurance company provide coverage only for unusual risk and TPA helps employer in managing the scheme.

Pawanjit, Dhingra (CEO, Prudent) presented market dynamics stating that group insurance market is although broker driven, but large accounts are

Pawanjit Dhingra

still directly handled by insurance companies, while poor underwriting is leading to under pricing which is resulting in all stakeholders are losing money although the product has potential. There is opportunity due to low penetration, mandatory coverage for Non-ESI employees and withdrawal of government from self-managing health schemes. The main challenges faced are lack of quality data, lack of standardization of medical coding, wage policy terms and conditions. The solution is to enhance sharing of data between companies, remove reward for internal fraud and correct pricing for each account.

Session 5: Presentation on Moratorium Underwriting or Reduced Underwriting – Why, When and How? by Detloff Rump, Chief Underwriter, Swiss Re

Moratorium or Reduced Underwriting (RU) was defined as underwriting process which has less number of questions, reduced or no risk assessment is based on substitute risk factors and is not straight through processing. Benefits of RU are less hassle for customer/sales person and saving of time. Detloff

Detloff Rump

Rump shared result of two surveys done in China, Japan, Singapore, Hong Kong and Korea. First survey tested if customer is willing to share its health related details and to which channel and the results showed that over 60% of people are willing to share their health related details and most preferred channel is Insurance Agent. Second survey tested how much proportion of additional premium customer are willing to pay in case medical questions are not asked and the results showed that customer are willing to pay more than 20% of additional premium across countries. It was concluded that customer understands the importance of underwriting and is willing to pay additional premium in case there is no underwriting or reduced underwriting. He added that underwriting does not change the mortality/morbidity of an individual but reduces uncertainty and improves experience of the portfolio. He further added that cost of reduced underwriting is less but it will be compensated with increased cost of mortality, hence it is important to have a balance at portfolio level, so that benefits of reduced underwriting can result in increased sales. He also emphasized that other risk mitigators such as pre-existing clause, age limits, and sum insured limits can also help in mitigate the risk due to reduced underwriting risk. Conclusion was drawn that reduced underwriting is in demand which can be offered if it is used cleverly keeping benefits it offer to customers in mind.

Session 6: Presentation on International Health Insurance Market by Richard Kipp and Gayle Adams.

Richard (Principal Consulting Actuary, Milliman) presented overview healthcare reforms in US which has come through Affordable Care Act (ACA). ACA allows coverage to section of society it is most required, protects consumer interest, allows choice of insurer and helps in reducing cost and improved

Richard Kipp

quality of healthcare. ACA has many key features which are helpful to customers apart from empowering them against the insurance companies and protecting their interest. Some of the features which protects customers interest are allowing insurance coverage in case of pre-existing disease or denied insurance coverage, does not allowing denial of coverage to a child with pre-existing disease, stops retrospective cancellation of the insurance policy, allowing evaluation by expert in case of significant increase in insurance premium in any state etc. It also provide framework to Consumer Operated and Oriented Plan (CO-OPs), which can run as a mutual company operated by customers. It also provide framework for Health Exchange, which eases the process of buying and comparing health cover for consumer. Under ACA insurance companies are required to essentially spend 80% to 85% on medical care else provide rebate to customer and allows State to seek waivers on certain conditions to help people obtain health insurance. ACA has helped in creating first central database for health coverage options covering over 8000 private insurance company products, giving option to customer to choose option as per specific need. ACA has also introduces new taxes and fees resulting in additional revenue for the government. It was concluded that ACA will change the insurance sector in US and India can learn from it.

Gayle Adams (Consulting and Appointed Actuary, Raheja QBE) presented a comparison on various aspect of Health Insurance for Asian Countries

Gayle Adams

(India, UAE, Saudi Arabia, Thailand, Australia, Singapore and New Zealand). Comparison was done on aspects related to regulation, impact of providers on insurance and technical aspects of the insurance. It was concluded that Indian regulation is different on portability and guarantee renewability as compared to other countries, while fixed premium for 3 year is not applicable in any country. In India insurance companies are funding private hospitals growth similar to Australia and New Zealand and in most of the countries (including India) insurer does not have major control on quality of providers. Except Indian other countries have standalone or multi-line private insurance with majority of business. Aging population is not concern for India currently the way it is for developed countries like Australia, New Zealand and Singapore. Escalation of claim cost is a concern for all the countries and availability of statistical data is improving in India, while it is of high quality in Australia, New Zealand and Singapore. The session was concluded with observations that solutions and learning of Asian countries can be transferred to India after considering regulation, diversity of population, underwriting considerations, prevalent product designs etc.

Session 7: Presentation on Flexibility in Product Design – Learning from International Market by Krishna Singla, chaired by Vishwanath Mahendra, Appointed Actuary, Apollo Munich Insurance Company.

Krishna (Manager Actuarial Services, AXA Business Services) presented an overview on the product designs which are prevalent in International Market and features which can be applicable to Indian Markets, by comparing the health system of Germany, UK, Mexico and Singapore. He commenced by defining healthcare needs by state of economy of any country and life stage of insured. Four type of Private Healthcare Insurance (PHI) were defined as Primary PHI, Duplicate PHI, Complementary PHI and Supplementary PHI, with reference to the

Krishna Singla

coverage provided by government/social schemes. The countries discussed in the presentation had a mix of government/ social/universal coverage and private/ individual coverage, but the difference is in the proportion of population covered under each category. Germany has a Private Health Insurance System (PKV), which supplements Government Health Insurance System (GKV). GKV system provides wide range of coverage such as Sick Pay Insurance, Travel Insurance and Evacuation Benefits, Dental Care, Pharmacies and Long Term Care (LTC) provides limited coverage, additional coverage are purchased through PKV. UK has a strong government system (NHS) while PHI (11% population covered) mostly duplicates or supplements NHS. Products offered under PHI in UK are 60+ Cash Cover, Cash-back Entry, Retirement Essentials, Dental and Corporate Health Plans. Mexico has structure in which have Government Organization (50% population covered), Social Security (47% population covered) and PHI (3% population covered). Social

Vishwanath Mahendra

Security provides wide range of coverage without exclusions, waiting period and copayments. Products offered by PHI are Hospital Cash (for admission only due to accidents), Critical Illness (available as a rider only) and Medical Evacuation (available as a rider only). Singapore has a unique multilayered Universal Coverage with government providing coverage to primary, acute and rehabilitative (through Medisave) and catastrophic coverage (through MediShield). An Endowment fund has been set up by government to help insured in case payment from Medisave and MediShield are inadequate. Also an ElderShield plan is offered providing LTC to elder citizens. As per the trends in International Market future health product will emphasis on Health rather treatment, measure value of service rather volume, will have care cycles instead of discrete interventions, will consider co-occurring conditions instead of individual disease and will provide integrated care. The session was concluded by proposing product ideas which are relevant to Indian market such as LTC, Outpatient/Drug Coverage, Preventive/Wellness Services and High-Net Worth Products, challenges in implementation of these product and countries from whom model from these products can be considered.

Session 8: Presentation on Issue related to health insurance products sold by life companies by Rajesh S.

S. Rajesh

Rajesh (Product Actuary, Swiss Re Services (I) Pvt Limited) gave the overview of Healthcare Insurance Market between life and non-life insurance companies stating that although Healthcare Insurance sector is growing at healthy pace of 15% but life insurance companies have a share of only 500 Cr as compared to 15000 Cr for non-life companies. Life and non-life companies have different approach towards design of product, distribution of policy, underwriting constraint, claims management, analytics of data/experience and customer experience, which are possible reasons for difference in business volume. Life companies are late entrant into the market with limited or no data to support pricing. The commission structure for life product is different from health product which leads to reluctance of sale by channels. Lack of understanding on medical underwriting, challenges faced in managing the claims, difficulty in handling TPA's, limited indemnity products being offered and yet to explore the potential of fixed benefit products are the other possible reason for low volume of business. Possible solutions to these challenges/issues were differentiation in product from non-life companies, explore potential of fixed benefit products, automated underwriting engines and predictive underwriting tools.

Session 9: Discussion on Improving health of Health Insurance Industry by Krishanan Ramachandran, COO Apollo Munich Health Insurance chaired by Suresh Sugathan, Head - Health Administration Team, Bajaj Allianz General Insurance

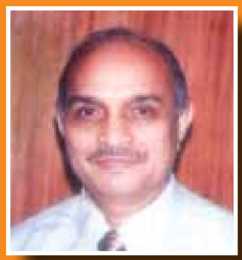
The session deliberated on the key problems and potential solutions, to improve the health of the healthcare insurance industry. Problems included lack of profitability and relatively poor stakeholder experience / relationships. Solutions were discussed based on proposed action which four key stakeholders (Insurer, Provider, Regulator and Intermediary) can take to improve

Krishanan Ramachandran, Suresh Sugathan

the status. Insurer needs to rationalize underwriting and premium, take firm action to improve conduct stakeholder in the market and improve customer experience. Providers have to adopt treatment protocol, have self regulation, curb abuse/frauds, standardize data capturing and requirement of an independent regulator. Regulator need to collaborate with other regulator such as SEBI, TRAI etc and enable various stakeholders to increase penetration of healthcare insurance by encouraging stakeholder to develop innovative products and services catering to various segments of society. Emphasis was made on streamlining of product approval process, effective grievance resolution mechanisms, publish study based on data collected through IIB, help industry in reducing fraud and claim cost leakages and help establishing standards of quality in the health sector through accreditation/grading of hospitals, licensing, and introducing treatment protocols by regulator. Intermediary are required to offer innovative marketing process which increase customer awareness with low cost, reduce dissemination of information to the customer and stakeholders, help build trust with other stakeholders and regularly train and update themselves towards new challenges and concerns faced by the industry and help solve them through active participation. Audience commented on concept of renegotiating of contract with hospital if fraud is proved, is PIL a way to reduce abuse and direct authorities to take action. It was decided to approach IRDA from IAI with the specific recommendations which regulator may consider in order improving the health of Health Insurance Industry.

8TH SEMINAR ON CURRENT ISSUES IN HEALTHCARE INSURANCE PHOTO COLLAGE

Welcome



Mr. RBL VAISH

EXCUTIVE DIRECTOR OF INSTITUTE OF ACTUARIES OF INDIA

R B L VAISH joins as Executive Director of the Institute of Actuaries of India, on 16th August 2013.

Mr. Vaish was the first Executive Director of the Indian actuarial profession when it took shape as Institute of Actuaries of India under Actuaries, Act, 2006 and served in this capacity from 7th June 2008 to 10th April 2010. He then had the immense responsibility of pioneering number of Regulations and Rules within the framework of the Actuaries Act, 2006 replacing similar structures existing then of the Actuarial Society of India, besides many other aspects of the Institute's administration.

Mr. Vaish retired from Life Insurance Corporation of India in the capacity of Executive Director (Finance & Accounts) from its Central Office in September, 2005 and had the distinction of service in many senior positions such as Chief Vigilance Officer New India Assurance Co. Ltd., Head Office at Mumbai, General Manager Audit, Investment & H.R. LIC Housing Finance Ltd., Head Office at Mumbai, Joint General Manager Marketing LIC Mutual Fund Head Office at Mumbai and apart from these held various positions in Marketing, Accounts and Audit Department of LIC of India at various places in India.

Mr. Vaish, now settled in Mumbai, is a commerce Graduate (B.Com) and a fellow of the Institute of Chartered Accountants of India (FCA).

WORKSHOP ON IFRS

6th September 2013 in Hotel Sea Princess, Mumbai

The International Accounting Standards Board (IASB) has released Exposure Draft ED/2013/7, a revision of ED/2010/8 relating to Accounting for Insurance Contracts. The IASB has invited comments on the ED to be provided to them by October 25, 2013. The Institute of Actuaries of India is working on putting together comments on the ED. The Advisory Group on Life Insurance (LIAG) and the Advisory Group on Accounting and Solvency (AGAS) are jointly working on drafting the comments.

This seminar is intended to provide a platform for members of the profession to understand the proposals contained in the Exposure Draft as well as to provide feedback that can be incorporated in the Institute's response to the IASB. The seminar will be anchored by the members of the drafting group from the two Advisory Groups.

Anchors/ Speakers: Peter Duran – AIA Group, **Satyan Jambunathan** - ICICI Prudential life, **Avijit Chatterjee** – ICICI Prudential life, **Subha Neelakantan** – Gen Re, **Jose John**- Max Life Insurance

Announcement, Program Schedule and Exposure Draft are available on IAI website. It is recommended that participants go through the Exposure draft prior to attending the seminar.

Who should attend: Members of the Actuarial and Accounting profession in the fields of Life and General Insurance. The seminar is open to Members and Non-Members.

- Registration Fees : ₹ 5000
- Last day to Register: 3rd September, 2013
- Register at: www.actuariesindia.org
- Dress Code: Business Casual
- CPD Credit for IAI Members: 4 hrs (As per APS 9) in Life Insurance & General Insurance Area of practice
- Point of Contact for any query: Quintus Mendonca (quintus@actuariesindia.org)

OPPORTUNITIES & CHALLENGES IN OFFERING WHOLE LIFE FIXED RATE ANNUITIES

About the Author

patrick.curtin@aegonreligare.com

Patrick Curtin is Chief Risk Officer of Aegon Religare Life Insurance Company. Mr. Curtin has been with Aegon since 2006 in a variety of risk and actuarial roles across Ireland, USA and The Netherlands. Prior to this he worked with Towers Watson. He is a Fellow of the actuarial bodies of the UK, Ireland and India. He has also attained the Chartered Financial Analyst (CFA) designation.

Introduction: Whole Life Fixed Rate annuities come in many different forms however the underlying objective of each is to provide security of income. Typically these annuities are used to provide a stream of replacement income in retirement once an individual has stopped working. Therefore there is a clear customer need for such products and insurance companies are perfectly placed to offer such long term solutions.

This article will discuss the various forms these annuities come in with references to offerings in various countries around the world. The opportunities are many and often times already well known and will be summarized whilst the challenges are often subtle but never uncomplicated and will be covered in more detail.

What are Whole Life Fixed Rate Annuities?

The simplest form comes in the shape of single premium contracts, often known as immediate pension annuities. The policyholder exchanges a lump sum in exchange for guaranteed payments for life. These are very popular in the UK and US where defined contribution (or 401K) pots of money which have been accumulated during the working years are used to purchase an annuity. This form is also offered by certain providers in India today.

Trustees of defined benefit pension schemes sometimes purchase immediate annuities to transfer the longevity risk from the pension scheme to an insurer. The stream of payments purchased in any case can be level or inflation linked, single life or joined life, guaranteed for a minimum period of time etc. depending on the requirements of the purchaser. The income from the annuity is usually taxed as regular income or, in the case of the US, the income is split into a return of principal component (non-taxed) and income component (taxed as regular income).

Whole Life Fixed Rate Annuities ("WLFRAs") can also come with an accumulation phase before the payout/ income phase. This accumulation phase can be unit linked where the policyholder bears the risk and return or there can be some form of guaranteed accumulation or minimum maturity benefit embedded in the terms and conditions. The latter are more commonly known as "variable annuities" even though the guaranteed minimum accumulation rate may be fixed in nature. Variable annuities are common in Japan, UK, US and Canada. Their popularity amongst policyholders comes from the features which allow the policyholders to participate in the upside of an index (say, equity market) whilst at the same time providing an ultimate floor against adverse performance. The participation in upside doesn't just occur during the accumulation phase – in the payout phase the regular income is usually defined as a % of the Guaranteed Fund and a ratchet feature in the product design allows the Guaranteed Fund to increase with capital appreciation at certain times (e.g. policy anniversary), thereby continuing to give upside exposure.

Other variants to the above structures include guaranteed annuity options where by the rate at which an accumulated fund will be converted to an annuity may be guaranteed in advance, and impaired annuities (providing higher regular payments to reflect an impaired life) or life settlement annuities (providing replacement income for accident victims due to court settlements) etc.

Whatever the form, this type of product eliminates two big retirement risks – (1) that a market crash will decimate your savings while in retirement, and (2) that you will outlive your money.

Opportunities

The opportunities in India are many. First and foremost there is a clear customer need:

- People are living longer
- Lack of social support in India – no 'safety net'
- Nuclear family structure becoming more common in urban areas leading perhaps to a reduction in the support that was there in the past for the older generation
- Desire for financial certainty

There is a difference between a customer need and an awareness of that need amongst customers. For example I have lost count of the number of times I have heard people say that their 'pension' is the property they own and live in. Have they considered how it will generate income in their retirement? Have they considered what would happen if there is a property crash right when they needed the sales proceeds? Have they considered whether they really want to eventually sell a family home which comes with strong emotional ties and many great memories? It is the challenge of the insurance industry to educate the general population about the need for adequate retirement provision.

Other opportunities:

- The National Pension Scheme requires annuity purchase so a market demand already exists
- Current pension regulations require

annuity purchase post accumulation phase (from same company)

- India has one of the largest and youngest populations in the world with an average age in the mid 20's. This demographic along with rapidly increasing wealth leads to a huge market for pension solutions with both an accumulation phase and eventual income phase
- Not many providers are successfully targeting this space today
- Diversification – Longevity risk can act as a natural hedge against mortality risk on the books of life insurers. Whilst the current statutory regime does not recognize this offset in capital, it will ultimately lead to a more stable profit stream for the insurance company and therefore even an opportunity to retain more profitable mortality risk via an increase in reinsurance retention levels

The opportunities are many and significant and there are countless more over and above those listed here. One final benefit to note however, and one which is perhaps underestimated, is that there is a whole history of ideas and structures in other countries. We have numerous examples of what has worked well and what has not. That in itself is a significant opportunity for us to do things right and not repeat the errors of the past.

Challenges

So what are the challenges of offering these products? Firstly there are what I will call the 'environmental factors' – education and tax incentives.

As already alluded to above, one of the key challenges is to educate the general population about the need for pensions, particularly amongst the youth. How many under 30 years old know they should already be saving for their retirement? How many under 40 even know? And if they do know, are they saving in the right way or relying on their home to be their pension? Without creating this awareness insurance companies will struggle to attract significant interest in their pension products. Exacerbating this is the lack of special tax treatment for retirement savings which would incentivize such behavior. Whilst India has a tax relief cap of around 1 Lakh on contributions to any insurance/savings arrangements (and this includes other items such as Provident Fund contributions), other countries have age related tax relief on income to encourage pension saving. Below is an example of tax relief on pension contributions in Ireland:

Age	% of income with tax relief
Under 30	15%
30 to 39	20%
40 to 49	25%
50 to 54	30%
55 to 59	35%
60+	40%

Based on this table, someone aged 45 can have up to 25% of their income contributed tax free into their pension arrangement (either by personal or employer contributions or both). These savings then grow tax free. The trade-off is that these funds cannot be accessed until retirement.

Without such tax incentives, individuals are more likely to keep their pension savings more liquid (i.e. accessible) in the event of some unforeseen event occurring when they might need the funds, rather than investing in long term pension products which prevent access to the funds until retirement. This also increases the risk of mis-selling at a time when this is already a real problem n the industry.

The environmental factors noted above relate more to the challenges of selling the product. The challenges discussed below relate to managing the product itself.

Managing / measuring longevity risk – what will the rate of longevity improvement be like and how do we capture it in pricing? How do we capture items such as urban v rural India experience, medical advances, diet improvement, increased health awareness, increasing wealth etc? Various sources of data which can help are LIC, reinsurers, university studies, Government Statistics Office, similar developing countries, trends from developed countries from when they were at India's stage of development. One important item to be aware of when setting longevity assumptions is that we as actuaries have almost always underestimated longevity improvements over time!

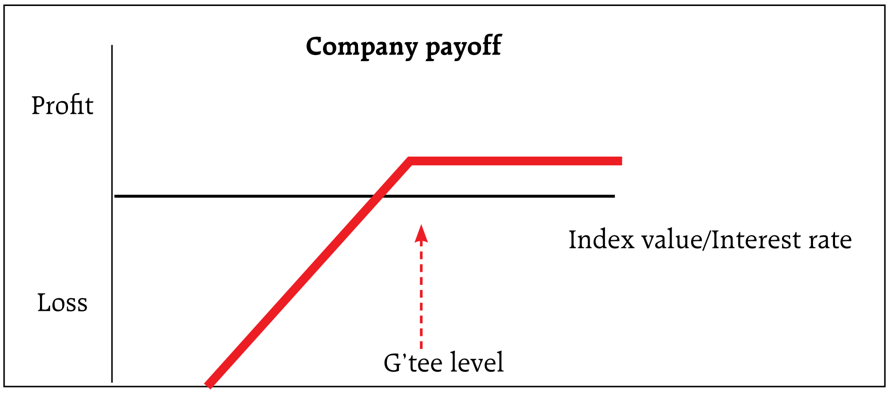
Competitive pressures – WLFRAs are often viewed as commodity-like products, particularly in the immediate annuity form. This can lead to aggressive pricing and low or unsustainable profit margins. In the UK, for example, we have seen competitor pressure result in annuity providers investing in lower quality fixed income securities in order to generate additional spread to improve pricing or boost profit margins. Such strategies can ultimately lead to capital shortages in the event of a crisis similar to what happened in 2008 due to impairments or extra default allowances in the valuation rate of interest).

Asset Liability Management and financial guarantees – ALM for plain vanilla immediate annuities can be a challenge depending on the duration of the liabilities. Even where annuity payments are linked to inflation, the new RBI index linked offerings can result in basis risk depending on inflation definitions and 10 years max maturity will result in reinvestment risk. In order to differentiate their products (avoid the commodity effect), insurers may also be tempted to offer features such as accumulation guarantees, annuity conversion options etc. in order to differentiate their products and make them more attractive. Current regulations already require non-zero accumulation guarantees in pension products. In effect, insurers will be tempted or forced to move towards variable annuity type offerings. The company now has three options when it comes to writing such financial guarantees:

1. Hold the risk
2. Mitigate the risk via product design
3. Remove/reduce the risk via hedging or reinsurance

Insurance companies need to be cautious when it comes to holding market risk related to financial guarantees. Actuarial techniques and deterministic model runs work on insurance risks because they diversify away and become more predictable in large size. However the Central Limit Theorem does not apply to financial markets risk as these do not diversify away and generally impact many products at the same time. Setting long term assumptions in our actuarial basis should not lull us into a false sense of security that the risk is mitigated when it comes to financial guarantees. In effect we are just holding a buffer against adverse experience and the ultimate payoff can be very asymmetrical as illustrated in diagram.

The true extent of the tail risk is only understood via detailed stochastic analysis and insurers need to be aware of the distribution of potential outcomes if



unpleasant surprises are to be avoided.

Mitigating the risk via product design can go a long way to reducing the risk but sometimes will also have a negative effect on policyholder value. We must always be aware of the balance between customer value and risk to the company if we are to fulfill our promises to our customers. It is equally important to avoid a suboptimal outcome for both sides – e.g. less value for the policyholder (limited upside potential) and at the same time a profitability stream still highly dependent on the varying whims of the markets.

The third option is to remove or reduce the risk via hedging. This is how variable annuity providers in Japan/US/UK etc. manage the risks associated with offering financial guarantees. Instruments such as futures, options, swaps etc. are used to mitigate the risks and ensure stability of company profits irrespective of what economic reality plays out. The importance of this was seen during the 2008 crisis where those insurers who had not adequately hedged their variable annuity portfolios were severely hit in the distressed markets. Of course even with full availability of such instruments, policyholder behavior remains an uncertainty and will impact any hedge effectiveness. Insurers in India are currently only allowed to hedge interest rate risk, however the benefit is limited to 12 months under the rule for forecasted transactions. Draft guidelines point to a relaxing of this restriction which will be a significant benefit to the insurance industry as a whole as it will allow companies to hedge the interest rate risk in their liabilities if they so wish.

Whichever option is chosen, insurers should ensure they have the capacity to hold the risks related to financial guarantees on their books where hedging is not allowed or available, or whether they choose not to hedge. In other words, there should be conscious risk decision making.

Another challenge for the insurance industry is the alignment of interests in Whole Life Fixed Rate Annuities. In protection products, it is clear that both the interests of the company and the policyholder are aligned – neither want a payout but the insurance company is there to fulfill the promise if the insured event occurs. Likewise with health products. In annuity products, how can we align the interests of the insurance company with those of the policyholder? Does it matter?

Conclusion

It is clear that there is a huge opportunity and need in India for Whole Life Fixed Rate Annuities. The challenges are also many. Some have been listed here to provoke thought. What is clear however is that if we are truly to address the pensions need in India, no one side can do it alone. Tax Authorities, Regulators and the Insurance Industry need to come together to develop an optimal solution which includes raising awareness, creating tax incentives to drive the savings behavior and regulatory changes to allow insurance companies hedge the financial guarantees implicit in many of the products so that we can fulfill our promises to our customers and provide stable returns for our shareholders.

■■■

Please send feedback on the article to library@actuariesindia.org

Farewell

Shirish Mishra

It is with a heavy heart that we must say goodbye to all of our friends and colleagues here. We would like to take this opportunity to thank everyone for the support and co-operation.

Nilesh Chavan

Funny Actuary

The President, the Pope, a lawyer and an actuary are on a crashing plane. There are only three parachutes. "I should have one, since I'm the President," said the President. "Me too, ... since I'm the Pope," said the Pope. "Well," said the lawyer, "I should escape so we can properly sue the airline," but the actuary said "what about the insurance premiums? Someone has to calculate those!" Everyone stopped to think about it, but it was too late and the plane crashed.

FEATURES

Impact of Non-Linked Insurance Products Regulation, 2013 on Surrender Value and Variable Par Product Structure

In February, Non-Linked insurance product regulations were published. In the second half of June, clarifications to these guidelines were issued. While the actual impact of these regulations and clarifications will become clear in the due course of time, this article is a discussion of two major impacts of these regulations i.e. on the surrender value and the variable participating product.

Surrender Values for conventional savings products

Regulation

The regulation prescribes guaranteed surrender values (GSV) to be at least a certain percentage of total premiums paid together with the surrender value of any vested bonus or guaranteed additions. A policy with a premium paying term of 10 years or more acquires a GSV if three years premiums have been paid. Policy with a premium paying term less than 10 years acquires a GSV if two years premiums have been paid. The following table states the GSV percentages at various policy years.

GSV as a percentage of premiums paid		
Policy Year	**Policy Term <10 years**	**Policy Term >=10 years**
2nd	30%	NA
3rd	30%	30%
4th – 7th	50%	50%
Beyond 7th	Should depend on premiums paid and take into account the asset share	

For policies with terms of less than 7 years, the GSV in the last two years must be at least 90% of the total premiums paid. Any survival benefits paid can be deducted from the minimum GSV.

Affect on Policyholders

The new minimum GSVs have generally increased the guarantee available on surrender and therefore the liquidity available to the policyholders. Increases in guarantees and liquidity generally bring along associated costs. It will be challenging for actuaries to ensure that the cost of this guarantee is not met from the continuing policyholders, especially in the case of participating policyholders since bonus rates may be directly affected by surrender profits/ losses.

Challenges

It will be challenging to allow for a sharp increase in the level of the GSV at certain points as we move along the policy duration. Let us consider an example of a policy with term of 6 years with a regular annual premium of Rs 1,000 payable in each year. In the 3rd policy year, the GSV has to be at least Rs 900. In the fourth year it has to be Rs 2,000 and in the 5th year it has to be Rs 4,500. This is a 400% jump in year 5 from what was payable during the 3rd year. The surrender value of any vested bonuses has also to be added to this GSV.

Setting assumptions, especially for withdrawals and per policy maintenance expenses poses a further challenge, as there is little / no prior relevant credible experience available pertaining to policyholder behavior for this type of GSV. At the time when the value of the guarantee is positive to the policyholder, it is more likely that he/she will exercise the surrender option. It may also lead to a situation where large number of policyholders surrender at a time riding on the bandwagon effect. Several large scale anti-selective surrenders could have a severe impact on the financials of the company.

If, as a result of these changes, withdrawal rates increase, insurers may adopt lower equity backing ratios (EBRs) and an adjustment to the proportion of the reversionary bonuses & the terminal bonuses. A lower EBR, together with lower free assets due to guarantees will lower the expected return. Also, for a company which follows a well matched position of assets and liabilities, higher surrenders will shorten the duration of liability. To match this, the company may have to invest in shorter duration

About the Authors

Philip.Jackson@birlasunlife.com

Phil is a Fellow of the Institute and Faculty of Actuaries. He manages Group Products and Pricing at Birla Sun Life

ashish.maths@gmail.com

Ashish is a student member of IAI and is close to qualification. He also holds PGDM in Finance from IMI, Delhi. He works at SBI Life Insurance Co. Ltd.

assets, which may lead to lower expected returns depending on the shape of the yield curve.

Over all, companies may be forced to be more conservative in their investment and bonus policy. Lower EBRs and lower levels of reversionary bonus are some of the strategies to follow in order to mitigate the impact of the high level of guarantees.

Further, when the GSV is at such a high level, the special surrender value (SSV) will lose its relevance, as it would be very close to or less than the GSV.

For a participating policy, the SSV shall be based on the asset shares and for a non-participating policy this shall be based on the 'proxy-asset share'.Prior to the regulation, for a non-participating policy, the surrender value reflected a best estimate reserve of future guarantees as the maturity benefits are generally guaranteed. This ensured that surrender values run into maturity values. Basing the surrender value on the proxy asset share may lead some policyholders ending with a higher surrender value than the corresponding maturity value (for example if investment return was better than expected). Past experience, either better or worse, than the pricing basis, would be passed on to the surrendering policyholder which is not the essence of the non-participating platform.

Issues around Variable Par

Variable par are participating products which are accumulating in nature and where regular crediting bonus rates apply on the Policy Account.

Regulation

Regulation prescribes that every variable participating policy should have a policy account and a corresponding shadow account. The balance of the policy account would depict the accrual to the policyholder.

The policy account shall be credited with premium net of charges. The guaranteed rate and variable interest rate shall be applicable to the balance of the policy account. Non- negative residual additions, if any, shall be credited to the policy account in order to comply with the maximum reduction in yield prescribed by the regulations.

Shadow policy account values are to be maintained on a daily basis. Such a shadow policy account shall be computed based on the actual accruals of all income elements like premiums, top-up premiums, income from investments as and when received and all actual debits (e.g. partial withdrawals to the policy account value as and when debited) to arrive at the actual gross investment return and compute the reduction in yield on the policy account value.

Challenges

The variable participating products will have to meet the maximum reduction in yield requirement (MRIY). That is, the difference in gross yield in shadow account and net yield in policy account shall be less than those prescribed. If it is not so, a non-negative residual addition would have to be allocated to the policy account to comply with this.

For a policy term of 15 years, the MRIY at maturity should be 2.25%. Let us take for example a variable life insurance participating product where there is no surplus other than investment surplus. In this scenario for 10% investments return earned 10% would be the total surplus, of which 7.75% would have to be necessarily allocated as bonuses in order to meet MRIY. However, if a company earns a 10% surplus from participating product, then first it has to allow for taxes on transfer to policyholder and shareholder, which is currently around 14% of the transfer, which comes to 1.24%. The remaining 8.76% has to be distributed between policyholder and shareholder in the ratio of 90:10. This implies only 7.88% can be allocated as bonuses to policyholder. That is a 2.12% reduction in yield just because of tax and shareholder transfers. It is difficult to see how all other costs (expenses, commission etc.) can be incorporated in the remaining yield. The situation is exacerbated by the fact that the tax rate may increase in the future. An obvious solution to this problem, however, would be to consider the investments allocated to shadow account, net of tax and net of shareholder transfer, for calculating the MRIY, but it will remain to be seen whether this is permissible.

The position here seems contradictory if company has to credit non-negative residual additions in order to meet MRIY requirements. For a typical participating policy, the bonus would be determined with reference to the asset share. Asset share is usually net off shareholder transfer and taxes. The Regulation stipulates that the crediting bonus rate would follow the yield on shadow account with some adjustment for reduction in yield. As a result, the policy account would always be higher than the asset share which is not a sustainable position for the product.

If a policyholder discontinues paying premium during the first five years then his/her policy account after deduction of discontinuance charges, if any, will be shifted to the Discontinued Policy Account. The discontinued policy account appears to be a segregated fund. The switching / shifting of participating fund to discontinued policy account (segregated fund) in case of discontinuance and from discontinued policy account to the participating fund in case of revival poses a challenge for actuaries to ensure all policyholders are treated fairly. The situation is exacerbated by the fact that the shareholder and policyholders participate in the surplus from participating fund whereas in the case of discontinued policy account no income can be transferred to shareholders.

The other question that one can ask is whether the minimum guaranteed interest rate and the residual additions are to be considered bonuses for the purpose of calculating shareholder transfers.

We have tried to highlight only some aspects of the topic considered. We hope this would lead to further discussion among the actuarial fraternity and opinion evolves further.

■■■

Please send feedback on the article to library@actuariesindia.org

Calculating Interest Rate Capital: A Principal Component Analysis

Introduction: Interest rate risk is one of the largest components of risk in an Economic Capital calculation in most geographies including India. The risk is critical to evaluate as well as understand completely as the interest rate movements can impact the balance sheet of a life insurance company. The interest rate capital can be typically calculated by applying a shock to the term structure of interest rates and assessing the impact of the change on assets as well as liabilities.

To calculate the appropriate interest rate shock, a company may be faced with numerous scenarios that can possibly constitute an interest rate shock. To illustrate this with an example, a company that models the term structure of interest rates for durations 1 to 20 can be faced with a large value of possible interest rate shocks since interest shocks may be defined multiple combinations of shocks at 20 durations. This creates a large number of interest rate shocks which is unfeasible to consider.

Analysis too Complicated?

Objective of this paper is to arrive at the interest rate shocks using principal component analysis techniques applicable to the term structure of interest rates specific to Indian market. This can further be used to arrive at the capital for interest rate risk for a life insurance company.

Principal Component Analysis (PCA): Concept and Mathematical Understanding

The Concept

The use of principal component analysis can dramatically reduce the number of scenarios with relatively little sacrifice of accuracy. Principal Component analysis takes historical data on movements in the market variables and attempts to define a set of components that explain the movements.

By construction, the first principal component explains the maximum percentage of the total variance of interest rate changes. The second principal component is linearly independent of the first, and explains the maximum percentage of the remaining variance, and so on.

For yield curves, the yields at different maturity durations are highly correlated to one another but not 100% correlated. The statistical method of PCA is ideally suited to the interest rate risk category. Principal component analysis decomposes these highly correlated yield curve data into components which are independent of one another. This dramatically reduces the complexities in an interest rate risk analysis.

Mathematical Understanding

If Σ represents the covariance matrix of dimension n×n where n is the number of bond yields used in the analysis, then Σ has n distinct and positive eigenvalues and there exists an orthogonal matrix Ω such that:

$$\Sigma = \Omega\,\Lambda\,\Omega'$$

Where Λ is the n × n diagonal matrix of eigenvalues of Σ and Ω is the n × n matrix of eigenvectors.

$$\Omega = \begin{bmatrix} e_{1,1} & \cdots & e_{1,n} \\ \vdots & \ddots & \vdots \\ e_{n,1} & \cdots & e_{n,n} \end{bmatrix}$$

$$\Lambda = \begin{bmatrix} \lambda_1 \\ \vdots \\ \lambda_n \end{bmatrix}$$

Eigenvalues describe the variances associated with the movement in interest rates; however, they do not describe the shape of the yield curve movements. Eigenvectors on the other hand, describe the shape of the PCA shocks.

Each eigenvector has an associated eigenvalue which tells us how important that eigenvector is in explaining the variance of the yield curve. This help us in deciding how many eigenvectors are important in explaining the correlation of the yield curve and hence to keep in our analysis.

A threshold level may be defined (say 95%) which is a benchmark to consider while deciding how many principal components must form a part of the analysis. Usually 3 to 4 principal components would be sufficient to explain over 95% of the variance in interest rates.

About the Authors

nakulyadav@gmail.com

Nakul Yadav is a senior manager in the pricing team of MaxLife Insurance Co. Ltd. He is the student member of IAI

reet_nj@rediffmail.com

Reetika Jain is a senior manager in the pricing team of Aviva life insurance Co. India Ltd. She is the student member of IAI

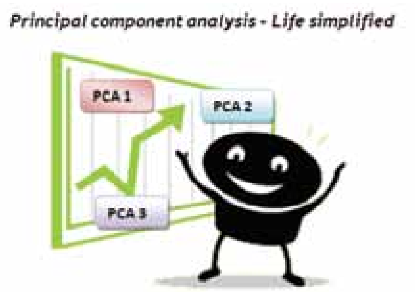
This can be represented as follows:

$$\frac{\{\lambda_1 + \ldots + \lambda_k\}}{\{\lambda_1 + \ldots + \lambda_n\}} > 1 - \xi$$

Where: 1- ξ = threshold level, k = number of principal components to be used in the analysis

The principal components of the Government Bond yield curve

The typical factors in a principal component analysis for interest rates are commonly interpreted as a "level", "slope" and "curvature" effects. These three components can describe a large proportion of the variation in the yield curve. If the data is highly correlated, the first 3 components may be sufficient to explain the vast majority of the variation; however, with uncorrelated data more principal components may be required. The measure of the amount of variation that can be explained is defined by the cumulative percentage of eigenvalues.



To demonstrate this, if the sum of eigenvalues for the first three components accounts for 95% of the sum of all eigenvalues calculated, we can conclude that the first three principal components account for 95% of the variation of yield curves. The above is demonstrated in the table below:

The largest principal component (PC1)

Principal Component	Eigenvalue	Variance Explained	Cumulative Variance Explained
PC1 (Level)	*0.0368*	*80%*	*80%*
PC2 (Slope)	*0.0044*	*10%*	*90%*
PC3 (Curvature)	*0.0023*	*5%*	*95%*

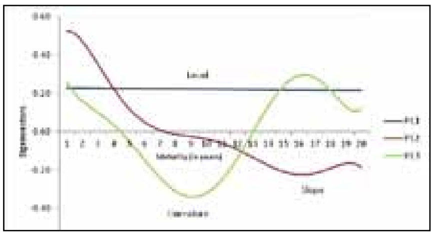
The above figures have been derived using the government bond spot rates data from years 2001 to 2013 for maturities of 1 year to 20 years

explains the parallel movement in the curve i.e. "Level" or parallel shift. This type of movement contains almost 80%of the variability of the yield curve.

This movement corresponds to increase or decrease in the rates for all maturities. This is reflected in the sense that all the coefficients of the first principal components (i.e. eigenvectors) have the same sign.

The second largest component (PC2) explains the changes in the "slope" of the curve, such as a rise in the short-term rates and a fall in the long term rates which results in the flattening of the yield curve. This pattern is being observed from second principal component coefficients (i.e. eigenvectors) having positive short term and negative long term rates. Hence a variation in this component would cause short term rates to move in one direction and long term rates in another direction.

The third largest component (PC3) explains movements in the "curvature" of the curve. These movements refer to similar movements in the short term and long term rates, and movements in the opposite direction to the medium-term rates. This is reflecting in our third main component, as the sign for short-term rates is the same as for long-types, while medium-term rates move in opposite direction.



Each of the eigenvalues corresponds to an array of eigenvectors which highlight the shape of the yield curve shocks. The graph below represents the first three principal components for the government bond spot rate curve:

The principal components are generated on the covariance matrix of the following:

$$\Delta = LN\left(\frac{Z_n^t}{Z_n^{t-1}}\right)$$

Where; Z_n^t= spot rate at time t for a n-year maturity and is the rate at time Z_n^{t-1} is tje rate a time t-1 for a ney\ear maturity

Deriving Interest Rate Shocks

The principal components can be converted into their corresponding yield curve shocks under the following assumption:

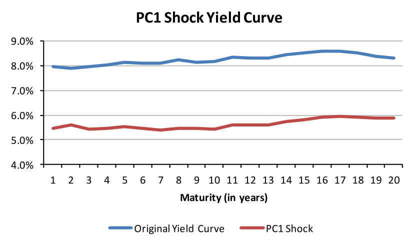
$$LN\left(\frac{Z_n^t}{Z_n^{t-1}}\right) \sim Normal\ (0,\ 1)$$

The principal component shocks at a 99.5% VaR may be derived as follows:

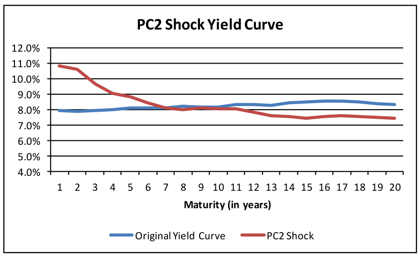
$PC_n^{+} shock = \exp\left(\phi^{-1}(0.995) \times e_{c,n} \times \sqrt{\lambda_c}\right)$

$e_{c,n}$ = n-th element of eigenvector e_c

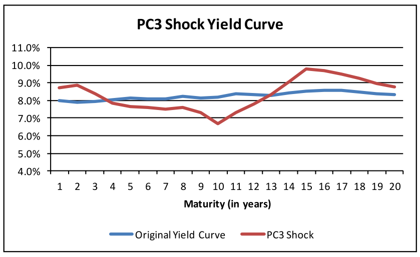
λ_c is the eigenvalue corresponding to the eigenvector e_c



The above is a level shock (PC1 shock) to the existing yield curve. It represents a level increase in interest rates across maturities. Note that this is an upward shock to the yield curve and similarly a downward shock to the yield curve may also be calculated.



The above shock represents a change in slope of the yield curve.



The above shock represents a change in curvature of the yield curve.

The components found will most likely not create smooth curves. This could give rise to bumpy stressed yield curves which look unrealistic. The stressed yield curve may also be such that small changes in the business's assets and liabilities have a significant effect on capital.

Hence the components should be smoothened by weighting the data so that less weight is placed on the terms around where the bumps occur or by using a subset of the term series in the analysis, and interpolating resulting components or yield curves between them.

Interest Rate Risk - Capital Calculations

Our analysis has an underlying assumption that

$$LN\left(\frac{Z_n^t}{Z_n^{t-1}}\right) \sim Normal\ (0,\ 1)$$

This assumption may itself be tested using various statistical tests such as Anderson Darling Test. If the statistical test fails, the PC shocks may be altered according to the revised distribution.

If the first three principal components capture more than 95% variation of the term structure of interest rates, then to arrive at capital for interest rate risk at 99.5% percentile, the net asset value for a portfolio can be calculated at each of the following shocked yield curve independently and the combination of PCs (up or down) that give maximum capital for the interest rate risk shocked be picked to calculate capital:

Interest Rate Capital = Δ $NAV_{\text{interest rate shock}}$

The overall interest rate capital for the company can be defined as follows:

Interest Rate Capital =

$$\sqrt{PC1^2_{capital} + PC2^2_{capital} + PC3^2_{capital}}$$

The overall interest rate risk capital can be calculated using the formula above since PCA reduces the correlated data into independent components. Hence we can combine the capital from the independent components as described (i.e. correlation = 0%)

Shocks scenario can be different for different products types and the benefits/guarantees offered along with the products but the chosen combination should be one that maximise the capital for the life insurance company under interest rate risk capital shocks.

Though PCA is a recommended way of modelling the term structure of interest rates (also referred to in the QIS 5 calibrations) but it does have some shortcomings.

PCA is strongly affected by the choice of units of the series. An important consequence of this fact is that PCA will not detect risk factors that do not contribute significantly to the total variability of the data. This shortcoming could be remedied, at least in principle, by multiplying the series with appropriate portfolio weights. However, this requires knowledge of the actual asset holdings in the portfolio.

Another limitation is that it only identifies linear dependence between variables, and the resulting components are linearly independent. This method may not be effective in analysing data sets that exhibits non-linear relationships between variables.

Even with the limitations of PCA, it serves as a powerful tool to analyze interest rate risk and more appropriately model one of the largest risks that life insurers face.

Principal Component	Upward Shock	Downward Shock	Capital
PC1 (Level)	*PC1+ (99.5%)*	*PC1- (0.5%)*	$PC1_{capital}$ = *Max (PC1+, PC1-)*
PC2 (Slope)	*PC2+ (99.5%)*	*PC2- (0.5%)*	$PC2_{capital}$ = *Max (PC2+, PC2-)*
PC3 (Curvature)	*PC3+ (99.5%)*	*PC3- (0.5%)*	$PC3_{capital}$ = *Max (PC3+, PC3-)*

Using the above mention principal component shocks (PC1, PC2 & PC3 shock); it is possible to calculate a capital value for each of the yield curve shocks. The capital for a shocked yield curve is the delta change in net asset value for the portfolio under consideration.

"Life Insurance companies are moving towards the calculation of risk based capital to better understand the risks inherent in their business. Interest rate risk is one of the largest risks in economic capital calculation. This article discusses the Principal component analysis (PCA) technique to analyse the term structure of interest rate and perform capital calculations for interest rate risk. It is a recommended method of analyzing interest rates movements. PCA reduces the numbers of scenarios significantly with little sacrifice of accuracy and hence make analysis relatively simple."

Please send feedback on the article to library@actuariesindia.org

Welcome

Mr. Larry Barretto has joined on 1st August 2013 as IT & Members Services Manager.
He is B.Com, Diploma in Software Engineering and carries 3.4 years of experience.
His hobbies include playing badminton and guitar.

We welcome Larry Barretto to the family of **Institute of Actuaries of India.**

He can be reached at: larry@acturiesindia.org

MARK V.T SAUNDERS

Managing Director - Asia Pacific Insurance Sector and Asia Pacific Risk Consulting Practice Leader at Towers Watson, Hong Kong

mark.saunders@towerswatson.com

PERSONAL

What jobs and experiences have led you to your present position?

In a nutshell, it boils down to a combination of hard work and good luck! I have always strived to be the best I can and help others, with the right attitude, be the best they can. I am described by some as a passionate leader with a relentless determination to succeed: an Achiever with a proven track record of success. Others may say similar but with less kind words!

My late father was an entrepreneur and involved me in all kinds of businesses from a very young age which has been a fabulous foundation for me in life. After University (which my father was not keen on me attending -- perceiving it instead as wasting working time!?!) I was not sure which direction I wanted to take so thought I'd train to be a teacher as that would provide very valuable skills for the future (and had great summer holidays!). My father remained less than impressed.

Teaching was fantastic, wonderfully rewarding, and has proved to be everything I had hoped in terms of being valuable for whichever direction I wanted to take in future.

But at the time I decided the world of finance was for me and became an actuary as it provided an opportunity to put my Maths degree to use (and show my father that it wasn't a complete waste of time) and also a great opportunity to try to satisfy my insatiable thirst for learning and challenge.

Also, as with teaching, I was convinced that becoming an actuary would be invaluable experience providing a wealth of potential opportunities as I was still unsure exactly which direction I wished to take in the world of finance.

So looking back it seems I was keen to learn valuable and useful skills whilst keeping my options as open as possible. And, by the way, even my father became proud when I qualified as an actuary!

My employers, Clerical Medical of the UK, provided me great opportunities and were very supportive of my ambition to take on a wide variety of roles and responsibilities especially in the international arena. Through good fortune I became a young Executive Director of the Board of the international subsidiary of my employer and even more educational was the role as Executive Director of the Board of our Joint Venture insurance company in Korea which commenced in 1989. I was also responsible for our Asian businesses being CEO based in Hong Kong and becoming resident here in 1994. When we undertook a sponsored demutualization I was offered a high profile role back in the UK but wanted to stay in Asia and joined the consulting firm, Tillinghast, in 1997.

On top of my C-suite experience the consulting environment has provided tremendous breadth through a vast array of invaluable exposure to very demanding, business critical, complex, often ground-breaking and high profile work with nearly all the leading Asian insurers. And I have been extremely fortunate to have worked closely with so many great leaders and practitioners of the insurance sector here in Asia all providing me with the opportunity to learn so much. For the last 15 years or so, I have attended the greatest educational establishment for insurance in the World – the School of Hard Knocks of emerging (and developed) insurance markets in Asia!

I am proud to have been a driver in building the market leading consulting firm to the Asia Pacific insurance sector and now also to be Managing Director of Towers Watson's Hong Kong business which is our oldest and largest office in Asia Pacific. And particularly proud now to be considered a Trusted Advisor to many C-suite executives and Boards of Asia's leading insurers.

I also believe it's important to 'give back' and I undertake various roles such as: Chairman of the Organizing Committee for the Institute and Faculty of Actuaries, Society of Actuaries and Institute of Actuaries of Australia Joint Regional Seminar series which is the largest pan-Asian annual educational event for the profession in Asia with around 1000 attendees spread over 5 Asian locations every year. I have also served and continue to serve on numerous professional, regulatory and industry committees as well as being a regular speaker and trainer at numerous industry events.

I'm also currently a member of the HKSAR Government's Working Group on Long Term Fiscal Planning for the Financial Secretary and Treasury and am Honorary Vice President on the Advisory

Panel of the Business Association BEA of Hong Kong University as well as a mentor on their select mentee program.

I now say I was raised in the UK but made in Asia!

Finally, back to the first point I made of hard work and good luck: At around a half a dozen points in my life I have been faced with decisions as to whether to continue doing what I was doing (which each time I felt was going rather well) or to take on a totally different challenge and effectively start again. Each time I decided to take on the new challenge and so far, so good. The fact that these opportunities have come along has been lucky. Although I am a firm believer in the old adage that the harder you try, the luckier you get!

"Be the best you can and do well by doing good" is a powerful recipe for success. Add the special spice of 'Can Do' attitude and you have the key ingredients. What you make is up to you.

On the route to becoming an Actuary, how did you balance your job, studying for exams, and personal time?

By learning to sleep faster! I even tried sleeping in a microwave oven so that I could get a full night's sleep in just a few minutes (that's a joke by the way in case any accountants are reading this – don't try that at home).

How long you have been associated with this profession? How it was earlier and how is it now?

I've been involved since the mid 1980s. When I started, many of the non-actuaries I mixed with viewed the profession as "aloof' and hidden away in ivory towers. I fear that perceptions have not changed much. Candidly I worry about the future of the profession. Some readers might recall a Panel session I chaired at the GCA a few years back when one of the CEO panelists referred to an issue he saw with actuaries suffering from "intellectual arrogance".

I think that's a very powerful warning message to us as a profession and something we have to work extremely seriously at addressing. We need to take a good, hard, look at ourselves and work determinedly to demonstrate our value-add. At the end of every day, a good question to ask oneself is "what have I achieved today, was recognised and appreciated by others, that demonstrated the value I add to our business, my colleagues and key stakeholders?". "What good have I done today?!?".

INSURANCE INDUSTRY IN INDIA

What trends do you see for this industry in the next 3 to 5 years?

The Indian insurance industry is proving one of the most difficult in Asia to make predictions about. Since opening up just over ten years ago, the dynamic nature and occurrence of major changes in such a short space of time is extraordinary.

Most practitioners are hedging their bets by predicting that the industry new business levels will be more or less flat for the next few years. The rationale for this is that many of the insurers will need to take stock of the impacts and implications of the rapid changes and adjust to the new regulatory environment whilst nervously contemplating the possibility of potential additional new measures to be introduced . The introduction of a host of recent regulatory changes over the last few years has caused insurers to reassess their strategies and adjust, or at least consider adjusting, virtually all aspects of their business operations.

The final form of the new bancassurance guidelines is not yet known at the time of writing. Clearly these have a potentially major impact on those insurers with banks as promoters as well, of course, as to any players having or contemplating having bank distribution. Whether the new regulations help or hinder and favour some players over others will be watched with interest and participants will be positioning themselves appropriately.

Sourcing business via the internet is an emerging trend and many companies are developing strategies appropriate for this medium and tool. The companies already having internet business capability are expanding online to include more online products, propositions, and services to increase their reach to potential customers and advocates through vehicles such as web aggregators and online marketing campaigns. We will see more companies entering this segment and innovation and creativity in abundance. This might be a field in which India could emerge as leading-edge.

The industry will likely experience some more M&A activities. Either or both promoters and/or foreign partners are reconsidering their appetite for insurance at quite a number of the players. Of course, whether or not the proposed FDI increase to 49% passes in this August's parliament will have a tremendous potential impact on the structuring of all the private players. If it does pass, there could be an extraordinary amount of early stage M&A-related activity for the second half of this fiscal year which will cause great excitement both in India and around the world in Head Offices of foreign participants, both current and potential.

On what seems like a more mundane level many insurers will also undertake marked activity in the enhancing the fundamentals of their businesses for example in improving governance, expense efficiency and policyholder persistency

Are there things that the IRDA or the Government should have or should not have done to assist the industry?

The IRDA is a rather unique form of regulator with responsibility for both Development and Prudential Supervision. And there have been swings from where their activity has been more on the former to more on the latter. And it's an extremely difficult task to get the balance right. Government and the Industry should have done more collectively and collaboratively.

Some insurance observers around the world are quite astonished by some of the recent major regulatory changes.

That being said there is also recognition that perhaps some players had not acted as responsibly as they should have; thus forcing the regulator to step in to protect the interests of the consumers. One has to say that it can be considered that the regulators have been quite firm handed but, again, there are mixed views as to how appropriate or not such action has been.

In any case the industry must now move forward positively demonstrating and reinforcing the social and economic good of insurance. By being relentlessly focused on the benefit for the customer, one should expect that other stakeholders such as shareholders and the regulators will be satisfied too. Happy customers should result in sustainable businesses being built and fair and reasonable returns for shareholders.

What market share do you see the private sector players having in ten years time?

- There are so many unknowns and uncertainties. However, one should expect the market share will increase from current levels. So perhaps around 50%.would be a sensible guess.

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

- Regulatory activity, action and current anxiety due to uncertainty for the players
- Customer experience, acquisition and retention. Building a positive image for the industry.
- Achieving sustainable profitable growth

What are burning / key issues in profession & line of business in India?

- Demand vs Supply – On opening up and for the first several years thereafter the industry suffered from a huge lack of appropriately experienced actuaries. This led to a favourable supply and demand relationship for the profession with relatively rather attractive salaries being paid to actuaries. And, as such, (not just because it's so cool to be an actuary!) huge numbers were attracted to enter the profession on graduating.

However, in recent years we have experienced exponential growth in the number of student actuaries in India. This tremendous increase in quantity has resulted in insufficient opportunities available in the Indian insurance market for many aspiring actuaries. So is a complete reversal from just a few years earlier. Consequently there is a great need to explore roles within other industries such as banking, investment banking, asset management, and wider afield into risk management across all sectors. Actuaries are risk experts and it's time to turn our attention to being more widely recognised as such and outside of the insurance industry too.

CAREER CORNER

MARKETS UPDATE

LIFE INSURANCE INDUSTRY UPDATE

The life insurance industry performance continues to be in the negative territory amid regulatory changes and changing company and consumer preferences. As per latest figures released by the Insurance Regulatory and Development Authority (IRDA), the life insurance industry recorded a year-on-year decline of 19% in weighted new premium income collections (10% of single premiums plus 100% of regular premiums) in the first quarter of FY2013-14. The aggregate growth rate was primarily pulled down by the 27% fall in weighted new premium collection of the Life Insurance Corporation of India (LIC) while private players recorded a modest decline of around 1% in weighted new premiums. Moreover, group weighted new business premium has shown a recovery this financial year; having declined 47% in FY2012-13, group weighted new business premium grew 32% in the first quarter of FY2013-14 over the same period last year. Therefore, the entire decline witnessed in weighted new business premium collections in the first quarter this fiscal is on account of individual weighted new business premium, which registered a 28% decline over the same period last year.

On an unweighted new premium basis however, both the LIC and private players recorded a contraction of only up to 2% in the first quarter of FY2013-14, down from the 6% contraction recorded in FY2012-13, indicating an early trend of recovery this financial year.

Last quarter has seen frenzied activity amongst companies for re-filing their products, especially group insurance products which needed to be compliant with the new product guidelines by 1 August 2013. The companies have an additional two months before the non-compliant individual products would be pulled out of the market (30 September 2013). While the larger industry view continues to be that the new product guidelines will cause a strain on resources and profitability, the IRDA believes that the product shuffle is not likely to adversely affect growth trends this financial year. Meanwhile, the LIC's traditional products are set to become expensive by around 3% from October 2013 as the Corporation plans to charge the service tax levied on non-unit linked products from customers going forward, which it currently absorbs on behalf of the policyholders.

Entry and exit of promoters in the life insurance industry is expected to continue into this fiscal with realty major DLF agreeing to sell its 74% stake in DLF Pramerica Life to Dewan Housing Finance, with speculative media reports indicating a deal price of Rs3.5 billion to Rs4 billion. Exide Industries, which became a 100% owner of ING Vysya Life earlier this year, is reportedly seeking a partner for the life insurance operation as also a leading public-sector bank in India, 'Indian Bank' having expressed a renewed interest in entering the life insurance sector by purchasing stake in an existing company.

Recently, the IRDA released the much awaited IRDA (Licensing of Banks as Insurance Brokers) Regulations, 2013. The regulations, permit banks, with prior approval of RBI, to become a broker of life and / or general insurance products.

According to the regulations that have been notified, banks acting as brokers cannot place more than 25% of the insurance business handled by them in a given year with the insurance company promoted by the same group, separately for life and general insurance. Given this restriction, it is seemingly unlikely that banks who have promoted their insurance companies would consider becoming an insurance broker, especially because they are known to account for a significant proportion of the new business premium underwritten by their insurance joint ventures. At the same time, other banks who have not promoted an insurance company might see this as an opportunity to become more customer-centric by offering them a wider choice of insurance products, having said that they might also be wary of the associated challenges in terms of enhanced compliance requirements, increased training (from multiple providers) and enhanced senior management commitment to the business (dealing with multiple partners). So we will have to wait and watch as to how the banks react to this opportunity.

About the Author

vivek.jalan@towerswatson.com

Director – Risk Consulting, India
Towers Watson

The insurance regulator is planning to introduce a new standard formula for calculating persistency rates of life insurance companies and agents and has released circulars whereby life insurers will be required to disclose all lapsed policies and segment-wise persistency rates for single premium and regular premium policies. Persistency is presently disclosed by the companies for the 13th, 25th, 37th and 49th month. Press reports suggest that surrender payments have increased significantly in the life insurance industry largely due to shifting customer needs and continued effects of mis-selling.

Also on the regulatory front, the IRDA has allowed insurers to lend equities under the stock lending and borrowing (SLB) scheme to generate additional income and has released draft regulations with tighter norms for web aggregators. With the IRDA releasing guidelines for insurance companies wanting to open subsidiaries/ branch offices outside India, it is reported that insurers may look to expand in overseas markets to diversify their revenue stream especially in the light of temporary weakness in the domestic market.

On the distribution front, insurance companies continue to focus on technology based sales media like the online channel and the use of smart phones. Given the high attrition rate in the agency channel, the IRDA has given a one-time chance to insurance companies to renew archived individual agency licenses.

The Union Cabinet had approved the hike in the foreign direct investment limit (FDI) in the insurance sector to 49% in October 2012 but the final decision on the bill remains pending. The insurance bill is likely to be taken up for discussions in the monsoon session of the Parliament, which commenced on 5 August.

The industry would welcome such a move as an increase in FDI would mean that foreign institutional investors (FIIs) could now participate in an insurance IPO, which would lend depth to the price discovery process as well as significantly increase the possibility of absorbing large scale IPOs. Additionally, of course many a foreign promoters are keen on increasing their stake in their local joint ventures as and when the FDI cap is increased, which would help increase our forex reserves and to a certain extent ease and / or reverse the downward pressure on the Rupee.

The article reflects life insurance industry events until 12 Aug 2013 and takes no account of developments after this date.

■■■

DISCIPLINARY PROCEEDINGS

In the matter of **R KANNAN** (M. No 00092) Information No PD/IN/1/2010-11,

This matter is being published in the Actuary India magazine, the in-house publication of the Institute of Actuaries of India, in accordance with the decision of the Executive Committee (now Council) in its meeting held on 4th March, 2003 applicable to all such cases and keeping in view IAI's membership requirements of the International Actuarial Association.

THE ORDER OF THE COUNCIL

(under section 30 of Actuaries Act 2006)

BEFORE THE COUNCIL OF THE INSTITUTE OF ACTUARIES OF INDIA (the IAI)

Reference:

R KANNAN (M. No 00092) Information No PD/IN/1/2010-11,

REPORT OF THE DISCIPLINARY COMMITTEE

Date: 15th June, 2013 Time: 10:30 am to 1:30 pm Venue: Hotel Sea Princes, Juhu, Mumbai

Agenda 3: Disciplinary Case in respect of Dr Kannan – Information No PD/IN/1/2010-11, Report of the Disciplinary Committee dated 11th February 2012 – Hearing as per section 30 of Actuaries Act 2006

MEMBERS OF THE COUNCIL PRESENT			
1)	M Karunanidhi, President (in chair)	6)	Saket Singhal
2)	K S Gopalakrishnan, Vice - President	7)	Dilip Charan Chakraborty
3)	Rajesh Dalmia, Hon. Secretary	8)	Chandan Khasnobis
4)	Liyaquat Khan	9)	A R Prabhu
5)	N Kalpana	10)	G L N Sarma
OFFICE STAFF PRESENT;			
1)	Gururaj Nayak, Head Operations	2)	Yogesh Pandit, Compliance Officer
RESPONDENT (RESPONDENT NOT PRESENT):			
R KANNAN"Sai Vittal" 11, Plot No 63, Sheela Nagar First Street, Madipakkam, CHENNAI-600091			

RECORDS AND DOCUMENTS BEFORE THE COUNCIL

Report dated 11th February 2012 of Disciplinary Committee and other relevant documents and evidences on record including some of these as mentioned under the narration for the sake of completeness of this ORDER.

Narration (the word Defendant and Respondent have been used for the same person contextually):

1) A letter dated 24th February, 2010 was communicated to the Respondent by Mr. R B L Vaish, the then Prosecution Director of the IAI stating and asking the clarification along with necessary documents in support of the bills raised, within 21 days from the date of receipt of the said letter, that the Respondent had submitted altered/false Air tickets and claimed reimbursement in respect of 12 journeys (22nd March 2008 to 8th June 2009) performed while attending various meetings of the 'Institute of Actuaries of India' but the respondent failed to reply,

2) Thereafter, letter dated 27th March, 2010 / 8th AprIl, 2010 was communicated by Mr. R B L Vaish to the Disciplinary Committee of IAI, wherein it had been alleged that the Respondent had submitted forged Air tickets and claimed reimbursement in respect of 12 journeys performed while attending various meetings of the 'Institute of Actuaries of India',

3) Based on the aforesaid letter, The Disciplinary Committee of IAI in their meeting held on 14th May, 2010 decided to treat the said letter of the former Prosecution Director Mr. R B L Vaish, as "information" under Rule 7 of the Actuaries (Procedure for Enquiry of Professional and Other Misconduct) Rules, 2008 and process as per the rules.

4) The Prosecution Director Mr. R L Narasimhan (replacing R B L Vaish who had resigned by then) informed the respondent vide letter dated 29th June,2010 asking to submit Written Statement on the acts of commissions and omissions alleged thereon, the Respondent filed his Written Statement vide his reply dated 5th August,2010.

5) The Disciplinary Committee through number of proceedings ending with the last meeting held on 21st January, 2012 concluded its proceedings. Report of Disciplinary Committee was accepted in its meeting held on 11th February 2012 and communicated the same vide its letter dated 11th February, 2012 to the President of the Institute stating inter-alia, "the Disciplinary Committee in its meeting held on 21st January, 2012 unanimously concluded that Dr. R Kannan, the Defendant is guilty of Misconduct in terms of section 31 of the Actuaries Act, 2006 and Part iii (1) & (3) and PART IV (A) (2) of the Schedule".

6) The Disciplinary Committee Report was sent to the Defendant vide letter dated 15th June, 201`2 inter-alia communicating to him that Council meeting would be held on 23rd June, 2012 under section 30 of the Actuaries Act, 2006 advising the Defendant to present himself, "so as to afford you a reasonable opportunity of being heard before making any order."

7) The Council meeting was held on 23rd June, 2012 to deliberate the Disciplinary Committee Report referred to above, and the

Respondent was directed to remain present in person vide letter dated 15th June 2012. In response to the said letter the Respondent had expressed his unwillingness to remain present in the said meeting and the Respondent had submitted to, that the said meeting can be held without his presence vide his letter dated 19th June 2012 appealing inter-alia as under;

- As my (late) mother's annual religious ceremony falls on 23rd June 2012 I can not visit any place on this date.
- "I also submit that now I realize there have been some more similar lapses on my part for number of travels over the priod from some date in the year 2004 till some date in the year 2009. I take responsibility for all these lapses."
- **I appeal to the Council to exercise its discretion and magnanimity to accept my appeal as under;**

1) I resign with immediate effect from the membership of the IAI with no right to appeal for reinstatement or re-admission in future.
2) I reimburse to IAI the payments made to me for the travels over the period mentioned above less the payment that I have already made to IAI and pay to the IAI the amount that is demanded on me calculated in accordance with the following request within seven working days of being communicated of the same.
3) I will have no right to appeal against the decision of the Council if the Council considers my pleadings as under

- **In Lieu of above I request;**

1) The disciplinary proceedings as covered under the Disciplinary Committee report dated 11 February 2012 be dropped.
2) Any proposed disciplinary action for the lapses on my part over the period other than that covered under the Disciplinary Committee report dated 11 February 2012 be not proceeded with.
3) The reimbursements on account of expenses on meetings/lunches/dinners taken by me be re-examined and if possible not recovered from me.
4) No "fine" as envisaged under section 30(c) of the Actuaries Act, 2006 be imposed on me, taking into account my contribution to the Institute and to the profession.

8) The Defendant, however, vide his letter dated 8th October, 2012 withdrew his letter dated 19th June, 2012.
9) The Respondent was finally served the notice dated 23rd May,2013 in accordance with section 28 of the Actuaries Act, 2006 containing that the Council had deliberated the report from Disciplinary Committee in the matter of PD/IN/1/2010-11 dated 11th February 2012, that was placed before the meeting of the Council held on 8th December, 2012 and on 4th May 2013 and the Council is satisfied that the respondent is guilty of Other Misconduct in terms of section 31 of the Actuaries Act 2006 and Part III(1) & (3) and Part IV(A)(2) of the Schedule, and the finding has been recorded.

Therefore, the Respondent was directed to remain present in the meeting of the Council which was scheduled to be held on Saturday, 15th June 2013 at 11.00 am at Board Room (1st Floor), Hotel Sea Princess, Juhu Tara Road, Juhu, Mumbai.

The Respondent was advised to appear together with evidence both oral and documentary to defend himself before the Council, this notice was served upon the Respondent as required under section 30 of the Actuaries Act, 2006.

The Respondent was also advised to treat the said notice under section 28 of the Actuaries Act, 2006 and requested to comply therewith accordingly. It was further stated that in the absence of compliance of the above on the part of the respondent, the matter would be decided by the Council on the basis of evidence available on record pointing out interalia, that you were also required to appear before the council on 23rd June, 2012 which you had not attended.

10) The meeting of the Council was held on 15th June 2013 to decide upon the matter. The Council placed on record the notice of the final meeting which was served to the Defendant through Registered AD on 24th May 2013 that was returned unclaimed by the Respondent on 6th June 2013). The notice was also forwarded to the respondent by speed post on 5th June 2013 which was delivered on 7th June, 2013and also through emails dated 28th May 2013 and 5th June 2013 respectively.
11) The council also placed on record the letter of the Respondent dated 12th June 2013.
12) On consideration of report dated 11th February 2012 of Disciplinary Committee and other relevant documents and evidences on record in particular the letters dated 19th June, 2012, 8th October, 2012, 17th December, 2012, and 12th June, 2013 of the respondent, while taking the decision on the matter, Council noted that reasonable opportunities have been given to the respondent more than once to appear with all the evidences both oral and documentary to defend himself.
13) Finally, the Council in its meeting held on 15th June,2013 held that the respondent is guilty of 'Other Misconduct' under section 31 of the Actuaries Act 2006 and Part III(1) & (3) and Part IV(A)(2) of the Schedule.

CONCLUSION:

1) Within the provisions of the section 30 (b) of the Actuaries, Act 2006 the name of the respondent is removed permanently from the register of members with immediate effect, and
2) Within provisions of section 30(c) to impose a fine of Rs. 5,00,000/-(five lacs) on the Respondent.

By ORDER
Gururaj Nayak
Head – Operations

Place: Mumbai
Date: 29th June, 2013

DISCIPLINARY PROCEEDINGS

Complaint of Mr. T Bhargava (M. No 00017) against Mr. Liyaquat Khan (M. No 00096)

Complaint No PD/C/1/2012-13

This matter is being published in the Actuary India magazine, the in-house publication of the Institute of Actuaries of India, in accordance with the decision of the Executive Committee (now Council) in its meeting held on 4th March, 2003 and 3rd August 2013 applicable to all such cases and keeping in view IAI's membership requirements of the International Actuarial Association.

THE ORDER OF THE COUNCIL

(Under Sub-Rule 4 of Rule 9 of The Actuaries (Procedure for Enquiry of Professional & Other Misconduct) Rules, 2008)

BEFORE THE COUNCIL OF THE INSTITUTE OF ACTUARIES OF INDIA (the IAI)

Reference:

Complaint of **Mr. T Bhargava** (M. No 0017) against **Mr. Liyaquat Khan** (M. No. 0096) Complaint No PD/C/1/2012-13, REPORT OF THE DISCIPLINARY COMMITTEE

REPORT OF THE DISCIPLINARY COMMITTEE

Date: 15th June, 2013 Time: 2:00 pm to 3:30 pm Venue: Hotel Sea Princes, Juhu, Mumbai

Agenda B6: Report of Disciplinary Committee dated 20 April 2013 in case of Complaint of Mr. T Bhargava (M.No 0017) against Mr. Liyaquat Khan (M.No 0096) - Complaint No PD/C/1/2012-136

MEMBERS OF THE COUNCIL PRESENT			
1)	M Karunanidhi, President (in chair)	5)	Dilip Chakraborty, Member
2)	Rajesh Dalmia, Hon. Secretary	6)	Chandan Khasnobis, Member
3)	N Kalpana, Member	7)	A R Prabhu, Member
4)	Saket Singhal, Member	8)	G L N Sarma, Member (abstained from discussion)
OFFICE STAFF PRESENT;			
1)	Gururaj Nayak, Head Operations	2)	Yogesh Pandit, Compliance Officer
COMPLAINANT:			
Mr. Bhargava [Membership No.0017] Flat No.801, Inder Tower, Gokhale Road, Dadar, Mumbai-400025			
DEFENDANT:			
Mr. Liyaquat Khan [Membership No.0096] B-1/9, Sector J, Aliganj, ,Lucknow-226024			

RECORDS AND DOCUMENTS BEFORE THE COUNCIL

Disciplinary Committee Report dated 20th April 2013 and other relevant documents and evidences on record.

COMPLAINT:

1) Mr. T. Bhargava filed the complaint before The Institute of Actuaries of India [hereinafter referred to as 'IAI' for the sake of brevity] vide his complaint dated 27th April,2013 under Actuaries (Procedure for Enquiries of Professional and Other Misconduct) Rules, 2008 in accordance with Sub-Rule(1) of Rule-3 against Mr. Liyaquat Khan alleging that:-

   a. the Defendant has conducted an enquiry based on some information received by the Defendant as per letter dated 1st March,2012 to the complainant in respect of Appointment of Dr. R. Kannan, Fellow Member[membership No.92] as Peer Reviewer of LIC of India for its annual valuation as at 31st March, 2011 by the complainant;

   b. the Defendant who has no authority to enquiry as per Para 4 of Part III of Schedule to Section 31 of the Actuaries Act, 2006 has violated the provisions under the Actuaries Act, 2006 and therefore the Defendant is liable for action under 'Professional Misconduct' as applicable to Members of the Institute generally.

DISCIPLINARY PROCEEDING:

2) A letter dated 11th May, 2012 along with the complete set of the complaint filed by the complainant was communicated to the Defendant by Mr. R. L.Narasimhan , the then Prosecution Director of the IAI requesting to submit a Written Statement along with documentary evidence if any, within 21 days from the date of receipt of the said letter but the Defendant failed to reply;

3) The Prosecution Director again forwarded a reminder letter dated 23rd November, 2012 to the Defendant requesting to file the Written Statement against the complaint made by the complainant within 21 days from the receipt of the said letter after consideration of the Prima Facie opinion of the Prosecution Director by the Disciplinary Committee in the meeting held on 10th November,2012;

4) The Prosecution Director Mr.R.L.Narasimhan addressed a letter dated 9th January, 2013 to the Presiding Officer forming his opinion and holding the Defendant "Guilty of Misconduct" under Section 31 of The Actuaries Act,2006 read with clause(4) of the Part III of the Schedule after the Defendant failed to submit the written statement despite the reminder letter dated 23rd November, 2012 of the Prosecution Director;

5) The Defendant forwarded a letter dated 15th February, 2013 to the Presiding officer Mr. K. S. Gopalakrishnan raising procedural questions on the appropriateness of the President of the Institute asking him to abstain from the Disciplinary Committee meeting's discussion relating to this case.

6) The Disciplinary Committee members in their meeting held on 16th February, 2013 noted that the Council had nominated three members of the Council to the Disciplinary Committee u/s 26 of the Actuaries Act, 2006 at its meeting held on 22nd September, 2012. The Disciplinary committee also noted the Minutes of the meeting of the Council held on 22nd September, 2012 which states that 'The council decided that if a situation arises wherein there is a complaint against or by a member of the disciplinary committee, such member shall abstain from the proceeding of the Disciplinary when such complaint is being taken up. Further, such member shall have no access to the material pertaining to the case [except as entitled in his /her capacity as a complainant or a defendant].

7) The Committee members deliberated whether the letter dated 15th February, 2013 of the defendant should be dealt with under Rule 8 of The Actuaries (Procedure for Enquiry of Professional and Other Misconduct) Rules, 2008 and consider as Written Statement. The Committee concluded that the letter dated 15th February, 2013 of the defendant is not in accordance with sub-Rule 3 of Rule 8 of The Actuaries (Procedure for Enquiry of Professional and Other Misconduct) Rules, 2008 as it was not addressed to the Prosecution Director and was also much beyond the 21 days' time limit allowed to the Defendant to respond. The Committee, therefore, decided to proceed with the case under Rule 9 of Actuaries (Procedure for Enquiry of Professional and Other Misconduct) Rules, 2008.

8) The Committee members deliberated the prima Facie Opinion dated 10th October, 2012 of the prosecution Director. Para 1 to 14 provide a summary of correspondence and the complaint, Para 15 to 22 are the findings of the prosecution director. The committee members disagreed with the Prima facie opinion of the prosecution director in view of the following reasons:

   a. The letter dated 1st March, 2012 was forwarded by the Defendant in his capacity as the Chief executive Officer (CEO) of the Institute. The defendant was the President of the Institute at that point of time and sub-section 2 of section 17 of the actuaries act,2006 states that "The president shall be the Chief Executive officer of the council;

   b. The said letter of the defendant states 'Prima facie' the complainant may be liable of professional Misconduct within the meaning of section 31 of the Actuaries Act,2006;
   The committee members agreed with the opinion of the prosecution director in so far as the Para 15,16 and 17 are concerned i.e., the President does not enjoy immunity from disciplinary proceedings, the President can call for information from any member of the Institute and President cannot directly initiate any disciplinary enquiry himself;

   c. The Committee members noted that the letter dated 1st March, 2012 forwarded by the defendant to the complainant ends with 'However, this letter is to inquire into the facts of the case and accordingly you are requested to let us know …..' and seeks specific information from the complainant. The letter further requested the complainant to respond in ten days' time. The committee members concluded that the letter dated 1st March, 2012 of the Defendant neither implies nor states that the information sought per se constitute an inquiry proceeding and the letter in itself states that the letter was to inquire into facts of the case seeking information. The letter does not further states that it is formal process of inquiry. The Committee members concluded that the Defendant was only seeking information from the Complainant and did not take upon himself the authority of the Disciplinary Committee and the Defendant did not initiate any proceeding within the meaning of section 31 of the Actuaries act, 2006 or the Actuaries (procedure for Enquiry of professional and Other Misconduct) Rules, 2008.

   d. In view of this, the committee disagreed with the prima Facie opinion of Prosecution Director and decided that the defendant is not guilty of misconduct as per Para 4 of part III of Schedule to section 31 of the Actuaries act,2006.

9) The meeting of the Council was held on 15th June 2013 to decide upon the matter. On Consideration of Report of Disciplinary Committee dated 20th April 2013 and other relevant documents and evidences on record deliberated the matter in detail and accepted the conclusion arrived by Disciplinary Committee that Mr. Liyaquat Khan, the Defendant, is not guilty of Misconduct under clause (4) of the Part III of the Schedule read with Sec 31 of the Actuaries Act, 2006.

CONCLUSION:

10) In the considered view of the Council in respect of the Complaint against the defendant Mr. Liyaquat Khan it is held that he is not guilty of Misconduct under clause (4) of the Part III of the Schedule read with sec 31 of the Actuaries Act, 2006. The complaint is disposed off accordingly.

By ORDER
Gururaj Nayak
Head – Operations

Place: Mumbai
Date: 31st July, 2013

INSTITUTE OF ACTUARIES OF INDIA

LIST OF STUDENTS WHO HAVE TOPPED IN MAY 2013 DIET

Sr. No	Subject	Subject Name	Name of the Donor	Name of the Candidates	Place	Prize Money
1	CT1	Financial Mathematics	Shri R. Krishnaswamy Memorial Prize Fund	Manish Agarwal (25712)	Kolkata	5000
2	CT2	Finance And Financial Reporting	Shree Atma Ram, Shri Chhaju Ram and Smt Parvati Devi Memorial Scholarship Endowment	Amit Bansal (26257)	Chandigarh	5000
3	CT3	Probability and Mathematical Statistics	Shri H V Krishnamurthy Prize Fund	Sumil Sethi (22308)	Jalandhar	5000
4	CT4	Models	Shri R. Krishnaswamy Prize Fund	Shiva Sai Venkata Aditya (23272)	Bangalore	5000
5	CT5	General Insurance Life And Health Contingencies	Smt. Vidhya Wati and Smt. Santosh Kumari Memorial Scholarship Endowment	Sanjay Nawandhar (24017)	Jaipur	5000
6	CT7	Business Economics	Prof R M Joshi Prize Fund	Punit P Parekh (26499)	Kolkata	5000
7	CT8	Financial Economics	Prof G S Diwan Centenary Commemoration Prize	Saurish Biswanath Bose (22392)	Kolkata	5000
8	CA1	Actuarial Risk Management	The Future Actuary Prize Fund	Rahul Khandelwal (3222)	Hyderabad	5000
9	ST1	Health & Care Insurance	G S Diwan 100th Birth Anniversory Memorial Education Fund	Kapil Aggarwal (509)	Delhi	5000
10	ST2	Life Insurance	Late Shri Janardan Pundalik Nerurkar Prize Fund	Pushp Aggarwala (22000)	Delhi	5000
11	ST4	Pension & Other Employee Benefits	Shri K A Pandit Memorial Prize Fund	Kruti Kamlesh Patel (4607)	Mumbai	5000
12	ST5	Finance and Investment A	Mr. Kamal Kumar Noranglal Podar Prize Fund	Rohit Ajgaonkar (594)	Mumbai	5000
13	ST6	Finance And Investment B	Late D Basu Prize Fund	No Candidate Passed	-	-
14	ST7	General Insurance - Reserving and Capital Modelling	Mr. Peter Akers Prize Fund	Roopali Bhargava (1112)	Gurgaon	5000
15	SA1	Health & Care Insurance	G S Diwan 100th Birth Anniversory Memorial Education Fund	Khushboo Hamirbasia (10557)	Kolkata	5000
16	SA2	Life Insurance	Prof G S Diwan's Memorial Prize Fund	Sachin Garg (10198)	Gurgaon	5000
17	SA4	Pension & Other Employee Benefits	Canada Life Scholarship Endowment Fund	Shuchi Jindal (2869)	Delhi	5000
18	SA6	Investment	Prof G S Diwan Memorial Scholarship Fund	Rohit Ajgaonkar (594)	Mumbai	5000

**"There are no secrets to success.
It is the result of preparation, hard work learning from failure"**

- General Colin Powell

Implications of RBC for Actuaries in Sri Lanka

As I mentioned in my last article, the Sri Lankan regulator and industry are working together to finalize the proposed Risk-Based Capital (RBC) framework for the country. This article looks at the latest progress and also the ramifications of RBC, particularly in terms of the actuarial profession in Sri Lanka.

Regulatory Update:

In Q1 of 2013 the regulator established a Joint Working Committee consisting of itself and key industry representatives with a view to finalizing the proposed RBC framework in 2013.

The Committee has successfully resolved most of the identified issues concerning the proposed RBC framework, and is currently working on the balance items, the most significant of which are summarized below:

- The derivation of a risk-free yield curve
- Concentration risk and its application
- Appropriate risk charges for certain asset classes.

As a result of the above, it looks likely that the RBC framework could be finalized according to the aspired date of 2013 year end, with voluntary adoption of the framework possible prior to the full regulation change in early 2016.

Actuarial Impact:

At present the Actuarial Association of Sri Lanka (AASL) has 58 members, categorized as follows: 14 Fellows, 7 Associates and 37 Ordinary members. Of the 14 Fellows, only 4 are working full-time in Sri Lanka, with 4 of the 7 Associates working full-time in the country. However, only 2 of the 4 full-time AASL Fellows are internationally recognized Fellows. Additionally, many companies have just 1-3 full-time actuarial staff.

As a result, it is clear that the industry is going to struggle to find actuarial resources in attempting to comply with the proposed RBC framework. For instance, it is likely that the proposed RBC framework, being so critically dependent on the control cycle, would require a detailed actuarial assumptions report in conjunction with annual experience investigations of every material aspect affecting the capital calculations. For actuarial departments used to the prevailing Net Premium Valuation (NPV) methodology and only two major types of assumption (economic assumptions and claim rates), this represents a considerable amount of additional work.

In the medium term the industry may be forced to rely on international consulting firms to carry out the numerous tasks required to comply with the proposed framework. This is likely to be extremely expensive by local industry standards, and the industry will therefore need to consider over what time horizon it intends to rely on this approach.

If it wishes to solve this problem in the long run it must first attract and encourage more actuarial students to the industry and then better support them to qualify as international Fellows. To do this, several components would likely be required:

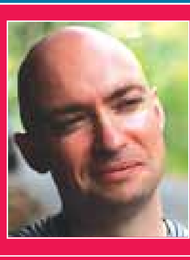
- Specified salary increments for exam milestones
- Improved tuition and support for actuarial exams
- Internationally experienced actuaries working full-time in the market.

The third point could be an important one- this may be the most cost-effective and efficient way for companies to develop their existing actuarial resources to handle RBC in the long run.

In addition to this, the regulator may need to consider whether a single consulting actuary constitutes sufficient actuarial resource to monitor the RBC positions of the entire industry the across Life and Non-Life sectors. The success of any regulatory framework is partly dependent on the availability of skilled resources to oversee it.

In sum, it is evident that the proposed RBC framework may result in a wide and quite sudden range of changes to the actuarial profession in Sri Lanka, and should significantly increase the demand and opportunities for skilled actuaries in the country.

About the Author



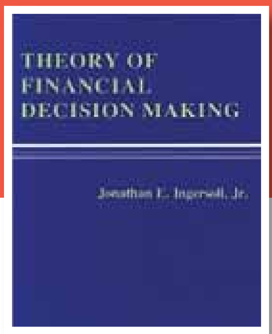
Frank.Munro@aia.com

Frank Munro is the Chief Actuary at AIA Insurance Lanka PLC and is a Fellow of the Institute and Faculty of Actuaries UK. Frank is a member of the RBC Joint Working Committee, a regulatory and industry group currently working to finalize the RBC framework within Sri Lanka. He is further the Secretary of the Actuarial Association of Sri Lanka.

BOOK REVIEW

THEORY OF FINANCIAL DECISION MAKING

Author : Jonathan E. Ingersoll, Jr.
Reviewed By : Dinesh Chandra Khansili
Email : dinesh.khansili@avivaindia.com



The celebrity writer initially introduces to the Mathematics and briefly explains Taylor Series, Leibniz's rule, Vector Differentiation, Method of Lagrange, Central and Non Central Moments, Chebyshev's inequality , Lognormal, Jensen's inequality, Stochastic Process, Markov process etc. This reminded me initial days when I started studying Actuarial Science. The book is structured in four parts. In Chapters 1 to 3, it introduces to Utility Theory, Arbitrage, and Portfolio formation. The second part is important and covers Chapters 4 to 9, which explains Mean Variance Portfolio Analysis, Generalised Risk, Portfolio Selection and Asset Pricing, Portfolio Separation Theory, Arbitrage Pricing Theory, Equilibrium Models with Complete Markets, and General Equilibrium Consideration in Asset Pricing. The third section covering Chapters 10 to 15, cover Inter Temporal Models in Finance, Discrete Time Inter Temporal Portfolio Selection, Distribution of Continuous Time Finance, Continuous Time Portfolio Selection, The Pricing of Options and Review of Multi Period Models. The final important section is covered in Chapters 16 to 19, where it introduces to Stochastic Calculus, Advanced Option Pricing, The Term Structure of Interest Rate and Pricing the Capital Structure of a Firm.

The Chapters 18 and 19- The Term Structure of Interest Rate and Pricing the Capital Structure of a Firm were of interest as it is directly related to Life Insurance Company's day to day job. Actuarial Fraternity is introduced to term V^n when they start career and they are comfortable in calculating Present Value of 1 Amount due at end of n period at given rate of interest (i). This magnificent book introduces to present value concept using different formulas and slowly introduces you how problem of valuing risky assets can be reduced to one of discounting at the riskless rate by using the expectations hypothesis and liquidity preference and preferred habitats theory.

■■■

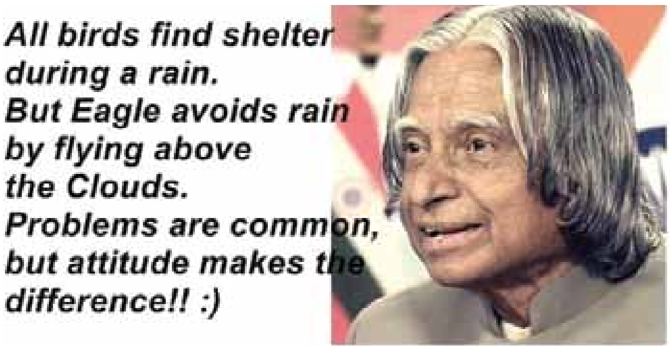
CAREER CORNER

PUZZLE

Puzzle No 197:
In the equation below, each capital letter represents a different digit and p and q each represent an integer between 10 and 99.
p. ROD^3 + q. $SOLVE^2$ = ROD × MARSHALL
What numbers do the letters and words represent?

Puzzle No 198:
A building has 150 floors. You have two identical pieces of crystal, which will completely shatter if dropped from a high enough floor. What is the minimum number of "drops" which must be made in order to determine the lowest floor from which the crystal will shatter?

shilpa_vm@hotmail.com



BIRTHDAY

Many Happy Returns of the day

the Actuary India wishes many more years of healthy life to the following fellow members whose Birthday fall in **August 2013**

D C CHAKRABORTY	N SEETHAKUMARI
BADRI PRASAD GUPTA	N H THANAWALA
O LAKSHMINARAYANA	M S VENKATARAMAN

(Birthday greetings to fellow members who have attained 60 years of age)

SUDOKU

SUDOKU No. 13 for the month of August 2013

HARD

	1	6					3	
	2	5			3	9		
	9				4	7		
9				2				8
5				6				9
6				1				3
		8	9				6	
		9	7			5	2	
	4					8	9	

HOW TO PLAY
Fill in the grid so that every horizontal row, every vertical column and every 3x3 box contains the digits 1-9, without repeating the numbers in the same row, column or box.
You can't change the digits already given in the grid.

- Sudoku Puzzle by Vinod Kumar

Solution of Sudoku Puzzle No.12 published in the Month of July 2013

SOLUTION

8	2	4	7	5	6	9	3	1
1	7	5	9	8	3	6	4	2
9	3	6	2	1	4	7	5	8
6	8	9	1	3	7	5	2	4
4	1	7	5	9	2	8	6	3
2	5	3	6	4	8	1	7	9
7	9	1	3	2	5	4	8	6
3	6	8	4	7	1	2	9	5
5	4	2	8	6	9	3	1	7

WE BELIEVE IN SUSTAINABLE GROWTH. FOR BUSINESS AND FOR YOU.

At EY, we combine the best of global insights and local reach. We attract and develop diverse talent, and our inclusive values-based culture brings our employees together as part of high-performance teams to deliver exceptional client service, thereby helping in building a better working world.

Opportunities in Actuarial Services

Our Actuarial services assist our financial services and insurance clients in developing strategies that deliver success for their enterprise.

We are looking for professionals with a truly global mindset, who combine the right mix of technical and interpersonal skills. Opportunities exist in Mumbai at Associate Consultant, Consultant, Senior Consultant and Manager levels.

- You will be tackling a variety of challenges on consulting projects such as Mergers & Acquisitions, Asset Liability Management, Model Validation and Financial Modeling for Pricing, Reporting, Business Planning, MCEV, Product Pricing and Development, Regulatory Compliance and more.

Eligibility:

- 2 to 10 years of experience in the life insurance industry or consulting
- Minimum of 2 Actuarial papers to recently qualified
- Prophet modelling skills will be preferred

Apply today by sending your resume to careers.ey@in.ey.com mentioning <Actuarial Services> and <Location> in the subject.

Visit us at www.ey.com/IN/en/Careers/Experienced

EY

Building a better working world

RNI NO. - MAHENG/2009/28427
Published on 16th of every month

Postal Registration No. - MH/MR/South/297/2012-14
Posted between 17th - 23rd of every month