Institute of Actuaries of India

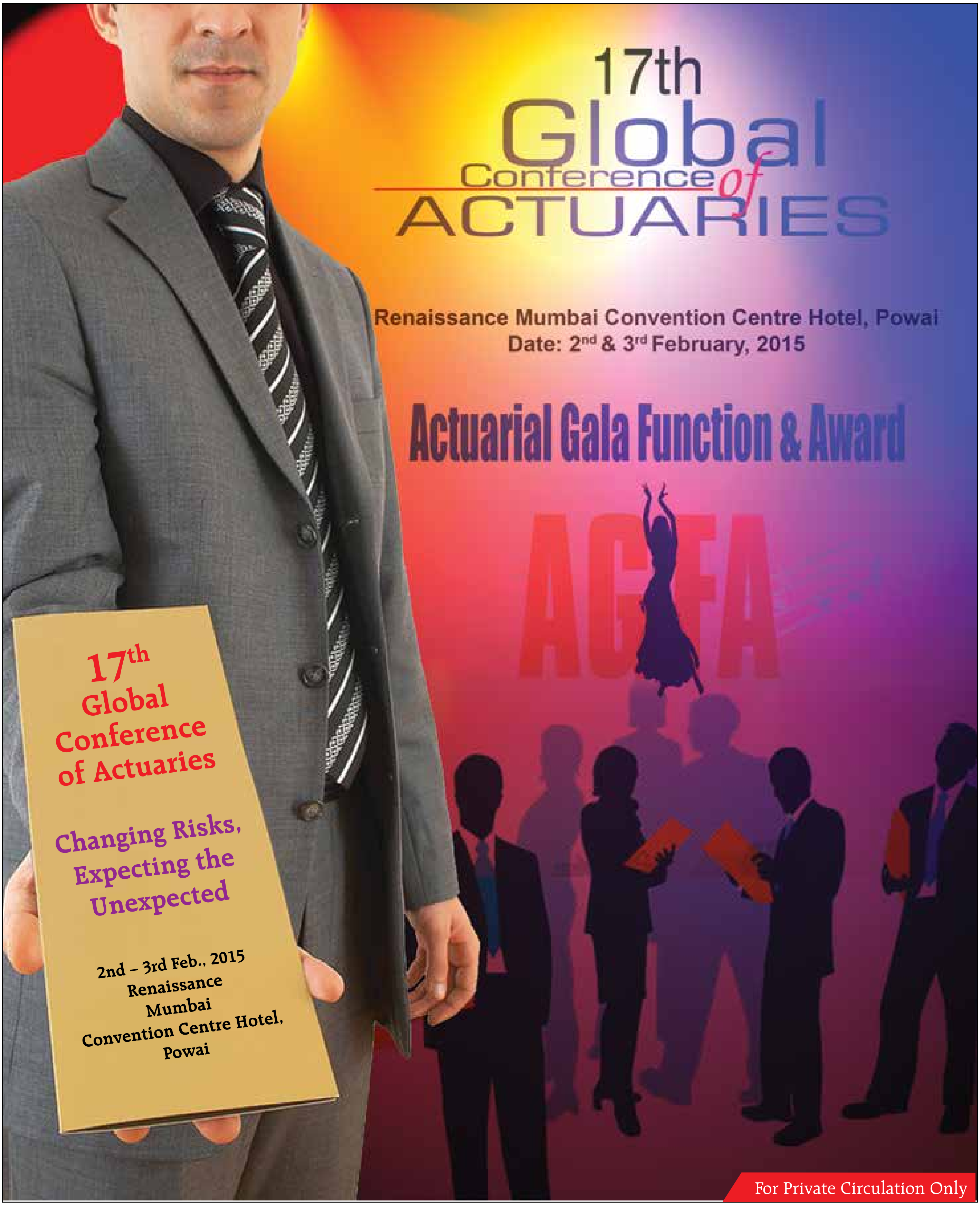
www.actuariesindia.org

INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest

the Actuary INDIA

THE MAGAZINE OF THE INSTITUTE OF ACTUARIES OF INDIA

VOL. VI • ISSUE 11 | NOVEMBER 2014 ISSUE | Pages 20 • ₹ 20



CAREER CORNER

नेशनल इंश्योरेन्स कंपनी लिमिटेड
(भारत सरकार का उपक्रम)
पंजीकृत एवं प्रधान कार्यालय : 3, मिडिलटन स्ट्रीट, पी. बा. नं., 9229 कोलकाता-700 071

NATIONAL INSURANCE COMPANY LIMITED
(A Govt. of India undertaking)
Registered & Head Office : 3, Middleton Street,P.O Box No. 9229, Kolkata-700 071

Requires

ACTUARY

National Insurance Company invites Applications from resident India Citizen for the post of 'Appointed Actuary' on Full time Basis.

Name of the Post	Appointed Actuary
No. of Post	One Post
Age (as on 1/1/2014)	The candidate should not be over the age of 62 years
Qualification	The candidate should be a "Fellow" of Actuarial Society of India/Institute of Actuaries of India and he/she should satisfy all the requirements specified in regulation No. 3 sub regulation (2) of IRDA (Appointed Actuary) Regulation, 2000 & 2013.
Experience	The candidate should have minimum 10 years relevant experience and at least 2 years of post-qualified (Fellowship in the specialized subject) experience out of those 10 years of experience.
Emoluments and Benefits	Negotiable. Please Indicate your expectations.
Duties and Obligations	As per Regulation 8 of IRDA (Appointed Actuary) Regulation, 2000.
Service Conditions	Should be a resident of India. After appointment he is not expected to act as an Appointed Actuary of any other Insurance Company nor work in any other capacity in any General Insurance Company.
Selection Procedure	The selection procedure shall be by personal interview.
How to Apply	Complete application on foolscap paper typed in CAPITAL LETTERS, along with a recent photograph & copies of requisite certificate/documents should reach the following address on or before 31/12/2014. The envelope should be super-scribed in the top corner "NICL – Appointed Actuary". To, Shri Sukanta Mishra, Chief Manager, Personnel Department, National Insurance Co. Ltd 3 Middleton Street Kolkata 700 071. Softcopy of Resume should also be mailed to sukanta.mishra@nic.co.in

General Instruction:

1. Company reserves the right to restrict the number of candidates to be called for interview.
2. The decision of the Company will be final and binding in all the matters.
3. In case it is found at any stage of recruitment that the candidate does not fulfil the eligibility criteria and/or he/she has furnished any incorrect/false/incomplete information or has supressed any material fact(s), the candidature will stand cancelled. If any of these shortcomings are noticed even after appointment his/her services are liable to be terminated forthwith. Before applying for any post, the candidate should ensure that he/she fulfils the eligibility and any other norms mentioned in this advertisement. The decision of the Company in respect of the matters concerning eligibility of the candidate, the stages at which such scrutiny of eligibility is to be undertaken, the documents to be produced for the purpose of conduct of interview selection and other matters relating to recruitment will be final and binding on the candidate.
4. The Company shall not entertain any correspondence or personal enquires. Canvassing in any form will disqualify the candidate.
5. For detailed advertisement, refer to recruitment section of our website: www.nationalinsuranceindia.com

HR Department, Head Office

the Actuary INDIA
www.actuariesindia.org

CONTENTS

ENQUIRIES ABOUT PUBLICATION OF ARTICLES OR NEWS

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

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

FROM THE EDITOR'S DESK

SUNIL SHARMA

sunil.sharma@kotak.com

Digitisation has made the world very small. Innovation in technology is taking over the traditional way of selling products. Constraints relating to availability of internet no more exist. The internet is available in cities, towns and even in villages through e-kiosks. The internet is available on Personal computers, Laptops, Tablets and mobile phones.

This rapid change in technology is changing the way consumers are searching the products, comparing the features, which products to buy and then how to buy product.

In a recent news the China's online retail giant Alibaba says it has pulled in $9.3bn in sales from its annual 'Singles' Day' shopping event. As per reports in newspapers, Flipkart claimed it sold products worth $100 million (over Rs 600 crore) within 10 hours, while Snapdeal pegged its sales at Rs 1 crore a minute-which translates into a figure similar to Filpkart's. In UK, more than 20% of the motor business was procured through direct online sales.

These massive figures demonstrate the change in the buying behaviour of the customers. Current generation of customers feel more comfortable buying the good online.

While the story of the retail business may not be fully applicable to Insurance, the change in the behaviour of potential insurance customers is imminent. It may not be inappropriate to expect a new distribution landscape emerging from the digital innovation. The customers who in past used to interact with agent or broker for the advice and services would expect to interact with the insurer as per their own schedules via call centre, Internet on line services, chatting, video calling etc. Given the expectations of the customers, it is very likely that the companies may have to continue to adopt a multichannel approach to be successful.

While Information/advice available on the website may help customers to make up their mind, majority of the potential insurance customers may not confortable buying insurance online. The channel conflict is likely to become a significant challenge for insurer as the digitisation takeover.

It would be interesting for profession to be a part of this change and help protect the interest of the society in emerging environment.

■■■

We invite opinion and comments on the articles published in the magazine.

E-mail: library@actuariesindia.org

(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 **November 2014**

M G DIWAN
A GHOSAL
K J PRADHAN

3RD SEMINAR ON ENTERPRISE RISK MANAGEMENT

- Organized by : Advisory Group on Enterprise Risk Management, IAI
- Venue : Hotel Sea Princess, Mumbai
- Date : 10th October 2014

The seminar was organized to support the development of professionalism in risk management, provide thought leadership, share hands-on experiences and challenges faced by practioners whilst implementing ERM with the wider profession and share the best practices gleaned from different industries and geographies. B N Rangarajan, chairperson of Advisory Group on ERM welcomed the participants.

Session1: Implementing ERM – Practical experiences and learnings

Speakers: B N Rangarajan - CRO & Appointed Actuary, Exide Life Insurance; **Kunj Maheshwari** - Consultant-Risk Consulting, Towers Watson

Kunj started with the "Stick and Carrot" description for the implementation of

Kunj Maheshwari

ERM. On one hand regulatory scrutiny, compliance, pressure from rating agencies, operational losses etc act as typical sticks whereas expected business benefits & enhanced valuations act as carrots. In view of lack of any regulatory requirements the Indian environment is currently driven by the perceived benefits i.e. Only carrots and no sticks! He then discussed the key drivers for ERM and how these can impact Indian arena. Strong ERM credentials & controls can:

- lead to greater management control & over-sight which in turn can help in avoiding operational issues like mis-selling

- enhance the investor confidence and work as a talent retention tool. This can become the X-factor in company valuations when it comes to IPOs and M&As.

- help in "risk informed" strategic & operational decisions which in turn can lead to improved risk-adjusted returns and more efficient use of capital

He then shared experiences and insights from a number of practical examples of ERM implementations in life insurance companies globally. One such implementation started with months long exercise setting the target operating model which resulted in a single page framework. The biggest challenge in general was to achieve the buy-in of key stakeholders as they are are not able to make business sense out of it. At the time when the CRO was struggling with the same, he did a very simple thing which worked wonders. The CRO just replaced the word "risk" with "strategy" in meeting invitations & discussions and all things started falling in place!

Kunj then gave an overview of the steps and considerations in setting up a risk register and determination and application of risk limits.

B N Rangarajan took over and discussed an example where the objective was to manage various sub risks in the risk

B N Rangarajan

register with a monthly monitoring. He demonstrated how risk limits such as Market Limits were used in market risk management. Kunj then concluded with

About the Author

him.hs88@gmail.com

Himanshu Bhatia holds a B.Tech. (Mathematics and Computing) from IIT Guwahati. He is an Associate member of IAI and a member of the Advisory group on Social, Cultural and Youth Affairs of IAI. He is handling Product Pricing and Shareholder Reporting for a leading life insurer at Mumbai.

the "What's really changed in BAU?" i.e. the implementation resulted in range of changes from clearer accountabilities of individual to better understanding of risk profile vs appetite to improved risk & compliance processes.

Session2: Establishing a Risk Appetite Framework

Speakers: Sam Morgan - Principal and Consulting Actuary; **Shamit Gupta** - Consulting Actuary Milliman

Shamit started the session with a variety of definitions of "Risk Appetite" and "Risk Tolerance". The basic difference is that Risk Appetite usually contains high

Shamit Gupta

level statements about the amount of risk a company is willing to take whereas Risk Tolerance usually refers to a certain product or risk type. He emphasized the fact that there is no consensus on definition so everyone in an organisation should agree on (& understand) the definition and apply it uniformly. He discussed the importance of Risk Appetite as it sets the business tone and provides the benchmark to judge the performance, decisions and culture. The stakeholders of Risk Appetite vary from the policyholders to shareholders to regulators. He cited the examples covering risk appetite not properly defined and of insufficient involvement of the board in setting and monitoring adherence to firm's risk appetite. The three main players in the risk appetite design are Strategy, Risk and Finance. In case of group companies, the risk appetite at the entity level is set as per the appetite of the parent company with any adjustments due to the local regulations or preferences/comfort level of the local board. The risk appetite is intimately linked to the risk culture and in order to change the risk appetite a firm needs to change its risk culture.

Shamit then presented the relevant extracts from the risk appetite statements of some large insurers. The typical components were related to capital, liquidity, P&L and reputation. The approach varied from silo (Standard Life) to broad (Prudential) and the statements varied from being generic (Standard Life) to very specific (Old Mutual).

Sam took over at this point and discussed the practical bit of "Risk Appetite Execution". The first step is to engage the management and get their buy-in which can be made easy by talking in a

Sam Morgan

language well understood by them. The management often cares about capital, profitability and liquidity as any issues can lead to the regulator, shareholders and policyholders respectively knocking on the doors. The next step is to define the key risk indicators (KRI) and the target minimum operating levels (e.g. projected profits no less than 90% of budgeted profits). He illustrated setting up the minimum target levels w.r.t capital. The minimum target capital level is generally set with a buffer capital above the tolerance level so as to absorb any small adverse shock(s). The buffer capital is calculated by stress & scenario tests but setting the stress level(s) is complicated. Ideally, all risks should be considered but the aim in general is to restrict to the quantitative risks. The definition of stress levels uses standard calibration techniques depending on the risk (e.g. lognormal for equity returns). The same can/should be refined in situations e.g. equity calibration can be made more realistic based on a central shock plus a cyclical adjustment factor. He added that companies often include one or several combined stresses but it is important to reduce the base shocks in later to get the same intensity of event. The final capital buffer is based on the scenario that generates the greatest reduction in surplus capital. Sam emphasized that the stresses should be communicated in a way understood by senior management so rather than talking about a 95th percentile, it is better to present the stresses as either a stress level e.g. 40% drop in equities or, even as an absolute level.

Session3: Analytical Framework for Risk Management

Speaker : V Sriram - COO, IMACS

Sriram started with the discussion on financial sustainability as a balancing act among Growth, Risk, Profits and Capital. He then introduced the five key areas of the analytical framework for risk management namely Risk Governance, Risk Management Practices (RMPs), Regulatory Compliance, System Assessment and Reporting. He

V Sriram

emphasized that Risk Governance acts like a backbone and ensure that the activities are aligned to the strategy, risk appetite & long term viability. He cited example of banks where risk managers enjoy veto to sanction loans and hence govern and control credit risk. The requirements of good governance include an independent risk management function with sufficient authority, clear segregation of front, middle and back office functions & clearly defined responsibilities in terms of risk strategy, policies and internal control systems. Sriram continued with the detailed overview of RMPs in the context of ALM & Liquidity risk, credit risk and operational risk. He discussed RMP as a 5 component process > risk identification > risk measurement > risk monitoring > risk mitigation > risk reporting.

Liquidity risk is the risk that insurance and reinsurance undertakings are unable to realise investments and other assets in order to settle financial obligations when they fall due. Liquidity risk management typically involves day to day & ongoing cash flows management and scenario testing analysis. The tools generally used are cash flow models & liquidity ratios (minimum level plus margin) and reporting covers cash inflows & outflows (under normal & stressed conditions) and level of liquid assets held.

Sriram then discussed the operational risk management in context of life insurance companies in India. He commented the same is in nascent stage and will take few years to develop. Currently, the companies are using broad approaches for the operational risk capital like the standard formula approach of Solvency II (less than 30% of the base Solvency Capital Requirement (SCR)) and "Rule of Thumb" approach recommended for companies in India (one per cent of the technical provisions). He then covered Internal Event Analysis (which includes incident data collection and analysis), key risk indicators and how data pooling arrangements (with anonymity) can help deal with lack of operational risk data. Sriram gave brief overview of Regulatory Compliance, System Assessment and Reporting. He concluded with the remark "Without numbers, risk is wholly a matter of gut".

Session4: ERM in Banking: Challenges and Opportunities

Speaker: Pratik Shah - Partner – Financial Services Risk Management Advisory, EY

Pratik set the context of the session with a simple yet tricky question put forward by bank risk managers "How ERM is different from what we have been doing from so many years?". He said the answer lies in the "way" they have been doing the same and how ERM has revamped that "way". He then discussed how 7 key areas of Risk Management has changed after the Global Financial Crisis (GFC) as

Pratik Shah

per an EY survey:

- Role of Board: increased involvement on risk areas
- Role of CRO: now a key role in strategy/planning decisions
- Models: is ever changing & evolving
- Liquidity management: enhanced compliance to capital requirements
- Capital & Stress Testing: capital (re) allocation based on risk
- Risk Culture: strengthening of risk roles, responsibilities, reporting & training
- Risk appetite: now has become a strategic tool.

Pratik then moved on to the key issues and factors impacting the ERM agenda for the financial institutions in current scenario. These are risk culture, risk appetite, risk assessment & reporting and capital management & stress testing.

Risk Culture:

In terms of the framework, every individual should have awareness of risk management issues, risk appetite, risk profile etc. The leaders should hold people accountable, be role models and reward them appropriately. The culture should be constructive to help prevent risk and open to detect risks. All this would lead to a sustainable business, enhanced customer experience, better shareholder value, compliance, people engagement and community contribution. The challenge here is to define culture based on abstract attributes and embed the values in actions. This can be dealt with frequent Risk Culture Assessment in form of surveys, re articulation of the roles & responsibilities and training programs.

Risk Appetite:

The challenging part is embedding the appetite throughout the organization in day to day actions and availability of data to embed through financial metrics. While the former can be dealt by calibrating organization wide risk appetite function and decomposing them into business group/ product level metrics, proxy methodologies e.g. expected loss for credit loss can cater the later. The simple financial metrics like a minimum of X% of Risk Adjusted Return on Capital (RAROC) with a maximum Y% Earnings Volatility can help aligning strategy and decisions with the risk appetite.

Vivek Jalan, B N Rangarajan, Patrick Curtin, Pashupati Kumar, Mehul Shah

Risk Assessment and Risk Reporting:

The challenge here is that assessment is overly complex, is generally conducted in silos and viewed as burdensome by middle management. A top-down assessment approach focusing on risk vs return would make the approach simple and effective. On the other hand narrative & actionable risk dashboards that have reference to past, present & future should help can make reporting clear & meaningful.

Capital Management and Stress Testing:

The challenging part is extracting and aggregating data for enterprise wide stress testing, quantifying capital requirements for qualitative risks and integration of risk & finance function. These can be tackled by joint working groups of risk and finance functions and establishing & improving IT systems that enable data collection & integrated stress testing.

Pratik then concluded with the key takeaways.

Session5: Embedding and getting value from Enterprise Risk from Enterprise Risk- Management in Life and Non-life Insurers- (Panel Discussion)

Speakers: **Patrick Curtin -** AA, Aegon Religare Life Insurance; **B N Rangarajan, Vivek Jalan, Director-**Risk Consulting, Towers Watson; **Mehul Shah** - AA & Head-ERM, L & T General Insurance; **Pashupati Kumar -** Director, Deloitte

The panel discussion started with the question whether an appointed actuary can/should hold the position of CRO as well. Patrick replied that although there is quite an overlap these roles are different. Rangarajan added that both the roles complement each other and can be effective.

On being asked about his top priorities in terms of ERM Mehul replied these include develop risk appetite, roll out across the company and get the same translated to business. He added that the last part is most challenging along with the required monitoring to check things are in place. On the risk appetite embedding Rangarajan added that it's important to get the balance right between the short & long term goals and embed risk appetite into the business plan accordingly.

On the "starting point of risk appetite statement", he shared that the risk management policy at his firm covers all the financial & non-financial risks. Patrick commented that even the best risk appetite statement can't make the company immune so it's important to have a holistic view of risks. Pashupati shared insights from a study on values killer by Deloitte which looks at the factors which can lead to value erosion of the companies.

To the question on the implementation of ERM, Rangarajan shared that buy-in can be obtained if things are communicated well and shared few example to show it is possible to convince the senior management to stay away from businesses that do not reward sufficiently for the risks.

The panel members identified climate change, interest rate risk, data risk & cyber risks as the emerging risk which can prove challenging in future.

The session concluded with the brief discussion on the desired qualities of a CRO. Pashupati said CRO should network with people well, build relationships and should take views of all others. According to Mehul, CRO should be a "dancer" who goes around the field to understand the market dynamics!

In the end **Khushwant Pahwa** thanked the speakers and partcipants on behalf of IAI.

Khushwant Pahwa

MANAGED VOLATILITY FUNDS

Introduction:

The financial crisis of 2008-09 exposed weaknesses in the risk management programs of US insurers providing guaranteed Variable Annuity (VA) products – even the most sophisticated ones. After badly burning their hands, many of them responded by retreating from the market entirely, cutting back on sales, modifying product features and increasing prices. They also stumbled upon something called managed volatility strategy which already existed in the fund management space for some time. Since then, the popularity of managed volatility funds has grown manifold. From the end of 2006 to the second quarter of 2013, the assets under management (AUM) of managed volatility strategy funds has increased from USD 30B to over USD 200B. These managed volatility strategy funds also became popular in Asia, particularly in Japan where a well developed VA market exists.

More about VA Products

Variable Annuity or VA products are essentially unit linked products where the policyholder has the ability to direct his investments in different funds-equity or otherwise. Investor's money is invested in separate accounts and the account value goes up or down based on fund performances. Often these products include one or more guarantees namely:

- GMDB – Minimum guaranteed amount equal to the premium paid minus any withdrawal (or some multiple of it) payable at death of the policyholder.
- GMIB – Minimum guaranteed floor of income once the contract is annuitized after a stipulated time.
- GMAB – Minimum guaranteed amount (often initial premium or some multiple of it) of accumulation after a stipulated time.
- GMWB – Minimum guaranteed return of premium (or some multiple of it) over time through systematic withdrawal.

Since the funds are mostly invested in equities, insurers bear significant risk in case fund values go down due to weak stock market performances. In addition to a reduction in fund management fees (as AUM diminishes), liabilities from the guarantee features skyrocket. In the past, insurers tried to limit fund's exposure to equity by mandating a minimum required investment percentage to non-equity funds. Despite this requirement, policyholders tended to maximize their exposure to equity market as the downside is limited from a policyholder point of view. Post financial crisis, insurers severely limited the number of fund options. They also started offering internally rebalanced funds (not rebalanced by policyholders) and offered significantly lower management fees to attract policyholders. In the past few years, insurers have added managed volatility funds as investment options in an attempt to further cut down risk exposure.

Managed Volatility Strategy

Insurers/Fund managers can employ a number of rebalancing strategies for the underlying funds of unit linked products (such as VA). Fixed asset allocation is one of the most popular and easily employed fund rebalancing strategies. In this strategy, assets are allocated and rebalanced periodically to different funds based on fixed percentages. Insurers put an additional limit on the allocation that can be invested in equity funds. This is a very passive strategy and reacts adversely to market conditions. For example if we follow a 60:40 allocation (i.e. 60% in equity funds and 40% in bond funds) and the equity market drops, this strategy will put additional money into equity funds during rebalancing as the proportion allocated to equity funds has been reduced. Similarly, in a rising equity market more funds will be allocated to bonds. This strategy performs the worst in times of an equity market downturn when insurer's liability increases significantly due to an increase in VA guarantee costs. .

Another asset rebalancing strategy is the Constant Proportion Portfolio Insurance (CPPI) strategy. This is a dynamic strategy in which the amount invested in equity and bond assets is rebalanced based on market conditions. For example if INR 100 is invested with a guarantee of 90 and time to maturity of three years, then based on a leverage multiplier of 3 (any other multiplier can be used), this strategy allocates 3*(100-90) = 30 to equity funds and 70 to bond funds. If the market rallies up and total investment becomes 105, then 3*(105-90) = 45 is invested in equity and 60 in bond funds. Similarly, if the market drops and total investment becomes 95, then 3*(95-90) = 15 is invested in equity and 80 in bond funds. Moreover, if the investment further loses value then the entire investment gets invested in bond funds (also known as locked up situation). This is less onerous on insurers, but policyholders lose equity market exposure in locked up situations and cannot participate should the equity market rally later.

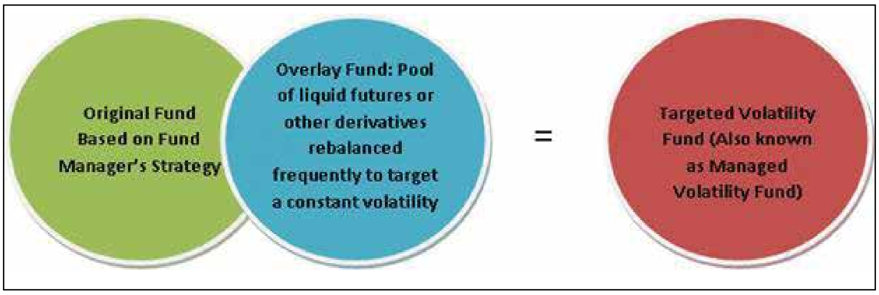
Managed volatility funds rebalance based on target volatility. If the equity market volatility increases beyond the target volatility, exposure to equity is reduced and vice versa. We can use the equity and money market's to reach the target volatility. Another popular and widely used method is to employ

About the Author

roy.sougata@gmail.com

Sougata Roy is a fellow actuary from Society of Actuaries, USA and a CFA charter holder. Sougata has several years of experience in US annuity industry primarily in enterprise risk management context.

a futures overlay fund. In the original fund, we are always 100% invested to instruments based on the fund manager's strategy. In the overlay fund, we employ short futures (of one or more indices which mimics the fund strategy) to adjust the exposure. For example, if the target volatility is 12% and fund's realized volatility is 20%, we will short futures to produce the target volatility in net and take the opposite action (while maintaining funds leverage constraint) when fund volatility goes below the target. The benefit of the overlay strategy is that the fund manager's security selection (alpha) is protected while market risk (beta) is smoothed through overlay.



In many of the managed volatility funds used in the VA industry, capital protection is employed in addition to volatility management. To do that, another set of derivatives is used for tail risk mitigation in the overlay portfolio. Often, several rolling put options (or a replication of them using futures) are used for capital protection. We will look at the benefits of these types of funds in subsequent sections.

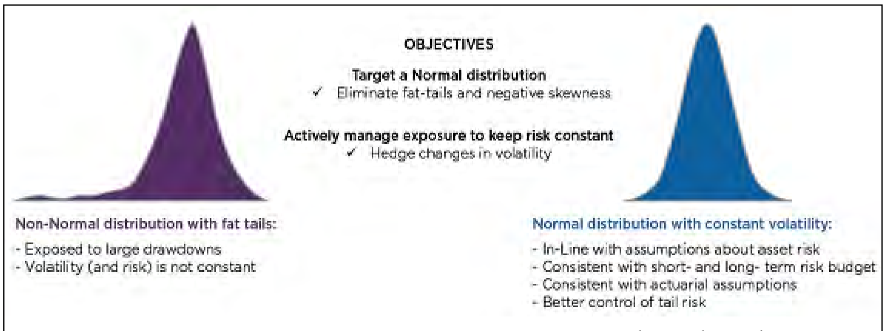
Benefits and Risk Management:

In general, both volatilities and returns (in either direction) are clustered. We also tend to see a jump in implied volatilities before a market downturn. Since managed volatility funds use volatility as an indicator to manage exposure to the market, they tend to reduce market exposure right before a market downturn. Most of the managed volatility funds have a better Sharpe ratio and less drawdown profile than their corresponding base funds.

All of the risk management models assume a normal distribution of market returns with constant volatility. In real life, constant volatility is a myth. Managed volatility funds, to some extent, bring us closer to that myth by reducing the skew in fund returns, making them normal shaped. Additionally, if capital protection is employed, the tails of the curve are also shortened.

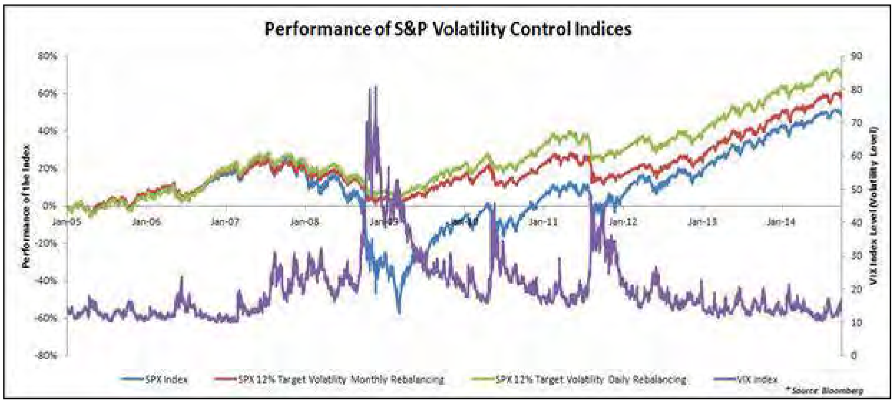
Clearly the managed volatility funds offer many benefits to investors. Insurers are a clear winner in this game as the liabilities arising out of the guarantees are smaller. Insurance companies, which previously used dynamic hedging to hedge the guarantees, could embed some of the hedging directly in the fund. For these companies, Vega (sensitivity to volatility) hedging becomes redundant as the volatility of the fund is constant. Most insurers used long dated options or variance swaps for hedging Vega risk – both of which are very expensive. Insurers employing those funds in the VA business would realize large cost savings just by getting rid of their Vega risk management program.

In the US variable market, linked products use VACARVM regulation for statutory capital calculation. VACARVM essentially uses the average of the worst



Source: The Pavilion Advisory Group

30% (CTE 70) of accumulated present values of the liability under a prescribed stochastic set of scenarios. Companies using dynamic hedging program need to embed their hedging strategy in the VACARVM calculation in order to take credit for the hedging program. This not only complicates the calculation immensely, but also increases the capital requirement arising out of losses (in some scenarios) from derivative instruments used for hedging. When constant volatility funds are used for VA purposes, fewer derivatives are used for hedging. Since fewer hedging instruments are used, the losses arising out of hedging are less, thereby reducing the capital requirement. This provides significant capital relief for insurers.



In total, insurers have shown a reduction in guarantee costs by close to 100 basis points, stemming from a reduction in hedging cost (30-50 basis points), capital relief (30-40 basis point) and a reduction in earnings volatility (15-25 basis points). This is a significant reduction in expense, but at the same time we need be aware of some potential pitfalls of the volatility control strategy. The entire strategy is built upon the fact the correlation between equity market level and equity market volatility will behave the same way as it has in past. While that negative correlation has remained similar across so many years (and even during several crises periods), it does not eliminate the possibility of a breakdown in future correlation. Consequently, we need to keep a very close eye on that. Also, the implementation of these funds requires a very thoughtful approach and sophisticated infrastructure. The key issues that need to be addressed by insurers while implementing this strategy in equity linked products are:

- Appropriate targeted volatility while keeping in mind the risk/return characteristics of funds
- Calculation of historical volatility (possibilities include EWMA model, GARCH model etc)
- Calculation of exposure factor (possibilities include often used and simple actual volatility/target volatility ratio to distribution targets based approach)
- Potential use of leverage by funds
- Frequency and limits of rebalancing trades to optimize trading cost
- Robust quantitative and reporting infrastructure to implement these funds in pricing and reserving calculations

The issues are challenging, but potential savings are worth the cost.

Conclusion

The use of targeted volatility funds has entirely changed the Variable Annuity landscape in the US and has been a win-win solution for all the parties involved. It has provided a better risk adjusted return for policyholders. It has also provided insurers an avenue to stabilize capital requirement and management fee revenues. The reduction in hedging cost has resulted in a reduction of the cost of guarantees and premiums. These funds are becoming popular in Europe and Japan as well. The Indian insurance market can benefit from these strategies too. With 2010 regulations on Unit Linked plans, these types of funds can provide an avenue for insurers to offer living or death benefit guarantees at affordable costs. It is high time the Indian insurance market gets warmed up to this approach.

References:

1. Whitepaper in Using Volatility to Manage Risk by Pavilion Advisory Group.
2. Development of Managed Risk Funds in VA Market presented in EBIG conference (2013), Atlanta.
3. "A Constant Volatility Framework for Managing Tail Risk" by Hocquard, A., Ng, S. and N. Papageorgiou published in Journal of Portfolio Management (2013)

MAP-21, PENSION FUNDING RELIEF IN US: AN ACTUARIAL OVERVIEW

About the Authors

nabajitsaikia@gmail.com

Nabajit Saikia is an actuarial Professional working with Mercer Consulting (India). He is a student member of IAI and IOA.

anupal.borah@gmail.com

Anupal Borah is working as a Team Manager in Mercer Consulting (India). He is a student member of IAI and IOA.

Introduction:

On July 6, 2012, US President Barack Obama signed a bill popularly known as MAP-21, also referred to as the "highway" bill. Moving Ahead for Progress in the 21st Century (MAP-21) is a bill that aims to fund and govern federal road transportation spending. The Congressional Budget Office estimated that enacting MAP-21 would reduce the federal budget deficit of the US over the 2012-2022 period by $16.3 billion. Apart from other measures, the Act also has a provision that has brought significant changes to the funding requirements of single-employer Defined Benefit pension plans. Further to this, US Congress has passed another bill (Highway and Transportation Funding Act of 2014) in July, 2014 that makes certain changes, extending certain provisions that were initially applicable to only year 2012. This article tries to analyse various aspects of these provisions and resulting implications on pension plans and their sponsors based on the latest regulations.

1.1 MAP-21 and DB plans:

Qualified Defined Benefit (DB) Pension Plans in the US are governed by the Pension Protection Act (PPA) of 2006. Plans perform yearly actuarial valuations and maintain a fund (assets) with a trustee to enable them to meet their pension liabilities. Plans have to account for two major components while calculating their pension obligations, funding liability and normal cost[1]. A funding shortfall arises when assets are not adequate to meet liabilities. Based on the normal cost and the funding shortfall, plan sponsors need to contribute a specific, minimum amount to the trust (pension fund) to ensure a certain funding status (ratio) and solvency. This specific minimum contribution is known as the Minimum Required Contribution (MRC).

To calculate the MRC, a plan sponsor has the option to elect either the 'full yield curve' of corporate investment grade bonds for the preceding month, or three 'segment rates' that are drawn from the average yield curves over the most recent 24-month period. For plans that use segment rates, MAP-21 has adjusted these segment rates by allowing them to fall within a specified higher range to arrive at a set of smoothed rates. Details of how these rates are developed are covered in Section 2.

Following basic actuarial and mathematical principles, we know that a higher interest rate used to discount future cash flows results in a smaller present value and vice-versa. By allowing segment rates to fall within a specified range, MAP-21 has provided plan sponsors an opportunity to use significantly amplified discount rates, resulting in a drastic drop in actuarial funding liabilities and normal costs and in turn the funding shortfall and MRC. On the contrary, MAP-21 election greatly increases Pension Benefit Guaranty Corporation (PBGC)[2] premiums. Moreover, for those rare pension plans that are actually overfunded, MAP-21 extends and broadens an existing provision allowing for tax-free transfers of excess pension assets to fund retiree welfare benefits.

1.2 Funding relief through MAP-21:

When interest rates in the US were at a historical low, the enactment of MAP-21 came as a relief to many insufficiently funded plans and their sponsors; a smaller MRC means that plan sponsors have to put in a lesser amount of money or no money at all depending upon the plans' funded status. The money once contributed by the plan sponsor is debited from their balance sheet and cannot be taken back in any form. So, any contribution made towards the MRC is an absolute liability for the sponsor. A reduced contribution helps a cash-strapped sponsor who currently doesn't have enough money to contribute, or enables making alternative investments out of the money 'saved'.

Additionally as a result of MAP-21, the funding ratio of plans improved significantly, resulting in obliterations of any benefit restrictions that may have earlier been levied on the plans. Funding ratio is nothing but the assets to liability ratio, technically known as the Adjusted Funding Target Attainment Percentage (AFTAP). Unless a certain AFTAP is met, plans are not allowed to amend existing provisions to enhance plan benefits and also to provide accelerated benefits and lump sums[3]. A plan sponsor may want to amend existing plan provisions or

1 The funding liability, calculated as of the valuation date, accounts for the accrued benefits attributable to past service whereas the normal cost (popularly known as service cost) is the (additional) liability attributable to the additional year of service during the valuation year.

2 **Pension Benefit Guaranty Corporation** (PBGC) is an independent agency of the United States government that was created by the Employee Retirement Income Security Act of 1974 (ERISA). It collects premiums from private DB pension plans and acts as a reinsurance agency to provide guaranty of timely and uninterrupted payment of pension benefits to plan participants.

benefits to make them more lucrative for employees. Also, the sponsor may want to pay accelerated or lump sum benefits in order to immunize the plan against any future interest rate volatility.

Finally, a smaller MRC also helps to retain 'Credit Balances[4]' which in turn provides greater flexibility towards fulfilling future contribution requirements.

2.1 Development of non-stabilized interest rates (Pre-MAP-21 Rates):

develop segment spot rates by taking an arithmetic average of yields with different maturities. The first, second and third segment spot rates represent the average yield for maturity period of 0-5 years, 5-20 years and greater than 20 years respectively. Finally the segment spot rates are smoothed over the last 24 months to derive the non-stabilized interest rates.

As mentioned before, the corridor stipulated by the original MAP-21 Act of 2012 is superseded by the Highway and Transportation Funding Act of 2014. Effectively the corridor is 90%-110% of corresponding 25-year average segment rates for 2012 through 2017; the range gradually increases by 5% each year thereafter.

A point to note here is that pre-MAP-21 segment rates (24 months average) were

24 Months Average Rates

	1/1/2013 Segment Rates with			
	0 month lookback	1 month lookback	2 months lookback	3 months lookback
Segments	Jan, 13	Dec, 12	Nov, 12	Oct, 12
0-5 years	1.62	1.66	1.69	1.72
5-20 years	4.40	4.47	4.53	4.58
20+ years	5.45	5.52	5.60	5.67

Segment Spot Rates

Segments	Dec, 12	Nov, 12	Oct, 12	Sep, 12	Aug, 12		Mar, 11	Feb, 11	Jan, 11	Dec, 10	Nov, 10
0-5 Years	1.00	0.97	0.96	1.02	1.13	----	1.91	2.02	1.93	1.98	1.65
5-20 Years	3.57	3.50	3.57	3.71	3.71	----	5.23	5.34	5.26	5.23	4.91
20+ Years	4.77	4.60	4.58	4.67	4.52	----	6.46	6.54	6.42	6.52	6.52

Yield Curve

Maturity Points	Dec, 12	Nov, 12	Oct, 12	Sep, 12	Aug, 12		Mar, 11	Feb, 11	Jan, 11	Dec, 10	Nov, 10
0.5 Years	0.32	0.32	0.32	0.36	0.37	----	0.46	0.47	0.52	0.69	0.66
1.0 Years	0.53	0.52	0.51	0.54	0.60	----	0.76	0.81	0.81	0.85	0.80
----	----	----	----	----	----	----	----	----	----	----	----
5.0 Years	1.56	1.51	1.54	1.64	1.76	----	3.33	3.48	3.33	3.41	2.82
5.5 Years	1.72	1.67	1.70	1.81	1.92	----	3.58	3.73	3.58	3.66	3.06
6.0 Years	1.89	1.84	1.88	2	2.10	----	3.80	3.95	3.81	3.88	3.28
6.5 Years	2.07	2.02	2.07	2.2	2.29	----	4.01	4.15	4.01	4.08	3.49
7.0 Years	2.26	2.20	2.26	2.4	2.48	----	4.19	4.33	4.20	4.25	3.68
----	----	----	----	----	----	----	----	----	----	----	----
19.5 Years	4.44	4.33	4.37	4.5	4.42	----	6.00	6.09	6.00	6.00	5.86
20.0 Years	4.46	4.34	4.38	4.51	4.43	----	6.02	6.11	6.02	6.03	5.90
20.5 Years	4.47	4.35	4.39	4.51	4.43	----	6.05	6.14	6.04	6.05	5.93
21.0 Years	4.49	4.36	4.40	4.52	4.43	----	6.07	6.16	6.06	6.08	5.96
21.5 Years	4.50	4.38	4.41	4.53	4.43	----	6.09	6.18	6.08	6.10	5.99
22.0 Years	4.51	4.39	4.41	4.53	4.44	----	6.11	6.20	6.10	6.13	6.02
22.5 Years	4.53	4.40	4.42	4.54	4.44	----	6.13	6.22	6.11	6.15	6.05
23.0 Years	4.54	4.40	4.43	4.54	4.44	----	6.15	6.24	6.13	6.17	6.08
----	----	----	----	----	----	----	----	----	----	----	----
59.5 Years	4.93	4.73	4.69	4.76	4.57	----	6.66	6.74	6.60	6.75	6.80
60.0 Years	4.93	4.73	4.69	4.76	4.57	----	6.67	6.74	6.61	6.76	6.80

Figure 1: Shows the development of non-stabilized 3-segment interest rates from yield curve

A yield curve is the starting point for deriving segment rates. A yield curve is calculated for each business day of a month based on high quality investment grade corporate bond yields. Then monthly spot rates are developed by taking an arithmetic average of yields on all business days in a month. These spot rates reflect yields on zero coupon bonds with different maturities, maturities of ½ year up to through all future years. This resulting yield curve is then used to

2.2 Development of stabilized interest rates (MAP-21 Rates):

Reflecting the changes made by MAP-21, the Internal Revenue Service (IRS)[5] came up with guidance on adjusting the non-stabilized interest rates based on the most recent 25-year average segment rates. MAP-21 retained the 24-month averaging concept but softens its impact by creating a corridor of permissible rates on either side of a 25-year average.

available as far back as October 2005 (24 months average of October 2003 to September 2005 rates). In order to determine equivalent rates for earlier months for the 25 years average, the Treasury Department used a statistical regression analysis using parameters such as zero-coupon yields for Treasury Securities, Corporate Bond Index Values, and Constant Maturity Treasury Rates.

3 Internal Revenue Code (IRC) Section 436 requires the plan to meet specified funding thresholds to avoid various benefit restrictions. If the AFTAP is over 80%, no restrictions are applied. If it is less than 80% but at least 60%, benefit accruals and lump sum payments are allowed but any amendments for increasing benefits are restricted. For AFTAP less than 60%, benefit accruals must be frozen and lump sum payment and amendments for increasing benefits are not permitted.

4. Credit Balances for a DB pension plan represent contributions that a sponsor has made in excess of the MRC. These excess contributions can then be used in a future year to meet contribution requirements.

5 The Internal Revenue Service (IRS) is the revenue service bureau of the Department of the Treasury of the United States federal government. The IRS is responsible for collecting taxes and the interpretation and enforcement of the Internal Revenue Code.

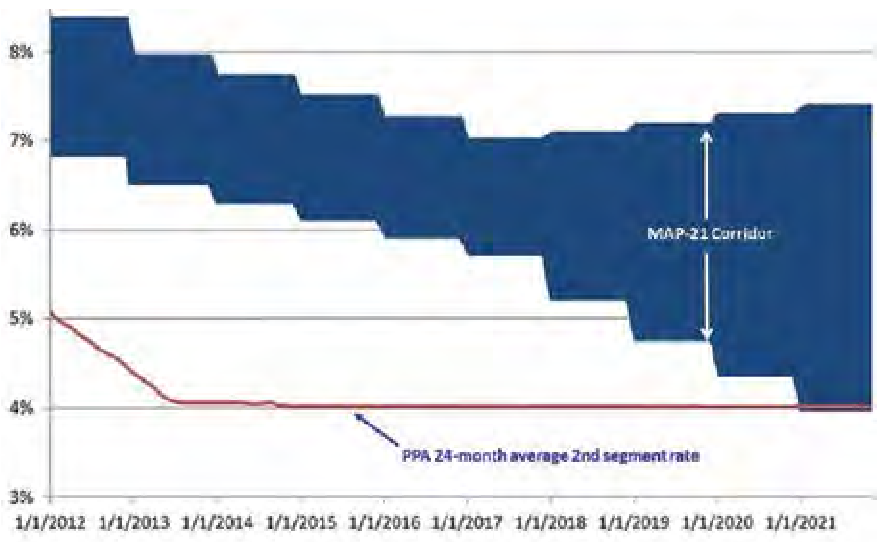


Figure 2: Shows the MAP-21 corridor and PPA 24-months average second segment rate

As evident from the above figure, the floor of the MAP-21 corridor is higher than the segment rates till year 2021, after which the segment rates enter the MAP-21 corridor and hence the MAP-21 effect softens. The effect eventually disappears as the corridor broadens and the 25 years average gradually decreases. (We have assumed here that the segment rates stay same in future through 2021.)

3.1 Impact of MAP-21 on pension plans:

As mentioned in the previous sections of this article, implementation of stabilized interest rates has reduced funding actuarial liabilities and MRC of pension plans significantly and improved the funding status considerably. We collected data for a plan as an example to show how MAP-21 impacted pension plans since 2012. The MAP-21 rates used here are the updated rates as per the 2014 bill.

Funding measures	2012 (Without MAP-21)	2012 (With MAP-21)	2013 (Without MAP-21)	2013 (With MAP-21)	2014 (Without MAP-21)	2014 (With MAP-21)
Funding Actuarial Liability	$37,329,000	$31,190,000	$41,186,000	$33,163,000	$43,628,000	$34,512,000
AFTAP	83%	100%	79%	111%	78%	109%
Funding Shortfall	$6,172,000	$0	$8,551,000	$529,000	$9,408,000	$293,000
MRC	$2,129,000	$769,000	$2,186,000	$797,000	$2,362,000	$804,000

Table 1: Shows impact of MAP-21 on different funding measures of a pension plan (this may vary slightly for different plans)

3.2 Impact of MAP-21, other perspective:

- **Plan sponsor vs. plan participants:** Use of elevated MAP-21 interest rates provides short term funding relief to sponsors, especially to those suffering from a short term cash crisis. On the other hand, cash contributions made towards MRC are exempted from tax (subject to a very high cap); so reduction in contributions means that the sponsor ends up paying more taxes.

  The participants of a DB pension plan are least affected by this legislation as participants do not contribute towards MRC of a plan. The changes don't affect actual pension payments being made. Also long term pension funding is not jeopardised.

- **Long term vs. short term:** This MAP-21 legislation and its subsequent extension were intended to provide short term relief to plan sponsors rather than long term assistance. If we consider the 25 years averaging method used for the development of segment rates and the corridor used for adjusting the 24 months rates, we find that MAP-21 funding relief is particularly substantial for plan years 2012 through 2017 because 90% of each of the 25-year averages will be substantially higher than the 24-month average. Going further, as the corridor widens and the three segment rates could be as low as 70% of their 25-year averages after 2021, this funding relief will be less significant in later years.

- **Impact on PBGC:** Given that MAP-21 has reduced the funding actuarial liability and required contribution, it is quite apparent that it has increased the risk of termination of underfunded plans. So PBGC, which ensures timely and uninterrupted payment of pension benefits to plan participants of private DB pension plans, has to shoulder the added risk. MAP-21 legislation therefore included a PBGC premium increase - both flat-rate and variable-rate PBGC premiums. Flat-rate PBGC premiums for single-employer plans increased from $35 per participant in 2012 to $49 in 2014. Variable-rate premiums paid by underfunded plans also increased; $9 per $1000 of unfunded vested benefits in 2012 was increased to $14 in 2014.

- **Impact on assets:** The change in discount rates also affects assets of a pension plan. Plans are allowed to use a market value, smoothed up to the last 24 months (called Actuarial Value of Assets) for calculating funding status, which uses the minimum of the prior year's 3rd segment rate and long term expected rate of return on assets in its calculations. The prior year effective interest rate also gets used to discount the receivable contributions. Finally as mentioned before, a smaller contribution requirement results in retention of Credit Balances and hence provides greater flexibility to sponsors to take future contribution decisions.

- **Impact on actuarial firms:** This is a unique situation where plan sponsors or clients require timely and expert advice that helps them to take informed decisions. While helping clients meet regulatory requirements, such an opportunity also creates great revenue prospects.
- **Transfers of assets from well-funded plans:** MAP-21 extended the availability of Section 420 of the IRC, which allows plan sponsors of substantially overfunded pension plans to transfer some of those excess assets to a separate account dedicated to the provision of retiree medical benefits, through the end of 2021 (under previous law, this transfer option was slated to expire at the end of 2013). Most importantly, such transfers can be made on a tax-free basis.

Conclusion:

MAP-21, as the name suggests and what the US Joint Taxation Committee described as 'historical law', is indeed an innovative and progressive legislation. The Act is much diversified and exhaustive and by no means can be seen as an endeavour to only grant relief to pension plan sponsors. It was meant to garner higher revenues as plan sponsors earn more taxable profits by way of paying lesser tax-free contributions. At best it just delays the funding requirements till the effect of higher rates softens and probably gives a chance in disguise to rejuvenate cash strapped sponsors. While countries like India have not yet implemented a comprehensive DB pension system, the US has used DB pension plans as a source for greater federal revenues.

Irrespective of the intention and its long term repercussions, the Act has its distinct impact in the short term, both on operations of pension plans and the overall pension industry as a whole. Considering the current scenario, where many employers are contemplating DC (Defined Contribution) pension plans to ease out fiscal burden, such steps may also help to prolong the lives of DB plans.

References:

- 112th Congress Conference Report – House of representatives Senate, USA
- IRS website (http://www.irs.gov)
- PBGC website (http://www.pbgc.gov)
- The HQM Yield Curve: Basic Concepts – James A. Girola, U.S. Department of Treasury

IAI: UPCOMING EVENT

Workshop on the Financial Condition Assessment Report for General Insurance

Date : 3rd & 4th December, 2014

Venue: *Aditya Park- A Sarovar Portico Hotel, Aditya Trade centre, Ameerpet, Hyderabad -38. Telephone: +91-040- 66788888*

Topics:

1. Solvency Scenarios and Model-building
2. Analysis of Experience
3. Adequacy of Premiums
4. Adequacy of Reserves
5. Reinsurance & Risk Management
6. AA Views/Queries on new FCR
7. Business Projections, Analysis of Business Growth

Who should attend? The seminar is only for **IAI members** who wish to enhance their skills in GI domain

General Points:

- **Participation Fees :** 7500/-(+ 12.36% Service Tax)
- **Dress Code:** Business Casual
- **CPD Credit for IAI members :** 6 hours, as per APS 9
- **Registration : Close Date – 25th November, 2014**
- **Capacity:** admission will be on **first-come-first served** basis subject to receipt of payment.
- **Register at:** http://www.actuariesindia.org.in/SeminarRegistration.aspx
- **Contact:** Quintus Mendonca at quintus@actuariesindia.org for any assistance.

CAREER CORNER

AGRICULTURE INSURANCE COMPANY OF INDIA LIMITED

Regd. Office: "AMBADEEP" (13th Floor), 14, Kasturba Gandhi Marg, New Delhi – 110 00

Agriculture Insurance Company of India Limited, pioneer in providing Crop Insurance solutions to farming community invites Applications for two posts in its Actuarial Function Department as under:

1. Chief Manager (Scale V)/ Manager (Scale IV) : 1 vacancy
2. Assistant Manager(Scale II)/Administrative Officer (Scale I) : 1 vacancy

Eligibility criteria as on 01.11.2014

Cadre	Minimum Qualification	Minimum Experience	Basic Pay-Scales *
Chief Manager (Scale V)	Graduate + all CT +all CAs + ST 7 or ST 8 or ST 3	7 years' experience in Actuarial domain	₹ 41660-1200(3)-45260-1350(2)-47960/-
Manager (Scale IV)	Graduate + all papers of CT series+2 papers of CA	5 years' Experience in Actuarial domain	₹ 34460-1200(7)-42860/-
Assistant Manager (Scale II)	Graduate with Maths and statistics + 6 papers of CT series (other than CT 9)	3 years' experience in Actuarial domain	₹ 23120-840(7)-29000-910(6)-34460
Administrative Officer (Scale I)	Graduate with Maths and statistics + 4 papers of CT series (other than CT 9)	-	₹ 17240 -840(14)-29000-910(4)- Rs. 32640

* Other allowances like DA, HRA, CCA etc.are payable along with above Basic Pay-Scales as per General Insurance Industry.

Interested candidates may send their Resume with all relevant information with regard to their educational qualifications/ experience/current salary/expected salary etc. to DGM (HR), at his email id. mdgupta@aicofindia.com by 10th December, 2014.

DGM (HR)

SUCCESS STORY

Adarsh Kishor Agarwal

CA3 Topper May 2014

adarsh_mech@rediffmail.com

Tell us about yourself, your educational background and your hobbies

I was born and brought up in Jaipur and later completed my Mechanical Engineering from IT BHU, Varanasi. I believe in doing things with perfection and full enthusiasm. I love spending time with my family and watching Bollywood movies.

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

My Family's contribution in my success is immense. Since my childhood, my mother has been biggest motivation factor for me. Special mention of my wife and son, who allows me to study during weekends and holidays to enable me to succeed in exam.

How many hours of study on average per day did you put in to top the CA3 result where in only 8 candidates passed out?

I devoted about half hour daily for 10-15 days and then 1 full day before exam.

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

This exam requires lot of practice rather than reading. If someone is working, then presentations made during professional career are helpful in preparing for exam. Time required for serious preparation of exam will vary from individual to individual.

Did you face any difficulty while studying this subject?

Not at all. Assignment provided by IAI was quite helpful to build the momentum. Moreover the first 2 days workshop before actual exam helps in better preparing for the exam.

CA3 is a three day exam where first two days are dedicated to workshop based training sessions taken by communication experts. What all exercises were included in the exam workshop? How they helped you prepare for the exam?

Workshop included quite a few exercises. In the first exercise, we were divided into teams of 2 members and we had to introduce ourself to our team partner. Later, partners had to introduce each other to other teams. This worked well as an ice-breaker. Another exercise included building an innovative product, its Tag Line, a short advertisement and enact the advertisement. We prepared a mock presentation as well and presented the same. All the activities were engaging and helped us in identifying the expectations of the examiners in the exam, important points to take care of while presenting including body language and content.

This communication based exam tests an individual's presentation and written skills. How this exam has professionally helped you in your day to day communication at work?

Communication is very important aspect of one's success in professional career. Someone might build a very robust and dynamic actuarial forecasting model, however, if this is not communicated well to end-users and stakeholders, all efforts go in vein. The exam helps in improving the communication skills and identifying do's and don't of effective communication.

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

I have very diversified experience in the Non-Life actuarial domain ranging from pricing, reserving, business planning, reinsurance optimisation, risk transfer analysis and capital modeling for both commercial and personal lines of business. I can help in providing the wide range of ideas to solve critical actuarial problems.

What was your purpose while selecting this course – Communications?

Honestly speaking, I appeared for the exam, since this is a prerequisite to qualify as a fellow Actuary.

■■■

CAREER CORNER

NOTICE INVITING EXPRESSION OF INTEREST

EOI NO. 2-1/ACCOUNTS/ACTUARY EOI/2014-15 DATED: 03.11.2014

Mahanagar Telephone Nigam Limited (MTNL) invites EOI from interested eligible actuary firms for appointment as actuary for actuarial valuation of retirement benefits in MTNL as per AS 15 for the financial years 2014-15 & 2015-16 and also for mid year interim projection of liability for the year 2015-16. For details please log on to our website www.mtnl.net.in

DGM (Accounts)
MTNL, Corporate Office

DEVELOPMENTS IN SOUTH AFRICA UPDATE

INTRODUCTION

The Actuarial Society of South Africa (ASSA) is an extremely vibrant and active society with high levels of international participation. This article summarises some of the main areas of activities for the actuarial profession in South Africa.

KEY ECONOMIC DEVELOPMENTS

South African consumer price inflation rose to 6.4% in August driven by accelerating food prices. The South African Reserve Bank (SARB) expects inflation to trend downwards after September on lower petrol prices. However, these expectations are at risk given the recent sharp depreciation of the South African Rand. Recently, the SARB revised economic growth forecasts down to 1.5% for 2014, 2.8% for 2015 and 3.1% for 2016.

The Johannesburg Stock Exchange (JSE) All Share Index lost 2.6% in September, underperforming global markets and falling below the 50,000 level. It also lost 8.0% for the month when measured in US$. Over the last twelve months, the JSE has delivered 15.4% in local currency. The JSE has posted a return of 22.2% p.a. for the last 3 years and 18.0% p.a. for the last 5 years.

Bond prices fell 1.6% as an expanding current account deficit and weaker fiscal position are increasing the probability of a sovereign ratings downgrade. The All Bond Index (ALBI) has gained 5.7% year-to-date and 5.8% over the last 12 months. Over 12 months, cash has returned 5.6%. The Rand weakened significantly by 5.8% against the US$ as commodity currencies capitulated.

RETIREMENT FUNDS – SIGNIFICANT REFORMS UNDERWAY

Currently, most South Africans in formal employment belong to Defined Contribution Provident Funds – contributing about 15% of salaries to these funds. Typically about 1% of salaries is used to cover management expenses, another 2% to 3% covers the cost of risk benefits and the remainder is invested for retirement savings. Provident Funds pay cash lump sums at retirement and members may cash in their benefits on leaving employment. Statistics indicate that 90% of members do not preserve benefits on changing jobs.

Reform initiatives include converting Provident Funds to Pension Funds and enforcing preservation. Pension Funds allow a maximum of one third of retirement savings to be withdrawn as cash, with the remaining two thirds to be used to purchase an annuity at retirement. On changing jobs, monies must be preserved either within the Fund or via separate individual policies.

Recently, there has been some resistance to these reforms from organised labour. Labour unions argue that – due to high levels of poverty – workers need access to their monies on resignation or retrenchment and should not be forced to preserve their exit benefits. The implementation of some reform initiatives has been postponed.

LIFE AND SHORT-TERM INSURANCE – SOLVENCY II-STYLE REGULATORY CHANGES

The Financial Services Board (FSB) – with the assistance of stakeholders in the local life insurance industry is working on a Solvency Assessment and Management (SAM) project. This new prudential regulatory regime is in line with the Solvency II regime being rolled out in Europe. Essentially, the SAM framework aims to enhance risk-based supervision, and will apply to both life and short-term insurers registered in South Africa. Full implementation of SAM is scheduled for 1 January 2016.

The FSB is also working with the national revenue authorities to develop an appropriate tax regime under SAM. Given the scale of the proposed regulatory changes, the FSB is further conducting a study to assess the impact of the SAM-related changes on the broader South African economy.

In light of the various changes, the Life Assurance Committee of the South African Actuarial Society has embarked on a project to revise the Guidance Note framework for the Life Insurance Practice Area. A note with preliminary findings and recommendations has been submitted to the Professional Matters Board for consideration and further guidance.

Revisions are also been made to the Life Insurance Practising Certificate framework – given the potential changes relating to the role of the appointed actuary under the proposed SAM regulatory framework. A 'generic' certificate has been introduced certifying the competence of an ASSA member with the actuarial skills typically expected of a statutory actuary without certifying their knowledge of, or experience with, the legislative framework of a particular country.

BANKING

Actuaries are increasingly playing a greater role in Banking. The country's economic and financial stability depends to a large extent on a sound and prudently managed banking system and actuaries are increasingly involved in various areas of risk assessment and management. ASSA has a Banking and Finance Committee that guides actuaries working in this area. Course material is currently being developed to offer Banking at a Specialist Level for the local actuarial curriculum

AIDS

South African actuaries continue to be vigilant of the impact of HIV/AIDS. It is estimated that 12.2% of the South African population is infected with HIV/AIDS. Women aged between 30 and 34 and males aged between 35 and 39 have the highest infection rates.

The roll out of anti-retroviral therapies by government, is expected to reduce mortality rates. However, of particular concern is that in 2012 some 400,000 new infections occurred despite the widespread government intervention. This is indeed the highest incidence rate in the world.

The ASSA AIDS model is considered to be an extremely credible model and is widely used for projections. Actuaries consider the impact of HIV/AIDS in their day-to-day actuarial work including the possible impact on pricing and reserving.

NORMATIVE SKILLS TRAINING

ASSA is undertaking a programme to focus on normative skills training to assist actuaries with developing wider skills, in addition to their technical skills. This programme will take the form of compulsory workshops to develop (amongst others) effective communication, understanding business management and the regulatory environment, professional and ethical practice and life skills.

TRANSFORMATION

ASSA is working closely with ASABA (the Association of South African Black Actuarial Professionals) to help create greater educational opportunities for South Africa's previously disadvantaged citizens. Programmes include school guidance counselling and mentoring and vacation work programmes for university students. The current demographic statistics of ASSA membership by race is as follows:

	AFRICAN	COLOURED	INDIAN	WHITE	OTHER	TOTAL
Population	41.0m	4.6m	1.3m	4.6m	0.3m	51.8m
%	79.2%	8.9%	2.5%	8.9%	0.5%	100%
Fellows	57	14	92	819	12	994
%	6%	2%	9%	82%	1%	100%
Students	548	63	345	945	49	1950
%	28%	3%	18%	48%	3%	100%

About the Author

Krishen.Sukdev@iac.co.za

Krishen Sukdev is an actuary based in Johannesburg working for Independent Actuaries and Consultants (IAC).

PUZZLE

Puzzle No. 223:

The sides a, b and c of a triangle are connected by the equations $a^2 = b(b + c)$ and $b^2 = c(c + a)$

What are the angles of the triangle?

Puzzle No. 224:

In how many ways can the numbers from 1 to 9 be arranged in a 3 × 3 array, such that no number has a smaller number than itself appearing either below or to the right of it.

Solutions to puzzles

Puzzle No. 217:

$239 = 5^3 + 3^3 + 3^3 + 3^3 + 2^3 + 2^3 + 2^3 + 2^3 + 1^3$

$= 4^3 + 4^3 + 3^3 + 3^3 + 3^3 + 3^3 + 1^3 + 1^3 + 1^3$

Puzzle No. 218:

The numbers correspond to the alphabetical positions of the letters I, V, X, L, D and M; that is, the letters which are used in roman numerals written in ascending order of value. The missing letter is "C", which in this sequence corresponds to 3.

Puzzle No. 219:

A – B 0 - 0
A – C 2 - 0
A – D 2 - 0
B – C 0 - 0
B – D 2 - 1
C – D 1 – 1

Puzzle No. 220:

The birthdays being celebrated were 12, 15 and 18. On the first occasion the birthdays being celebrated were 3, 6 and 9. On every birthday the middle child has an age which is half the sum of the other two ages.

Correct Solutions were received from:

Puzzle No. 217:

1. Mahipal Choudhary
2. Graham Lyons
3. Sourav Mahapatra
4. Indranil Deshmukh
5. Manoj Malhotra
6. C. R. Narsimha Sai
7. Mercy Amalraj

Puzzle No. 218:

1. Mahipal Choudhary
2. Graham Lyons
3. Indranil Deshmukh
4. Manoj Malhotra
5. Rakesh Sharma
6. C. R. Narsimha Sai
7. Mercy Amalraj

Puzzle No. 219:

1. Prasham Rambhia
2. Partha Talukder
3. Mayank Bagri
4. Amit Bohara
5. Brijesh Kumar Singhal
6. Indranil Deshmukh
7. Manoj Malhotra
8. Graham Lyons
9. Anuradha Krishnamurthy
10. Nikant Aggarwal
11. Adibhattar
12. Divyansh Saraogi
13. P. Rajakumar
14. Rachit Kamdar
15. Siddhesh Bhoir
16. Arun Bharti
17. Narasimha Sai
18. Mahipal Choudhary
19. Shreya Singhania
20. Venkatesh Konar
21. Manoj Barbhaya
22. Mercy Amalraj
23. Shilpi Jain

Puzzle No. 220:

1. Prasham Rambhia
2. Partha Talukder
3. Shilpi Jain
4. Amit Bohara
5. Indranil Deshmukh
6. Manoj Malhotra
7. Graham Lyons
8. Rachit Kamdar
9. Narasimha Sai
10. Mahipal Choudhary
11. Manoj Barbhaya

shilpa_vm@hotmail.com

SUDOKU

SUDOKU No. 26 for the month of November 2014

SUDOKU

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

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.25 published in the Month of October 2014

SOLUTION

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

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