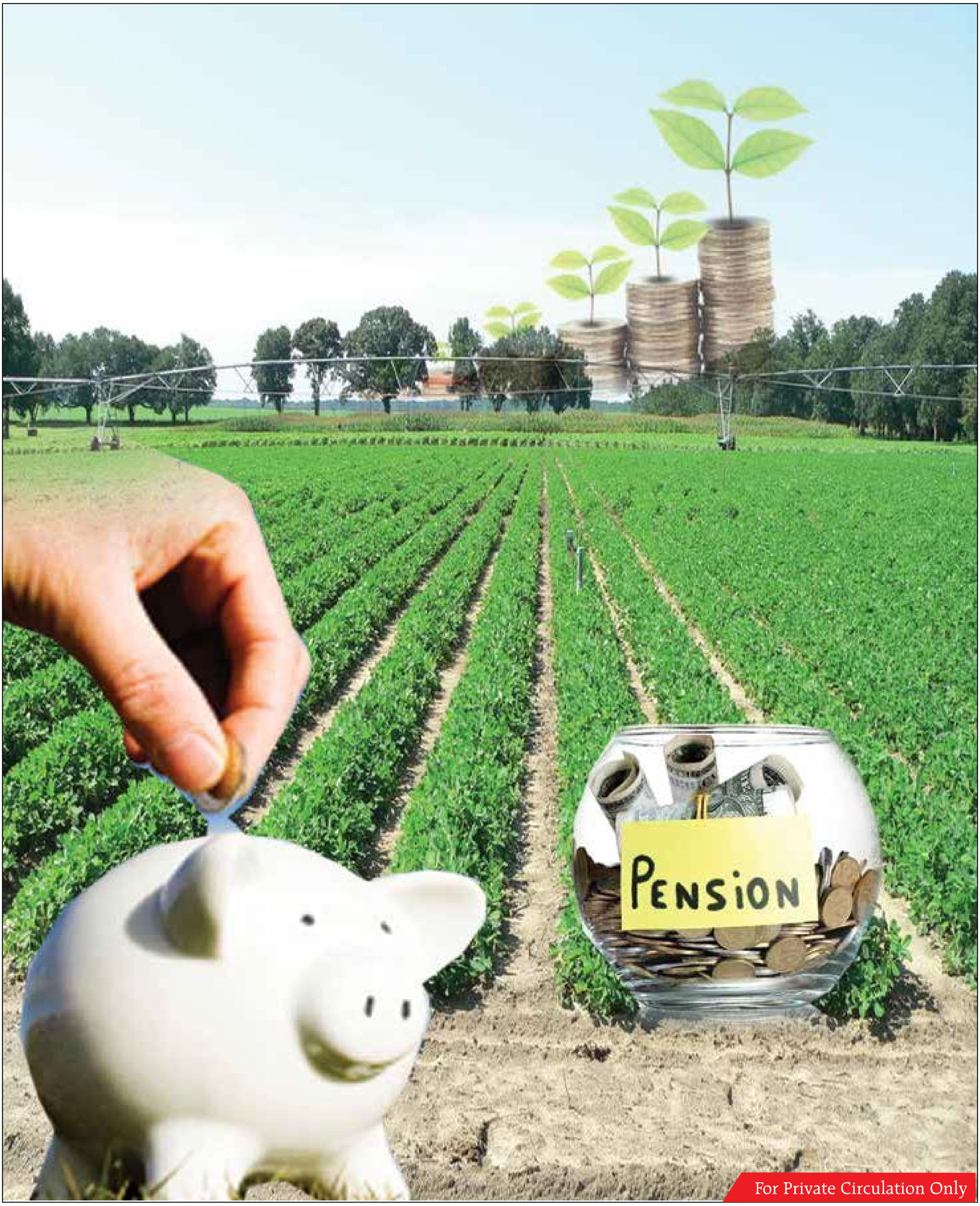
Institute of Actuaries of India
www.actuariesindia.org

the Actuary INDIA

INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest

THE MAGAZINE OF THE INSTITUTE OF ACTUARIES OF INDIA

VOL. VI • ISSUE 10 | OCTOBER 2014 ISSUE | Pages 32 • ₹ 20



CAREER CORNER

GENERAL INSURANCE CORPORATION OF INDIA

GIC Re

GIC Re 40 Glorious Years 1972-2012

(A Government of India Undertaking)

'SURAKSHA', 170, J. TATA ROAD, CHURCHGATE, MUMBAI 400 020

APPOINTMENT OF SPECIALIST ON CONTRACT BASIS FOR LIFE RE

Applications are invited by General Insurance Corporation of India (GIC Re)for the post of specialists (Actuary, Chief Underwriter, Head of Business Development and System Head) on contract basis for Life Re Department. Details are available on our website www.gicofindia.in

Last Date of submission of application- on or before 31st October 2014 by 17.30 Hours

Deputy General Manager (HR)

CAREER CORNER

Gain a new perspective.

Milliman is seeking motivated actuarial students with strong analytical, modelling and communications skills to join our brand new Life Consulting Support Centre in Gurgaon.

Seize this opportunity to work closely with our best consultants from across the globe in a dynamic, challenging and rewarding environment.

Please send your applications along with a detailed Curriculum Vitae by 31 October 2014 to:

shamit.gupta@milliman.com

Note that shortlisted candidates will be invited for an assessment test followed by an interview in November 2014.

For more information about Milliman, please visit:
in.milliman.com

Milliman

the Actuary INDIA
www.actuariesindia.org

CONTENTS

FROM THE EDITOR DESK

RAUNAK JHA 4

REPORTAGE

- 10th Seminar on Current Issues in Retirement Benefits (Pension) by **Khusboo Baid**
- 2nd Workshop on Crop Insurance by **Harshvardhan Bhonsle** 8

KNOW YOUR PRESIDENT

Dr. Rajesh Dalmia 10

FEATURES

- Equity Release: Shopping for happiness at old age - Part II by **Saket Vasisth & Sarah Chapman** ....
- Nigerian Insurance Market- A first-hand experience by **Dinesh Chandra Khansili** 16

STUDENT COLUMN

- Copulas - A brief introduction by **Abhinav Singh & Jyotsna Kaushik** 21

- Global Product Design of Annuities and its Taxation: An abridged report by **Prof. D. N. Panigrahi** 24

IAI: UPCOMING EVENTS 23

OBITUARY

Narayanan Lakshmanan 23

SUCCESS STORY

Shristy Agarwal 28

BOOK REVIEW

Life Insurance – Principles and Practice by **Padmaja R.** 29

COUNTRY REPORT

Canada by **Kedar Mulgund**

SHILPA'S PUZZLES 31

CAREER CORNER

- GIC invites applications for the post of Specialist (Actuary, Chief Underwriter, Head of Business Development and System Head) 2
- Milliman invites applications for Actuarial Students for New Life Consulting Support Centre 2
- Cigna TTK invites applications for the position of 'Senior Manager- Actuarial. 3

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

RAUNAK JHA

Raunak.Jha@CignaTTK.in

Hi Friends!

The festival season is here and we all are looking forward to Diwali celebration.

When it comes to exhilarated celebration, we often ignore our safety and may get expose to unexpected accidental events. This in our technical lingo is called 'change in customer behavior under special events'!

Now moving to risk management part attached to it; advice is to play safe and avoid accidents (which we had heard from our parents umpteen number of times but hardly followed). This is very similar to our health insurance policies, which should be bought at the right time to avoid possible financial mishaps. The general population understands and appreciates that it should have health insurance but faces the two big questions; when to buy and what to buy. This is definitely a challenge, given the vanilla health insurance products which are available in Indian health insurance space.

We know that everyone has his own way of adding variety to Diwali celebration; with different sweets, firecrackers, clothes etc.; which is governed by personal preferences. Similarly every individual has different health related goals which could not be covered by standard insurance solutions. This is the area where our actuarial fraternity can help by designing requisite insurance solutions; identifying individual's health needs and working towards his wellness and not only focusing on his illness(that's a hint!).

So I invite suggestions from you all for innovative health insurance solutions which could be offered to our Indian population. Feel free to mark your response directly to me on raunak.jha@cignattk.in. Hope to see some really innovative (but Desi) ideas from our young minds. The best ones would form part of our magazine's future editions.

Cheers!

CAREER CORNER

10TH SEMINAR ON CURRENT ISSUES IN RETIREMENT BENEFITS (PENSION)

- Organized by : Advisory Group on Pensions, Other Employee Benefits & Social Security, IAI
- Venue : Hotel Sea Princess, Mumbai
- Date : 18th September 2014

Innovation is an effect in economy and society, a change in the behavior of customers … of people in general," Peter Drucker wrote. "Or it is a change in a process—that is, in how people work and produce something. Innovation therefore always has to be close to the market, focused on the market, indeed market-driven."

The purpose of this seminar was to provide a general and technical update to all Indian professionals who are involved in the design, management, accounting and evaluation of employee benefits schemes.

KEY NOTE ADDRESS

The seminar commenced with a key note address by Chairman of the Advisory

K Subrahmanyam

group on PEBSS **K Subrahmanyam**. His emphasis was on the fact that the responsibility of actuary was only to provide the liability numbers and the responsibility of the accounting disclosures with respect to the retirement benefits lies with the auditors and the company .

Session1: Overview of Ind AS19 and its impact on companies in India.

Speakers: Chitra Jaisimha – Practice Leader, Aon Hewitt Consulting, India This was followed by the first session in which **Chitra Jaisimha** discussed

Chitra Jaisimha

the current status of IND AS19 (Indian Accounting Standards 19) along with the comparison of AS15 Revised and IAS19 (International AS) both, pre and post revision. In February 2011, the Ministry of Corporate Affairs issued 35 Ind AS, one of them being Ind AS19 which is similar to the international standards, but modified to suit the Indian economy. The effective date of application of these standards by the companies is expected to be adopted from FY 2016-17. It is still not clear whether the new standards will be adopted for stand-alone company or consolidated accounts. Chitra's study stated that the Ind AS19 is yet to be updated to the Revised IFRS issued in 2011. She mentioned the differences between pre and post revision IAS19 . The session concluded with the agreement that actuaries need to be more prepared for greater scrutiny by the auditors on actuarial gains & losses as these would now be shown in the disclosures under a separate head.

Session 2: India Pension reforms and update on the PFRDA

Speaker: Mamta Rohit, PFRDA

Mamta Rohit gave her perspective on what social security in India is and who are the providers and beneficiaries. She said that "India is a very young nation; however we do not have too many resources to take care of them". Since the introduction of pensions in the late 13th century to its more recently developed complex forms, the pension industry is constantly evolving and growing. It has been observed that historically, only 12% of the workforce (mainly government employees) was covered for post retirement benefits. This scenario has

Mamta Rohit

been improved with the establishment of PFRDA in 2004 and there has been a shift in the Indian social security system from Defined Benefit (DB) to Defined Contribution (DC) (from unfunded PAYG to funded) to enable and protect wider coverage.

PFRDA, an authorized statutory body since 1 February 2014, created the National Pension System (NPS) as part of its focus on improving the position of social security within the country.

Session 3: Fair value of assets in the context of accounting for employee benefit plans (Indian benefit plans context)

Speakers: Dr. K Sriram – Consulting Actuary, (Actuarial viewpoint and application)

Prasanna Deokar - Investment market expert, India Life

Dr. K Sriram and Prasanna Deokar shared their perspective on "Fair Value of assets in the context of accounting for Indian employee benefit plan" from an actuarial viewpoint & application and investments respectively.

About the Author

khus.baid@gmail.com

Khusboo is working with Jardine Lloyd Thompson India Pvt. Ltd. as an Assistant Manager in Actuarial Delivery Services. She has completed her Masters in Business Administration with specialization in Actuarial Science from NMIMS, Mumbai. She is a student member of IAI.

Dr. Shriram began with different definitions of Fair Value of assets in various Accounting Standards such as AS15, IAS19 Revised, IFRS13 etc. He emphasized that on the fact that the major concern being the market price if

Dr. Shriram

we consider the market value of assets. IFRS13 defines "fair value" as being a market based measurement and not an entity based measurement along with the widely used techniques being - market approach, cost approach and income approach. The key concerns are about consistency and that the market related values would add excessive and unnecessary complexities. Two approaches that are commonly used from actuarial viewpoint for determining a market related value of liabilities given for a fact that assets are taken at market values are:

- Asset Based Discount rate approach - the discount rate is the weighted average return based on asset allocation
- Economic valuation approach - the discount rate is based on the bond return with duration matching the liabilities.

The ultimate question aroused through discussion was "mismatching issue" which is not addressed by both the methods mentioned above. It was concluded that, it is still better to use these approaches rather than the approach where the assets are on market value and the liabilities are on the discounting approach as the mismatching would be less on the former.

Prasanna introduced the valuation methodologies used by the Trustees:

- Cost based valuation - DC trusts
- Market to Market based valuation or fair valuation - DB trusts

He mentioned the challenges of illiquidity associated with the instruments and

Prasanna Deokar

the absence of guidelines for valuation for assets held in retirement trusts. He emphasized that the fair valuation may be appropriate where there is a possibility of permanent impartment of bonds due to credit events. He gave a food for thought that the accounting practices should not influence investment decisions and these practices should be uniform across the industry.

Session 4: Overview of research papers by the Institute of Actuaries

a) Salary assumptions

b) Public sector assumptions

Speaker: Vinod Kumar - Associate, IAI (Presenting)

Kulin Patel - Director Client Account Management, Towers Watson (Facilitating)

Vinod Kumar gave "an overview of research papers by Institute of Actuaries on Salary assumption and public sector assumptions".

The first research paper was based on 'understanding salary escalation trends in Indian private sector'. Data collected for this research work was very limited and hence the conclusions were majorly

Vinod Kumar

based on the secondary data along with the information collated from various reports.

The findings suggested that the trend lines fit well to historical salary index and growth rates of GDP and CPI inflation are most significant macroeconomic factors that affect salary growth rates. He concluded that the relation between CPI and salary growth rates of the Indian private is negative which was highly debated.

The second research was 'to understand the demographic and salary trends in the PSU banks in India along with the identification of factors influencing long term salary growth other than CPI'.

Data sources referred in this work were very reliable, majorly based on published data and reports by RBI and other banks. This was a pretty extensive research with key findings being:

- CPI is the sole factor in deciding the changes in DA to all bank employees and major factor in deciding changes in basic pay level.
- The yearly compounding growth rate to be overall 8% from historical figures for long term perspective. This may end up being 6-7% depending on the reforms of RBI.
- Average annual growth rate for sub-ordinates and clerical cadres were around 11.45% and 10.55% respectively.

Full reports on the abovementioned Research is available on the IAI website.

Session 5 : (Facilitated discussion) - What do we need as practicing actuaries in terms of: - research from the IAI or other bodies and, - future topics of interest

Speakers: Kulin Patel- Director Client Account Management, Towers Watson; (Moderator)

Panelists

- **Anuradha Sriram -** Director, Benefits, Towers Watson;
- **Khushwant Pahwa**, IFFCO TOKIO
- **Vinod Kumar** –Associate, IAI

Kulin Patel requested the panelists to express their views on the research

Kulin Patel, Anuradha Sriram, Khushwant Pahwa, Vinod Kumar topics and other areas of interest for Vinod to take it further so that we can have a research pipeline in a year or two which can be a great source for all the actuaries to refer. The panelists discussed 3 areas being:

- What research should we do as practicing actuaries?
  - o Study the Industry trends on salary assumptions and continue analysis on salary assumptions
  - o Analysis can be performed on medical inflation assumptions
  - o Trends and impact of inflation on commodities such as gold, silver, etc.
  - o Longevity – isn't this a big problem today? How are we valuing our liabilities and Pension?
- As actuaries we have a social responsibility; what can we do about it?
  - o Raise awareness among general public on savings for retirement
- Other areas
  - o Publishing new annuitants table – the table being currently in use is 20 years old?
  - o Loyalty programs – does loyalty points need to be valued on accrual basis?

Session 6: ESOP Valuations- an overview

Speaker: Mayur Ankolekar, Ankolekar & Co

ESOPs (Employee Stock Option Plans) are European Call Options and as **Mayur** states that these tend to align the different interests by converging

Mayur Ankolekar

the goals of the management with the shareholders and are also an effective tool to attract and retain identified employees in an organization. Providing a brief history on ESOPs, he further discussed the practices in ESOPs being Equity settled and Cash settled (both variants are akin to call options) and their accounting treatment described in GN18. Most large companies in India like Reliance, ITC, Infosys, HDFC life have granted ESOP. KPMG's survey of 350 companies also suggested that 203 companies had either implemented or plan to implement ESOP with 42% of them being public listed companies.

The conclusion was - the assumptions' setting really needs an informed judgment with an in-depth understanding of the different regulatory guidance. Currently, ESOPs are not fair valued under Indian GAAP and so only intrinsic value is placed under P&L while the fair value is captured in the notes to the accounts and actuaries should take care of the draft disclosure items.

Session7: (Facilitated Discussion) –

- **Overview of the AGPEBSS Terms of reference**
- **Priorities members would like IAI/ AGPEBSS to consider**

Speakers: Preeti Chandrashekhar, Towers Watson; (Moderator)

Panelists

- **A D Gupta**, Consulting Actuary
- **Arpan Thanawala,** Consulting Actuary
- **Dr. K Sriram,** Consulting Actuary

It was mentioned that the existing GNs/ APSs need some revisions in terms of inclusion of detailed methodology for

Preeti Chandrashekhar, A D Gupta, Dr. K Shiram & Arpan Thanawala

valuation for certain benefits such as cap on gratuity benefits, earned leave, etc along with clarification on the position of assumptions and methodology. A D Gupta emphasized that mostly the modelling approach is standard and does not vary. Some new practice & research areas to prod over are:

- Longevity and Asset Liability Management
- Risk Management
- Merger & Acquisitions
- Research projects by collaboration with institutes like PFRDA
- How to build on other models?

The exposure of pensions is less in India with only traditional areas currently being in focus. It was concluded that there is a dire need to move out of comfort zones and start exploring the non traditional area. The session wrapped up with a consensus being there is lack of advice & brainstorming sessions along with a need for educating the auditors.

■■■

An actuary a doctor and a priest play golf together. They have a good day but it takes hours and hours to complete the course because the four in front are unbelievably slow. After the game they go to the club bar and have a drink. The club captain not having seen the new members welcomes them and asks them how their game went. They say how enjoyable it was but not really wanting to criticize they comment on how long the four in front took. The club captain explains the story that they are four firemen who in a tragic accident at a fire at the golf club house were blinded rescuing players from the bar. They are now honorary members allowed to play whenever they want but they do understandably take a while to complete a round. The doctor apologies and says he will get a friend who is a professor in eye surgery to have a free look to see if anything at all can be done. The priest says all his congregation will pray for them at church. The actuary thinks for a while and asks, "Couldn't they play at night?"

By Peter Barnard

2ND WORKSHOP ON CROP INSURANCE

- **Organized by** : Advisory Group on Micro Insurance, IAI
- **Venue** : Hotel Bawa International, Mumbai
- **Date** : 19th September, 2014

Welcome and Introduction

Speaker: Mayur Ankolekar - Advisory Group on Micro Insurance - IAI

Mayur Ankolekar began the day's proceedings with a short introduction to the role of the Advisory Group of Micro

Mayur Ankolekar

Insurance. He introduced the various forms of Crop Insurance which include Indemnity based products and Index Based products and the role the Actuary can play during the creation of such products. Basis risk is the risk which arises due to a mismatch between the farmer's actual yield and the readings recorded on the weather measuring device. He touched upon a subsidy scheme for the farmers which is "smart" in nature and a system where the farmer is incentivised to take risks and plant a single crop to get a good return rather than multiple crops to hedge their risks and in return obtain a below par yield.

Session 1 : Evolution and history of Indian Crop Insurance

Speaker: **D.D.Dange** – Regional Manager, Agriculture Insurance Company of India Ltd.

The first speaker, **D. D. Dange** provided a background to the Agricultural Industry in India which included land holding statistics, the major risks faced in agriculture, the costs incurred by the

D. D. Dange

farmers and the functioning of the crop insurance system in India. For Loanee farmers, obtaining insurance is compulsory and happens automatically whereas for Non Loanee farmers they can obtain insurance through a simple application process. He introduced the various crop insurance schemes in India. These include three major schemes which are the NAIS, the MNAIS and the WBCIS. The major achievements of each of the three major schemes were discussed as well as their pros and cons. A comparison of the three schemes showed that the WBCIS which is based on Weather station data is commercially viable, however the risks which present themselves while implementation of the scheme include basis risk, faulty data, and availability of weather station infrastructure for implementation of the scheme.

Session 2 : Crop Insurance Schemes – A Brief and Developments.

Speaker: **Pankaj Kumar Tewari** – Deputy Director, IRDA.

The next session was taken over by **Pankaj Kumar Tewari** who began by providing a history of the Indian Agricultural Industry and its development post-independence. He stated that as India progressed, the amount of land available for agriculture steadily declined however

Pankaj Kumar Tewari

currently more than 50% of India's population depends on agriculture for livelihood. There is also a need to reorient the agricultural policy to make it more holistic in nature. Following this, various crop insurance schemes around the world and their distinct characteristics were discussed. These countries included USA, Canada, Mexico, Brazil, Israel, China and Japan. These were then compared to the schemes available in India which are the NAIS, the MNAIS and the WBCIS and the various ways by which we can improve the crop insurance system in India.

Session 3 : Crop Insurance – An Actuarial Perspective

Speaker: **Tania Chakrabarti** – Royal Sundaram General Insurance.

Tania Chakrabarti introduced the audience to the role the Actuary has to play when crop insurance products have to be implemented by an Organisation. She first discussed the MNAIS and the WBCIS and the various factors that Actuaries have to consider while

Tania Chakrabarti

pricing of such products. These include indemnity limits and trigger points, Expenses, reinsurance arrangements and loading for the cost of capital. She stated that for development of such products it is necessary and prudent for the Actuary to obtain guidance and expertise of specialists who are well aware of the risks associated with such products. This is particularly because such products fall out of the traditional purview of actuarial expertise. She then provided a brief overview of the pricing mechanism along with explanatory examples of the product for paddy crop. She stated that India is a big opportunity for climate risks because of its large size with a number of

About the Author

Harshvardhan.bhonsle@ltinsurance.com

Harshvardhan Bhonsle is an actuarial student of the Institute of Actuaries of India. He is currently part of the Actuarial team working at L&T General Insurance Company Ltd.

climatic zones which provide a natural hedge against weather related risks.

Session 4 : "Climate Cost of Cultivation": a method to quantify the cost to farmers of climate change, exemplified in rural India.

Speaker: **Dr.Nihar Jangle** – Micro Insurance Academy

Dr. Nihar Jangle presented his research on the "Climate Cost of Cultivation" (CCC) method which forms part of his research paper co-authored with Mamta Mehra and David M. Dror. He started with a short introduction to the risks faced by Indian Agriculture and the cost to benefit

Dr. Nihar Jangle

ratio of implementation of indemnity based and weather based products. He stated that basis risk is the predominant risk which affects all weather insurance products and it is imperative in the development of such products to build in a mechanism which is able to reduce the basis risk as much as possible. It is in this regard that that CCC method has been devised. This method involves the use of high resolution climatic and bio-physical parameters, to create a CCC index, which works in reducing basis risk to a considerable extent. However he also went to state a quote from Clarke (2012): "There is currently no convincing statistical evidence from any reliable protection for farmers' program suggesting that weather index insurance can be relied on to pay in years that are bad for smallholder farmers."

Session 5 : Agricultural Meteorology

Speaker: **Dr. N. Chattopadhyay** - Deputy Director General of Meteorology, Agricultural Meteorology Division, India Meteorological Department, Ministry of Earth Sciences

Dr. N. Chattopadhyay introduced the audience to the role and activities of the Indian Meteorological Department (IMD). This was followed by the different types of Weather phenomenon which can affect the Indian Subcontinent and how the IMD is working towards obtaining better forecasting for them. These include Drought, Cold Waves, Heat

Dr. N. Chattopadhyay

Waves, Thunderstorms, Frost, Floods, Hailstorms and Tropical Cyclones. He stated that the role if the IMD is not just the forecasting of weather but also the communication of such phenomenon to a vast population. In this aspect India is unique and dissemination of information is a big challenge. Also, as time has progressed IMD has been able to increase its forecasting capabilities considerably. An example being Phailin in which there were zero casualties. He also stated that IMD collects and stores vast amounts of data which can be made available to insurers for the pricing of better weather insurance products.

Session 6 : Crop Reinsurance in India – An Insight

Speaker: **Nymphea Batra** - Marsh Reinsurance Brokers

Nymphea Batra commenced her presentation with a brief about the major global risks. Of the top fifteen risks faced by the world, five are related to climate and weather phenomenon. She then focused on what risks are prevalent in agriculture and how insurance and reinsurance plays a role in managing of

Nymphea Batra

these risks. She stated that reinsurance is needed to protect the insurer from the volatilities of weather related perils and to protect the balance sheet. Reinsurers are asset managers and they provide value to the insurer in the form of four pillars which are underwriting, expertise, protection against claims volatility and capital relief. She explained the way the premium flows from the farmer to the reinsurer. She stated that the Indian Crop insurance market is one of the largest and fastest growing in the world because of it being compulsory for loanee farmers. This coupled with India's natural hedging capabilities makes it an ideal market for reinsurers to operate in. As a recommendation she stated that the IAI can consider releasing a guidance note on Technical aspects of Crop reinsurance contracts in India.

Session 7 : Research Methodologies and Technical Paper Writing

Speaker: **Dr. Nihar Jangle** – Micro Insurance Academy

The last session of the day was again by Dr. Nihar Jangle. This topic included the methodology to be followed to write a technical research paper. A research paper can be about a new theory or a new methodology or simply about analysis of a specific topic. First, it is necessary to look at all the relevant history and research done in that particular area. Before commencing writing of the paper, you should ideally create an outline and draft your research questions. The reader's rule of thumb that can be applied while drafting research question is you should think "How pertinent, why has nobody else thought of this before?" Also it is not necessary to start at the abstract. In fact you may start writing the research paper with the findings or simply the methodology followed. Various international journals have their particular formats for submission of research papers. These can be obtained online however most of them are similar in nature. Also, all the results have to be presented objectively without personal interpretation. Before submission of any paper it is absolutely essential to proofread your work.

Session 8 : Vote of Thanks

Speaker: **Bharat Venkataramani** – Advisory Group on Micro Insurance

Bharat Venkataramani ended the day's

Bharat Venkataramani

proceedings with a vote of thanks to all the speakers and the participants for making the seminar a success.

Know your President

Dr. Rajesh Dalmia

I had worked with Rajesh Dalmia for around 5 years in the past in different companies. My first impression of him, when I met him in 2004 at the beginning of his actuarial career, is very different to the impression I have for him today. Rajesh initially came across as a bit curt, but the more I got to know him, I found him to be an extremely affable person. He is extremely professional and ethical, both in his work as well as matters relating to the actuarial profession. He is technically very good, and due to his research background is able to pick up challenging new tasks easily. His commitment to the job is also exemplary. I still remember the day when we got news that Rajesh has had a major car accident where his car turned turtle in a 25 feet (as per his prudent estimation!) deep pit by the side of the road. No one expected him in office for few weeks but he walked in two hours later with a heavily bandaged arm. I am sure he will continue to do good work and help the actuarial profession in India grow further. I wish him all the best in his new role as the President of Institute of Actuaries of India.

- Vivek Jalan

Rajesh is very focusing person towards his goal. He is the person who willing to take risk and make changes, which is important for one actuary. While doing his doctorate programme in finance, he suddenly got interested in Actuarial Science Course and completed it first and then completed his doctorate in finance. He was the fastest person, who becomes an Associate Member of IAI. His wife is professionally Chartered Accountant and he has two daughters Pragya & Gazal. He is very helpful person.

- Dr. Ajay Garg

CHILDHOOD-DARING AND STUDIOUS

He used to take classes of students of 8th grade (Maths), while himself is reading in grade 7th. He never got an environment of study, so used to study at nights when all fall asleep in his family or outside. He used to travel alone (from std 5th) 30 kms single side for schooling, by changing three public mode of transport. He took admission without any help of family members in std 5th in Hindi High School, Kolkata (one of the best school) and always desired for the best-IIM,ISI, ASI

TEENAGER

He loves taking up challenges related with studies/work, though all the family members were against him for the joining of ISI, (Indian Stastical Institute), he joined ISI, as he heard that this is the place, where he can take up his favourate subject maths and statistics, and he was the one of the six selected students from all over India. After B. Stats, he was on the job with PEERLESS SECURITIES LTD, KOLKATA, but soon he realised that its not his cup of tea. He left the job and appeared for CAT, though he wanted to appear for IIT, but his financials does support. He got an interview call from IIMA as well as IIMB. He choose IIMB.

YOUNG

It was again a new challange, he wanted to skip 1st year of doctoral study, as all the subjects were already read by him during his MBA days, but it was not in the rule of IIMB. Still he kept trying, and finally he got a success, that anyone can give all the 16 subjects altogether and 1st year could be waived. (though he couldn't be benefitted). During his 3rd year of doctoral, he joined ASI as a student. **He is the prestigious award winner, MEENA SIDHWANI OF ASI,** for passing all subjects within 5 years time. The most important thing, I would like to share, that he was never a book worm category. He enjoyed a lot by watching movies. He hardly studied 4-5 days for one paper, and 10 days were enough for enough to attempt 3-4 papers in single sitting for higher level subject.

UNIQUENESS

No one can beat his hard working, (can work 7 day and night without sleep), dedication towards his work. He hardly sleeps 4 hours in a day on an average basis. His Hobbies are meditation, Reading, tourism. Before shifting to Mumbai, he had a huge library. He can't tolerate any unethical issue. Once in a year, goes for the VIPASSANA COURSE, where he lives in a completely closed system on "Maun" for 10 days. "The difference between ordinary and extraordinary is that little extra." his believe. The idea that the harder you work, the better you're going to be is just garbage. The greatest improvement is made by the man or woman who works most intelligently." perfectly applies on him.

Today he took up the president ship of IAI, as he is having a dream to do something for the students and Institute's growth and he has the potential to do the same.

- Anju Dalmia

FEATURES

EQUITY RELEASE: SHOPPING FOR HAPPINESS AT OLD AGE - PART II

(This is second part of this article . Part I published in September Issue of Actuary India)

This article is about the general and economic environment for the Equity Release products available in the UK.

Contents of this article are:

1. Advantages and disadvantages of Equity Release for the customer
2. Advantages and disadvantages of Equity Release for the provider
3. Risks to which provider is exposed to and a note on management of those risks
4. Information which a borrower should obtain before signing the contract
5. Few recommendations for the borrower
6. Appendix: Sample list of providers registered with the Equity Release Council

Here are the advantages and disadvantages of Equity Release product on the customer and provider:

Equity Release	Advantages	Disadvantages
For the Customer	**1.** Allows the policyholder to release money from their property without the need to downsize or move home. **2.** The cash can be spent on anything so can be useful in planning retirement and help in payments towards holidays or house repairs etc. **3.** The NNEG feature can reassure policyholders that any dependants will not be left with any debt. **4.** Option to take further cash in the future. **5.** Allows the policyholder to stay in their home for as long as they live. **6.** It is relatively easy for the policyholder to work out how much needs to be repaid at any time. **7.** They are highly regulated products.	**1.** The loan is not usually re-paid until after death, so most of the costs are met by the dependants when they pay to acquire property. **2.** Lenders may specify certain conditions which may concern policyholders, e.g. keeping the house in good condition. **3.** It may reduce their ability for state benefits and affect their tax position **4.** Can reduce the value of the property and the amount that any beneficiaries will receive upon death. **5.** If there are any dependants living in the house they will need to vacate the house upon death of the policyholder, unless the contract conditions specify otherwise. **6.** There may be more suitable ways of raising funds rather than Equity Release. **7.** Interest rates can be much higher than standard residential mortgages
For the Provider	**1.** With an ageing population, the target market is big and demand is growing for these types of products. **2.** Further opportunities to sell other products to policyholders i.e. cross selling opportunities, e.g. term assurance. **3.** They gain the ability to utilise the huge amount of equity tied up in the policyholder's property. **4.** There may be diversification benefits to selling these contracts, i.e. the asset could be less volatile than other assets in some situations.	**1.** The NNEG feature introduces the risk that the value of the property will reduce to be less than the outstanding loan on the sale of the property. **2.** Pricing the contract is difficult because house prices and decrements may be difficult to find. **3.** The costs of ensuring the property is being maintained adequately can be expensive. **4.** The company is at risk of not having sufficient liquid assets in the future. **5.** The reputation of the company is at risk by angry dependants who may feel they have been swindled out of their inheritance. This could be worsened by the fact that the product is sold to elderly people who may not fully understand how the product works. **6.** The NNEG can be difficult to price and may need to be modelled stochastically. **7.** Care needs to be taken in selling the product when there are dependants living in the property also. (Ref: April 2009 SA 2)

About the Authors

saket.vasisth@gmail.com

Saket Vasisth is involved in actuarial reporting for life insurance. He is student member of IAI and is working at WNS.

skchapman1@hotmail.com

Sarah Chapman is part of the Asset Production and Equity Release reporting team. She is a student member of the institute and faculty of actuaries and works for Aviva.

There are many risks which a provider takes by choosing to sell Equity Release. Following section has list of risks and methods to mitigate these risks.

Risks which a provider takes on by selling Equity Release:	How risks can be reduced:
The value of the property is less than the debt which needs to be repaid. This could be due to an extended period of high interest rates.	Reducing the maximum loan to value (LTV) of the property can help lower the risk of falls in property values. The loan to value could also vary by age or geographical region to match the risk.
Difficulty in pricing the product due to lack of data on house price inflation and volatility. If the company gets the price wrong it could be uncompetitive in the market.	This risk is difficult to mitigate. The company should carefully monitor other competitors' prices so it can remain competitive within the market.
Risk of reputation by bad publicity if for example a dependant refuses to move out the house.	Terms and conditions of the Equity Release contract should be worded clearly so ambiguity can be avoided.
Higher than expected expenses. This could be from more business than expected, higher expense risk or fewer policies sold so development costs are higher.	The company should monitor the amount of contracts sold so it can check admin and development areas can cope with the new business strain.
Policyholders live longer than expected so the value of the put option on the property increases.	The expected term of the contract could be minimised by introducing a high minimum age limit.
The policyholder has no incentive in maximising the sale value so they might not keep the property in good condition.	The company could put clauses in the contract so that the policyholder is obliged to keep the property in a good condition. The company could also carry out independent valuations of the property to ensure it is not in a state of disrepair.
Property values are likely to fall in times of low equity values. Also there is the risk returns could become very volatile.	Property derivatives could be bought by the company to reduce the exposure to falls in property values. To match this risk they would have to buy over the counter derivatives since there are no traded property derivatives.
Marketing risk if the product is relatively new to the company, especially if the company has had previous bad selling practises.	The company should try to improve the markets perception of them before releasing the product.
Reserving for the product will be very prudent because there is lots of uncertainty over future events. This means Equity Release is very capital intensive.	Research of the potential market to reduce uncertainty should be done as far as possible before launch. (Ref: September 2005, SA 2)

What all borrowers should know before taking loan?

1. **Keeping track of what is outstanding on loan:** Providers normally share a periodic statement showing details of the transactions taken place in that period in the customer's account. The borrower can also contact the provider with any questions they have and need not wait for the annual statement.

2. **Loan repayment:** Normally the customer makes no monthly/ annual loan repayment during the term of the loan. Instead, the interest accumulates and is added to the mortgage balance each month and will itself have interest charged on it. Eventually, the original loan, any draw downs, further advances, unpaid fees, costs or charges and accrued interest must be paid back in full from the proceeds of selling property or by other means if customer so choose. No negative equity guarantee provides that if the sale proceeds are not sufficient to cover the balance, his or her legal heir/s of the customer will not be required to make up the shortfall as long as the customer has complied with the terms and conditions of the mortgage. Any positive difference between the sale proceeds and the amount required to pay back the loan remains with the customer or his or her legal heir/s.

3. **Maximum amount which can be borrowed:** This depends on the following three factors:
   - Estimate of value of house as per the opinion of a professional surveyor
   - Age of the borrower
   - Lifestyle and health of the borrower

4. **Minimum amount which can be borrowed:** There may be a minimum amount, the borrower has to take. This could be, for example, £10,000 or £20,000. It will depend on the product and the provider. The borrower may not have to take it all at once. Drawdown loans can be taken in smaller amounts over time.

5. **Changing home during contract period:** Normally, providers give the borrower the option to transfer the contract to their new home based on the lending criteria of the provider at the time of transfer. The borrower gets the same loan to value just like a new customer subject to payment of property transfer fee (many providers may not charge ERC though). In case, if the new property do not meets the criteria for loan disbursement, borrower will have to repay the whole loan

with accumulated interest when his or her current property is sold.

6. **Contract terms post borrower's death:** Upon the borrower's death (or in the case of joint applications, upon the death of the survivor) the executor/administrator of the estate should notify the provider and the loan must be repaid, usually from the sale of the property. The provider must be notified of the sale price when the property is placed on the market. If the sale price is lower than the outstanding mortgage balance, the provider may insist on a second independent valuation and may insist the property is not sold for less than this amount. If the property is sold for more than the outstanding mortgage balance, the difference will be paid to the borrower's legal heir/s, once sales costs have been deducted. If the property is sold for less than the outstanding mortgage balance and sales costs, the borrower's legal heir/s will not have to make up any shortfall because of NNEG feature. Where a proportion of property value is covered by the Inheritance Protection, the borrower's legal heir/s will retain at least that proportion of the sale proceeds. Interest will continue to be charged on the outstanding balance until it is repaid. If the property hasn't sold after six months, the provider may ask for the help of an agent to sell the property.

7. **Contract terms post death of borrower's partner:** If the scheme is in both the borrower and their partner's name the arrangements will continue. If the property and scheme are in the sole name of the borrower, the property would have to be sold and their partner would have to find somewhere else to live unless partner could repay the debt in full.

8. **Need of solicitor:** This is essential because the borrower will need independent legal advice. They can contact the National Solicitors Network (TNSN) in order to get in touch with solicitors in local area who are fully qualified, Equity Release specialists, they can be contacted at www.tnsn.com or 0845 389 0381. Whilst acting on behalf of the borrower, the solicitor normally provides the lender with a SHIP Solicitor's Certificate, verifying that they have explained the terms of the contract to the borrower. All legal costs and disbursements are to be met by the borrower.

9. **Property valuation:** A valuation will be needed to establish whether the property represents adequate security for a mortgage, and to allow the provider to calculate exactly how much a person may be able to borrow. Normally, a valuation fee is included in the fee charged by the provider at the time of application. Along with any other expenses, this is usually non-refundable once the valuation has been carried out, even if the loan is not made. An independent, professional valuer is instructed to carry out the valuation. They submit their report to the provider and also a copy to the borrower.

10. **Property insurance:** It is up to the borrower to arrange insurance for the house, contents and possessions.

11. **Share of family members post borrower's death:** If the borrower chooses to sell 100% of their property, he or she will no longer have any equity in the property. Therefore will not be able to leave any inheritance from the sale proceeds of the property to his or her family. However, if the borrower sells less than 100% then they (or legal heir/s) will receive the proceeds after sales cost. The amount they will receive will be based on the sale price of the property at the time of the sale. Property prices can fluctuate over time and therefore an exact amount cannot be guaranteed until the actual time at which the property is sold on the open market. All expenses associated with the sale, such as legal and advertising costs and commission, will be deducted from the sale proceeds of the property before calculating the amount due to the borrower or borrower's estate. It must be stressed that the value of the property may not increase over the duration of the Equity Release tenure and could even fall. This may mean that the amount of equity that the borrower retains in the property (i.e. the proportion of the property value which the borrower did not sell) may be substantially less at the end of the Equity Release plan than it was at the outset.

12. **Impact on inheritance tax:** It is best to take professional financial advice if the borrower is thinking of using an Equity Release scheme as part of inheritance tax planning.

13. **Maintenance expenses:** The borrower will be responsible for keeping the home in good condition. If the borrower does not maintain the home, the provider could arrange the necessary repairs and the borrower would have to pay for them.

14. **Difference between sale and rent back scheme and home reversion:** The borrower may have to leave his or her home after the end of the fixed term in the tenancy agreement which may only last say 5 years. The borrower may have to pay a much higher rent in sale and rent back agreement than under a home reversion plan and the rent could go up.

15. **Treatment in case borrower or his/her partner moves into long term care:** In such a situation, the Equity Release scheme will carry on unchanged, if care is provided in borrower's own home or just one (either borrower or partner) moves to a residential or nursing home. If both move into a care home, the scheme will usually end and the properly will be sold.

Some recommendations before applying for the Equity Release product with a provider:

- Before applying for a lifetime mortgage the borrower must seek financial advice from an appropriate financial adviser, authorised by the Financial Conduct Authority, with suitable qualifications to advice on Equity Release.
- The borrower should discuss intention to apply for Equity Release with his or her next of kin, immediate family or any other person having an interest in the property, before applying for loan.
- The borrower should make a will before taking out a lifetime mortgage.
- Providers normally do not give advice on tax or related matters including eligibility for state or other benefits. The borrower should consider the implications for their entitlement to these benefits, which may be affected by taking out an Equity Release product.
- The borrower should ensure that the financial adviser has provided a personalised Key Facts Illustration before applying for a lifetime mortgage.

Appendix:
Sample list of providers in the UK: There are more than 50 providers registered with the Equity Release Council. Some of them include: Aviva, Partnership, Stonehaven, Just Retirement, More 2 Life, Sixty Plus, Crown Equity Release, Bridgewater Equity Release and LV=. Interesting to note that in this list, insurers like Prudential, Standard Life, Met Life, Axa or Legal and General are absent. Out of top 5 life insurers in the UK, Aviva is the only one selling this product. Majority of the firms in the list, specialise in pensions and are not life firms. Full list of Equity Release providers, financial advisors (Region wise), solicitors, and surveyors: http://www.equityreleasecouncil.com/member-directory

References: www.equityreleasecouncil.com
http://www.which.co.uk/money/retirement/guides/equity-release-explained/equity-release-schemes/

Sincere thanks to Manoj Budholia and Rajiv Mukherjee for their inputs.

FEATURES

NIGERIAN INSURANCE MARKET- A FIRST-HAND EXPERIENCE

Abbreviations used

The Act- Insurance Act 2003 of Federal Republic of Nigeria, IRDA- Insurance Regulatory and Development Authority, NAICOM- National Insurance Commission (counterpart as IRDA), NIA- Nigerian Insurers' Association, IAIS- International Association of Insurance Supervisors, N-Naira (Nigerian Currency as Rupee in India), mn- Million, bn-Billion, FY- Financial year (Jan to Dec)

Exchange rate – 1 Indian Rupee =2.674 Naira

Insurance Supervision in Nigeria

Insurance Act 2003 of Federal Republic of Nigeria is main Act which supervises insurance in Nigeria. This Act repeals the Insurance Act 1997 and enact a new Insurance Act, which provides among other things, for (a) an increase in the paid –up share capital of insurance companies; (b) classification of insurance business into life insurance business and general insurance business and (c) better supervision and control of insurance industry in Nigeria. In addition there exist guidelines issued by NAICOM, tax and revenue authorities. The Insurance Regulator, NAICOM is currently headed by Fola Daniel- a dynamic personality which brought radical changes in Insurance Market. The following Act govern the six compulsory insurance coverages;

- Pencom Act 2004 - Group Life Insurance;

  Workmen's Compensation Act 1987- Employers liability
- Section 64 of the Insurance Act 2003- Buildings under construction
- Section 65 of the Insurance Act 2003- Occupiers liability insurance
- Section 68 of the Insurance Act 2003 - Motor third party insurance
- Section 45 of the NHIS Act 1999 - Health care professional indemnity insurance

The earlier act are as under;

- National Insurance Corporation of Nigeria Act 1969 (NAICON Act 1969)
- Nigeria Reinsurance Corporation Act 1977
- National Insurance Commission Act 1997

Though the Act would be strengthened with the passage of time yet NAICOM as member of IAIS has liaison with its counterpart across world including IRDA. NAICOM is funded by industry levy and government grants, 50 percent of which is for operational purposes, 30 percent for upgrading industry capacity and 20 percent for industry development and compensation.

Insurers in Nigeria must be established as the limited liability companies under the Companies and Allied Matters Act, 1990. No Premium No cover was buzz word in Nigeria, I heard in every meeting post my first visit to Lagos (Nigeria) in Jan 2014. NAICOM, in addition has issued guidelines on voluntary code on corporate governance, operational guidelines, risk management framework, KYC and AML/CFT requirements. NAICOM has recently issued micro insurance regulations. To make regulations effective, the regulator needs technical help.

Minimum capital requirement for non-life companies, life companies, composite companies and reinsurance companies is N- 3 Bn, 2 bn, 5 bn and 10 bn respectively. There is no requirement of minimum capital for Brokers.

Section 16 of the Act states about approval of New Products. This states:

- No new products without prior approval of commission
- Approval or otherwise by commission within 30 days.
- Non - compliance fine = N = 10,000.00

Solvency

Section 24 of Insurance act defines solvency requirement but it pertains to

About the Authors

dineshkhansili@rediffmail.com

Partner - Mithras Consultants - An Actuarial Firm Consultant - Actuarial Function, Aviva India, Former General Manager (Technical-Actuarial), Asset Resource Management, Life, Lagos.

other than Life Companies. For life companies the assets should be higher than liabilities. I believe this is the area, where more guidelines require to be issued. The non- admissible assets have been defined separately.

Reserve

There are minimal instructions. E.g. Subsection 22 – for Life Insurance business states;

- Net liabilities on policies in force at the time of Actuarial valuation plus 25% of net premium for every year between valuation date.
- A contingency reserve 1% of gross premium or 10% of profit whichever is greater and accumulated until it reached the amount of minimum paid up capital.

IFRS Adoption

NAICOM has mandated the adoption of IFRS from January 1, 2012. The effectiveness is yet to be seen.

Insurance market in Nigeria

The annexures below depict the insurance market in Nigeria. The highlights as per 2011 published figure as on date are;

- As per published figures, there are 58 insurance companies, consisting of 16 life companies, 29 general insurance companies and 13 composite companies. Composite insurance companies sell life and non-life (general) business both. All companies are Lagos based companies. Lagos is economic capital like Mumbai in India. NAICOM head quarter is at Abuja, the capital of Nigeria.
- General Insurance business (Non-life) in Nigeria is much bigger than

Life Business;

- In non-life business, marine/ aviation, motor, miscellaneous, property and work-man compensation contribute to 31.9%, 28.5%, 23%, 15.6% and 1% respectively,
- In life business, group business (insurance and pension) dominate the market;
- In life business- group life, group pension and individual life contribute 68.8%, 10.1% and 20.5% respectively,
- Total Asset of Life companies as per published 2011 figures is N 2,13,663 mn and Non-Life it is N 4,07,432 mn, which shows an increase from year 2006 as 19.3% and 13.2% p.a respectively,
- The total liabilities in life was N 2,10,240 mn and Non-life it was N1,25, 530 mn, which shows non-life business a profitable business, (total liabilities include current liabilities, insurance funds, outstanding claims, short term and long term borrowings and other liabilities.
- In FY 2011, Composite total claim analysis shows claims in amount term as N 60204.76 mn, which shows an increase of 24.4% p.a. Life business in composite companies tops the table with 34.6% of pie followed by Motor business as 21.9%,
- In 2011, Group Life Insurance business contributed gross premium of N 38,164 mn. Expenses of management as % of gross premium in this category of business was 12.9%,
- In group life, gross claims as % of gross premium was 35.6%,
- 2011 Annual premium/claim consolidation general business report shows that general business excluding reinsurer business – ceded local as % of total gross premium was 25%, commission paid as % of gross premium was 12% and unearned premium as % of net earned premium was 27.4%, (which shows that main business in first three months Jan to March. Similar trend was observed in 2013 for group life business). Management expenses as % of total gross premium was 19%.

FURTHER:

- The total premium income was ₦ 201 billion in 2010, which represent 0.7 percent of GDP or only just above a tenth of the average penetration of the OECD countries.
- The insurance sector is an underdeveloped part of the Nigerian financial sector with assets less than 2 percent of GDP.
- The substantial increase in the minimum capital requirements in 2007 led to a reduction from 104 to 60 insurers in 2008.

NIA meet and message forward

In Feb 2014, I attended three night and two days' CEO Retreat meet organised by NIA. The representation was from NAICOM including NAICOM commissioner, CEO and COO of - Nigerian life companies, general insurance companies, composite companies, reinsurers, KPMG and Tax and revenue authorities.

NAICOM commissioner stressed upon for more insurance penetration which was also aired by revenue authorities in their respective address later-on, need of development of local Actuarial personnel and own mortality table.

I got opportunity on second day to address the meet. Based on my actuarial, Indian regulatory and insurance companies' experiences, I presented a road map how the path and concern shown by the NAICOM commissioner may be met. It was to my surprise, when NIA Chairman while consolidating his address asked me to write my views and present them to NIA in a paper. I did it later-on. The following are main excerpts;

- To address the low penetration, reinsurers should come forward and reduce the reinsurance premium rates and provide the required know-how.
- Further, for growth of insurance business, I stressed on need to review the overlapping guidelines issued by NAICOM and other authorities. I cited one such example- that for submission of annual returns NAICOM provides six month after close of financial year while revenue authorities' deadline fixed is within 3 months. If NAICOM comes back and ask particular insurer to revise the accounts then accounts filed with revenue authorities becomes null and void. Thus the instructions issued by various authorities should be in sync.
- Currently the life insurance market is dominated by group business but current ratio of group business to individual business would reverse in coming decade. Market should adhere what NAICOM Commissioner asked to develop actuarial talent in the country. Because management of individual business would require actuarial know-how more.
- Nigerian insurance market is adopting A67-70 mortality table published by Institute of Actuaries of UK. I made point relating to efforts made in India to produce IALM 2006-08 Ult table in place of IALM 94-96,
- For local development of actuarial personnel, I acted as representative of Institute of Actuaries of India (IAI) and offered the Nigerian market the full support from IAI.

  (I request current team of IAI to help in this regard. I offer my services, if required.)

Actuaries and Actuarial Firm in Nigeria

There is only one Actuarial firm which has limited number of fully qualified Actuaries. Now Insurance companies have shown interest in recruitment of Actuarial personnel but still local regulator requirement remains to file the product or undertake the valuation only through local Market Actuary. Further, the life insurance market was driven by group insurance business and so not much necessity was felt for in-house actuarial talent. But with IFRS adoption and growth of individual business, companies would feel necessity to recruit more and more actuarial personnel. Some Actuaries from South Africa are also helping Nigerian market.

Emerging risk for life insurance companies

In individual segment, the annuity business is on rise. This is because of compulsory group pension business. The insurance companies are offering very high annuity rates and guarantee for life. There is caution to Nigerian insurance market that though current interest rate regime appear to be high yet in line with developed markets, the interest rates would fall in years to come and then guarantee offered would be onerous and on-going solvency of many insurance companies may be threatened. Hence there is need for strong ALM process set-up in place. Further, Sufficient investment instruments do exist to cover current short term insurance liabilities, but, as the annuities and long term insurance markets are developing, little longer term investment instruments exists. Interestingly, the Nigerian market asset composition for insurance companies both life and non-life is similar. This is because majority of insurance market in life companies is group insurance which behave in line of non-life companies. This position shall change as individual business grow. It is thus necessary that life companies and long term business transacted by non-life companies should keep additional reserve for Asset and Liability duration mismatch risk.

Reinsurance terms

As stated earlier, the mortality rates adopted are as per A 67-70 Ult mortality table (age next birthday) and reinsurance terms are based on the said table. The reinsurance premium terms appear to be high. One reason is cited that Nigerian people average life expectancy is low. Yes, this is evident from World Bank 2011 report. The report estimates average life expectancy of Nigerian people as 52, seventeen lowest in world. But this may not be true for insured personnel. It would be much higher. I came across an Obituary published in a newspaper- which stated the age at death of a female as 104 years. I also asked participants of my Friday Classes in my Company, where I was explaining Longevity Risk, about their age of parents and most of them replied more than 60. As individual business shall grow and experience analysis regarding mortality shall be undertaken, then only real picture may emerge. This leads to necessity to develop local mortality table.

Insurable interest

It was to my pleasure to see the definition of insurable interest in the Act. Because the same is not defined in India either in Insurance Act, 1938 or IRDA regulations. Sub section 56 of the Act states– No insurance to be made on lives without insurable interest.

Part X -Sub section 56 (2) of the Act states– A person shall be deemed to have insurable interest in Life of any other person or in any other event where he still stands in any legal relationship to that person or other event in consequence of which he may benefit by the safety of that person or event or be prejudiced by the death of that person or the loss from the occurrence of the event legal relationship.

- Relationship which exists between person under customary law or Islamic law whereby one person assume responsibility for maintenance and care of other.
- No policies on lives without inserting the names of persons interested.
- Limitations on amount receivable by person with insurable interest.

Broker dominated market

Nigerian market is dominated by Brokers. The important Brokers are Hogg Robinson, Scib Nigeria, IBN, ARK, Nigeria Life and Glanville. In a partners' forum organised by my company, there were more than 100 persons present representing various Brokers. I also visited Glanville office, it was huge multi story building with tight security arrangement and hundreds of personnel working inside office.

Telecommunication companies offering insurance

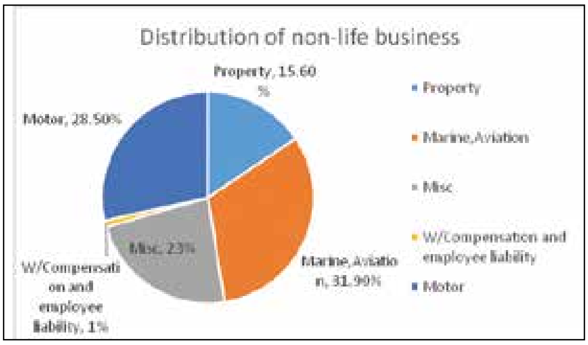
Telecommunication companies e.g. MTN, Etisalat are offering insurance coverage to their client on group insurance plateform with partnership with life insurance companies.

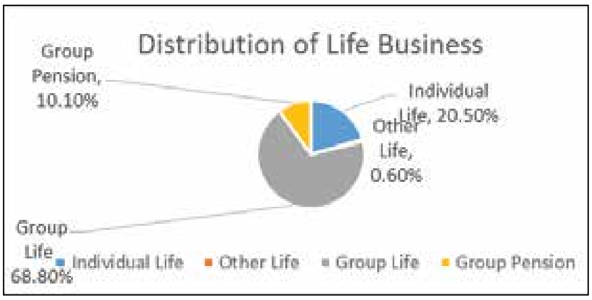
Nigerian Bonhomie

Despite of thousands of miles away, there is special connection between people. India and Nigeria are so common in many aspects especially warm interpersonal relations;

Conclusion The article in a magazine may not cover full detail and so information above has been given in brief. A full- fledged paper may be presented in GCA, citing how Actuaries of India may contribute to west African Insurance market.

Annexure





Total Assets- Life & General Business			Total Liabilities*- Life & General Business		
Year	**Total Asset in Mn Naira- Life**		**Year**	**Total Liabilities* in Mn Naira- Life**	
2006	88,456		2006	64,840	
2011	2,13,663		2011	2,10,240	
Growth per annum		19.3%	Growth per annum		26.5%
Year	**Total Asset in Mn Naira- General**		**Year**	**Total Liabilities* in Mn Naira- General**	
2006	2,19,087		2006	1,58,530	
2011	4,07,432		2011	1,25,530	
Growth per annum		13.2%	Growth per annum		-4.6%
Year	**Total Asset in Mn Naira- Life+General**		**Year**	**Total Liabilities* in Mn Naira- Life+ General**	
2006	3,07,543		2006	2,23,370	
2011	6,21,095		2011	3,35,770	
Growth per annum		15.1%	Growth per annum		8.5%
Liabilities* include Current Liabilities, Insurance Funds, O/S claims, Short term and long term borrowings, other liabilities					

Gross Claims in Mn Naira (Composite)					
Class of Business	**Claim Amt in Mn N-Yr 2007**	**% Contribution**	**Claim Amt in Mn N-Yr 2011**	**% Contribution**	**Growth P.a since 2007**
Fire	1,793.39	7.1%	8,520.45	14.2%	47.6%
Accident	3,829.06	15.2%	6,820.64	11.3%	15.5%
Motor	6,196.12	24.7%	13,205.62	21.9%	20.8%
W/comp	207.54	0.8%	271.05	0.5%	6.9%
Marine	1,904.23	7.6%	2,889.58	4.8%	11.0%
Oil & Gas	-	0.0%	4,651.55	7.7%	NA
Misc	1,913.39	7.6%	3,030.27	5.0%	12.2%
Life	9,289.51	37.0%	20,815.60	34.6%	22.3%
Total	**25,133.24**	**100.0%**	**60,204.76**	**100.0%**	**24.4%**

Gross Claims - General and Life in Mn Naira			
Year	**General**	**Life**	**Total**
2007	15,843.73	9,289.51	25,133.24
2011	39,389.17	20,815.60	60,204.77
% inc p.a	26%	22%	24%

2011 Annual Group Life Insurance Business		
Item	**Amount in Naira-Life Companies**	**Continental Re & Nigeria Re-Insurance Corp**
Gross Premium received locally	381638,69,556	403572,57,556
Net Premium	336362,50,698	355179,43,698
Life fund BoY	104177,72,235	111166,38,235
Life fund EoY	80329,75,405	71213,83,405
Investment Income	9458,17,844	9717,45,844
Expenses of Management	49251,11,047	50721,61,047
G/Claim Paid	135679,76,741	144211,50,741
N/Claim Paid	121168,83,101	129700,57,101
Net Premium as % Gross Premium	88%	88%
Investment return using IRDA formulla 2*I/(A+B-I)	10.8%	11.3%
Expenses of management as % of Gross premium received	12.9%	12.6%
Expenses of management as % of Net premium received	14.6%	14.3%
G/claim paid as % Gross Premium	35.6%	35.7%
N/claim paid as % Gross Premium	31.7%	32.1%

2011 Annual Premium/ Claim Consolidation General Business Profile			
Item	**General Business**	**General Business including Continental re and Nigeria Re-Ins Corp**	**Reinsurer**
Direct Business	1592376,36,266	1592376,36,266	-
Accepted Locally	61415,39,992	128522,49,992	67107,10,000
Accepted abroad	-	39462,98,000	39462,98,000
Total Gross Premium	1650997,54,630	1757567,62,630	106570,08,000
Ceded Local	412540,23,105	419206,93,105	6666,70,000
Ceded Abroad	20410,21,822	24650,13,822	4239,92,000
Net Premium	1226722,89,541	1322386,35,541	95663,46,000
Unearned Premium	313390,14,238	344505,26,238	31115,12,000
Net Earned	1144357,03,592	1236760,64,592	92403,61,000
Gross Claim	359167,57,195	393888,37,195	34720,80,000
Net Claim	238195,65,907	272916,45,907	34720,80,000
Commission Paid	193659,72,785	222078,77,785	28419,05,000
Management Expenses	317680,98,617	328764,80,644	11083,82,027
Underwriting Profit/loss	479026,45,997	496762,98,781	17736,52,784
Profit after tax	142239,85,732	152938,20,732	10698,35,000
Net claims incurred	298455,20,846	338361,69,846	39906,49,000
ceded local as % Total gross premium	25.0%	23.9%	6.3%
Unearned premium as % of net earned	27.4%	27.9%	33.7%
Commission paid as % of total gross premium	12%	13%	27%
Management expenses as % of total gross premium	19%	19%	10%

■■■

17 GCA THEME CONTEST WINNERS

Changing Risks, Expecting the Unexpected

jyotsna.kaushik@gmail.com

Jyotsna Kaushik is a nearly qualified Actuary currently working in the Actuarial Systems team of a Life Insurance company in London (UK). In this role she is involved in the development of Solvency II compliant Assets models and Pricing and Valuation Systems.

bankukapila@yahoo.com

Tejinder Kapila is a B. Tech (Mechanical Engineering). He is currently working with New Indian Assurance as Administrative Officer and previously worked with SBI as probationary officer from 1st march 2011 to Nov 2011.

STUDENT COLUMN

COPULAS - A BRIEF INTRODUCTION

Correlation and Copula

Correlation and copulas are important tools to measure the dependency between two or more variables.

Dependence between two variables refers to the relationship between two variables. For example:

$Y = aX + b$ (Linear)

$Y = X^2$ (Quadratic)

are two of the many possible relationships between variables X and Y.

Correlation measures linear dependency and assigns a single number to the dependency between two variables. An example of high correlation includes the correlation between the smoking habit of a person and his mortality. The correlations can be used to predict or formulate a relationship between two variables. The most common correlation coefficient in use is Pearson correlation coefficient (ρ) which is defined as

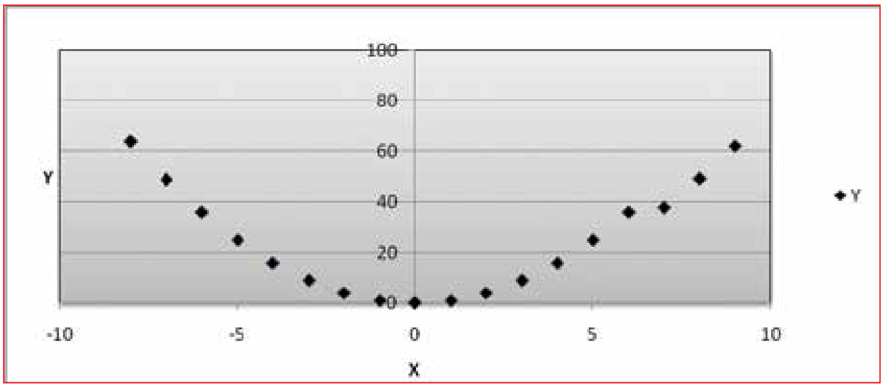
$$\rho(X, Y) = \frac{\text{cov}(X, Y)}{\sigma x \, \sigma y}$$

Where cov (X, Y) is the covariance of X and Y, σx is the standard deviation of X and σy is the standard deviation of Y.

A value of 1 for the Pearson correlation coefficient implies a high degree of positive association whereas a value of -1 implies a high degree of negative association. A value of 0 implies no association. A higher Correlation coefficient means that the two variables are more likely to move together. In a market of assets this implies that a bucket of assets with high correlation will increase the risk or volatility of returns. This implies a loss of return that may have been achieved otherwise because of diversification. Similarly if losses of an insurance company are being modelled, a higher correlation between the events that cause a loss would mean that these events move more closely. The linear correlation between the variables can be calculated from the data or can be obtained as per the specification by an expert judgement (e.g. low, medium or high).

However the correlation does not describe the relationship between the variables accurately when the two variables are not linearly dependent. Another limitation of correlation coefficient is that, it is only defined when the variances of the variables are finite. So it is not suitable for heavy tailed risks/variables which show a high volatility.

Correlation alone is insufficient to describe more complex relationships (or dependence structures) such as those observed in financial world. For example, consider the relationship between the (arbitrarily chosen) variables X and Y,as shown below:



Relationship between variables X and Y

The correlation calculations show that there is little or no relationship. The correlation coefficient of X and Y is a small number of the order of 7%. But clearly there is a stronger relationship than that described by correlation.

That's where copulas come into use. Copulas, similar to correlations, can be used to describe the dependence structure between two (or more) variables, however, more accurately. Main reason for this is that unlike correlations, copulas do not implicitly assume that the relationship between the variables is constant.

The word copula is derived from the Latin noun for 'link' or 'tie' that connects two different things.In statistical terms, the copulas are used to formulate a multivariate joint distribution between two or more univariate marginal distributions.

In financial world and otherwise the impact of two variables working together is of particular interest. It could be the case that an event on its own doesn't cause a large impact but two events combined together can have a large impact. For example breaking down of a machine will cause a loss to the company. This combined with a high

About the Authors

abhinav31singh@gmail.com

Abhinav Singh is a qualified Actuary currently working in the Risk team of a General Insurer in the UK. In this role he is involved in Economic Capital Modelling, Standard Formula (Solvency II) development and reporting.

jyotsna.kaushik@gmail.com

Jyotsna Kaushik is nearly qualified Actuary currently working in the Actuarial Systems team of a Life Insurance company in London (UK). In this role she is involved in Asset Modelling and development of Pricing and Valuation Systems.

frequency of breaking down will cause even larger loss. The copulas can be used to model this loss by formulating a distribution for intensity and duration of loss.

When modelling risks, main focus is on the tail of the distribution of losses. The tail represents the extreme events that occur with low probability. These events, if they occur, may have large impact. The impact may be much greater if there are more than one event and the events are tail dependent. Tail dependency measures probability of joint extreme events that can occur in upper tails or lower or both. Using a suitable copula allows modelling of tail dependency between two or more variables. This makes copulas extremely useful in estimation of the impact of the extreme events.

Copulas can be specified using two components:

1. Type of copula which is used to describe the shape relationship between variables and
2. Parameters of the copula- There may be one or more parameters, which are used to describe the strength of the relationship.

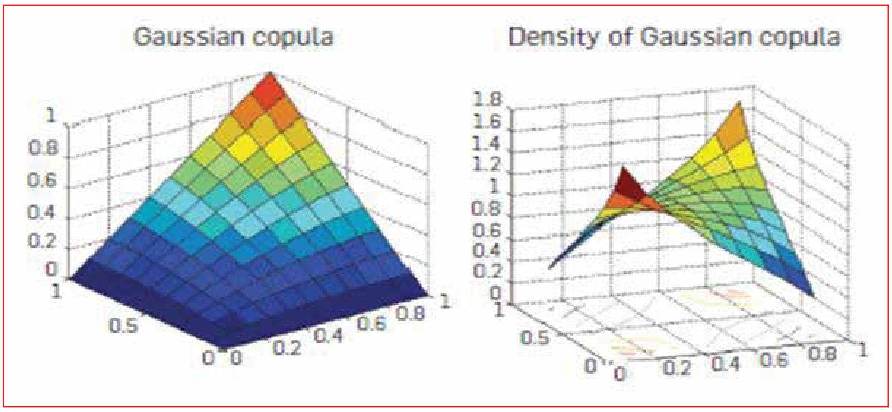
This article discusses three different copulas

1. Normal or Gaussian copula
2. Student's T copula
3. Gumbel copula

1. Normal or Gaussian copula

It can be thought of as an extension of Normal distribution which is the most commonly used distribution. Under a Gaussian copula two (or more) variables underlying the distribution follow a normal distribution. In order to specify the Gaussian copula, a single parameter namely the linear correlation (or correlation matrix) between the variables is required.

A three dimensional graph for a Gaussian copula looks like the three dimensional bell curve as shown in the chart.



Under a Gaussian copula the events in the tails are (vaguely) independent, which is usually not true for the extreme events in financial world. This is also referred to as zero tail dependency for Gaussian copula. This means Gaussian copula may not be suitable for modelling dependency with heavy tails.

2. Student's T copula

It is constructed in the same way from the T distribution as is Gaussian copula created from the Normal distribution.

Student's T copula requires two parameters for specification, namely

- Correlation (as in Gaussian copula) and
- Degree of freedom (**df**).

The **df** can be used to control the tail dependence. Smaller values of **df** correspond to greater amount of probability being assigned in the tails of T copula (i.e. increasing the probability of joint extreme events).

So choosing a lower value of **df** will lead to a higher probability being assigned to joint extreme events. So, in a two variable case, for losses being modelled, it would mean that the probability of occurrence of both the losses simultaneously will increase.

Under T copula, the events in the tail are not independent, so it is suitable for modelling heavy tailed events.

As df increases, T copula approaches Gaussian copula (approximately for df>30). This parameter df is based on df of the component T distributions, which is equal to n-1, if n is the number of observations.

3. Gumbel copula

Gumbel copula is specified by a single parameter called 'Tail parameter' which can take any value greater than or equal to 1. Higher values of the tail parameter correspond to higher degree of dependence between the risks. This means a higher value of the parameter is more likely to lead to more extreme movements of the two (or more) variables it describes.

The shape of the Gumbel copula makes it useful for describing the upper tail dependence. So under a Gumbel copula large positive joint extreme events are more likely to occur than large negative ones.

It is suitable for the modelling situations where association increase for extreme high values. An example of application can be modelling losses from a Reinsurance Credit risk portfolio – where losses are recorded as positive values.

The parameter can be derived using expert judgement (implied from correlation) or by using the relationship between Kendall's Tau and the tail parameter. Kendall's tau is a measure of rank correlation between the variables.

Application of copulas

Other than the financial world where copulas are used to price complex securities and model extreme events, the copulas have a variety of applications in fields like weather research, drought analysis, civil engineering and reliability analysis, just to name a few.

Criticism of copulas

Gaussian copulas were very frequently used by the investment banks to model complex risks like the relationship between prices of mortgage based securities. The mortgages include the financing of house loans made by the banks. Copulas were particularly considered useful in stress testing for the extreme events. One major reason for the popularity of Gaussian copula is its simplicity and elegance. However its ability to predict complex relationships was proved lacking in the period before and during the global credit crisis of 2008 - 09. Main reasons for the same were the failure to identify the limitation of the Gaussian copulas to correctly predict the relationship between two variables and insufficient or irrelevant data to model extreme events.

After accounting for their limitations, copulas can be useful tool for pricing of complex securities like Collateralized loan obligations (CLOs). Also their ability to capture dependence between the variablesis well known in the financial world.

To conclude, parameters of copula should be based on sufficient volume of data over long enough time periods so that they can accurately capture the risk that is being modelled. Choice of the correct type of copula to model the risk is equally important. Copulas are useful tool for modelling related risks. It shows in the fact that despite the criticism the copulas are still widely used in financial world and otherwise.

IAI: UPCOMING EVENTS

Tile of Event	Date	Venue
Leadership Development Program	20^{th} - 21^{st} Nov. 2014	Gurgaon
Workshop on Financial Condition Report	03^{rd} - 4^{th} Dec. 2014	Hyderabad
22^{nd} India Fellowship Seminar and LDP (IFS)	18^{th} - 20^{th} Dec. 2014	Mumbai

REMEMBERING SHREE NARAYANAN LAKSHMANAN

Oct 1938-26^{th} September 2014

We are deeply shocked to know that Shri N Lakshmanan, our fellow member passed away on 26^{th} Sept. 2014 at Mumbai at the age of 76 years

Shri N Lakshmanan was a fellow member of Institute of Actuaries of India, Associate of Institute of Actuaries, London. He was also an Associate member of Insurance Institute of India.

He passed M.Sc. in Mathematics and Statistics in 1960 and was Gold Medalist from Madras University. He has excellent career record. He had been a lecturer for post-graduate classes in Mathematics prior to joining LIC as direct recruit AAO in 1962. He worked in various important departments of LIC of India in all geographical areas. He retired in October 1996 as an Addl. Executive Director (Actuarial) of LIC of India and made very big contribution in various areas of Actuarial Work in LIC.

After his retirement from LIC, he worked as Appointed Actuary of HDFC CHUBB General Insurance Company Ltd. at Mumbai. He made big contribution in the Actuarial Profession by his work. He was examiner of CT6, CT9 & SA3 subjects. He was Chairperson of General Insurance Advisory Group also.

He has left behind him one son and one daughter. We pray to the Almighty that may his soul rest in peace, god may give strength to his family members to bear this great loss.

STUDENT COLUMN

GLOBAL PRODUCT DESIGN OF ANNUITIES AND ITS TAXATION AN ABRIDGED REPORT

Acknowledgements: The topic has been proposed by the Research Department of Institute of Actuaries of India and has also facilitated the project by rendering all support and guidance required. A full text of the report is available in the website of IAI and can be downloaded from:

http://www.actuariesindia.org.in/subMenu.aspx?id = 179 &val = Completed

1. Concept of and Need for Annuity Products

Purpose of a Retirement (Pension) Plan

The purpose of a pension or annuity plan is to provide retirement income security for the remaining life of the plan member. In short, to eliminate the risk that the pensioner outlives his/her savings or resources.

Definition of a life annuity

What is a life annuity? It is a financial contract that provides regular income (monthly, quarterly, semi-annually or annually) to the annuitant for his/her remaining life in exchange for a premium.

So clearly life annuities have a role to play in pension provision and retirement finance of an individual. But what precisely is their role? Also what are the alternatives to life annuities and how effectively do these alternatives meet the definitions of a life annuity?

How annuity woks: Annuity can be looked upon as a form of insurance. Annuities that pay income for the rest of a person's life insure the individual against the possibility of outliving the money set aside for retirement. As with other forms of insurance, risk is pooled so that there are both gainers and losers. The pooling mechanism uses the funds of those who die early to subsidies the income of those who live longer than average. This is called **"mortality cross-subsidy" (or mortality credit or survivorship benefit)** whereby those who die young or early subsidies those who live long lives.

Determinants of annuity rates: When an annuity is taken out, an annuity rate is stipulated. For example an annuity rate of 7% per annum means that a payment of ₹ 100,000 as a single premium (annuity purchase price) secures an annual income of ₹ 7,000 per year. Annuity rates are basically functions of the [annuitant's mortality (i.e. life expectancy or the expected duration of annuity payment) and expected investment return over the pay-out phase]. So accordingly, the price of life annuities or annuity rates depend on several 'risk factors' pertaining to an annuitant. In particular:

a) age at the time of annuity purchase;

b) gender or sex;

c) voluntary annuities versus pension annuities

d) information available to the insurer about the annuitant's expected lifetime based on his health conditions and other lifestyle habits are important factors.

2. Different types of globally available Annuity Products

In the following paragraphs, we'll discuss different types of annuity products available globally, their features, benefits for the annuitants and their funding by insurance companies (the annuity providers).

Life-contingent annuity (or simply, life annuity), where periodic payments are contingent on the survival of the annuitant(s). For example, a lifetime annuity of ₹ 75,000 pa for a single annuitant is an example of a life-contingent annuity. Life-contingent annuities can be sub-divided into single life annuities and joint life annuities. Joint life annuities can be established so that on the death of the primary annuitant (typically the one who saved up the money to buy the annuity) or on the death of either annuitant, the benefit amount is reduced because one person can live less expensively than two.

Immediate annuity, which provide periodic benefit payments to the annuitant(s) commencing on the purchase of the annuity (i.e. first payment starts during the first period after purchase).

Deferred annuity, where periodic benefit payments to the annuitant(s) may commence at some future date, made conditional on the annuitant being alive on the payment start date and subsequent payment dates.

Temporary annuity, where periodic benefit payments are made while the annuitant(s) is/are alive, but with a maximum number of payments: payment ceases either on the death of the annuitant(s) or when the maximum term is reached, whichever happens first.

Guaranteed annuity (also known as life annuity with a guaranteed period), where periodic benefit payments are made for at least the guarantee period, even if the annuitant dies before the end of the guarantee period.

Value-protected annuity, which provides an alternative mechanism for receiving a

About the Author

dnpanigrahi@gmail.com

Prof. D N Panigrahi, MBA (Fin – FMS, Delhi University), CFA, CAIIB & DFS, have been working as an Associate Professor (Finance & Bank Management) since 21st April 2008, with the Institute of Management Technology, Nagpur (IMT-N), one of the top 30 B-Schools in India. I've 11 years of teaching experience in Management and Banking and 20 years of Industry Experience as a Professional Bank Manager with a reputed PSU Bank. I'm also a student of actuarial science.

return of capital in the event of the early death of the annuitant. If the cumulated sum of the annuity payments at death is less than the initial premium, then the difference is returned to the estate of the deceased.

Level annuity, which provides a constant nominal money income for the remaining life of the annuitant; annuity providers invest the premium in fixed-income bonds and the coupon payments on these are used to make the annuity payments. Thus, the real value of the income (value in terms of purchasing power) will fall over time as prices rise.

Escalating annuity (or constant-growth annuity), where the annual benefit increases at a fixed annual rate, k, so that the sequence of payments is:

$$b_1, b_2 = b_1(1+k), b_3 = b_1(1+k)^2, \ldots.$$

Usually, the premium is calculated accounting for the annual increase in the benefit. Thus, for a given amount S (the single premium of the immediate life annuity), the starting benefit b_1 will be lower than the benefit the annuitant will get from a level annuity.

Index-linked annuity (or inflation-linked annuity), a particular type of escalating annuity which provides a growing income in line with rises in some inflation index like consumer price index (CPI) in India or retail-price index (RPI) in UK; usually with a stated upper limit. The annuity providers should invest the premiums in inflation-linked assets like index-linked government bonds or inflation-indexed government bonds so that these back the annuities where the payments are linked to a price index and the coupon payments from these assets are used to make the annuity payments.

Equity-indexed annuity, which earns annual interest that is linked to a stock or other equity index (e.g., the Standard & Poor's 500). Here the fund backing the annuity is to be invested in an equity product and the annuitant will receive a random annuity payment which is related to the performance of the equity market. Usually, the annuity promises a minimum rate.

Investment-linked annuity, the main examples of which are with-profit and unit-linked (or variable) annuity; the premium is invested in an equity fund and part of the profits are allocated as a bonus to the annuitants each year. If the investment performance is poor, then the income from the annuity can fall, although if the investment performance is strong, the income from the annuity will rise.

In the following paragraphs, we'll focus on two more important types of annuities, namely, Variable annuity and Impaired-life annuity, which are growing in popularity in USA and European markets in greater detail.

Variable annuity: While the use of the term "variable annuity" is understood in the US (where these products were invented) this term sometimes tends to cause confusion in other parts of the world. VAs are sometimes also known as unit-linked product with investment guarantees, segregated funds, equity linked guarantees, etc., outside the US. Therefore, VAs are not really variable and are not necessarily annuities… they are actually unit linked savings contracts with attaching guarantees. VAs allow the allocation of premiums into a range of investment options, which usually contains stocks, bonds, money market instruments or some combination of the three that in many cases include mutual funds.

The benefits to the policyholder will then depend on the performance of this investment option. Typically, the benefit for a defined invent (e.g., death, maturity) is the higher of the market value of the policyholder's investment and the guaranteed amount. This implies that the policyholder is protected against the insured event (e.g., death) and poor investment performance.

Of course the insurance companies will charge a premium (fee) for issuing these guarantees, as well as for administering the contract and paying its sales channel.

Variable annuity product features

To summarise, VA writers follow a **Liability Driven Investment (LDI)** approach (strategy) designed to manage the risks so that any product guarantees can be paid when they fall due. They use similar tools and techniques as liability driven investment strategies for the asset liability management like duration matching and convexity hedging. While variable annuities take many forms, each can be described as the combination of two primary elements: (1) an investment account, and (2) guarantees.

i. The investment account (separate account)

The core investment account is a basket of investment funds, or subaccounts. The options typically include stock funds, bond funds and money market accounts. Policyholders allocate premiums into the subaccounts and often have the ability to change the allocation and to contribute additional premiums. The benefits provided by the guarantees are a function of the performance of the investment account.

Policyholders have typically had significant discretion of the movement of funds from one subaccount to another. Recent product innovations have added constraints to this ability by limiting the percentage of funds in the riskiest investments or by automatically rebalancing allocations in times of market stress. These limitations are designed to reduce the market risk to the insurer in adverse market scenarios.

The insurer typically holds the investment account funds in a separate account protected from claims against the insurer in the event of insolvency and for which the policyholder bears all the investment risk.

ii. Guarantees

Variable annuity guarantees are calculated in reference to the "benefits base," which is a notional amount used to determine the amount of payments to the policyholder from guarantees. The benefits base may differ from the value of the investment account as a result of various guarantees on the benefits base. Variable annuities generally provide guaranteed appreciation of the benefits base even if the account value has not grown.

The benefits/guarantees, collectively referred to as GMxBs (namely guaranteed minimum benefits of type x), include minimum benefits both in case of death and in case of life. The GMxBs are usually defined in terms of the amount resulting from the accumulation process (the account value) at some point of time, compared with a given benchmark (which may be expressed in terms of the interest rate, a fixed benefit amount, etc.). One or more than one GMxB can be included in the policy as a rider to the basic variable annuity product.

Key Risks of Variable annuities to the Issuing Insurer

Longevity risk is the primary insurance risk due to the nature of the income guarantees that are offered; some mortality risk exists due to the nature of the death benefit guarantees that are offered.

Equity risk and interest rate risk are the primary market risks due to 1) the underlying equity and fixed-income investments that drive the policyholder's account value performance and 2) the long-term nature of the income guarantees. In addition, some credit risk also is present in the fixed-income investments.

Persistency risk and benefit utilisation risk are the primary behavioural or utilisation risks due to the nature of the product structure which generally has the insurer receiving revenue over time and insurance claims being paid well into the future.

Impaired-life Annuity: An impaired or enhanced annuity is simply a purchased life or compulsory purchase annuity under which the client is offered a higher annuity income than that available to a "standard" annuity purchaser. The higher income is offered to those clients assessed by the insurance company as being likely to experience higher than average mortality, and hence more likely to suffer from premature death. Because the insurer expects to make annuity payments for a shorter period of time, it can afford to make these payments appropriately higher.

Thus enhanced annuities for impaired lives offer an increased annuity or pension if the annuitant has serious health problems certified by a doctor, such as cancer, chronic asthma, diabetes, heart attack, high blood pressure, kidney failure or stroke which significantly reduces life expectancy. These impaired-life annuities offer substantially increased benefits.

Whereas ordinary enhanced annuity products offer limited uplift over the standard annuity rates if the annuitant is overweight or smokes regularly and these are self-certified and are non-underwritten.

Risks of impaired annuity products: The greatest risk in impaired –life annuities lies in underwriting, i.e., correctly assessing the level of impairment and correctly quantifying the extra payment to be afforded for a particular medical condition. A second risk is of substantial increases in life expectancy brought about by improvements in treatments for key conditions underwritten in the impaired annuity market.

New UK budget 2014 pension reforms/ Implications on annuity product design/Pricing of annuity/other possible design of pension provisions/ alternative to annuities: At UK Budget 2014, the government announced the most fundamental change to how people can access their pension savings in nearly a century. The budget provision has removed the effective requirement to buy an annuity compulsorily; people will have greater flexibility in accessing their pensions.

This means that people can choose how they access their defined contribution pension savings; for example they could take all their pension savings as a **lump sum, draw them down over time (income draw down), or buy an annuity**.

Implications/Consequences of Budget 2014 Pension Reforms:

i. **On Pensioners/Retirees: More responsibility for managing retirement finance. Choice [Difficult for some/better for the smart/adverse or sub-optimal for not so smart].** The overwhelming majority of people who buy an annuity from their existing provider could get a better deal on the **'Open market'** option available.

ii. **On Pension Providers:** Legal Duty to give proper advice to retirees on using their pension corpus.

iii. **Tax boost for Treasury.**

iv. **Adverse Selection for the annuity providers/insurance companies and higher annuity prices for the annuitants.**

v. **The annuity price will go up (i.e. annuity rates will come down), or, inversely, annuitants will get less annuity.**

vi. **Enabling innovation in annuity product design to annuity providers/insurance companies.** Examples: [Allow lifetime annuities to decrease once an individual becomes eligible for the State Pension; Allow lump sums to be taken from lifetime annuities; Remove the ten-year guarantee period for guaranteed annuities; Allow payments from guaranteed annuities to be paid to beneficiaries as a lump sum, where they are under £30,000.]

III. Taxation Issues of Annuity Products from Annuitants' Perspectives

The taxation of annuity plans varies from country to country. In the following paragraphs we'll discuss the tax status of annuity products for some specific countries:

Taxation of Annuity Plans in India

Periodical contributions by the employee (annuitant) to annuity/pension plans [e.g. New Pension Scheme (NPS)] during accumulations phase enjoy tax exemption (E) up to a specified limit per annum, under section 80C of IT Act, 1961 (current limit is ₹ 150,000/- which is an overall limit including other permissible investments like PF, PPF, Life Insurance Premium, NSC, ELSS, Tax Saving Bank FD etc.); periodical growth in value (i.e. return earned by the contributions or income accrual) also get tax exemption (E), but periodical annuity payment on annuitisation of the pension fund on maturity gets taxed (T) according to the marginal tax rate of the annuitant. This is called EET (exempt-exempt-taxed) tax incidence for the annuity plan. Also any lump sum withdrawal from NPS on or before age 60, subject to permissible limit of the accumulated corpus, known as Commutation of pension, is fully taxable. For example, NPS allows 60% of the corpus to be withdrawn as lump sum on maturity at age 60 (on retirement) which is taxable compared to 1/3rd tax-free withdrawal from an ordinary pension plan on retirement.

Taxation of Annuity Plans in UK

In the UK there are two annuity markets: a voluntary market and a compulsory market. The voluntary purchased life annuity market (PLA) is open to any individual; annuity payments are treated as part of income (which is taxed) and part of capital repayment (which is not taxed) assuming that investment was made using after-tax funds. The compulsory purchase annuity market (CPA), also known as pension annuities, is open only to individuals who have accumulated their wealth in a tax-exempt (or tax-deferred) DC pension plan and these annuity payments are taxed on the full amount as income when received, at the annuitant's marginal tax rate.

Taxation of Annuity Plans in UK/ Implications on recent changes/Recent Budget 2014 announcements:

At the moment people in UK don't have full flexibility when accessing their defined contribution pension during their retirement – 25% of the withdrawal from the retirement corpus on or after retirement is tax free and any withdrawal above this tax-free limit up to the remaining 75% of the corpus is subject to 55% tax. Some far reaching reforms in pension and related taxes on withdrawal have been announced in UK Budget 2014. As per this budget 2014 proposal, from April 2015, people aged 55 and over (whatever be the size of their DC pension pot) will only pay their marginal rate of income tax on anything they withdraw up to 75% from their defined contribution pension pot – either 0%, 20%, 40% or 45%. Withdrawal of the 25% of their pension pot will continue to remain tax free.

Taxation of Annuity Plans in USA/ Canada

When an individual buy a life annuity to generate income in retirement, the source of the funds—the origin of the $100,000 premium, for example—will affect the tax treatment of the income. There are really only two possible sources.

First, the $100,000 might come from a tax shelter, such as a 401(k), IRA, or other such account (in Canada, an RRSP or MP plan). When these funds are used to buy the annuity, the individual have carried out a qualified life annuity transaction. (In Canada, it would be called a "registered life annuity.") Remember that the defining characteristic here is that the individual have never really paid any income tax on this qualified (registered) money yet. The money contributed to the account was deducted from the taxable income—perhaps a long time ago—and no income taxes have been paid on the gains as this money grew over time. For this reason, when the annuitant reaches retirement around the age of 70 or so, he/she is required to start withdrawing money from these accounts and paying the income taxes which was not paid ever during the time of working and contributing.

Here is the bottom line: If the individual use that tax-sheltered money to purchase the life annuity, then all of the income from the annuity is taxable. Technically, the taxpayer add this life annuity income to other taxable income—such as pension income, employment income, or interest income—and pay whatever tax is due on the total amount every year. Now, if there is little other income, or if the individual have large tax credits and/or deductions that he/she can take advantage of, it may end up paying very little tax. But 100% of the income is taxable. No exclusions or exemptions.

Alternatively, the annuitant can use a different pot of money to purchase a life annuity. The $100,000 premium might come from "regular" funds that are not part of a dedicated retirement tax shelter. This source buys a nonqualified (nonregistered in Canada) annuity, and in this case, only a portion of the lifetime annuity income is taxable. After all, most of the money getting back was already taxed income from the hands of taxpayer. The actual amount that is taxable versus the non-taxable amount is determined by the insurance company that sells the annuity on the basis of tax rules set forth by the U.S. Internal Revenue Service (IRS) or, in Canada, the Canada Revenue Agency (CRA).

Bibliography, References and Acknowledgements

1) Dellinger, Jeffrey K., The Handbook of Variable Income Annuities, John Willey & Sons, 2006
2) Cannon, Edmund and Tonks, Ian, Annuity Markets, Oxford University Press, 2008
3) Kalberer, Tigran and Ravindran, Kannoo, Variable Annuities, Riskbooks, 2009
4) Milevsky, Moshe A., The Calculus of Retirement Income, Cambridge University Press, 2006
5) USA IRS actuarial mortality table
6) Canada Revenue Agency (CRA)
7) https://www.gov.uk/government/consultations/freedom-and-choice-in-pensions/
8) http://www.rosaltmann.com/annuities_pricing_bonanza_no_controls_13aug2013.htm/

When learning is purposeful, creativity blossoms. When creativity blossoms, thinking emanates. When thinking emanates, knowledge is fully lit. When knowledge is lit, economy flourishes.

Dr. A.P.J. Abdul Kalam

SUCCESS STORY

SHRISTY AGARWAL

shristy4me@gmail.com

Personal

Congratulations! Ms. Shristy Agarwal for being Topper in CA2 Exam held in June2014 . Tell us about yourself, your educational background and your hobbies

I was born in Dhanbad (Jharkhand), wherein I completed my schooling. I then completed my B.Com (Hons.) from SRCC (Delhi University), during which I also started taking a few actuarial exams. I joined Towers Watson after this and have been working here since then.

I am fond of watching movies and going out shopping with friends and try not to miss out on these even during exam days!

How did your parents, family and friends contribute to your success?

My family and friends have always been very supportive in my education. They have always encouraged me do my best.

In the particular case of CA2, my colleagues in office provided me a lot of support and guidance based on their experience.

How many hours of study on average per day did you put in to top the CA2 result where in only 16 candidates passed out?

I think, CA2 is one exam for which you don't have to sit with the course material days before the exam. I did practice a few sample questions and went though the reading material few days before the exam. Also, the training held on the day before the exam was a very important part of the preparation.

How much time do you think one requires for serious preparation for this examination?

For CA2, it's not the number of hours that you put in, but how effectively you use your time while preparing for the exam (in terms of practicing the sample questions, being mindful of every small things told on the training day and mentioned in the course material). It is one of the toughest exams to get through as there is lot of scope of the focus being shifted to building of the excel model and compromising on the audit trails and summary, which are the key areas of focus of the exam. Hence, while preparing for the exam, there should be focus on every small aspect mentioned in the material and highlighted in the solved sample questions.

Did you face any difficulty while studying this subject?

No. The course has been structured very well and is easy to understand and follow its objectives and requirements.

CA2 is a 7.5 hour long exam which examines documentation, analysis and reporting skills of the candidates within the given timeframe. What was your strategy to cover all these aspects while preparing for exam?

Time management!. That was my key strategy. Being under the exam condition for 7.5 hours may actually prove to be very stressful. But it is important to keep track of your time, so that the audit trail and summary, which are the key focus of the exam, do not suffer due to poor time management. Before the exam, I had planned out how to split the 7.5 hours between model, audit trail and summary and on the exam day ensured that I don't lose out the planning.

Also, asking right questions at the right time worked out well for me. There is all help present to build the model. All you need to do is ask.

How this exam has helped you at professional level?

The focus of CA2 is on model documentation its communication. These things are required frequently in our work. The learning of this exam has helped me do things in a better way. And with this I do feel that it is a very significant one out of the fifteen papers.

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

I work in a consultancy, which provides me sufficient opportunities to work with different clients across the globe and add value to the profession.

Besides, I think I can also add value by contributing to the various research publications of the Institute and participating and providing quality inputs in the seminars organised by the same

What was your purpose while selecting this course - Core Application Model Documentation, Analysis and Reporting?

Because it is one of the 15 papers!. So, I planned it once I completed my CTs and was eligible to take CA2.

■■■

Learning gives creativity
Creativity leads to thinking
Thinking provides knowledge
Knowledge makes you great.

Dr. A.P.J. Abdul Kalam

COUNTRY REPORT

COUNTRY UPDATE - CANADA

Greetings from Canada !

In my last update, I had given an overview of the Standards of Practice for the valuation of life insurance contract liabilities, including proposed changes for the economic reinvestment assumptions and investment strategies for long-tailed liability cash flows. These changes have now been adopted with effect from October 15, 2014. In this update, I will highlight some of the main changes, which include changes to:

1. Ultimate reinvestment rates
2. Calibration criteria for stochastic risk free interest rates
3. Grading to risk free debt instruments
4. Limitation on modelling of non-fixed income assets
5. Maximum net credit spread

Ultimate Reinvestment Rates

The Standards of Practice require certain prescribed interest rate scenarios to be tested, and these scenarios include minimum and maximum levels for the risk free interest rate. Previously, the minimum and maximum levels were defined by historical averages of the risk free interest rates. The range will now be promulgated by the Actuarial Standards Board (ASB) from time to time and will be as follows:

Short Term	**Low**	1.4%
	Median	4.0%
	High	10.0%
Long Term	**Low**	3.3%
	Median	5.3%
	High	10.4%

Calibration Criteria for Stochastic Risk Free Interest Rates

For policy liabilities modelled using stochastic models, calibration criteria have now been specified for the risk free interest rate which will be promulgated by the ASB from time to time. The calibration criteria is based on maximum and minimum left-tail and right-tail percentiles, where the percentiles are defined by parameters including the initial starting risk free interest rate, projection year, short term rate, long term rate and slope of the interest rate curve. Below is an example of the calibration criteria for the long term risk free rate at projection year 2:

	Initial Rate	4.00%	6.25%	9.00%
Left-tail percentile	2.5^{th}	2.85%	4.25%	6.20%
	5.0^{th}	3.00%	4.50%	6.60%
	10.0^{th}	3.25%	4.80%	7.05%
Right-tail percentile	90.0th	5.15%	7.80%	10.60%
	95.0^{th}	5.55%	8.30%	11.20%
	97.5^{th}	5.85%	8.70%	11.70%

For example, at an initial starting rate of 4%, the 2.5^{th} left-tail percentile would be satisfied if the stochastic interest rate model results is less than or equal to 2.85%; the 95.0^{th} right-tail percentile would be satisfied if the stochastic interest model result is greater than or equal to 5.55%.

Limitation on Modelling of Non-fixed Income Assets

Currently the investment strategy assumed for each scenario should be consistent with the insurer's current investment policy. Liabilities should not assume increased risk that may result from a future change to the investment policy. The proportion of non-fixed income assets (e.g. equity) at each duration in the projection should be in accordance with the insurer's current investment policy.

An additional limitation on non-fixed income assets has now been added where the amount of non-fixed income assets on the balance sheet date and at each duration in the projection should not exceed the amount required to support 20% of cashflows for the first 20 years, and 75% thereafter.

Grading to risk free debt instruments

Previously, for certain prescribed scenarios, the reinvestment strategy was required to grade to risk free debt instruments by year 20. This requirement has now been removed.

Maximum Net Credit Spread

Credit spreads on non-fixed income assets are required to include a Margin for Adverse Deviation (MfAD) on the best estimate assumption grading from 0% on the valuation date to 10% by year 5. An additional provision has now been added where the difference between the asset's credit spread and the asset depreciation assumption must not exceed a defined value. The defined value will be promulgated by the ASB from time to time, and currently is 80bps.

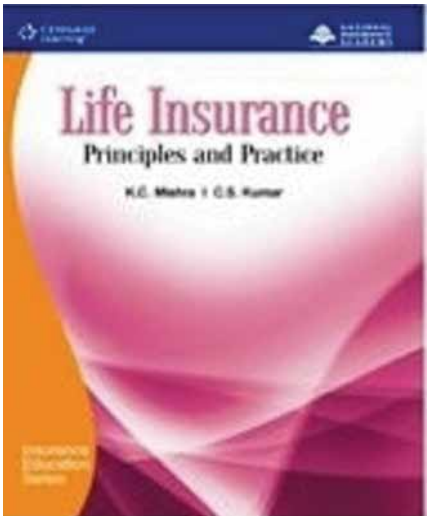
About the Author

kedar.mulgund@sunlife.com

Book Reivew

Life Insurance – Principles and Practice

Title	:	Life Insurance – Principles and Practice
Author	:	K. C. Misra and C. S. Kumar
Available in IAI Library	:	**Acc. No. :** B10908
Reviewed By	:	Padmaja R
		rpadmaja1970@yahoo.com



Life Insurance – Principles and Practice covers every aspect of life insurance business. It assumes no prior knowledge. It is divided into 8 units. It starts from the history of insurance including the regulatory developments, then takes you through all the aspects of the life cycle of a life insurance policy. Starting from various kinds of life insurance products to details

Written in the format of a text book, with regular check ur progress and self assessment questions at the end of each chapter. Cleary mentioning the objectives covered in every chapter.

Unit 1 & 2: Starts with an interesting mention of the origin of insurance to Vedas. Then they go on to cover certain elementary aspects of LI business, familiarizing the reader with various terminologies and principles this business is based on. Milestones in the development of Life Insurance industry are well documented. The unit also covers the economical, commercial and social benefits of life insurance. In the second unit many principles of life insurance to further explained along with the contents of a valid insurance contract.

Unit 3: This unit covers the details of various life insurance products explained with its purpose, advantages and disadvantages. It explains how life cycle based need analysis should be used for identifying the product need and map it the basket of products. The unit covers all the variations like traditional risk and savings plans, unit linked plans, annuities group insurance etc. Other special types of plan like Key man insurance, micro insurance products and riders are also explained.

Unit 4: This unit gives a complete explanation of the various sections covered under a policy document, giving reference to the IRDA guidelines in this regard. Additional provision required for unit linked contracts and incase of supplementary benefits. Many examples from past grievances are used to explain the importance having the correct policy wordings.

Unit 5: It covers all the basics of underwriting principles, the need of risk classification, its purpose and methods of classification. How various rating factors in mortality risk can be used to objectively measure the extra risk. There is an interesting section on how genetic testing can potentially be useful in underwriting.

Unit 6: This unit elaborates of the various pricing techniques. Concepts like present values, making of mortality tables, net premium and gross premium are explained in a very lucid manner. Other actuarial principles like prospective & retrospective reserving, analysis of surplus and distribution of surplus are also covered. There is a section on the various methods of surplus distribution like reversionary bonus, revalorization and contribution methods, some of which are not prevalent in Indian markets.

Unit 7 & 8: explain in detail the various policy servicing option available with the customer including the maturity benefits. There is a clear listing of the turn-around-time (TATs) expected for each policy servicing request as per IRDA regulations. All the processes and documentation involved in various claims like death, surrender, maturity, annuity, etc are covered in detail.

It also covers the different organizational structures prevalent and advantages and disadvantages of in the functioning of the company.

In the end 2 case studies are given to help the reader to apply the principles learnt in real life situations.

The units are well structured and the various sections flow in a very logical fashion making the read very easy. The language used is very simple and effort is made to explain all the technical jargons used with examples. The book will be very useful for anyone wanting to get a clear in depth understanding of the overall working of a life insurance company.

The weak can never forgive. Forgiveness is the attribute of the strong.

-Mahatma Gandhi

PUZZLE

Puzzle No 221:

The number 120 has the property that the sum of its divisors (1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60 and 120) is equal to three times the original number. What other three-digit number has divisors which sum to three times the original number?

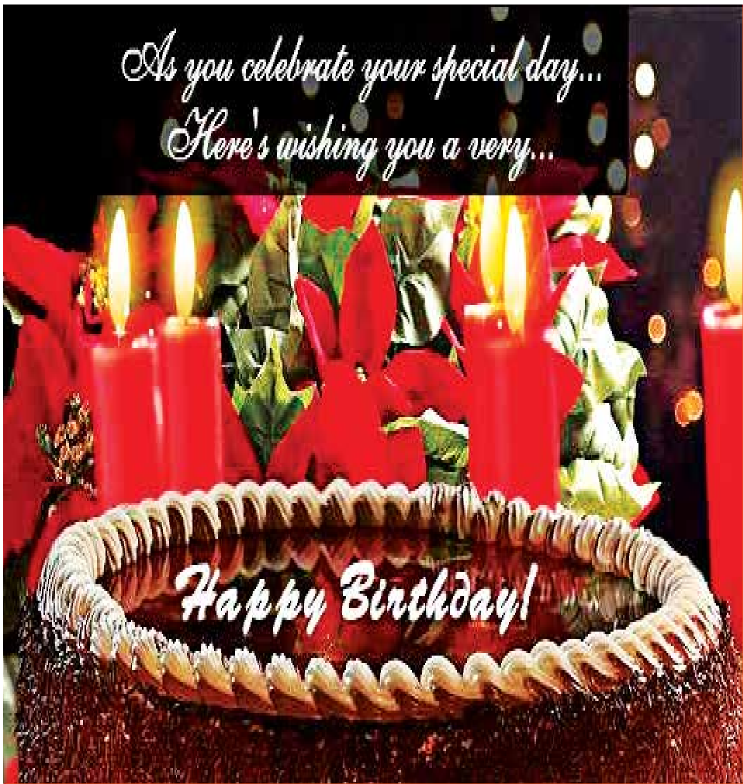
Puzzle No 222:

A cake being baked for Thanksgiving is to meet the following requirements:

- The cake is to be rectangular,
- It must be possible to cut the cake into five rectangular pieces, such that each piece has sides which are a whole number of centimeters long , and
- No two pairs of sides, whether of the five pieces or of the original cake, are to have the same length.

What is the area of the smallest cake which will meet the requirements?

shilpa_vm@hotmail.com



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

MANY HAPPY RETURNS OF THE DAY

the Actuary India wishes many more years of healthy life to the fellow members whose Birthday fall in **October 2014**

Samarao Laxmanrao Cuddalore
V. Govindan
J. R. Joshi
S. R. Mehta
K. P. Narasimhan
D. K. Pandit
R. Ramakrishnan
N. K. Shinkar
M. L. Sodhi

SUDOKU

SUDOKU No. 25 for the month of October 2014

SUDOKU HARD

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

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.24 published in the Month of September 2014

SOLUTION

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

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