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the Actuary INDIA

INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest

THE MAGAZINE OF THE INSTITUTE OF ACTUARIES OF INDIA

VOL. VII • ISSUE 8 | AUGUST 2015 ISSUE | Pages 32 • ₹ 20

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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 PRESIDENT'S DESK

MR. RAJESH DALMIA

Dear Members

It is interesting to understand why we do what we do. Many a times we do things which we know is not right and at times we regret later. Most often, this happens because mind takes the control, in place of, us controlling our mind. We usually work within the realm of conscious mind which is relatively smaller portion. However, there is a bigger portion of sub-conscious mind which usually takes the control in various situations related to anger, aggression, abusiveness, arrogance etc. It is really difficult to take control of this subconscious mind. In fact, subconscious stores all the past information and it reacts to a situation based on this stored past information. For example, when a familiar voice is heard, the ear sensor generates some sensation and then mind interprets these sensations and reacts to these sensations.

How do we take the control of this subconscious mind when even the conscious mind may not be in control? The answer lies in Vipassana meditation. I came in contact with Vipassana and that changed my life forever.

The Vipassana meditation is divided into three parts. The first part is all about controlling the diet and practicing of good behavior like not smoking or not lying etc. The second part is all about Samadhi where the focus is on developing concentration. Finally in the third part the focus is on controlling the mind by not reacting to a situation. You observe your body and feel various sensations going through your body but do not react to these situations/sensations. For e.g. you may perspire a lot due to heat but yet you just observe it without reacting. Finally, you do pray to ensure well-being of all living beings on this planet.

When you observe and do nothing (really nothing – not even wiping sweat or scratching the skin) then you will slowly get rid of the deep rooted habit pattern inside. It is vital that you do not react at all so that habit pattern can be broken. Slowly with practice, you will realize that your body is full of electrical currents which are interpreted by the subconscious. Slowly, this non reaction, ultimately leads to the conquerance of mind because mind would like to react and you hold it back. The Vipassana Meditation is fundamental to this transformation. You can visit the website http://www.dhamma.orga for further information.

I believe that as an actuary you need to be strong in ethics and independence which becomes easier through the exercises of the mind. In fact, the Vipassana meditation helps in achieving the same in a short span of time. Besides, you also need to be strong in the body and brain and for that you should be undertaking some exercises.

Though these are not part of the curriculum of an actuary, I believe these are vital and very important exercises to be undertaken by actuaries at any stage of their evolution.

Recently, I met a student actuary and I asked him for areas for improvements for the Institute. He gave a very interesting reply. He highlighted that a large number of student actuaries may be occupying a very good position in the insurance companies though they may be very poor in presentation skills. His ask from the profession was to make all those who puts in an effort to study a good communicator. When I deeply think about it, I see the merit in his asks. Only challenge is how we, at the Institute, get these implemented.

The perception of actuary being a very bad communicator is quite pervasive. We need to break that image and it can only be done by committing ourselves on the improvement and growth path. We do want to see increase in salary every year though we do not focus on improving our productivity and our own development. An actuary of the future would need to handle far more complex work than the current actuaries and the observations raised would be valid even in that era too.

The profession is going through change and like any other change, it will impact some positively and some negatively. There would rarely be a change which impacts all positively or all negatively. Yet, change is the only constant in today's world. I would love to hear from you on some of these changes.

FROM EDITOR'S DESK

MR. SUNIL SHARMA

The actuarial profession in India is young and not as old as the actuarial profession in markets like US and UK. The Actuarial Society of India was only started in September 1944 and only started its own examination system in 1989. It was only after denationalization of the insurance sector in 2000 that the actuarial profession came into limelight in India.

The actuaries of a number of life assurance companies established the Institute of Actuaries in London on the 8th of July 1848 with the First President Mr. John Finlaison. The Institute of Actuaries is the oldest actuarial professional body in the world.

The Society in America was founded as a merger of two major American actuarial associations, as reflected in its logo; The Actuarial Society of America (ASA) and the American Institute of Actuaries (AIA). The Actuarial Society of America was the first actuarial professional association in North America, founded in 1889 with only 38 members and headquartered in New York City. The American Institute of Actuaries was founded in 1909 and was based in Chicago.

As at 31st Dec, 2014, SOA had 15,729 Fellow members and 9,849 Associate members. The Institute and Faculty of Actuaries, had11,340 fellow members and 418 associate members as at 31 Dec, 2013. Compared to this the IAI has only 278 fellow members and 151 associate members as at 31st March 2014. Further, out of 278 Fellows of IAI, there are 75 members who are above age of 60 years. The numbers of student members stood at 8,804 as 31st March, 2014.

It is important to note that while majority of the Indian actuaries are working for Insurance companies, consultants and regulator, the actuaries in UK have been much more diversified into various areas of practice. In UK actuaries are working in the areas of :

- Life Insurance (insurance and reinsurance cos.)
- Pensions and Employee benefits (trusts, consulting companies)
- General Insurance (insurers and reinsurers)
- Investment Management (commercial Banks)
- Health and care insurance or advice (insurer, reinsurers and consulting Firms)
- Investment Banking (advisory and Finance)
- Enterprise Risk Management (insurers, regulators, consultants, Banks and non-Ins companies)
- Education (Universities and colleges)
- And Information technology

As the number of student members of IAI grows, it would be of utmost importance for actuaries to get engaged in the areas like investment banking, investment management, enterprise risk management, Education and Information technology. But the challenge is how? It's like a chicken and egg situation; do qualified actuary move first into these areas or students? To me the former looks more logical. Therefore, we need more qualified actuaries in India to take up some of these roles in Indian market into territories already explored by other actuarial professions in their markets. This will help creation of more job opportunities for the student community and add value to lives of people. We also need to promote CERA qualifications and more and more qualified Actuaries should take up CERA to get into the roles of ERM. With this message I would like to sign off.

We invite readers to respond briefly to our articles and to suggest new features with letters to the editor. Kindly mail your responses on library@actuariesindia.org with your name & contact details. Appropriate responses will be published in Actuary India magazine with the approval of competent authority.

EVENT REPORT

3RD SEMINAR ON CURRENT ISSUES IN GENERAL INSURANCES

Organised by :
Advisory Group on General Insurance, IAI

Venue : Hotel Sea Princess, Mumbai

Date : 3rd July 2015

Mr. Rajesh Dalmia

As the theme suggests, the sessions throughout the day focussed on the most pressing issues at current point of time in the General Insurance Industry in India.

Mr. Rajesh Dalmia, President of Institute of Actuaries of India greeted the audience and the speakers with his welcome speech. The audience consisted of representatives from the Actuarial Departments from various General Insurance and Re-insurance companies, General Insurance and Re-insurance Brokers, Regulators office, Consulting Firms and others.

In his introduction speech, amongst other things he spoke about the emerging risks in the general insurance space like cyber-crime, identity theft, product recall etc. and how those could impact the general insurance industry and the actuarial profession in general as well. He also hinted at chances of introduction of Peer Review for Actuarial work in General Insurance space which will be in line with the current ones in life insurance at present.

Session 1: Keynote Address.

Speaker : Ms. Pournima Gupte – Member Actuary - IRDA

Ms Pournima Gupte

Ms. Pournima Gupte recently took charge as Member – Actuary at the Regulators office. Prior to this, she has a vast experience of more than 30 years in the Insurance Industry across India and UK out of which more than 8 years as an Appointed Actuary in a Private Sector Insurance Company in India.

In her keynote address to the audience, she spoke about various current issues and challenges faced by the industry as a whole. She highlighted two crucial statistics at a macro level which are **Insurance Penetration,** which is a ratio of insurance premium to the GDP of the country and **Insurance Density**, which is ratio of insurance premium to population of the country described in US dollars. For Indian General Insurance Industry, these figures stood at 0.8% and USD 11 respectively as at Year 2013. Similar numbers for China stood at 2% and USD 200 respectively and for the world as a whole stood at 3% and USD 500 respectively. This demonstrates the potential of growth for general insurance industry in India.

She then spoke about the issues surrounding Motor Insurance which constitutes around 50% of total premiums. She discussed the issues of paucity of data, unattractive loss ratios in Motor Third Party segment, impact of IRDA regulations on Obligations of Insurers in respect of Motor Third Party Insurance, problems of uninsured vehicles on road and the implications of pending Road Transport and Safety Bill which restricts the maximum liability of an insurer in case of Third Party claim to INR 15 Lakhs.

She later discussed the issues in claims reserving including determination of Premium Deficiency Reserves and the detailed granular reporting in Financial Condition Assessment Report. She highlighted that the quality of data used for actuarial work in many general insurance companies were not of optimal standard which could give rise to any unforeseen calamity in the industry.

She also informed about the formation of committee to review the process related issues for new product approvals at IRDA and talked about some changes which can be foreseen. She then touched upon areas/functions in insurance companies which are not currently owned by the Appointed Actuaries, namely Reinsurance, Expense of management, Preparation of Financial statements and Investments. She spoke about the supply side constraints on availability of Qualified General Insurance Actuaries and requirement of Subject SA3 and the related regulations in the Appointment of Appointed Actuary Regulations.

She mentioned about IRDA's stand on Implementation of Risk Based Capital and the committee formed in September 2014 for providing recommendations and also about convergence to International Financial Reporting Standards via revised Indian Converged Accounting Standards, however these may be implemented only in around FY 2018-19 or so.

She then touched upon wider issues in terms of Registration of Indian Insurance Companies with the increase in FDI allowed and opening up of alternative forms of capital in form of debentures and preference shares which would be counted towards solvency calculations. She briefly also touched upon the amended reinsurance regulations and issues relating to opening reinsurance branches in India.

Session 2: Provisioning in Indian GI companies: Importance, challenges and suggestions.

Speaker: Mr. Bhargav Dasgupta – MD & CEO – ICICI Lombard General Insurance Company

Mr Bhargav Dasgupta

Mr. Bhargav Dasgupta started off by analysing the shift in the focus of the industry over the years from commercial insurances like fire, engineering, hull etc. to retail insurances like motor, health, cargo etc. He observed that over the past 10 years, there has been an almost 5 fold increase from INR 18 thousand Crores to INR 85 thousand Crores in the size of the Industry at a CAGR of 17-18%. He also observed that the relevance and importance of actuarial science is now sensed as the tail of the business is getting longer. Motor Third Party is one area where the tail has proved to be much longer than previously estimated. Also Health insurance with mandated guaranteed renewal-ability makes it a longer than perceived and brings in a need to understand the risks it pose from actuarial perspective.

He then came to the topic of importance of reserving in any General Insurance Company and quoted that out of the list of major causes for insurer failures worldwide, inadequate reserving has been in the top of the list over the years.

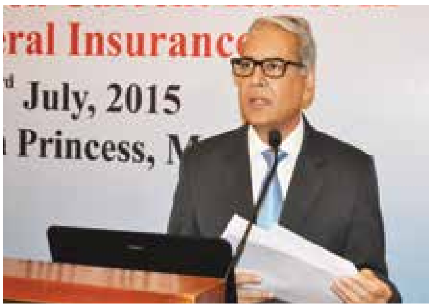
Reserving in the Indian Insurance Industry has undergone many changes, from formula based reserves in the pre-IRDA era, to the Appointed Actuaries Report for IBNR later on. A special case of IBNR for Motor Pool in Financial Year 2011 & 2012 was discussed and how that impacted in a financial loss of more than INR 100 Billion across the industry which shocked the industry and resulting to eventual dismantling of the Pool.

He then spoke about the challenges faced in terms of lack of data, expertise and guidance in handling long tailed reserves especially Motor Third Party where the intimation delay can go upto 8 years and settlement delay could go upto 15 years which will involve implications of various inflations, trends, legal judgements etc. Also there is lack of sufficient disclosures in the calculations performed in arriving at the reserves and also a lack of peer review guidelines.

He believed that the above challenges to some extent could be controlled or managed by following steps. First being making market disclosures mandated on the movement of the reserves. He cited an example on customer grievance numbers of how market disclosures drives corporate behaviour. Then he suggested industry level research initiatives which could help the industry as a whole, for example creation of tables similar to ODGEN tables which are used by courts in UK for dealing with Third Party claims. Formation of Indian GAD (Government Actuarial Department) like body which can give suggestions on wider Actuarial aspects. And lastly improved professional guidance in terms of benchmarks for setting assumptions, peer review system, adequate disclosures and communication.

Session 3: Reinsurance Regulations.

Speaker : Mr. Arun Agarwal – General Representative – Lloyds' London



Mr. Arun Agarwal

Mr. Arun Agarwal discussed the new reinsurance regulations and any opportunities it entails as perceived by the Reinsurers outside of India.

He first gave a few statistics for explaining the need of Reinsurance in India. According to the risk profile of India, the biggest risk it faces is a Pandemic in a big city like Mumbai which could result in financial loss of around USD 12 Bn. There were a total financial loss of USD 48 Bn (at current rates) due to catastrophes suffered by India in past 30 years where as in the next 10 years expected catastrophe losses are estimated to be around the same level i.e. USD 48 Bn. This position is exacerbated by the low insurance penetration ratio in India. According to the studies, 1% Increase in the penetration would lead to 13% decrease in the uninsured losses resulting in 22% decrease in taxpayer's contribution and 2% increase in National GDP. He then gave examples of how economic losses from catastrophe from worldwide were mitigated due to Re-insurance.

He then critically evaluated the regulations for registration of branch offices of Foreign re-insurers & IRDA (IFSC) Guidelines 2015 and discussed the operational challenges including underwriting of global policies, outsourcing, appointment of KMP's, accounting and investment standards, retrocession, order of preference of cessions by Indian insurers, repatriation of surplus, delegated authority and supervision and control.

He then finished the presentation by quoting lessons learned from recent successful Reinsurance Hubs like Dubai and Singapore. The distinguishing features which enabled this were Economic and Political Stability, Foresight and Economic engineering, Quality of local regulations, ease of doing business, cosmopolitan environment, availability or importability of highly skilled professionals, cluster of insurance related services, adequate education and training facilities, competitive tax environments, convenient geographical locations.

Session 4: Burning Cost.

Speaker : Mr. Sanjay Dutta – Chief Underwriting & Claims – ICICI Lombard General Insurance Company

Mr. Sanjay Dutta started off by briefly introducing the regulations on Burning costs in pricing. He then gave a flashback on the evolution of insurance pricing in

Mr. Sanjay Dutta

different phases over the years from tariff regime to price wars to market focus on profitability and the way forward he suggests brings in rational behaviour. He also gave examples of other Asian countries like China where tariffed pricing prevailed until 2002-03 and then it was de-tariffed in 2003 which led to price wars and deterioration of claims experience till 2006 when it was again put under tariff once again. In 2012 they again de-tariffed the market which behaves rationally now. In Japan as well until 1998 the prices were tariffed and then opened up. The losses went up for a few years after which the insurance companies went into market agreement in terms of pricing which resulted in controlled losses.

He then explained the concept of Burning Costs in pricing and the need to observe that in current scenario. Burning Cost is a concept which is used in pricing of experience based products and may not be so relevant for exposure based products, and hence he supported the regulations for having it only on FLEXA portion of risks and not on Natural Catastrophe rates.

He then spoke about the challenges in the current regulations like it covers only 40% of occupancies mentioned in the erstwhile tariff. There is no uniform method of calculating Burning Cost which is worsened by lack of adequate claims data. Adequate guidance needs to be developed on pricing the Natural Catastrophe rates. He then quickly went through the way ahead by suggesting use of exposure based pricing by estimating large loss load and also use of industry exposure curves and liability models for pricing.

Session 5: Lessons from Behavioural Finance for Product Pricing.

Speaker : Mr. Mayur Ankolekar – Consulting Actuary – Ankolekar & Co.

Mr. Mayur Ankolekar touched upon a very interesting topic which has got a lot of attention recently in the Financial and Economics Space. It was previously understood and assumed that Humans make decisions based on rational thinking and this forms basis for a lot of research and theories produced in economics and financial services area. However recent studies have shown that there is some level of irrational behaviour observed under certain scenarios, the study of which led to birth of Behavioural Finance.


Mr Mayur Ankolekar

For example when the underlying factors start getting too complex, humans make decisions based on the gut.

He then discussed 8 such behaviours and how these can impact the pricing and the design for Insurance Products. These include

- Anchoring - Decisions are made by adjusting from an existing position.
- Prospect Theory – People are risk averse when facing gains, but become risk seeking when facing loss.
- Money Illusion - People tend to think about money in nominal terms and not real terms.
- Mental Accounting – Use of separate mental accounts (implicit and explicit cognitive activities) impacts financial decisions.
- Framing - The framing of a problem can materially impact how a decision is made.
- Myopic Loss Aversion – The frequency with which something is monitored can impact the decision, shorter the term of monitoring, higher the loss aversion.
- Heuristic & Biases – People often employ thumb rules
- Prod and Compliance Prods – People are happy to spend if someone else (e.g. law) guides the decision.

Session 6: IIB Journey so far and road ahead.

Speaker : Ms. Nupur Pavan Bang– Head of Analytics - Insurance Information Bureau

Ms. Nupur Bang took the audience back in 2008-09 when the Insurance Information Bureau was created as an independent body to collect transactional data from the insurance companies and then produce industry wide reports. She


Ms. Nupur Bang

then briefed about the impacts of each of the initiatives which IIB took in these years.

First one being the Road Safety statistics, comparing the industry wide insurance data with automobile registration data, it was observed that around 55% vehicles plying on the road were uninsured, highest being the two-wheelers. Financial implication of these uninsured vehicles is around INR 5000 Crores only for the standalone mandatory Motor Third Party Premium. The secondary impact is that in case of accidents the victims of these vehicles have difficulty in getting financial recourse.

In Cyberabad, due to an initiative led by IIB in support with RTO and Police, actions were taken to issue 1.6 Lakh challans to uninsured vehicles and similarly the plan is to spread this campaign nationwide to create awareness about issues created by uninsured vehicles.

They have launched an online IIB Vseva which gives out web based claims history search for each vehicle. This can help reduce false No Claim Discounts being given to fraud customers. It is estimated that the industry loses INR 131 Crores each year on the false NCB declarations.

Second initiative relates to Market Conduct. IIB database was used to arrive at the burning costs mentioned in the recent regulations. It is estimated that the fire premium would have gone 48% upwards if the burning costs were used. Similar exercise is being carried out in Health line of business however it is in experiment phase due to lack of enough credible data.

Third initiative is towards healthcare where around 33000 unique hospital ids have been identified and geocoded. This will help create a hospital registry which can be useful in managing the insurance business and prevent frauds.

Fourth initiative is towards creating of depositories of life insurance agencies.

Fifth Initiative is towards KYC. IIB's ITrex maintains central index server which can be useful as digital platform for e-Insurance account details.

Sixth initiative being assisting the regulator in performing its duties by providing it timely analytics in the areas of pricing, reserving and solvency.

Last initiative is to be a part of international analytical bodies. IIB has signed MOU with Korea Insurance development Institute and is a member of Insurance Information & Ratemaking Forum of Asia.

She also spoke about IIB's mid-term and long term analytical goals to reach the stage of predictive and prescriptive analytics from the current descriptive and diagnostic analytics.

In the current work in progress at the Bureau are the health portability system for verification of claims history, fraud analytics project which is estimated to save upto USD 6.25 Billion annually which is around 9% of Industry Revenue, Natural Catastrophe events analysis and disaster financing for Nat Cat exposure.

Session 7: Behavioural Economics – Pricing Examples.

Speaker : Mr. Hiten Kothari– Actuary & Vice President – Almondz Reinsurance Brokers.

Mr Hiten Kothari

Taking a leaf out of the previous session on Behavioural finance, **Mr. Hiten Kothari** built it up by giving a few examples and case studies on how behavioural finance can be used in pricing and product designing. He noticed that people involved in the pricing process also exhibit behavioural bias.

The examples included impact of Anchoring which involves referring to the Tariff rates and discounts in the current market scenario, impact of Heuristics and biases when selecting trends or ranges for frequency or severity analysis and impact of overconfidence in complex pricing methods and on trend selections based on few data points. He then presented a case study on 2014 Jammu & Kashmir floods and the dynamics of behavioural finance surrounding it.

ABOUT THE AUTHOR

Mr. Neel Chheda

is a Fellow member of IOA, IAI & III. He is an Associate Member of ICAI and also a FRM Holder. He has completed Master's degree in Commerce & CS exams. He heads the Actuarial department at Future Generali India – Non Life.

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Participant's Feedback

Specific issues can also be focused like re-serving requirements in general insurer & vis-à-vis & other countries in xlo, UPR, URR, PDR, O/S Reserves as this is one of the area of debate

Would love to have sessions where we can understand risk for Motor TP by people on Ground (Lawyer, Courts, etc)

To include Technical aspects of actuaries pricing

There should be pure actuarial seminar where pricing of selective products (concern of society) is arrived at in presence of GI actuaries

Include the topics like Product Development, Commercial Lines, Risk Management, Distribution, New Emerging Topics

Pls add Threat from aggregators e.g policy bazaar

Data Analytics was a welcome addition, IIB info Really helped

To include E-Commerce opportunities

Approaches insurance companies are planning to deploy for current pressing issues

An educative seminar only on the above subject may be considered to educate the practices across the countries on reserving

It would be useful to have a session on global GI issues e.g. Impact of solvency II & globalisation

Wider Topics including underwriters, claims officials, finance people may prove good. It was nice to hear an U/W's pt. of view with respect to actuaries

An article from chairperson just before the seminar in Actuary India will help attracting more people at such events

Speakers from various fields, other than actuarial background should also be welcomed as speakers, also as audience

Exercise for thought process, advanced techniques used in reserving & pricing, best estimates, giving reinsurance & advise

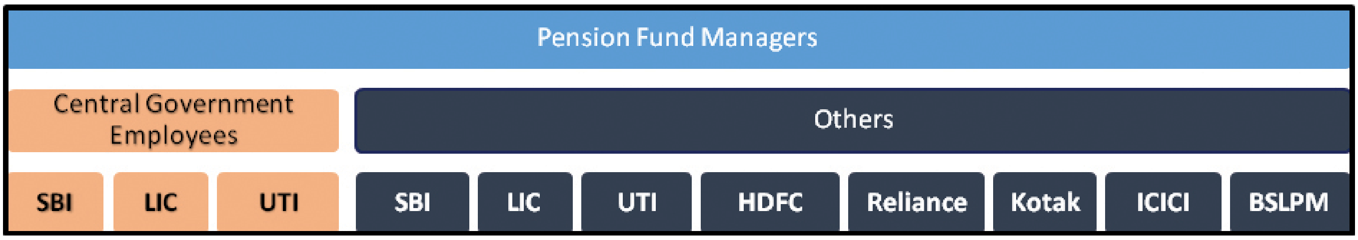
Represent Speakers from other Govt. Companies, court , lawyers rather than one private firm

Prospective of IRDA or some government official on moves they are planning to enhance insurance environment.

NATIONAL PENSION SYSTEM (NPS)

"A generous basic state pension is the least a civilized society should offer those who have worked hard and saved through their whole lives."

The Government had introduced the National Pension System (NPS) from 1st January, 2004 for new entrants to Central Government service, except for the Armed Forces. This Defined Contribution scheme was then opened to all citizens from 1st May, 2009 on a voluntary basis. The Government constituted an interim regulator, the Pension Fund Regulatory and Development Authority (PFRDA) through a Government Resolution as the precursor to the statutory regulator. The NPS architecture consists of, the National Securities Depository Limited acting as a **Central Recordkeeping and Accounting Agency (CRA)** for maintaining the data and records, **Pension Fund Managers (PFMs)** for generating and maximizing returns on investments of subscribers, Stock Holding Corporation of India Limited functions as a **Custodian** to take care of the assets purchased by the Fund managers, Axis Bank functions as **Trustee Bank**, responsible for the day-to-day flow of funds and banking facilities in accordance with the guidelines/ directions issued by the Authority under NPS, the **NPS Trust** which is entrusted with safeguarding subscribers interests, **Point of Presence (POP)** as the first point of interaction between the subscriber, **Aggregator** as a primary point of interaction between the subscriber and the NPS - Swavalamban architecture and **Annuity Service Providers (ASPs)** who are IRDA licensed and are empanelled by PFRDA for servicing the annuity requirements of the NPS subscribers.



Birla Sun Life Pension Management Limited (BSLPM) is yet to commence its business based on last update as on 14-07-2015. Source – PFRDA

Features

- The NPS account Permanent Retirement Account Number (PRAN) remains the same irrespective of change of employment or geography.
- NPS is comparatively advanced in the technology it uses. On joining NPS, each Subscriber gets log in ID and Password of NSDL system for accessing NPS details online.
- It offers a choice of Service Providers, Funds, Investment Options, Pension Fund Managers, Annuity Service Provides and Annuity Plans to Subscribers.
- It offers Subscribers freedom to switch the Service Providers, Fund, Investment Option and Pension Fund Manager.
- Amount and frequency of contribution can be changed as per the Subscriber requirement.
- NPS is regulated by PFRDA, with transparent investment norms and regular monitoring and performance review of fund managers by NPS Trust.
- Efficient grievance management through CRA / PFRDA Website, Call Centre, Email or Postal Mail.
- Investment Portfolio under each asset class can be viewed on respective Pension Fund Manager's website.
- NPS as a product, has very low cost.

Accounts

Under NPS there are two types of accounts available to the subscribers viz. Tier-I, where contribution will serve saving for retirement in a non-withdrawable account and are subject to tax benefit and a Tier-II account which is a voluntary saving account that allows withdrawal where tax benefits are not applicable. In case of a Corporate Model, the account charges can be borne either by the Corporate or Subscriber, at the discretion of the Corporate. Tier-II account can be activated along with the Tier-I account or at a later date.

Models

Government Sector

NPS is mandatory to all new recruits in Central Government, State Government, Central Autonomous Bodies (CABs) and State Autonomous Bodies (SABs) from 1st January 2004 (except the armed forces). The monthly contribution under this model is 10% of the Basic Salary and Dearness Allowance (DA) which is to be paid by the employee and the same amount is contributed by the Government also. The contributions and investments are deposited in the non-withdrawal Tier-I account of PRAN. In the default scheme for Tier-I account, the contribution is allocated to three PFMs, viz. SBI Pension Funds Private Limited (SBI), UTI Retirement Solutions Limited (UTI) and LIC Pension Fund Limited (LIC) in a predefined proportion. Each of the PFMs invest the funds in accordance with the prevailing investment guidelines. In Tier-II, the only difference is that the subscriber can select any one of the existing PFMs and the ratio in which his/ her money can be invested in one or more asset class viz. Equity, Corporate Debt and Government Bonds.

Corporate and All Citizen

The NPS Corporate Model allows three variations of contributions, viz. equal contributions by employer and employee, unequal contributions by the employer and employee or the employee contribution from either the employer or the employee. Particulars of the available NPS accounts are given below:

Particulars	Tier-I	Tier-II
Option of selection of the Account	Manda-tory	Optional
Withdrawal Facility	No	Yes
Minimum Contribution at the time of account opening	INR 500	INR 1000
Minimum amount for Subsequent Contribution	INR 500	INR 250
Minimum Contribution Required per year	INR 6000	INR 2000*
Minimum Number of Contribution per year	1	1
Frequency of Contribution Permitted	Unlimited	Unlimited

**Total Corpus of INR 2000 is required at the end of Financial Year*

NPS-Lite (Swavalamban)

In the Union Budget 2010-11, the Government of India introduced a temporary subsidy, the Swavalamban benefit as an incentive to unorganised sector for providing the retirement benefit such that the Govt. of India will contribute INR 1,000 per year to every Swavalamban account, provided that the contribution is between INR 1,000 to INR 12,000 per year.

Atal Pension Yojana (APY)

A new initiative called Atal Pension Yojana (APY) is announced in Union Budget for 2015-16. The APY focussed all citizens in the unorganised sector, who join the National Pension System (NPS) administered by the Pension Fund Regulatory and Development Authority (PFRDA) and who are not members of any statutory social security scheme. Under the APY, the subscribers would receive the fixed pension of INR 1000 – 5000 per month, at the age of 60 years, depending on their contributions, which itself would vary on the age of joining the APY. The minimum age of joining APY is 18 years and maximum age is 40 years. Therefore, minimum period of contribution by the subscriber under APY would be 20 years or more. The benefit of fixed pension would be guaranteed by the Government. The Central Government would also co-contribute 50.00% of the subscriber's contribution or INR 1000 per annum, whichever is lower, to each eligible subscriber account, for a period of 5 years, i.e., from 2015-16 to 2019-20, who join the NPS before 31st December, 2015 and who are not income tax payers. The APY would be launched from 1st June, 2015. The existing subscribers of Swavalamban Scheme would be automatically migrated to APY, unless they opt out. All Points of Presence (Service Providers) and Aggregators under Swavalamban Scheme would enrol subscribers through the architecture of the National Pension System.

Investment Choice & Guidelines

In addition to the option that a subscriber has with reference to choosing their PFMs out of available 8 PFMs (including BSLPM) in order to manage their fund, they are also eligible to choose amongst the two approaches with respect to investment choices in order to invest their money. The two approaches to invest subscriber's money are as follow:

A) **Active choice** - Individual Funds (Asset Class E, Asset Class C, and Asset Class G)

Subscriber will have the option to actively decide as to how his/her NPS pension wealth is to be invested in the following three options:

Asset Class E - Investments in predominantly equity market instruments.

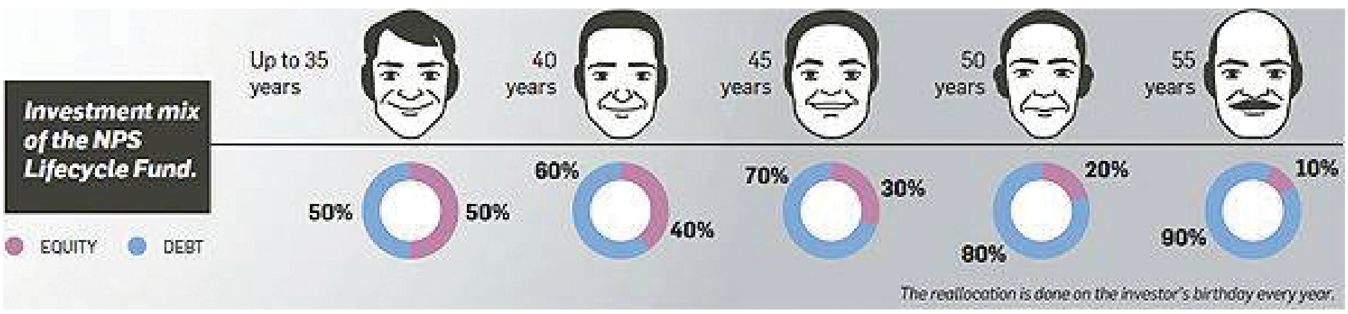
Asset Class C - Investments in fixed income instruments other than Government securities.

Asset Class G - Investments in Government securities.

Subscriber can choose to invest his/her entire pension wealth in C or G asset classes and up to a maximum of 50.00% in equity (Asset class E) or can also distribute his/her pension wealth across E, C and G asset classes, subject to such conditions as may be prescribed by PFRDA.

B) **Auto choice** - Lifecycle Fund

In case subscribers are unable/unwilling to exercise any choice as regards asset allocation, their funds will be invested in accordance with the Auto Choice option. Under this option, if the subscribers age is upto 35 years then, 50.00% of contributions and thereby accumulation will be allocated to asset class, "Equity", 30.00% of contributions and thereby accumulation will be allocated to asset class, "Corporate-Debt" and 20.00% of contributions and thereby accumulation will be allocated to asset class, "Government-Debt". At each birthdate of the subscriber, the Equity allocation will reduce by 2%, Corporate will reduce by 1% and after reducing the contribution to asset classes Equity & Corporate-Debt, a remainder will be allocated to asset class Government at each subsequent years. The allocated proportion to asset classes Equity, Corporate & Government at the age of 55 years and thereafter will remain constant, that is 10%, 10% and 80% respectively as illustrated below.



Asset Allocation under Auto Choice – Lifecycle Fund

**Applicable to Scheme CG, Scheme SG, Corporate CG, NPS-Lite Schemes and Atal Pension Yojana (w.e.f. 10th June 2015). Reference: - Circular, PFRDA/2015/16/PFM/7, dated 03-06-2015.*

Schemes

Government Sector	Private Sector
Central Government (CG)	❖ Scheme E (Tier I & Tier II)
Scheme State Government (SG)	❖ Scheme C (Tier I & Tier II)
	❖ Scheme G (Tier I & Tier II)
	❖ NPS-Lite*
	❖ Corporate-CG Scheme**

**Follows investment rules as applicable in case of Government employees.*

***Corporate CG Scheme has been discontinued for new enrolment w.e.f. 12th February 2013.*

Schemes Returns

The weighted average returns (since inception) of NPS Schemes are tabulated below.

Name of Scheme	Compound Annual Growth Rate (since inception) in %
Central Government (CG) (w.e.f. April 01, 2008)	9.10
State Government (SG) (w.e.f June 25, 2009)	8.59
Equity (E) (w.e.f. May 1, 2009)	9.20
Corporate (C) (w.e.f. May 1, 2009)	10.53
Government (G) (w.e.f. May 1, 2009)	7.93

The above returns are calculated based on scheme NAVs and the securities held under the schemes portfolio are valued on Mark-to-Market (MTM) basis. Source: - PFRDA Annual Report 2013-14

Exit/Withdrawal

(a) Exit from NPS upon attaining the age of Normal Superannuation (for govt. employees only) or upon attaining the age of 60 years (for all subscribers other than govt. employees): At least 40.00% of the accumulated pension wealth of the subscriber needs to be mandatorily utilized for purchase of an annuity providing for the monthly pension of the subscriber and the balance is paid as a lump sum payment to the subscriber.

(b) Exit from NPS before attaining the age of Normal Superannuation (for govt. employees only) or before attaining the age of 60 years (for all subscribers other than govt. employees): At least 80.00% of the accumulated pension wealth of the subscriber needs to be utilized for purchase of an annuity providing for the monthly pension of the subscriber and the balance is paid as a lump sum payment to the subscriber.

(c) Upon Death of a subscriber: The entire accumulated pension wealth 100.00% would be paid to the nominee / legal heir of the subscriber.

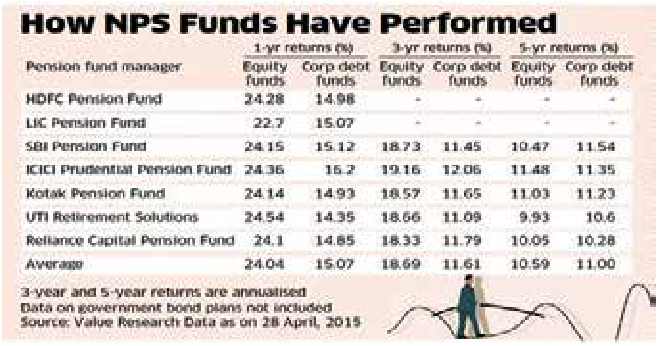
(d) For withdrawals arising out of NPS-Swavalamban accounts under (a) & (b) above, there is an overriding condition on the lump sum payment payable due to which the entire accumulated pension wealth would be annuitised in case if the monthly pension obtained by using the 40.00% / 80.00% of the pension wealth is below INR 1000/- per month.

Annuities and Annuity Providers

The subscriber has to mandatorily buy the annuity as specified in the exit rules of NPS. Annuity Service Providers (ASPs) are IRDA licensed and regulated Life Insurance companies, transacting annuity business in India and who are empanelled by PFRDA. Currently there are 7 types of annuities available with the 7 ASPs, viz. Life Insurance Corporation of India, SBI Life Insurance Co. Limited, ICICI Prudential Life Insurance Co. Limited, HDFC Standard Life Insurance Co. Limited, Bajaj Allianz Life Insurance Co. Limited, Reliance Life Insurance Co. Limited and Star Union Dai-ichi Life Insurance Co. Limited.

Default ASP is Life Insurance Corporation of India and the default annuity scheme is for life with a provision of 100.00% of annuity payable to spouse during his/her life on death of annuitant. Payment of annuity ceases once the annuitant and the spouse die or after death of the annuitant if the spouse deceased before the annuitant, without any return of purchase price.

Performance



How NPS Funds Have Performed

Pension fund manager	1-yr returns (%)		3-yr returns (%)		5-yr returns (%)	
	Equity funds	Corp debt funds	Equity funds	Corp debt funds	Equity funds	Corp debt funds
HDFC Pension Fund	24.28	14.98	-	-	-	-
LIC Pension Fund	22.7	15.07	-	-	-	-
SBI Pension Fund	24.15	15.12	18.73	11.45	10.47	11.54
ICICI Prudential Pension Fund	24.36	16.2	19.16	12.06	11.48	11.35
Kotak Pension Fund	24.14	14.93	18.57	11.65	11.03	11.23
UTI Retirement Solutions	24.54	14.35	18.66	11.09	9.93	10.6
Reliance Capital Pension Fund	24.1	14.85	18.33	11.79	10.05	10.28
Average	24.04	15.07	18.69	11.61	10.59	11.00

3-year and 5-year returns are annualised
Data on government bond plans not included
Source: Value Research Data as on 28 April, 2015

The equity funds of NPS strike an average return of 10.60% in the past five years, corporate debt funds delivered 11.00%. The third NPS category of gilt funds yielded average returns of 9.80% over the same period. The only exception is the ICICI Prudential Pension Fund that's part of the NPS, where the equity fund has consistently done better than the corporate bond and gilt funds.

Historically, it has been proven that equities are able to generate much better returns. Also retirement planning is a very long-term process, which necessitates having a healthy equity exposure. It can be observed that since its inception in May 2009, the equity plans of the NPS have outperformed the other two fund options. The underperformance of equity plans was probably a result of higher stock market volatility during the past five years. Even though corporate bonds will continue to perform well, they may not always beat the equity plans.

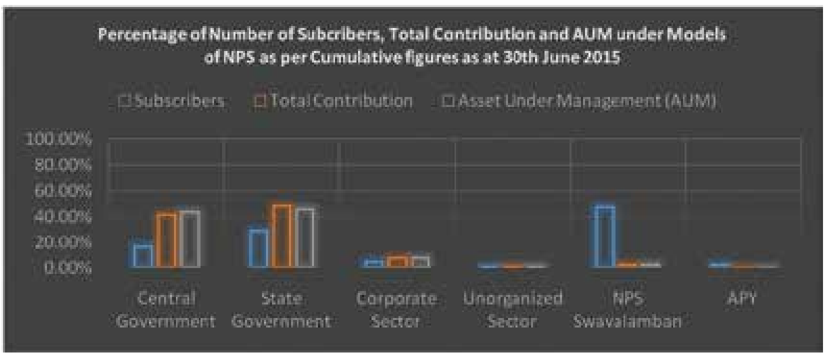
Growth

The summary of Growth in Number of Subscribers, Total Contribution and Asset Under Management when compared with Cumulative NPS Statistics as on 31-03-2014 and 31-03-2015, is provided in the table below.

NPS Model	Growth in Subscribers	Growth in Contribution	Growth in AUM
Central Government	12.6%	36.7%	51.9%
State Government	31.1%	67.1%	80.4%
Corporate Sector	42.3%	95.4%	116.0%
Unorganized Sector	10.2%	43.1%	62.6%
NPS Swavalamban	47.3%	71.5%	91.3%
Total	34.5%	55.1%	68.1%

Central Government includes CABs, State Government includes SABs and the AUM provided for Unorganised Sector include Tier-II also.

NPS-Lite is a different way of distributing the scheme and it has different investment rules targeting people at an economic disadvantage. The highest growth in number of NPS Swavalamban subscribersis observed may be due to Government reliefs to unorganised sector in terms of co-contribution. The next highest growth is observed in the corporate sector which could be mainly due to the available tax benefit to both employer and employee. Since the corporate model exist for the organised sector the reason for observed growth in AUM is due to the facility available for choice of PFMs and Investment options. The above table suggest that NPS is gaining popularity and sooner it may become the most popular pension product in India.



**Central Government includes CABs, State Government includes SABs, The AUM provided for UOS include Tier-II also.* Source: - Available on website of National Pension System Trust

All employees of the Central Government and of Central Government autonomous bodies, with the exception of the armed forces, are now covered by the NPS. Besides, 29 State Governments have also joined NPS in respect of their employees. As on 31.03.2015, over 4.1 million Government employees, from Central and State Governments, have already joined the NPS and the corpus (of their contributions & returns) has crossed INR 73,000 crore.

Net Replacement Ratio (NRR)

It is important for each investor to save enough money during his working life in order to provide for life after retirement depending upon the pattern of spending which could be as follows

- Property loan, are repaid prior to retirement.
- Fall in savings ratio, as people usually save for post-retirement.
- Reduction in travel costs, contributions to pension arrangements and the State scheme.
- More money may be required for leisure activities and healthcare after retirement.

Theoretically, NRR should vary by income with the less well-off needing a higher NRR and the wealthy a lower NRR. Usually the NRR is less than 100.00% since there are fewer expenses to be borne after retirement as explained above.

By definition, "Net Replacement Ratio" (NRR) is,

After-tax income in the year after retirement/After-tax income in the year before retirement

Consider an example where Mr. Common Man, who is hired by a company called ABC Limited, a month ago. Mr. Common Man is thinking to start saving for his retirement by joining NPS on his 35^{th} birthday that falls on the first day of next month and continue contributing at each birthday to Tier-I account until he exit from NPS. The current salary of Mr. Common Man is INR 300,000 per annum, net of all taxes, needs assistance in understanding the net replacement ratio that justifies the continuity between his pre- and post-retirement standards of living, if he chooses to invest with aninitial contribution of INR 6,000 on his 35^{th} birthday and increasing subsequent contribution in line with expected salary growth of 7.00% for all future years. Mr. Common Man is poor at understanding investment and hence has decided to opt for "Auto Choice Investment Option" as available under NPS. Assuming the pension corpus will bereceived on his 60^{th} birthday (i.e. when he will retires from his job), his accumulation at 60^{th} birthday is then determined by further assuming that the returns under equity, corporate debt and government securities that leads to investment earning and the contribution that is payable at the beginning of each subsequent year are restricted in regards to age wise asset allocation as prescribed under Life Cycle Fund. For simplicity, here we will ignore expenses at retirement (if there are any). The additional assumptions towards returns on investment under each scenario, viz. base, optimistic and pessimistic, expected income on retirement and annuity rate for life are mentioned in the below table.

Assumptions	Base - Scenario	Pessimistic - Scenario	Optimistic - Scenario
Age-Exact (in years)	35	35	35
Current Pay (p.a.)	300,000	300,000	300,000
Salary Increase (p.a.)	7.00%	7.00%	7.00%
Initial Contribution	INR 6,000	INR 6,000	INR 6,000
Increase in subsequent contribution (p.a.)	7.00%	7.00%	7.00%
Returns on Equity, Corporate Debt and Government Securities	10.00% p.a., 9.00% p.a. and 8.00% p.a. respectively	00.00% p.a., 7.00% p.a. and 8.00% p.a. respectively	15.00% p.a., 10.00% p.a. and 8.50% p.a. respectively
Annuity Rate at Retirement	10.905466	10.905466	10.905466
Income on Retirement From PF -(A)	5,000,000	5,000,000	5,000,000
Income on Retirement From Gratuity – (B)	1,000,000	1,000,000	1,000,000
Income on Retirement From Other Sources – (C)	1,500,000	1,500,000	1,500,000
Results	**Base - Scenario**	**Pessimistic - Scenario**	**Optimistic - Scenario**
Projected Salary at Retirement	1,628,229.79	1,628,229.79	1,628,229.79
NPS Accumulation at Retirement – (D)	986,588	750,269	1,197,911
Total Available Income to Invest (A+B+C+D)	8,019,581	7,857,441	8,167,184
Annual Income at Retirement in w.r.t.: assumed Annuity Rate	735,372.66	720,505	748,907
NRR	**47.79%**	**46.46%**	**48.98%**

The graph below shows Mr. Common Man's corpus at retirement, assuming different rates of return on Equity, Corporate Debt and Government Debt under base, optimistic and pessimistic scenario respectively and his corresponding Net Replacement Ratio.

It is clearly observed from the graph above that the higher the returns, the higher will be the accumulation and corresponding NRR. As per the Fixed Income Money Market and Derivatives Association of India (FIMMDA), the annualised par yield on Government Securities maturing in 25 years as on 30-06-2015 is 8.33%. Therefore, even if one does not want to take more risk and desires the minimum guaranteed return on his investment, then he can invest 100.00% in Government Securities. This approach of investors will not bring any material changes to the NRR in reference to above stated example and will produce little less accumulation at retirement but NRR will remain closest to the above determined NRR under the base scenario, subject to the fact that the reinvestment risk falls on investor.

Secondly, the annual contribution of INR 6000 is only 2.00% of the current annual salary, for example, if Mr. Common Man increases his saving ratio to 10.00% keeping all other assumptions constant, the corresponding NRR under base, pessimistic and optimistic scenarios will be 70.02%, 63.36% and 75.97% respectively.

The NRR depends largely on the lifestyle we want to maintain once we retire. If one plan to travel and live an expensive lifestyle compared to a simple life at home, you will have to save more. It depend on the timing when an individual is planning to retire, the level of saving of an individual, marital status and number of dependent at retirements, in case, if married, then the level of income of the partner etc. It is commonly believed and quoted that a pension of 50.00% to 75.00% of final salary is required to sustain the same lifestyle enjoyed up to retirement. There is no quantitative research that supports such and one should be careful to suggest a blanket NRR for all investors ignoring their individual needs and circumstances. It is tempting to think that a suitable NRR is 100.00% on the grounds that nobody will want to suffer a reduction in income after retirement.

The limitations of using a Net Replacement Ratio, on its own in order to set a retirement benefit target will only consider the income one year before retirement and thus can be distorted by variable pay, change in working patterns resulting in different remuneration just before retirement such as commission or overtime. Further NRR does not reflect any future appreciation/ depreciation of the post retirement income such as indexation relative to inflation and it also does not consider any allowance for survivor benefits attached to the post retirement income. Most important, NRR does not actually consider the change in expenses in the crude formula.

Advantages of NPS

- NPS is a well regulated, transparent, highly innovative and sophisticated product. It is based on the world's best practices in the pension sector involving disciplined saving, vigilant investment and its judicious draw down on retirement.
- NPS charges just 0.25% as fund management fee making it one of the cheapest pension products in the world. Mutual funds can charge up to 2.25% and life insurers can charge up to 1.35%.

- Private sector NPS subscribers have the choice of 8 fund managers and they are allowed to switch from one to another giving them the option of choosing the best fund manager. NPS subscribers are given the freedom to decide their asset allocation depending on the risk they can bear.
- The market linked returns are actually an uncertainty. But the subscribers also have the choice of investing 100.00% funds in Government securities wherein returns are more or less assured and may not be real.
- The availability of Auto choice or Life Cycle Fund comes as a big positive for those who do not want the asset allocation decision headache.
- It is a win-win situation as the employer and the employees both avail tax benefit from the NPS and this can be done by merely restructuring the Cost to Company without incurring additional cost.
- The addition of Tier-II account in December 2009 was a welcome move as it allowed unrestricted withdrawal.

Disadvantages of NPS

- NPS has both, rigidity issues when it comes to premature withdrawal from Tier-I account and liquidity issues due to applicable limit on lump sum withdrawal amount and mandatory annuitisation.
- The exposure to equity investment is restricted at 50.00%. People in the young age group who can take higher risks may see this as a disadvantage, as they might be losing an opportunity because equity investments can give good returns. Also, equity investment is restricted to index funds which replicate the BSE SENSEX or NSE NIFTY which means losing out on opportunities to get good returns from other stocks.
- As per prevailing Income Tax Rules, the funds will be taxed on lump sum withdrawal and on annuity returns.
- The returns are market linked and there is no guarantee of getting good returns.
- The levels of pension increases from DC provision such as flat, fixed, index-linked, etc., usually depend on the benefits from any annuity the member chooses to buy at retirement. The higher the expected pension increases, the lower the initial pension amount purchased from a given DC fund.
- Due to lack of understanding of the risks involved and how the pensions may differ now and in the future, may lead members to give up inflation protection, which may be valuable, particularly if actual inflation turns out to be significantly higher than expected and dependants are also likely to be affected by this.
- There are risks for a pension scheme investing in cash or short-term Government debt. These assets may be a poor match for the liabilities.

To conclude, NPS has the two main features that a pension scheme should have – one, it instils disciplined retirement planning by putting restriction on withdrawal during the accumulation phase and two, it leads to cautious withdrawal in the post-retirement phase, investing in an annuity plan being an effective way to do so. 50.00% restriction on equity exposure appears to be a fair when compared to traditional retirement schemes such as EPF (Employee Provident Fund) and PPF (Public Provident Fund), which do not allow equity investments at all. If NPS is brought in the EEE tax regime, making withdrawal as well as annuity tax free, it could become a very good pension product.

Pension Policy in India has traditionally been based on the employment contracts/ service conditions and financed through employer and employee participation. As a result, the coverage has been restricted to the organized sector and a vast majority of the workforce in the unorganized sector has remained outside the formal channels of old age financial support. As per the recent census, around 2.96 crore people are employed in organized sectors, which is around 8 per cent of the main workforce of the country. The remaining working population is engaged in the unorganised sector and majority have no access to any formal system of old age economic security.

In terms of assets under management, EPFO funds hold two-thirds of the share and private pensions and annuities one-third. Although NPS is still very small, it is gathering acceptance due to higher returns under the NPS schemes compared to all other options. The recent budget announcements relating to provision of choice to employees between PF and NPS, singular Income Tax rebate up to INR 50,000 to NPS in addition to rebate available to other investments and general awareness will hopefully swing the preference to NPS schemes.

The National Pension System (NPS) launched by Government of India and supervised by the Pension Fund Regulatory & Development Authority (PFRDA) has evolved out of this very need to provide old age security to the vast multitude of Indian population, without unduly straining the fiscal fabric of the Government and simultaneously enabling long term investment funds for the development of economy.

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ASSESSING TERRORISM RISK – AN ACTUARIAL APPROACH AND FRAME-WORK FOR A P&C CARRIER

Introduction

terrorism is usually defined as the systematic use or threatened use of violence to intimidate a population or government and thereby effect political, religious, or ideological change. In simple words, a **THREAT** to humanity and peace. Though, terrorism is as old as human civilization but, in recent time these activities are getting more frequent, powerful and technologically advanced.

Since the September 11, 2001 terrorist attack, the insurance industry is active chalking out an analytical approach to quantify terrorism risk. Catastrophe risk modelling software vendors released their first terrorism model in 2002. Since then the methodology has improved and validated by world-wide experience, resulting in a fairly standard practice.

In this article, we attempt to cover some of the components of the terrorism modelling framework- what exposure should be modelled for terrorism, what kinds of hazard apply to terrorism risk modelling, what attributes impact vulnerability, and finally, how probabilistic losses are generated.

Approaches for Managing Terrorism Risk

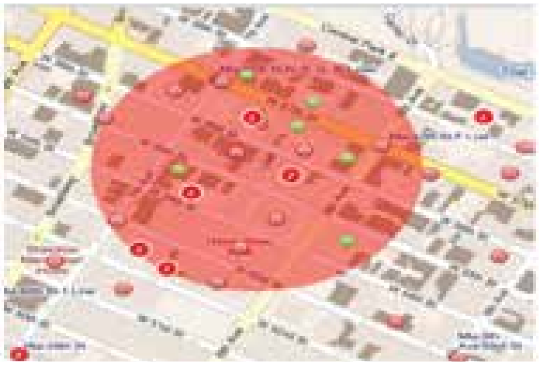
Terrorism risk is usually modelled as natural catastrophe perils which focuses heavily on probabilistic output. But, the dynamic nature of this risk suggests that a more holistic approach comprising – (1) Exposure management, (2) Scenario loss modelling and (3) Probabilistic loss modelling may work better and produce more comprehensive results. This three pronged approach, elaborated in following paragraphs, allows analyzing terrorism risk from multiple angles.

A1. Exposure Management

The first step in managing terrorism risk is exposure management, which is a means to identify, monitor and manage multi-line exposure concentrations that exceed company's risk tolerance. This approach considers 100% exposed risk, usually within a defined radius or geographic boundary. Eventually, this allows the insurer to better monitor capacity by not only flagging areas that are over exposed to terrorism risk, but also by identifying areas where the company can write more business. Drilling down into the accumulation zones allows identification of locations and policies that contribute to loss to maintain acceptable levels of risk.

Steps of Exposure management can be summarised as:

1. Identify and evaluate high-risk terrorist targets using past events, literatures and mouth piece communications of terror organisation or Industry target database. Although low by terrorism index standards, most probable targets in the Western World are tier I and II cities of USA, London, Dublin, Paris, Copenhagen, Brussels, Frankfurt, Munich, Berlin, Madrid, Milan, Rome, Athens, Ankara, Istanbul, Manila, Hong Kong, Tokyo, Singapore, Montreal, Toronto, Sydney, Brisbane, Canberra, Zurich, Geneva. In India, Imphal, Sri Nagar, Chennai, Bangalore, Pune, Hyderabad, Mumbai, Delhi, Nagpur, Kolkata has been studied as risk prone cities (in order).
2. Identify hotspots anywhere in a portfolio using the 'Spider' optimization algorithm. The spider algorithm allows crawling through the portfolio and finding the centroid



of the areas with the greatest amount exposed. Software is available in the market allowing you to achieve this.

However, that concentration may not be in a high risk area. To make sure exposure is being monitored in areas that are most likely to be attacked, one needs to also aggregate exposures around specific targets. Targets are buildings and city centers that are attractive to terrorists due to their symbolic value and their potential for large economic and human loss should an attack happen there. Target types include skyscrapers, commercial landmark buildings, hotels and embassies.

3. Identify Building level accumulations (i.e. exposure in a single building) utilizing available database and universally available information - Common issue, particularly in urban

areas, is that multiple addresses are associated with a single building with very large footprint. For example, The Empire State Building had its primary address as 350 5th Ave but, addresses on W 33rd St. and West 34th Street were also attached to it. Analyst should recognize multiple addresses that belong to one building and identify them with one specific building ID while performing a building level accumulation.

4. Identify and monitor accumulation in and around user-defined locations worldwide using a specific length radius (range in which most damage occurs for conventional attacks) and can be performed for a 100% exposed risk or a customized PML (Probable Maximum Loss) zone. Some of the software have 'Accumulation functionality' available for all geographies.

   Usually 500 meter radius is recommended for the spider analysis and to evaluate accumulations around potential terrorist targets. This is because the majority of damage and human injury from conventional attacks has been confined to the first half kilo meter of the detonation point and conventional attacks, such as bombs, are currently the most likely attack mode. These analytics can be performed using 100% exposed risk or by defining your own PML zones within that circle.

A2. Scenario Terrorism Loss Model

A deterministic approach can be used to quantify loss due to a range of different attack scenarios. Various Cat Risk software are capable of modelling approx 2 dozen attack modes ranging from conventional and CBRN (Chemical, Biological, Radiological, and Nuclear) attacks. Scenario modelling provides a more realistic range of loss compared to pure exposure management because it takes into account the amount exposed as well as the vulnerability of the locations impacted by the attack.

Once the areas of exposure concentration are identified, the next step is to analyze loss scenarios on a deterministic basis.

The terrorism scenario model quantifies potential loss due to probable terrorist attack scenarios and multiple attack modes. The model lays down an attack footprint on any geographic location to quantify losses to a portfolio. Consequently, (1) Locations which may cause the greatest amount of loss to a portfolio are identified, as well as (2) Losses to a portfolio given an attack occur at a high-risk terrorist target are quantified. Additionally, user defined locations can be used as target centroids.

Besides identifying the attack scenarios that pose the largest threat to a portfolio, a benchmark scenario is selected in order to analyse and manage losses to an acceptable loss threshold. Conventional major attacks (e.g. such as a 2-ton or 5-ton truck bomb) relatively more likely to happen and capable of causing significant loss, is usually modelled.

Scenario loss modelling is also being used by regulatory bodies and credit rating agencies, who focuses more on the 5-ton bomb scenario as part of its evaluation for the rating of P&C insurers. Lloyds of London has also started including terrorism scenarios as part of its Realistic Disaster Scenario.

A3. Probabilistic Terrorism Model

While these first 2 steps/methods can help insurer its absolute exposure to terrorism risk, considering the relative likelihood of different attack scenarios, the likelihood that an event will be made up of multiple attacks, and the frequency of events will allow them to identify the most critical attack scenarios for your portfolio and evaluate the full portfolio loss distribution.

High-resolution terrorism risk maps are used to provide insight into risk selection in major cities.

Deterministic modelling entails some

level of probabilistic risk assessment. Analysts need to determine which attack modes to analyze, which cities to focus on, and what targets are of greatest concern.

Commercially available probabilistic model incorporates these components using a comprehensive event set along with the relative likelihood of attack scenarios, the potential for swarm attacks, and event frequency. The results can provide insights into risk relativities:

- Major drivers of loss by account, location, target type, city, and line of business
- Quantify the risk of fire losses following terrorist attacks for policies without terrorism coverage

Terrorism risk is often more variable than market pricing. Large variation in risk even within a relatively small geographic area is a possibility. The probabilistic models can help underwriters to:

- Select the best risks for their portfolio by providing an understanding of the relative risk between different locations, which also helps inform decisions on accepting market prices.
- To diversity portfolio risk one can use varying loss thresholds by city or varying capacity allocation by city
- Evaluate different policy and treaty layers as well as model TRIPRA (Terrorism Risk Insurance Program Reauthorization Act) recoverable for a portfolio.
- Consider alternative risk transfer methods options such as terrorism pools and risk swaps.

Framework for Terrorism Modeling

Most of the terrorism models are based on concepts from natural catastrophe models. Estimation of sum at risk (i.e. to quantify loss related to potential terrorist attacks

-both on a deterministic and probabilistic loss basis) consist four components:

B1. Identification of / Understanding the exposure at risk

B2. Assess hazard associated with potential attack modes

B3. Quantify the vulnerability of building structures and human exposure

B4. Determine the probabilistic components and thus generate the Exceedance Probability curve

B1. Understanding Exposure to Terrorism Risk

Knowledge of following three items holds the key in determining exposure at risk to terrorist attack:

1. Sum Insured
2. Location of insured assets and/or individuals
3. Vulnerability of the insured assets and/ or individuals

Consider:

i. Whether the policy covers for terrorism?

- first step in deciding what exposures should be modelled
- determines if a policy should be included in the analysis
- In the USA, TRIPRA requires insurance companies to provide terrorism coverage to its policyholders. While, the inured can then accept or decline except workers compensation where it's compulsory.
- In few other countries such as France or Belgium, all standard policies include terrorism coverage
- If a policy isn't covered for terrorism, possibly standard fire cover may still apply, thus companies may still need to pay out for damages from fires that result from that bomb attack

ii. Whether any exclusion applies?

- Many commercial policies don't cover attacks that have a chemical, biological, radiological or nuclear component to it.
- However, workers compensation and life policies typically cover all causes of injury or death

iii. Whether correct locations are identified?

- These events are geographically focused. Thus, resolution of address data becomes extremely important for the accuracy of the result.
- Majority of damage from the likely attack modes is typically confined to a few hundred meters.
- Sensitivity of distance to attack centroid could lead to less accurate results if data is modelled at a postal code centroid

iv. Vulnerability to the insured assets (mainly a function of building construction and height)

v. Other crucial information

B2. Hazard Model

Hazard, represented by a numerical value indicating the severity, is a way of quantifying the physical characteristics of a terrorist attack. It varies geographically - greater at the centroid of attack than the distances further away. The amount of hazard at a location partly determines how much damage may occur.

The hazard associated with different attack modes use different hazard values & hazard scales and is often a well-defined, intuitive value linked to say, blast pressure or amount of particulate contaminant (in the case of bombs and toxic releases). But it can also be less intuitive or generic, such as distance to the centre of an attack.

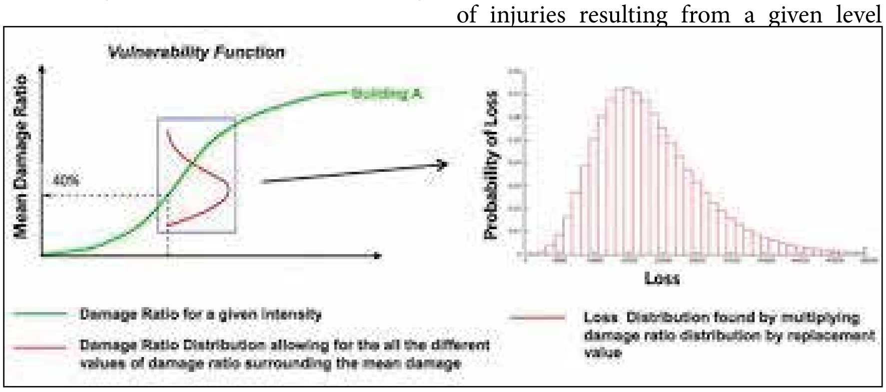
The hazard value associated with each attack consists of one or more loss agents. Depending on the attack mode being modelled, a specific agent is included e.g. if hazard associated with a bomb blast (which is pressure waves) is considered, 'blast pressure waves' will cause structural damage, which may in turn cause fire, debris, water damage, and other damages to both property and people (including business interruption depending on time required for clean-up and crime scene investigations).

Besides loss agents, the target environment also plays a crucial role in quantifying the level of hazard. For example, if a chemical material is released in an enclosed area with a poor ventilation system, the level of hazard will be greater than if the material was released outside. Similarly, pressure waves from a bomb detonated in a dense, urban area will travel differently and produce hazard levels different from a bomb detonated in an open area. In the open urban environment, the pressure waves are able to travel freely and not impacted by the shielding effects of buildings. In the dense urban environment, pressure waves are both absorbed and bounced off buildings.

The magnitude, or size, also impacts the level of hazard associated with a particular attack mode. Needless to say, the bigger the bomb is, the more hazard will be produced at the centroid of attack.

B3. Vulnerability Model Framework

Vulnerability functions or primary damage curves represents the vulnerability of a structure and the nature of injuries resulting from a given level of hazard. Mean damage ratio (MDR) gives an estimate of resulting damage to a property given a level of hazard and is defined as the ratio of the cost to repair a building, its contents or loss of use associated with the damage to its total insured value or replacement cost. Similarly, the nature of injuries resulting from a given level



of hazard is expressed through the Mean casualty rate (MCR) and is defined as the ratio of the number of people injured in various injury categories to the number of people exposed to the attack.

Vulnerability to terrorist attacks is mainly a function of building construction and building height. There are multiple combinations of construction classification and building height represented in the primary damage curves. Each classification has a primary damage curve to calculate damage to building, contents, and business interruption (or loss of use) as well as injury rates for the six injury levels. For the aid of analysts, country specific vulnerability are available in the Probabilistic Terrorism Model of commercially available software.

B4. Probabilistic Model Framework

Usual probabilistic model framework consists of four main components.

1. Stochastic attack set developed based on quantitative input (including historical attack data) as well as qualitative input (including expert knowledge) is defined to determine the most probable attack modes and targets from various terrorist threat groups.
2. For each attack in the stochastic attack set, the relative attack likelihood or the conditional probability of each attack is determined. Conditional probabilities (likelihood of the attack given that an attack occurs) are derived from concepts based on game theory as well as input from experts on attack and targeting patterns of terrorist groups.
3. Next, the likelihood of having multiple attacks making up a single event (or a swarm event) is determined. Attack multiplicity distributions are derived based on input from experts on terrorist groups' ability to coordinate multiple attacks for a particular weapon type.
4. Last, a terrorism event frequency distribution is modelled. Poisson distribution to model event frequency is common. Other approach considers the likelihood of attempted attacks, success rates, as well as a Suppression factor given heightened security after an event occurs.

Conclusions

- Quantifying terrorism risk is a strenuous task. Global collaboration to restrict or eliminate terrorism from civil society is being worked upon. Still, this is to remain for long and so will be the challenges in quantifying the risk.
- Terrorist orgnaization's network architecture impacts the frequency and severity of attacks significantly. Increasing pressure from counter-terrorist forces may force terrorist organizations to form swarm clusters. Besides, technology (e.g. use of internet for communication, formed virtual cells) is making the detection difficult. In general, nature of emerging networks indicates more frequent execution but, less ambitious and less damaging planned attacks.
- Given the dynamic nature of terrorism risk, threat level may change over the years. Therefore, alternative 'Risk Outlooks' needs to be considered allowing analysts to incorporate potential increased/decreased threat levels.
- An event-tree may be constructed to estimate the probability that a planned attack will succeed, depending on the availability and usage of intelligence; the effectiveness of security barriers; and technical and logistical mishaps.
- The loss severity distribution may be derived by mapping losses from realistic terrorism scenarios, and assigning a cost function to each. The cost function reflects practical logistical factors such as planning time, technical difficulty, and consumption of scarce resources.
- While computing terrorism loss exceedance curve, inclusion of subjective input probabilities based on formal expert judgement, is already in practice by government security agencies in advanced countries.
- Even if these loss curves themselves are uncertain, general guidance on the steepness and scale of these loss curves, and their sensitivity to model assumptions, would be welcome technical support for insurers in setting PML's and in pricing terrorism cover.
- As with any risk analysis, derivation of probabilistic loss exceedance curves for terrorism just an aid to make better decisions under uncertainty, not an end product.
- Although none of the major Western economies fall within the high or 'extreme risk' bracket at this point in time, even small incursions can have long-term effects on a complex economic and physical infrastructure. As political circumstances can change quickly, it is a reality of our current world situation that the risks of terrorism will need to be calculated and continuously recalculated for the foreseeable future.

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REMEMBERING KALAM SAHEB
HIS RELEVANCE TO THE ACTUARIAL SCIENCE

I was always fascinated by the person called AvulPakirJainulabdeen Abdul Kalam (Popularly known as APJ Abdul Kalam)- an Engineer, Scientist, Writer, 11th Peoples' President,Friend and Philosopher, and above all a Teacher till his death on 27-July-2015 at the age of 83 at Shillong. This fascination grew when I read his book 'Wings of Fire', experienced and experiencing year after year his vision 2020 and his visit to my daughter's school at BharatiyaVidyaBhavan's Public School, Jubilee Hills, Hyderabad in the year 2002 in capacity of then President of Republic of India.

It is hard to say – Rest in peace
Kalam Saheb.
I saw him always in peace!!

I looked back to the previous editions of theActuary India magazine published in year 2015. The following are the citations referring Kalam Saheb;

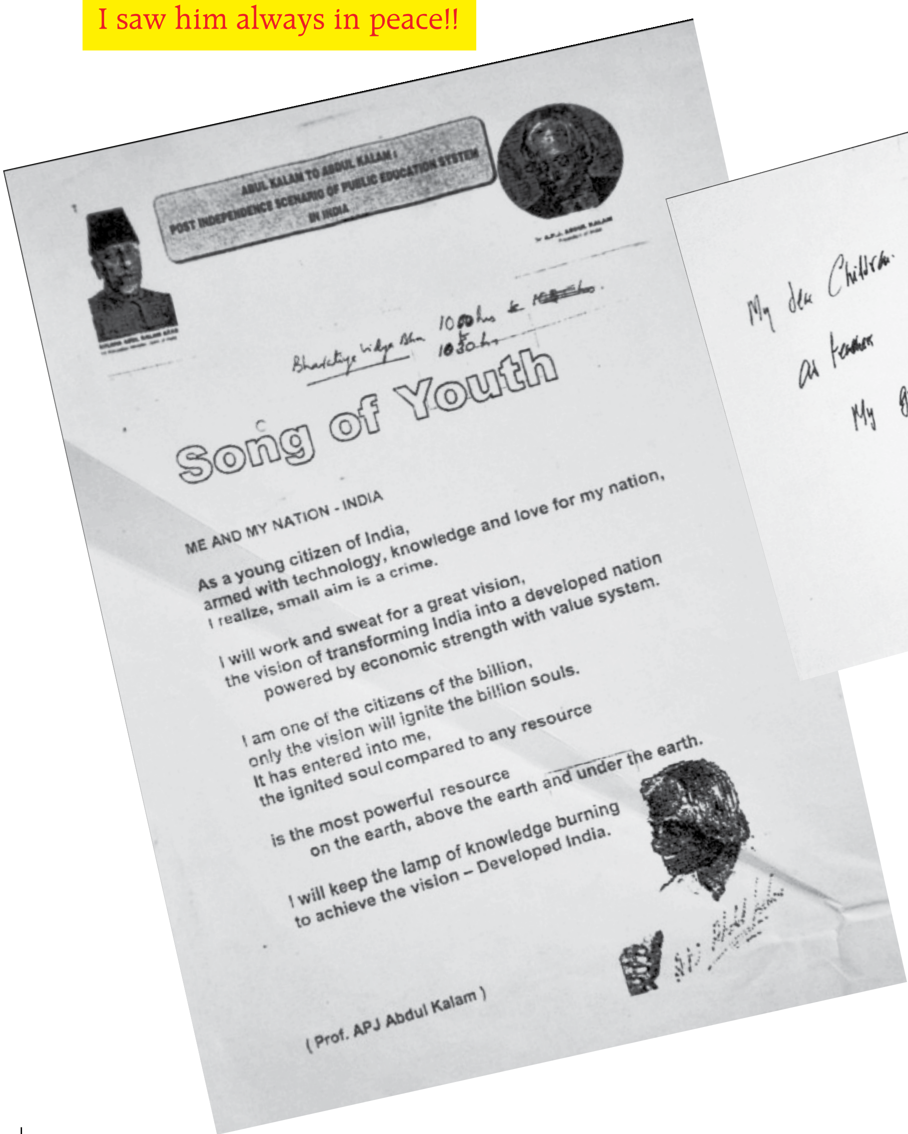
Issue of the actuary India	Citations
March, 2015	Confidence and hard work is the best medicine to kill the disease called Failure. It will make you successful person.
May, 2015	Man needs his difficulties because they are necessary to enjoy success.
June, 2015	We should not give up and we should not allow the problem to defeat us.

How aptly these fit to the actuarial students. Working hard, studying hard, at times failure (FA!!!), enjoying success ultimately.

Dream is not that which you see while sleepingit is some-thing that does not let you sleep. These words spurred a young boy of 10- ShubhamJaglan to win Junior world golf championship and are source of inspiration to many citizen.

At times I relate his vision 2020 to the work of Actuaries. Actuaries are also involved projecting future in their work.

The blessings and the handout given to the students during then President visit and treasured by my daughter Garima, then student of VIII standard:



ABDUL KALAM TO ABDUL KALAM : POST INDEPENDENCE SCENARIO OF PUBLIC EDUCATION SYSTEM IN INDIA

Song of Youth

ME AND MY NATION - INDIA

As a young citizen of India,
armed with technology, knowledge and love for my nation,
I realize, small aim is a crime.

I will work and sweat for a great vision,
the vision of transforming India into a developed nation
powered by economic strength with value system.

I am one of the citizens of the billion,
only the vision will ignite the billion souls.
It has entered into me,
the ignited soul compared to any resource
is the most powerful resource
on the earth, above the earth and under the earth.

I will keep the lamp of knowledge burning
to achieve the vision – Developed India.

(Prof. APJ Abdul Kalam)

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The Actuary India – Editorial Policy

Version 2.00/23rd Jan 2011

A: The Actuary India – Editorial Policy Version 2.00/23rd Jan 2011 A: "The Actuary India" published monthly as a magazine since October, 2002, aims to be a forum for members of the Institute of Actuaries of India (the Institute) for;

a. Disseminating information,

b. Communicating developments affecting the Institute members in particular and the actuarial profession in general,

c. Articulating issues of contemporary concern to the members of the profession.

d. Cementing and developing relationships across membership by promoting discussion and dialogue on professional issues.

e. Discussing and debating issues particularly of public interest, which could be served by the actuarial profession,

f. Student members of the profession to share their views on matters of professional interest by way of articles and write-ups.

B: The Institute recognizes the fact that;

a. there is a growing emphasis on the globalization of the actuarial profession;

b. there is an imminent need to position the profession in a business context which transcends the traditional and specific actuarial applications.

c. The Institute members increasingly will work across the globe and in global context.

C: Given this background the Institute strongly encourages contributions from the following groups of professionals:

a. Members of other international actuarial associations across the globe

b. Regulators and government officials

c. Professionals from allied professions such as banking and other financial services

d. Academia

e. Professionals from other disciplines whose views are of interest to the actuarial profession

f. Business leaders in financial services.

D: The magazine also seeks to keep members updated on the activities of the Institute including events on the various practice areas and the various professional development programs on the anvil.

E: The Institute while encouraging stakeholders as in section C to contribute to the Magazine, it makes it clear that responsibility for authenticity of the content or opinions expressed in any material published in the Magazine is solely of its author and the Institute, any of its editors, the staff working on it or "the Actuary India" is in no way holds responsibility there for. In respect of the advertisements, the advertisers are solely responsible for contents of such advertisements and implications of the same.

F: Finally and most importantly the Institute strongly believes that the magazine must play its part in motivating students to grow fast as actuaries of tomorrow to be capable of serving the financial services within ever demanding customer expectations. Version history:

Ver. 1.00/31st Jan. 2004 Ver. 2.00/23rd Jan. 2011

Visit us at: www.actuariesindia.org

THE ACTUARY INDIA WISHES
MANY MORE YEARS OF
HEALTHY LIFE TO
THE FELLOW MEMBERS
WHOSE BIRTHDAY
FALL IN
AUGUST 2015

Mr. Badri Prasad Gupta
Mr. D C Chakraborty
Mr. N H Thanawala
Mr. O Lakshminarayana
Ms. N Seethakumari
Mr. Derwyn Emrys Thomas

[Birthday greetings are made to veteran actuaries who are 60 and over.]

ACET JUNE 2015

Congratulations

Ms. Kanishka Sarda
kanishkasarda97@gmail.com

What were the basic mantras of your success?

The basic mantra of my success was concentration and thorough practise.

Tell us about yourself, your educational background and your hobbies.

I am born and brought up in Mumbai. I have just completed my 12th board exams and I am doing B.Com from Narsee Monjee College. My hobbies include baking and reading.

When did you decided to take up Actuarial professional course?

I came across this course when I was in my 9th grade, it seemed interesting and different but that time I wasn't firm on pursuing it. I decided to take this course up in my 11th grade.

How did you come to know about the ACET?

I had researched about this course and there I came to know about the Indian Institute's Entrance Test, ACET.

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

One needs minimum 2 months time for serious preparations for ACET. There are many minute things that you come across and you need time to retain it.

How did you start preparation for the ACET?

I went through the notes provided and started solving various questions and I also visited the online virtual classroom made available by the Institute.

Which is the most difficult part of this examination and why? What was your strategy to tackle this difficult part?

The most difficult part of the examination was the vast portion, I divided the portion into smaller units and completed it in the available time.

Did you prepare notes? How helpful are the notes? What is your advice on notes-making?

Yes, I did prepare notes. While studying, I jotted down all the points which I felt were important, for later reference. These notes were really very helpful to me for last minute revision when I didn't have the time to go through the course notes.

How do you visualize your success?

As I have just entered in this field, this success gives me inspiration to work harder for my future exams.

What were your strong points which enabled you to achieve success in ACET?

I feel my strong point which enabled me to achieve this success was thorough practice. My basic concepts were clear that helped me succeed.

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

As I have just entered my degree college, I feel that I am too young to add any value to the profession at present.

Are you working somewhere? Describe a typical work week?

No, I am a student

What are you passionate about?

I am passionate about achieving success in this course.

Behind one topper are many people who stood by him/her during those uncertain times when he/she was merely an 'aspirant'. Who were those people in your case? Any specific incidence that you would like to share with us?

I had the full support of my grandparents, parents and teachers during my preparation for the exam, they helped me shine through this.

What are some of the mistakes that an average aspirant can avoid for better time management? What is your message for them?

Do not panic. During the exam, when you see the timer ticking, it is very natural for you to panic. Instead, relax for a second, if you don't get an answer don't stick to the same question, move to the next and come back to it later. That's what I did, I wasn't getting some questions so I moved ahead, and when I returned, I found the answers to them easily.

Any comments on your experience with ACET process.

The process was smooth and friendly. I did not find any difficulty at any level.

PEOPLE'S MOVE

Mr. Balachandra Joshi

btjoshi@outlook.com

Mr Balachandra Joshi, FIAI, has joined Head of Actuarial Services - Life & Health with Swiss Re Shared Services India Ltd. In this new role he will be setting up a center of excellence for Swiss Re global operations in the area of experience analysis, reporting and model development. Formerly an Associate Director and Actuary with PNB MetLife India Insurance Co. Ltd. Mr Balachandra Joshi has overall 11 years' industry experience in the area of life insurance business planning, embedded value reporting, valuation (Stat/US GAAP), and other Corporate Actuarial roles as well as product pricing. Prior to joining PNB MetLife he worked with Central Government of India in the Customs & Central Excise Department for 9 years. He will be based in the Bangalore office.

ACET JUNE 2015

Mr. Narendra Bisht
narendra.mba.iitroorkee@gmail.com

What were the basic mantras of your success?

The basic mantras for my success are studying at regular basis, completion and revision of study material provided by IAI well before the examinations, making notes for the reference, solving the study material completely and repeatedly. Technology also helped me a lot, where much of my studies were done with the help of mobile PDF reader during my travel and leisure time.

Tell us about yourself, your educational background and your hobbies

I did my B.Tech in Electrical engineering from G.B.Pant Engineering College, Pauri Garhwal (a Government Engineering college of Uttarakhand) In 2010, followed by MBA from DoMS, IIT Roorkee in "Finance & Operations" (dual specialization) in 2013. I have a keen interest in Finance, Statistics & Mathematics. My hobbies include: watching movies, playing Badminton & chess, solving puzzles and mind games.

When did you decide to take up Actuarial professional course?

I took this decision in October, 2014

How did you come to know about the ACET?

Last year in the month of October, while I was pursuing Business Analyst Course (using SAS) from IISASTR Institute in New Delhi, one of my batch mates "Atul" told me about Actuarial profession. He opined that it would be the best career option for me as it would complement my interest in Finance, Statistics & Mathematics.

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

It largely depends on the educational background & level of interest. It also depends on the time one can devote per day. In my case, interest in Finance, Statistics & Mathematics was of great help. In my opinion nearly 150 hours are sufficient. It can be done in 50 days with 3 hours a day & so on provided, one study on a regular basis. I prepared for 25 days with nearly 5-7 hours a day.

How did you start preparation for the ACET?

I started my studies with FAC pack & STAT pack alternatively, along with solving problems. I emphasized more on understanding the subject matter well. After completion, I regularly revised it for better understanding of concepts. Finally, in last 3 days before examination, I only practiced solving problems. Study material provided by IAI is well structured and is sufficient for ACET.

Which is the most difficult part of this examination and why? What was your strategy to tackle this difficult part?

ACET study material was excellent and explained concepts clearly. So, I have not found any part difficult in the exam.

Did you prepare notes? How helpful are the notes? What is your advice on notes-making?

Yes, I prepared notes and according to me it is very useful to have notes in one's own style. For example, preparation of a table containing all the important formula & summary of chapter in my words proved to be very helpful in quick reference and revision for me. I am preparing notes for my upcoming CT exams too. My advice is one should definitely make notes as the best way to understand a concept is to write it in your own words & style. It is a faster way to revise course in a very short duration.

How do you visualize your success?

ACET is gateway to the Actuarial profession and being through in this examination is my first step into Actuarial profession. Being a topper is a morale booster and gives me utmost confidence to aim further for bigger goals. I will work hard for next actuarial exams & will try to clear all the exams in minimum possible time.

What were your strong points which enabled you to achieve success in ACET?

I think regular studies, time management & my special interest in this area were my strong points.

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

I have a keen interest in Mathematics, Statistics and Finance and I am quite comfortable with analytical tools like SAS & SPSS. By creating a consortium of my interest and analytical capabilities I want to contribute to the area of financial derivatives for which risk management has become an integral part. Further with my skills of Analytics & ability to practically implement the concepts which I have and will learn in my journey for this field.

Are you working somewhere? Describe a typical work week?

Yes, currently I am working as Assistant Professor in Graphic Era Hill University, Dehradun. I teach subjects of Finance with Quantitative aptitude & Logical reasoning. Also, I have been working as an external reviewer with the renowned Wiley publication and entrusted to review the books or specific topics of the books pertaining quantitative aptitude & logical reasoning. My 1st book in Logical reasoning for competitive exams will be published in next 2 months. Further, I also provide solutions to exam practice papers on quantitative aptitude & logical reasoning well-known publications.

? What are you passionate about?

I am passionate about numbers & Intensive calculations.

? Behind one topper are many people who stood by him/her during those uncertain times when he/she was merely an 'aspirant'. Who were those people in your case? Any specific incidence that you would like to share with us?

My parents, sister & brother were my real strength who always supported me and stood by me. My colleagues at GEHU always motivated me to excel in this exam & they made sure I get enough time for my preparation. I am thankful to my friends & well-wishers for boosting my confidence just when I was feeling low before exam. Thanks to "Atul" who introduced the area of Actuarial science to me. Very special thanks to the team who prepared the study material for explaining the subject matter so well. Lastly, I would like to thank almighty for bestowing me this success as with all the efforts, one can only be sure of passing an exam but, to become a topper one surely needs blessings from the almighty.

? What are some of the mistakes that an average aspirant can avoid for better time management? What is your message for them?

I have realized that most of the aspirants either neglect conceptual understanding or practicing problem solving & focus on one aspect only, which can create problem. One must give equal importance and accordingly ample time & efforts to both concept building and problem solving.

? Any comments on your experience with ACET process.

I appreciate IAI for the present ACET system. Study material is excellent & self-sufficient to cover the entire course. Though, I didn't use the tutorial support but I trust that too could be of great help to the aspirants.

Announcement

18th GLOBAL CONFERENCE OF ACTUARIES

INSTITUTE OF ACTUARIES OF INDIA INVITES EXPRESSION OF INTEREST

Institute of Actuaries of India invites **EXPRESSION OF INTEREST** to present papers in **18TH GLOBAL CONFERENCE OF ACTUARIES** to be held on **1ST & 2ND FEBRUARY, 2016.** The same will be peer reviewed according to relevance to the conference, originality of the work, specific results described, and potential impact. The Last date to submit Expression of Interest is **31ST AUGUST, 2015**. **Late submissions will not be considered and hence you are requested to kindly stick to the deadline**.

Topic Categories Life Insurance, General Insurance, Pensions & Social Security, Health Insurance, Enterprise Risk Management, Microinsurance etc. The topic chosen should be aligned to the fields of insurance, retirement benefits, finance, financial economics, investments and other similar fields of interest to Actuaries.

EXPRESSION OF INTEREST GUIDELINES:

- EOI must be submitted in English, via the **Online Submission System** (http://actuariesindia.org/gca/homepage.htm) only. E-mail submission will NOT be accepted.
- It should not exceed 200 words (2000 characters).
- Only Active members of IAI are expected to participate though non-members can join as Joint speakers
- EOI will be selected based on their merit, quality & novelty of data presented.

IMPORTANT DATES:

- **Last date to submit EOI : 31st August, 2015**
- **Notification of Acceptance/ Rejection: 20th September, 2015**
- **Full paper Submission: 31st October, 2015**
- **PPT submission for presentation: 30th November, 2015**

We look forward to your support in making the 18th GCA a grand success.
Should you have any query, please get in touch with binita@actuariesindia.org

ACET JUNE 2015

Congratulations

Ms. Ashvni Narayanan
ashvni.n@gmail.com

What were the basic mantras of your success?

I don't have any mantra. One can't work if they focus on success. Success is much sweeter if its unexpected, and real satisfaction is attained by knowing that you have put in not only your best, but better than your best.

Tell us about yourself, your educational background and your hobbies

I'm currently pursuing my second year of graduation (BMath) at the Indian Statistical Institute, Bangalore. I was born and brought up in Mumbai. My hobbies are reading, dancing, listening to music and maths.

When did you decided to take up Actuarial professional course?

I decided to take it up in the vacation preceding my second year.

How did you come to know about the ACET?

My father told me about it. It seemed like a good opportunity to explore an exciting application of mathematics. Moreover, actuaries cover a wide array of subjects, thereby increasing one's knowledge base exponentially. It seemed like a viable career option, providing a unique blend of economics and math, which I desired. It also explains how parts of the theory I study is applied in the real world.

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

This is purely dependent on the individual and their current knowledge base. It also depends on the learning speed of a person, which varies greatly from person to person.

How did you start preparation for the ACET?

I had some prior knowledge on the mathematics part covered in acet. So I started by brushing up on those topics. The booklets provided by the Institute were more than sufficient to give a good foundation. The immense number of practice questions played an important role too.

Which is the most difficult part of this examination and why? What was your strategy to tackle this difficult part?

I think it's important to stress on small intricate details. Proper knowledge of them can completely change the understanding of a person, and how we view a question. I made sure I didn't leave out the GK section, which spoke about currencies and abbreviations etc. Also, it helps to know and understand nitigritties like, say, the difference between population variance and sample variance. They bring about small changes in calculation which may change the answer vastly.

Did you prepare notes? How helpful are the notes? What is your advice on notes-making?

I didn't really prepare notes. I did list down the tricky questions I found and had a look at them on the eve of the exam day. Note making is highly personalized. It may work for some, it may not for others. Indeed it gives writing practice which may help understand concepts better, but again, it is relative to individuals. It's important to feel comfortable with the way you study, so one needn't worry if they feel they learn better without notes.

How do you visualize your success?

I don't visualize my success. It's far more important to concentrate on what I'm doing in the present. If I do it right now, it will go fine in the future. I only hope that I continue to have the fire to work, and excel at it. There's a saying - Yesterday is History, Tomorrow is a Mystery, but Today is a Gift - that is why it is called Present.

What were your strong points which enabled you to achieve success in ACET?

The biggest strong point I had was that I had more practice in probability since I had done courses on it in my first year at ISI. I had exposure to different kinds of problems which helped me understand the topic better.

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

I haven't considered taking up actuary as my future profession yet. In case I do, I would like to focus on research.

Are you working somewhere? Describe a typical work week?

No, I'm a student.

I'm passionate about math. It satisfies my intellectual thirst. I like the rigor which can only be backed by strong logical reasoning.

Behind one topper are many people who stood by him/her during those uncertain times when he/she was merely an 'aspirant'. Who were those people in your case? Any specific incidence that you would like to share with us?

My parents are the pillars of my life. They supported my decisions and made sure I had everything I needed. In case I was demotivated, they got me back on my feet.

What are some of the mistakes that an average aspirant can avoid for better time management? What is your message for them?

In my case, I spent a lot of time in solving questions. I think we give a lot of time to theory, but can't understand it's application unless we solve an adequate amount of questions. Hence I would suggest trying out as many questions as one can lay their hands upon. Also, it is useful if one learned how to use a financial calculator efficiently and doesn't try to do mental math.

Any comments on your experience with ACET process.

Overall the experience was good. New doors and opportunities await those who continue their actuarial studies. However I've had few technical difficulties with the website.

OBITUARY

SRI. N. GOPALAKRISHNA PAI (N. G. PAI)

(19TH MAY 1937 - 16TH JULY 2015)

consulting actuary aged 79 years, an active member of the Indian Actuarial Profession, breathed his last on 16th July 2015 in Mumbai.

Mr. Pai, a BSc (Hons) Mathematics graduate from the Kerala University started his career in LIC in 1959. Subsequently he took up actuarial career. He had an illustrious career in LIC working mainly in the Actuarial Department in the Central Office and was actively involved in actuarial valuations. He had also gone on deputation to GIC for assisting GIC in developing Crop Insurance Products. He had worked as Regional Manager(Actuarial) in the South Central Zone of LIC prior to retirement.

Mr Pai was part of the three member winning teamof LIC Officers which won the Business Game conducted by the Institute of Actuaries' Students Society, London in 1985 out of 21 competing teams from different countries

After retirement from in the year 1995, He worked as Appointed Actuary to Reliance General Insurance Company Limited from 2000 to 2013.

After retirement from Reliance General Insurance Company, he was practicing as consultant actuary in Employee Benefits. A rare honour to work and contribute in all three major Actuarial disciplines viz. Life, Non Life and Employee Benefits. He had been an active member of the profession since early days of Indian Actuarial Profesion till his last days. He is survived by his wife Ms. Pushpalata G Pai and two sons Narasimha Pai settled in Bangalore and Navin Pai, in Mumbai.

Let us pray for his soul to Rest in Peace

- Mr. A P Peethambaran

EMPLOYMENT OPPORTUNITY

JOIN THE TEAM WE ARE HIRING

Max Bupa Health Insurance invites applications for Senior Manager/ Chief Manager, Actuarial function

JOB DESCRIPTION

Position	Location	Reporting to
Senior Manager/ Chief Manager	New Delhi	Appointed Actuary

Description: Job Purpose

The job holder will be responsible for independently handling:

- All Actuarial analytics needs of the company to provide insights into root causes for experience trends and possible corrective actions
- Make presentations to management about the findings and recommend corrective actions. Monitor process on the actions and ensure closure
- Claim spend forecasting, design & implement tracking mechanism for actual vs planned metrics
- Set-up processes, data systems etc for regular analysis of experience. Prepare monthly and quarterly claim cost experience reports for management
- Perform need based analysis to analyze experience in particular areas
- Closely work with Underwriting, Claims and Benefits Management teams to work on projects to analyze actual vs expected patterns on various key metrics
- Assist in other actuarial projects as and when required

Qualification & Experience

- Good progress in the actuarial exams taken
- 5-8 years of actuarial experience preferably in General/ Standalone Health Insurance Company
- Ability to demonstrate subject matter expertise
- Work in highly competitive & demanding environment

Skills

- Superior Analytical skills
- Proficient in Excel & Access working with large datasets
- Experience in SAS/R is preferred
- Excellent Presentation skills
- Efficient & Effective Team building and people Management skills
- Strong written and oral communication skills

Kindly mail your resumes at **jyoti.rajpal@maxbupa.com** by **10th Sept 2015**.
Kindly mention 'Actuarial Opening' in the subject line

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COUNTRY REPORT

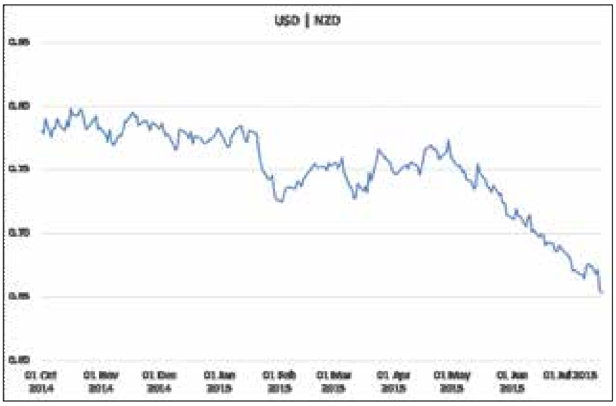
New Zealand

Currency

After months of unsuccessfully trying to talk the currency down, the Reserve Bank of New Zealand finally managed to weaken the New Zealand Dollar, after starting to cut the official cash rate and projecting further cuts.

Churn

Public submissions for a review of the Financial Advisers Act has closed(1). The review considers information, accessibility and public confidence in advice. One question was how to regulate commission and conflicts of interest.



The Financial Markets Authority (FMA) is investigating 'churning' of retail life insurance. Churn is where policies are switched for the benefit of salespeople not customers. The concern is that higher distribution costs result in higher premiums. Commission of 200% of premium in the first year and 10% afterwards is not uncommon. Independent advisers get another initial commission from a new provider when existing clients move. Claw-back of commission is pro-rated over two years, so some books of business move every three or four years. Many providers allow 'transfer terms' with little or no re-underwriting. Overseas trips and other incentives are given to advisers with high new business volume.

A similar investigation in Australia led to an agreement to reduce commission and extend the write-back period(2).

The New Zealand industry has commissioned a study to examine the cost of "churning" to the public of New Zealand, the impact of high commissions and identify solutions including a transition path likely to have wide support amongst stakeholders(3). This report will cover: inherent conflicts of interest that exist between insurers, advisers (and adviser groups) and customers; need for commissions and other remuneration for advisers if under-insurance is to addressed; impact of high initial commissions to insurers and customers including solvency and premium level impacts; role of advisers and their requirement for remuneration; impact of churning to insurers and customers including Bank sales practices; and potential solutions to these problems including possible regulatory responses and market solutions and any transitional requirements.

Disability Income

A sessional meeting was held in Auckland on 30th July 2015 to discuss the future of disability income insurance. This was the fifth sessional event in 2015(4). Claim experience deteriorated in Australia due to: scope creep through policy wording and court judgements; economic slowdown; and greater public awareness of ability to claim. The influences from across the Tasman Sea are reflected in hardening reinsurance terms.

Incidence of claims is similar for agreed value and indemnity cover. However, agreed value claims are longer with and fewer offsets. Higher replacement ratios and larger sums insured (with same replacement ratio) also have lower probability of return to work.

Although accidents in New Zealand are covered (under the compulsory ACC scheme(5)), income protection claims experience had been similar to Australia before their recent claims blowout, albeit with significant variation between life offices.

Insurer Returns

During the past few months, Insurers made two quarterly and an annual practice submissions to Reserve Bank of New Zealand. Formats were modified after considering industry feedback. Regular data returns are now part of the regulatory framework(6).

Earthquake Update

The Supreme Court ruled that a policyholder with cover for rebuilding is entitled to assessed cost of repairing earthquake damaged land, even if rebuilding elsewhere(7). This illustrates the importance of what the policy wording actually states, rather than intention ascribed by an insurer after a claim event.

References:

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ABOUT THE AUTHOR

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PUZZLE

Puzzle No 235:

On a sunny morning, a greengrocer places 200 kilograms of cucumbers in cases in front of his shop. At that moment, the cucumbers are 99% water. In the afternoon, it turns out that it is the hottest day of the year, and as a result, the cucumbers dry out a little bit. At the end of the day, the greengrocer has not sold a single cucumber, and the cucumbers are only 98% water.

How many kilograms of cucumbers has the greengrocer left at the end of the day?

Puzzle No 236:

On the market, Mrs Jones and Mrs Smith sell apples. Mrs Jones sells her apples per two for 0.50 euro. The apples of Mrs Smith are a bit smaller; she sells hers per three for 0.50 euro. At a certain moment, when both women have the same amount of apples left, Mrs Smith is being called away. She asks her neighbour to take care of her goods. To make everything not too complicated, Mrs Jones puts all apples to one big pile, and starts selling them for one euro per five apples. When Mrs Smith returns at the end of the day, all apples have been sold. However, when they start dividing the money, there appears to be a shortage of 3.50 euro.

Supposing they divide the amount of money equally, how much does Mrs Jones lose with this deal?

Solutions to Puzzles

(published in March & April Issue of Actuary India)

Puzzle No 231:

2^5 * 9^2 = 2592

Puzzle No 232:

	×			×	o
		o		×	
				×	
		o	o		

Puzzle No 233:

8, 1, 15, 10, 6, 3, 13, 12, 4, 5, 11, 14, 2, 7, 9, 16 or in reverse order

Puzzle No 234:

The best way is to put one black pearl in the first vase and all other pearls in the second vase. Then, the probability of grabbing a black pearl from the first vase is 1, and the probability of grabbing a black pearl from the second vase is 99/199. The total probability of grabbing a black pearl is $0.5 \times 1 + 0.5 \times 99/199 = 298/398$ (approximately 74.9%).

Correct solutions were received from

Puzzle No 231:

1. Ramandeep Suri2. Neeraj Devliyal 3. Graham Lyons 4. Kabilan V. 5. Aditi Vaidya 6. Ankit Samdaria 7. Shilpi Jain 8. Rashmi Bundel 9. Akanshya Bapat 10. Manoj Malhotra 11. Kiran Sarma 12. K. J. Shalem Raj 13. Rohma Azeem 14. Prasham Rambhia 15. Abhishek Sharma 16. Harshul Taneja 17. Jayesh Vide 18. Mercy Amalraj

Puzzle No 232:

1. Graham Lyons 2. Kabilan V. 3. Ankit Samdaria 4. Akhil Tom Prakash

Puzzle No 233:

1. Ekta Mehta 2. Kajal Mangla 3. Ankit Samdaria 4. Sanjana Agarwal 5. Neeraj Devliyal 6. Graham Lyons 7. Soham Chandra 8. Oshin Kotadia 9. Prasham Rmbhia 10. Shilpi Jain 11. Mohit Agarwal 12. Janani Sampathu 13. Harshul Taneja 14. Anuradha Krishnamurthy 15. Sangita Chhatre 16. Srushti Sheth 17. K.J.S. Raj 18. Divyansh Saraogi 19. Mahima Kundu 20. Akanshya Bapat 21. Kiran Sarma 22. C. R. Narasimha Sai 23. Nirupam Raha 24. Mercy Amalraj 25. Mohit Choudhary 26. Akshara Ravishankar

Puzzle No 234:

1. Akash Goyel 2. Ankit Samdaria 3. Neeraj Devliyal 4. Graham Lyons 5. Soham Chandra 6. Oshin Kotadia 7. Prasham Rambhia 8. Meghna Agarwal 9. Shilpi Jain 10. S. Uma Radhika 11. C. R. Narasimha Sai 12. Nirupam Raha 13. Mercy Amalraj 14. Mohit Choudhary 15. Akshara Ravishankar

shilpa_vm@hotmail.com

We regret to say that SUDOKU column will not publish in this month.

SUDOKU

Solution of Sudoku Puzzle No.34 published in the Month of July 2015

SOLUTION

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

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80% English in class XII

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RNI NO. - MAHENG/2009/28427
Published on 16th of every month
Postal Registration No. - MCS/057/2015-17
Posting Date: 21,22 & 23 of every month