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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. V • ISSUE 11

NOVEMBER 2013 ISSUE

Pages 32 • ₹20

16th Global Conference of ACTUARIES

17th-18th February, 2014

Renaissance Mumbai Convention Centre Hotel
Powai



For Private Circulation Only

AT HOTEL DOUBLETREE BY HILTON, GURGAON

2ND SEMINAR ON ENTERPRISE RISK MANAGEMENT

Date: 11th December, 2013 • Timings: 9:00 am to 5:30 pm

SPEAKERS: Confirmed yet

Mark Saunders (Towers Watson)

Joshua Corrigan (Milliman)

Marielle Theron (Max Life)

Peeyush Dalmia (McKinsey)



WHO SHOULD ATTEND?

1. Appointed Actuaries.
2. Professionals working in the insurance companies in particular in actuarial, risk management, audit, compliance, strategy, finance, underwriting departments.
3. Professionals working in the risk management, audit, compliance, finance departments of banks and other financial services companies.
4. Individuals interested in the field of Enterprise Risk Management in general.

REGISTRATION FEES:

Early bird ₹ 4000 till 30th November, 2013; 1 December Onwards ₹ 5000.

2ND CAPACITY BUILDING SEMINAR ON HEALTH CARE INSURANCE

Date: 12th December, 2013 • Timings: 9:00 am to 5:30 pm

SPEAKERS:

Raunak Jha (Towers Watson)

Keerti Singh (Apollo Munich Health Insurance)

Joanne Buckle (Milliman)

WHO SHOULD ATTEND?

The seminar is for IAI members who wish to enhance their skills in health insurance domain.

REGISTRATION FEES:

Early bird till 23rd November 2013 - ₹ 6500/-, from 24th November, 2013 - ₹ 7500/-

Register at : IAI Website

CPD Credit for IAI Members: 4 hrs (As per APS 9)

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FROM THE EDITOR'S DESK

by **K Subrahmanyam** 4

REPORTAGE



9th Seminar on Current Issues in Retirement Benefits
by **Hemanshu Jain**

FEATURES



- Companies Act 2013 and Insurance Companies by **C. L. Baradhvaj**
- Introduction to Interest Rate Derivatives by **Manish Kumar** 14

ABOUT

Shri J. T. Ranadive 18

STUDENT COLUMN



- Meet Mr. Barber: Modeling gender equalization for deferred annuities – Part 2 by **Saket Vasisth & PS Durga Prasad**
- Risk of Climate Change-Role of an Actuary by **Nitin Jain** 22
- Inflation effect on Common Man's Consumption by **Vinay Kumar H S** 25

FROM THE PRESS

IAA: Highlights of the IAA Council Meeting and Presidents' Forum in Singapore 26

SUCCESS STORY

CA3 Topper: **Himanshu Garg** 27

COUNTRY REPORT PAKISTAN

by **Nauman Cheema** 28

CAREER CORNER

- Star Health and Allied Insurance Co. Ltd.....13
- Milliman India Private Limited 30

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Back Page colour ₹ 35,000/-

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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 Website : www.actuariesindia.org



FROM THE EDITOR'S DESK

K SUBRAHMANYAM

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Advisory Group on Pensions, Other Employee Benefits and Social Security:

This is an advisory group created by the EC to guide consulting actuaries in the employee benefit area, social security area and to create new areas of work for them. As on date, our group has the following members, besides me: Mrs Chitra Jaisimha-Secretary, Mr Kulin Patel, Mrs Hemamalini, Mr Simon Methis Herborn, Mr Arunachalam, Mr Ganesan, and Mr A D Gupta. The group reports to the Education Committee in respect of SA4 syllabus for students; and to Professionalism Committee in respect of guidance notes, seminars, etc., for consulting actuaries. The group has done a good number of things for the benefit of consulting actuaries. Recently the group conducted 'CIRB' [Current Issues on Retirement Benefits] seminar on 8th October, 2013, at Mumbai. In that useful topics were discussed. These were on (a) the effect of new IndAS19,

(b) Problems faced by actuaries in the evaluation of leave encashment liability; (c) role of actuaries in the new pension system; (d) design of employee benefit scheme; (e) professional conduct issues. Members may visit the IAI website to download the presentations at that seminar. The group drafted and sent recommendations to the Institute on Certificate of Practice mechanism for consulting actuaries. According to us, the consulting actuaries may be those involved in issuing actuarial reports in the employee benefit area. Members need to comply with various Guidance Notes and Actuarial Practice Standards, Professional Code of Conduct. Members may visit and download the same from the IAI's website: www.actuariesindia.org. The group made some recommendations for the benefit of consulting actuaries — compulsory registration with the IAI for those who wish to practice as actuaries in employee benefit area, names of consulting actuaries to be present in the IAI's

website for the benefit of auditors and clients (users of actuarial services), and certain matters relating to conduct of consulting actuaries. The group is redrafting the APS26 in line with IndAS19 which is yet to be notified. The group represents the IAI in the PEBC (Pension and Employee Benefit Committee) of IAA (International Actuarial Association). Members may visit IAA's website: www.actuaries.org for latest updates in employee benefit area. IAA published a book on 'Discount Rates', which is useful for consulting actuaries and actuaries working for life insurers. There are many updates on IAS19 in respect of employee benefits. Members may find interest to see the recently published research paper on salary scales. Members are encouraged to send their views and suggestions to the Institute so that the group can be of help to consulting actuaries.

Best wishes for Deepavali and New Year 2014.

■ ■ ■



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

E-mail: library@actuariesindia.org

Funny Actuary

An actuary is flying on an old-style 4 prop plane to the annual meeting. Partway through the flight one engine conks out. The pilot comes over the intercom to advise the passengers that one engine is dead, but the plane is perfectly capable of flying on three, although this will delay their arrival time by one hour. A while later, the pilot advises the passengers that unfortunately, a second engine has ceased to function. He reassures them that the plane can fly on only two engines, but their arrival time will now be delayed by 3 hours. Shortly after, the pilot has more bad news - the 3rd engine is not working, but he reassures everyone again that the plane is perfectly capable of continuing with only one engine working, but that their arrival time will now be delayed by 7 hours. At this news, the actuary can no longer contain his frustration. He turns to the passenger sitting next to him and says "Boy that's just great - if the 4th engine stops working we're going to be up here forever!"

-Ken Hunter





9TH SEMINAR ON CURRENT ISSUES IN RETIREMENT BENEFITS

- Organized by: Advisory group on Pension, Employee Benefits and Social Security (Advisory Group)
- Venue: The Orchid, Mumbai • Date: 8th October 2013

I recently attended the 9th Current Issues in Retirement Benefits seminar and it was an exciting experience. Good topic selection, detailed content and active participation by audience made it a very engaging event. The event started with registration at 9:00AM and most sessions progressed as per schedule.

Session 1 – Kick off presentation by Chitra Jaisimha on behalf of the Advisory Group



Chitra Jaisimha

In her welcome address, she introduced audience to the core topics in Pension industry, including a brief about the new PFRDA Bill. The bill was passed in latest Monsoon session and is expected to give further push to the development & regulation of retirement benefits in our country. In her note, she also provided an update about the in-house research paper/report on "Understanding Salary escalation trends in India". The paper is expected to be published in the coming issue of the "The Actuary India" magazine.

Session 2 – Inaugural address by K Subrahmanyam, Chairperson, Advisory Group



K. Subrahmanyam

Mr. Subrahmanyam spoke about Professional conduct issues and updates. He emphasized that our profession is governed by our conduct and discipline is critical aspect for the professional

image of the actuaries. We have suitable guidance from the Act, Guidance Notes, Actuarial Practice Standards and Professional Code of conduct.

He covered two aspects of Professional conduct. First, new actuaries should inform previous actuaries about new assignments to which the previous actuary must provide a response. Compliance is necessary to keep trust in the system. Second, Actuarial Reports need to comply with the guidance. Incorrect reporting, inconsistency & missing information could be some serious consequences. He mentioned initiatives like CRIB as a way to address these issues.

Session 3 – IAS19 Revised 2011 (IAS19R) – Changes & Implications by Dr. K Sriram – Consulting Actuary



Dr. K Sriram

Dr. Sriram shared with us a widely discussed topic in the pension industry on IAS19 revised 2011 in a well compiled session. He discussed about the changes to the accounting standard in this session. He compared previous IAS19 & the new IAS19 and touched upon these aspects from IndAS19 and AS15R standards perspective as well.

He started his session sharing a rationale behind the change. He mentioned that the primary driver of the change is to increase the consistency in reporting

employee benefits. He also suggested that the change is a move from "Prescriptive Disclosure Approach" to "Principle based approach".

The discussion followed with details about changes in different components of balance sheet and profit and loss account. Notable topics included **"Recognition of Gains and Losses", "Recognition of Past Service Cost" "Net Interest Cost approach", "demographic assumptions" and additional disclosure requirements like enterprise risks in managing Defined Benefit plan.** Audience also shared their concerns about higher time charges incurred in transition to new standard and how clients are unwilling to bear any additional cost.

Session 4 – National Pension Scheme (NPS) – A perspective, Current status and Future Outlook

Kulin Patel – Director Tower Watson India's Employee Benefits practice, facilitated an interesting and arresting discussion about NPS. NPS has been in existence since 2004 and its intent is

About the Author



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to provide a portable, low cost widely available system of building sustainable pension to all Citizens of India. All Government employees effective 1.1.2004 accrue benefits under this scheme. Recent statistics indicate wide participation from Central and State governments but lower participation from private employers. He shared updates about Pensions Bill 2011, recent revisions to the NPS scheme, tax incentives on the scheme and newly released NPS corporate model. He concluded the session mentioning the probable role of Actuaries in this area which included a) Communication to employers and employees about retirement plans b) comparison of defined benefit and defined contribution risks in pre and post retirement stage and designing suitable DC schemes to complement NPS. The audience felt that the Actuaries with understanding of risk would help in ensuring financial soundness of the NPS scheme and make informed choices investments.

Session 5 – exempt provident fund (EPF) and GN29 Round tables – View Points and discussions

This session was a round table on the Valuation of Exempt Provident fund under GN 29 represented by an Actuary, an Auditor and an financial controller. A.D. Gupta, consulting Actuary, started the round table session discussing the pro and cons of the GN 29. Pramod Bhambani, head of financing, Siemens Limited shared employer perspective on managing the exempt provident funds. He suggested that an employer offer exempt provident fund to ease administrative hassle of employees. He also mentioned that complications around valuation of interest guarantees under GN 29 act as a deterrent to introduce the Exempt provident fund.

Facilitators also discussed the use of asset information in scheme disclosures.. Some members shared concerns about lack of Actuary control over gathering asset information and the usual practice to only rely upon client provided information.

Priyanshu Gundana, Partner PWC, mentioned that actuaries should proactively participate with client in determination of asset values and work closely with the Auditors. The Audience also agreed that this will help comply with the standards and reduce last minute updates. According to Mr



A D Gupta, Priyanshu Gundana, Pramod Bhambani

Gundana, GN29 does not cover in full investment & interest rate risks.

Materiality of using stochastic modeling and mark to market was hotly debated in this session and with this the first half of the seminar.

Session 6 – Leave valuations – Market Practice, Issues and Suggested Approach

First post lunch session was conducted by Arunachalam Rajaraman who is an independent Consulting Actuary. On the captioned topic he started the session by sharing a story with the Audience.

Throughout the session he presented market practices in the leave valuations and sought other actuaries view on



R Arunachalam

the subject. Notable topics discussed were company leave policy, LIFO (Last in first out) or FIFO (First in first out) approaches, level of disclosure requirements (full or partial) etc. There was also a discussion around providing actuarial certificates for short term leave

benefits. Though the general consensus on these benefits are that, they straight forward and does not require actuarial valuations some members in the audience suggested that if client\auditor insists on an actuarial certificate, as actuaries we need to provide the same.

Mr. Arunachalam also shared a sample model of valuing leave benefits under LIFO and FIFO approaches. He concluded the discussion debating about the assumptions to be used in the long term leave valuations.

Session 7 – A case study on II Pay Revision Commission (PRC) on Pensions

Chitra Jaisimha, Senior Actuary, Mercer Consulting India Retirement Benefit Practice shared a case study on IInd PRC recommendations for Department of Public Enterprise (DPE). This committee was Constituted in November 2006 and gave its recommendation in May, 2008 which is, an employer can contribute a maximum of 30% of Basic plus DA of the employee towards superannuation which includes contributory PF, Gratuity, Pension and Post-Retirement medical benefits

The session on the case study was of a mid-sized PSU restructuring its Post-retirement medical benefits and Pension as per guidelines. As a possible design she shared as to how under the new guidelines, the company should look to split its existing retirees among pre and post 01/01/2007. The Funds of the employees retiring prior to 01/01/ 2007 is a closed scheme, whose sustainability is dependent on factors like aging of the group, increasing medical costs, low contributions to the fund etc.



Anuradha Sriram

Finally Anuradha Sriram, Benefits Director, Towers Watson, concluded the session with closing remarks. ■ ■ ■



FEATURES

COMPANIES ACT 2013 AND INSURANCE COMPANIES

Companies Act 2013 has now been passed by the Parliament repealing the more than 50 year old Companies Act, 1956. Significant changes have been made in both governance and procedural matters keeping in mind the current corporate and regulatory environment. All Corporate professionals, including Actuaries, cannot afford not to know about the changes made. This article explains the changes made in the Companies Act in a simple and understandable language.

The Companies Act 2013 has been passed by both the Houses of Parliament and has been gazette on 30 August 2013. 99 sections under the Companies have been notified on 12 September 2013 while the remaining Sections are yet to be notified.

While the basic framework from the insurance perspective is laid down by the Insurance Act, 1938, read with IRDA Act, 1999 and applicable Regulations and other notifications from time to time, the Companies Act continues to govern Insurance Companies as well, as every Insurance Company is required to be a Public Limited Company under the Companies Act. This article attempts to analyse the important provisions as applicable to Insurance Companies under the new Act.

References to sections in this article are to the new Companies Act 2013, unless otherwise specified.

About the Author



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C.L. Baradhwaj (CLB as he is popularly called) is currently the Senior Vice President (Compliance), Chief Risk Officer and Company Secretary of Bharti AXA Life Insurance Company Limited. A Company Secretary, a Law Graduate and a Fellow of the Insurance Institute of India, CLB has worked for 10 years in LIC and for more than 10 years in private life insurance companies in the areas of Legal, Compliance, Taxation and Secretarial matters. He has been a regular contributor to articles in IRDA journal and other magazines on insurance subjects.

Applicability to Insurance Companies

Section 1(4) of the Act makes the provisions of the said Act applicable to the extent that they are not inconsistent with the provisions of the Insurance Act, 1938 and IRDA Act, 1999. In other words if there is a conflict between the provisions of Companies Act and Insurance (or IRDA Act), the latter shall prevail. A similar provision existed in Section 616(a) of Companies Act, 1956, but IRDA Act has also now been.

Definition of Key Managerial Personnel (Section 2(51))

A new definition has been inserted in the Act on Key Managerial Personnel which has been defined to mean the Chief Executive Officer or Managing Director or Whole Time Director, the Company Secretary, the Chief Financial Officer and such other persons as may be prescribed.

Section 203 of the Act requires such classes of Companies as may be notified shall have Key Managerial Personnel. The draft Rules have prescribed that every listed Company and every other company with a capital of ₹ 5 Crores

or more shall have Key managerial personnel, who shall be appointed and their remuneration determined by the Board. Such persons shall hold key managerial positions only in one Company, except acting as Directors with the permission of the Board.

Appointment of the same person as Chairman and Managing Director is prohibited unless the Articles otherwise provide or in the case of multiple businesses.

Provisions relating to incorporation

The documents to be filed with the Registrar upon incorporation of a Company includes, among other things, the Memorandum and Articles of Association, declaration from an Advocate or Chartered Accountant or Cost Accountant or Company Secretary in Practice that the requirements relating to incorporation have been complied with.

A Memorandum of Association contains the clauses relating to the constitution of the Company like the name of the Company, the principal and secondary objects for which the Company has been formed, the clause on limitation

of liability of members or otherwise etc. It is signed by the first shareholders who are also the subscribers to the Memorandum. Articles contain the bye laws of the Company and procedural matters such as conduct of meetings of Board, Shareholders, procedures relating to appointment and vacation of office of Directors etc.

A Company shall have a registered office on and from the 15th day of incorporation and at all times thereafter. Verification to this effect will have to be filed with the Registrar within 30 days of incorporation.

A Company can commence business only after filing a declaration that subscribers to the memorandum have subscribed to the capital of the Company (which shall not be less than ₹ 1 lakh for Private Companies and ₹ 5 lakhs for Public Companies) and a verification with regard to registered office as mentioned above are filed with the Registrar of Companies.

Section 3 of the Insurance Act, 1938 read with IRDA (Registration of Indian Insurance Companies) Regulations 2002, provides the framework for seeking IRDA approval after the Company has been registered under the Companies Act.

Authentication of documents on behalf of a Company (Section 21)

Section 21 of the new Act (which is a contemporary to the old Section 54), specifically states that any document or proceeding can be authenticated or a Contract made by or behalf of a Company may be signed by:

- (a) A Key managerial person (or)
- (b) An Officer of the company duly authorised by the Board in this behalf

Provisions relating to raising of Capital

While a Public Company can raise capital through issue of securities under private placement, rights issue, bonus issue and through public issue through listing arrangements under SEBI Regulations, a Private company can raise capital only through the first three means. No allotment under a public issue can be made unless the amount stated as the minimum subscription in the prospectus has been received by the Company. In case the minimum subscription is not received, the amount received shall be refunded. For all Public issues, listing in at least one of the recognised Stock exchanges is mandatory.

However, by virtue of Section 6A of the Insurance Act, 1938, Insurance companies are allowed to raise only Tier I capital, viz., Equity shares (Insurance Bill however recognises Tier II capital). Further, in addition to SEBI regulations, the Insurance Companies are also governed by IRDA (Issuance of Capital by Life Insurance Companies) Regulations, 2011 and IRDA (Issuance of Capital by General Insurance Companies) Regulations, 2013. As per these Regulations, insurance companies are allowed to go public only after completion of 10 years from the date of incorporation. Prior approval of IRDA would be required before approaching SEBI. Besides other conditions, for Life insurance companies, IRDA would expect that the Embedded value shall at least be twice the paid up capital, inclusive of the Share Premium. Special insurance related disclosures in prospectus prescribed by IRDA, in addition to disclosures mandated by SEBI.

As per Section 29, all issues of shares of a listed company shall be only in dematerialised form in accordance with the provisions of Depositories Act, 1996.

Where a company publishes its authorised capital in any letter head or any advertisements, it shall also contain with equal prominence the details of the subscribed capital of the Company (Section 60).

Private placement

Section 42 speaks about Private placements which have been defined as offer of securities to select group of persons through a private placement offer letter. The maximum number of shareholders to whom such shares in private placement can be offered, cannot exceed 50 or such other number as may be prescribed. The allotment of shares under private placement shall take place within 60 days from the date of application, failing which the application money shall be refunded within 15 days alongwith interest of 12% p.a for delay beyond 60 days. No advertisement shall be allowed for the issue of shares as it is through private placement. Receipt of subscription by cash is prohibited. Further the subscription money received shall be kept in a separate Bank account and shall be utilised for only for allotment of shares, failing which the moneys shall be refunded. Complete information about the offer shall be filed with the Registrar within 30 days of the circulation of the private placement offer letter. No fresh private placement shall commence unless the previous offer has been completed or has been withdrawn or abandoned. Return of allotment to be filed upon completion of the allotment.

This section would be of immediate relevance to all the insurance companies, if they raise capital through private placements.

Voting rights

Section 47(1)(b) of the Companies Act read with Section 6A(2) of Insurance Act state that the voting rights of a shareholder in an insurance company shall be strictly in proportion to the paid up amount of the shares held by the shareholder. While the voting rights

are in proportion to the face value, an insurance company may issue shares at a premium in terms of Section 52.

Issue of shares at discount is prohibited, except under Sweat Equity share option ("Sweat Equity" denotes issue of equity shares to Directors or Employees for providing know-how or intellectual property rights or such other value addition). Important conditions for issue of equity under Sweat Equity option includes Special resolution of shareholders, compliance with SEBI regulations on Sweat Equity and minimum cooling off period of one year from incorporation

Further issues of capital

Section 62 of the new Act corresponds to Section 81 of the old Act. Any issue of a capital subsequent to the initial issue, shall first be offered to the existing shareholders, who shall have a right of renunciation of the offer in favour of any other person. If the existing shareholders decline to accept the offer within a time period of not less than 15 days, but not more than 30 days, the offer is deemed to have been declined. Thereafter, the shares can be disposed off by the Board in such a manner not disadvantageous to the existing shareholders. Notwithstanding this provision, a Special resolution of shareholders may be passed deciding to issue the equity shares in favour of any person, in which case no offer need be made to the existing shareholders, provided the price of the shares, shall be valued by a Registered valuer.

A bonus share is a free share issued by the Company without receiving any consideration from existing shareholders. Section 63 empowers companies to issue bonus shares out of Free reserves (built out of past profits), Share Premium Account (moneys received over and above face value during previous issues of capital) and Capital redemption reserve account (a reserve created upon buy back of shares by a Company). Prior to issue of Bonus shares, the Company must ensure that it has not defaulted in its obligations towards Debenture holders, Deposit holders or any Statutory dues.

Transfer and transmission of shares

Section 56 provides for the transfer of shares and requires the instrument of transfer (Transfer deed) to be duly stamped and delivered to the Company within 2 months of execution of the instrument of transfer (except in the case of shares held in demat form). Under Section 6A of the Insurance Act, an insurance company needs to seek prior IRDA approval for registration of transfer of shares under the following circumstances:

(a) Where the post transfer holding of the transferee is likely to exceed 5% of the nominal capital of the Company (2.5% in the case of banking or investment company) (or)

(b) Where the nominal value of shares intended to be transferred a person of group or bodies corporate under the same management exceeds 1% of the paid up share capital of the insurance company

Share Certificates shall be issued by a Company within a period of 2 months from the date of allotment and any transfer of shares shall be registered by the Company within 1 month from the date of delivery of instrument of transfer and Share Certificate.

Nomination by Shareholders

Section 72 of the Act recognises nomination by shareholders – the nominee(s) will be entitled to become the shareholders upon the death of the shareholder. This is a welcome move as it could put to rest many legal disputes arising on ownership among legal heirs upon death of a shareholder

Provisions relating to charge on the assets of the Company

A charge is usually creation of an encumbrance on the assets of the Company against a borrowing. Section 77 requires every Company to register the charge created within 30 days of creation. If the Company fails to do so, the Creditor in whose favour the charge is created, may intimate the Registrar and recover the charges for intimation from the Company. Such a registration would be deemed to have put the acquirer of any property, notice of the

charge created on the property acquired. A charge once released shall also be informed to the Registrar who shall record the memorandum of satisfaction. Every Company shall maintain a Register of Charges at its Registered Office.

Shareholder meetings

There shall be one Annual General Meeting of Shareholders held every year – not more than 15 months shall elapse between two Annual General meetings. Such Annual General Meetings shall be held between 9 a.m. and 5 p.m. on a day which is not a National Holiday and in the registered office or any other place within the city or town where the registered office is situated. Every listed company shall file with the Registrar a Report on each Annual General meeting including the confirmation that it was held, within 30 days of such meeting.

An extraordinary general meeting (i.e. Shareholders meeting other than Annual General Meeting) to transact any business may be called by the Board of Directors or by the Shareholders representing not less than 1/10th of the voting power of the Company. Where the meeting is called by Shareholders, the Company shall convene the meeting within 21 days, failing which the Shareholders can convene the meeting within 3 months of submitting the requisition to the Company and recover the expenses from the Company.

Notice of Shareholders meetings

A notice of 21 days is mandatory for all shareholders' meetings, unless 95% of the shareholders consent for a shorter notice. Copy of the notice shall be sent to Statutory Auditors and Directors as well. Any item other than consideration of financial statements, declaration of dividend, appointment of directors in the place of those retiring, appointment of auditors and fixing their remuneration, shall be deemed to be special business and an explanatory statement needs to be annexed. Items where the Directors or the Key managerial personnel or their relatives are interested will have to be specifically disclosed.

Quorum for Shareholders meetings

As per Section 103, unless the Articles

of the company provides for a larger number, the quorum shall be 5 members personally present for a Public Company with not more than 1,000 (increases to 15 members if the number of members is more than 1,000 but less than 5,000 and to 30 if the number of members is more than 5,000). If quorum is not present within 30 minutes, the meeting shall stand adjourned same time and day next week or to such other date, time and place as the Board may determine. Meeting called by shareholders representing 1/10th, shall stand cancelled. For adjourned meetings 3 day notice to be given by the Company or published in Newspapers. In the adjourned meeting, the members present shall constitute the quorum.

Proxies

Proxy is a person entitled to attend the meetings on behalf of a shareholder. A proxy cannot speak and participate in vote except by Poll. A person cannot act as a Proxy for more than 50 members. Instrument appointing Proxy shall be submitted to the Company 48 hours ahead of the meeting.

Ascertaining the sense of the meeting

A voting shall first be taken by show of hands. However Chairman may, at his discretion, and shall, at the request of shareholders holding not less than 1/10th of voting power with ₹5 lakhs paid up, order voting by poll. A demand for poll on adjournment of the meeting or change of Chairman shall be taken forthwith.

Minutes of meetings

Minutes of all meetings, including Shareholders, Board and their Committees, are required to be prepared and signed within 30 days of the meeting. In respect of Board meetings, the names of Directors present and the names of Director(s), if any, dissenting from or not concurring with any resolution shall be recorded. Chairman has the right to delete any defamatory, irrelevant, immaterial or such other matters detrimental to the interests of the Company from the Minutes. It is mandatory for every company to follow the Secretarial standards prescribed by

the Institute of Company Secretaries of India on Board and Shareholder meetings.

Dividends

A Dividend, including an interim dividend, may be paid out of Free reserves (created out of past profits). Separate Bank account to be opened to which the funds for payment of dividend to be transferred within 5 days of declaration of dividend. Any unpaid dividend within 30 days of declaration shall be transferred to a special Bank Account called "Unpaid Dividend Account" with any Scheduled Bank. Names of shareholders who have not claimed the dividend shall be published in the website of the Company. Any amount unclaimed for 7 years from the date of transfer to Unpaid Dividend Account shall be transferred to Investor Education and Protection Fund alongwith the shares whose dividend has not been claimed.

Financial statements

For Insurance Companies, the financial statements are prepared in accordance with the formats prescribed under IRDA (Preparation of Financial Statements and Auditors' Report of Insurance Companies) Regulations, 2002. Subject to the provisions under the said Regulations, the provisions of Companies Act are applicable. Under Section 134, Financial Statements shall be signed by the Chairman of the Board or by two Directors, including Managing Director if there is one, the Chief Financial Officer and the Company Secretary, after the approval of the financial statements by the Board. Auditors Report shall be attached to the financial statements. The Board Report shall, among other things contain, the extract of the Annual Return, the number of meetings of the Board, Comments of Directors on every remark or qualification of Auditors, Directors' Responsibility Statement etc. Further where an independent director is proposed to be appointed, a confirmation that the independent director fulfills the conditions specified in the Act for his appointment as independent director shall also be furnished alongwith the Board Report.

Corporate Social Responsibility (CSR)

In order to promote the cause of giving back to the Society in which the Company has grown and made profits, it has been made mandatory that a Company having a reasonable size shall contribute not less than 2% of their average net profits during the immediately preceding financial years towards CSR activities. The threshold limit for attaining reasonable size has been fixed as one of the following, viz., (a) Networth of ₹ 500 Crores (b) Turnover of ₹1,000 Crores or (c) Net Profit of ₹5 Crores. A CSR Committee shall be formed which consist of 3 Directors, including an independent director. The Committee shall frame the CSR Policy and recommend activities. The policy shall be approved by the Board and the implementation shall be overseen by the CSR committee.

Statutory Auditors

The Statutory auditors appointed in the first Annual General meeting shall hold office till the conclusion of 6th Annual General meeting. Thereafter, the Statutory Auditors shall be reappointed till the conclusion of every 6th subsequent Meeting.

For listed companies and certain other prescribed Companies, an individual auditor cannot hold for another term of not exceeding 5 years, before completing a 5 year cooling off period. However, a Firm of Chartered Accountants can serve for two consecutive term of 5 years after which the 5 year cooling off period is required. Where the same person is acting as a partner in two different audit firms, out of which one is the retiring auditor firm in the preceding financial year, the other audit firm cannot be succeed as the Auditor for the same Company, in view of the common partner, for a period of 5 years.

For insurance companies, IRDA have prescribed that there shall be two Joint Statutory Auditors one of whom shall be for a term of 5 years while the other one for 4 years, after which there will be a cooling off period of 2 years before they are reappointed. There are additional guidelines for Statutory Auditors prescribed by IRDA such as 15 year track

record by the firm etc. which must also be complied with.

A retiring auditor may be reappointed in the Annual General meeting unless it is specifically resolved that the retiring auditor shall not be reappointed, for which special notice is required to be given.

An Auditor shall be a Chartered Accountant. An Audit firm may be appointed as an Auditor, if majority of the partners of the firm practicing in India are qualified under the Act to act as Auditors. Persons who have any pecuniary interests, directly or indirectly, with the Company of which they would like to become Auditors, are prohibited from taking any audit assignment with such companies.

Section 144 prohibits Statutory Auditors from directly or indirectly rendering certain specified services to the Company of which they are Auditors, which could be viewed as a conflict to their audit assignment. For example, accounting and book keeping services, internal audit assignments, investment advisory services etc.

Board of Directors

Every Public Company shall have a minimum of 3 Directors. If the number of Directors exceeds 15, Special resolution is required to be passed. In certain classes of companies to be prescribed, there shall be atleast one women director on the Board. As per the draft Rules, it is proposed that Companies having a share capital exceeding ₹ 100 Crores or a turnover of ₹ 300 Crores or more, shall have a Women Director within 3 years.

Resident Directors: Every Company shall have atleast one director on their Board who has stayed in India for a period exceeding 182 days in India in the previous calendar year.

Independent Directors: Every listed public company shall have atleast one-third of their total strength constituting independent directors. Central Government may prescribe minimum number of Independent directors for certain class of Companies

Section 149(6) of the Act defines

independent Directors as persons who are not Executive, Managing or Whole time or Nominee Directors or promoters or associated in any way with the promoters of the company and who do not directly or indirectly through their relatives hold any pecuniary relationship with the company of which they are the independent directors. Further such person shall not hold any position in the company or should not have acted as the Auditors, company secretaries or legal advisor during the preceding three years. Further he cannot hold any equity which constitutes more than 2% voting power in the company. Further such a person cannot be a CEO or a Director of a Trust or a Non profit organisation which receives 25% or more of its receipts from the Company or its Directors or Promoters.

An Independent Director is not entitled to any stock option, but is eligible to receive fees for rendering services as independent director and profit related commission. He shall hold office for a maximum period of 5 years after which he or she may be appointed for another term of 5 years. Thereafter, a cooling period of 3 years is required, during which period he shall not engage in any pecuniary relationships with the company to be eligible to get reappointed after the cooling off period. Further the Independent directors are not liable to retire by rotation.

Central Government may notify an institution or a body which will create a database of independent directors to enable companies to select independent directors. All appointments of independent directors shall be approved in the Shareholders' meeting.

Liability of independent and non executive directors: Independent and non-executive directors are not liable for any acts of omission or commission of the company unless the acts or omission have happened through a board process with the knowledge, consent or

connivance of the director or that he or she had not acted diligently.

like to step down, if any, consequent to the above amendment.



Half Knowledge is worse than ignorance.-Thomas B. Macaulay

Appointment of Directors

The articles of association shall contain the names of First Directors. In the absence of any provision in the Articles, the subscribers to memorandum shall become the First Directors of a Company. Every person intending to become a Director shall possess a Director Identification Number (DIN) and shall not suffer from the disqualifications mentioned in the Act. A declaration to this effect shall be furnished to the company alongwith the consent to act as a Director.

Section 167(b) has made an important amendment to the effect that a Director shall vacate office if he or she absents himself or herself for all meetings held during a period of 12 months, whether or not leave of absence has been granted (the old Section 283(1) (g) allowed a Director to continue to be absent beyond 3 meetings with leave of absence)

Ceiling on number of directorships

A person can hold directorships in not more than 20 Companies (both Public and Private put together). Out of these 20 directorships, a person cannot be a Director in more than 10 Public Limited Companies. While calculating the number of Directorships, the positions held as Alternate Directors shall also be included. Under the erstwhile Section 275 of the old Companies Act, 1956, the limit was 15 companies, excluding Private Limited Companies. Within a period of one from the commencement of the Act, a Director must decide the Companies wherein he or she would

Retirement of Directors

Unless the articles of association provides for retirement of all Directors, 2/3rds of the total number of Directors shall be persons who are liable to retire by rotation. The remaining 1/3rds can be non-retiring Directors. Out of the 2/3rds, 1/3rd shall retire at every Annual General meeting. Independent directors shall be excluded in calculation of the

retirable directors. In determining who will retire in each meeting, the persons who have served longest as Director in the company shall retire first followed by others less senior to them.

Additional, Alternate and Casual Vacancy Directors

The Board has the power to appoint any additional director on the Board who shall hold office till the conclusion of the immediately following Annual General Meeting.

An Alternate Director may be appointed by the Board only when a Director goes outside India. Only a person qualified to become an independent director can be appointed as an alternate to an Independent director. Such Alternate Directors shall vacate office once the original director in whose place he was appointed returns to India.

Board of Directors are empowered to fill casual vacancies arising out of death, resignations etc. in the Board. Such Directors can hold office only up to the date till which the original director would have held office.

Board meetings

There shall be a minimum of 4 Board meetings in a year without more than 120 days elapsing between any two consecutive Board meetings. Participation through Video Conferencing has now been specifically provided for in the Act (so far it was allowed though a notification).

Minimum notice of 7 days for conducting a Board meeting has been

made mandatory. If Board meeting is required to be held at a shorter notice than 7 days, presence of independent director, if any, in the meeting is mandatory, failing which the decisions taken such meeting shall be circulated to all Directors and shall be final only if it is ratified atleast by one independent director, if any.

The quorum for the Board meeting is $\frac{1}{3}^{\text{rd}}$ of the total strength of the Board or two whichever is higher. A director participating through video conferencing shall be counted for the purpose of quorum. While reckoning the quorum, the directors interested in the resolutions shall be excluded. If the strength of the non-interested directors falls below $\frac{1}{3}^{\text{rd}}$, the directors present, not being less than two, shall be the quorum. If a quorum is not present, the meeting shall stand adjourned to the same day, time and place in the next week, which is not a national holiday or the next succeeding day, as the case may be.

Resolutions may be passed by the Board through circulation, other than those which are specifically required to be passed only at a Board meeting under Section 179(3). However, not less than $\frac{1}{3}^{\text{rd}}$ of the Directors may require a circular resolution to be decided at a meeting of the Board. Every circular resolution shall be noted in a subsequent meeting of the Committee or the Board and recorded in the minutes accordingly.

Audit Committee & Nomination and Remuneration Committee

Every Listed Company and Public Companies having a Capital of ₹ 100 Crores or more shall have an Audit Committee, comprising of a minimum of 3 directors with independent directors forming a majority. Further majority of the Directors, including the Chairperson, shall be financially literate. The role of the Audit Committee includes the following:

- Recommendation on appointment, remuneration etc. of Auditors of the Company
- Monitoring the Auditor's independence and performance
- Examination of financial statements

- Approval or modifications to transactions with related parties
- Valuation of undertakings
- Evaluation of internal financial controls and risk management
- Monitoring end use of funds raised through public offers

IRDA's Corporate Governance guidelines govern the formation of Audit Committee. It requires that the Chairman of the Audit Committee shall be an independent director. CEO or Managing Director cannot be a member of the Audit Committee.

A Nomination and Remuneration Committee is also required to be formed by listed and Companies having a paid up Capital of ₹ 100 Crores or more (as per draft rules) comprising of 3 or more non-executive directors out of which not less than one half shall be independent directors. The Committee shall identify persons who are qualified to become directors and who may be appointed in senior management as per criteria to be laid down and formulating their remuneration policy. As per IRDA's Corporate Governance guidelines Nomination and Remuneration Committees are non-mandatory committees.

Powers of the Board

Section 170 states that the following powers can be exercised by the Board only at a duly convened Board meeting:

- Power to issue securities, including shares and debentures
- Approval to financial statements and the Board's report
- Power to invest the funds of the company
- Power to borrow monies
- Power to engage in diversification, amalgamation, merger or reconstruction or takeover
- Power to make calls or authorise buy back of securities

No circular resolution of Board of Directors is allowed in the above cases. However, the power to borrow or invest can be delegated to a committee of directors.

Section 180 requires specific approval of Shareholders in respect of certain matters like disposal of the undertaking, borrowing money in excess of capital and reserves etc. As per Section 181, Board may contribute to bona fide charitable funds. However if the amount of contribution exceeds 5% of net profits, prior approval of Shareholders necessary.

Disclosure of interests by Directors

A director shall disclose his interests in various Companies and firms, at the time of joining or at the time when he or she becomes interested. Further at the first meeting of every financial year such a disclosure shall be made. A Director is deemed to be interested in a body corporate if he or she holds more than 2% shareholding in the said body corporate or is it's promoter or CEO or is a partner or owner if the body corporate is a partnership firm. An interested director shall desist from participating and voting in the resolutions in which he or she is interested. A contract entered into with Companies wherein a Director is interested is voidable at the option of the Company.

Loans to Directors

Section 185 prohibits loans to Directors, except for loans given to managing or wholtime directors as employees as part of terms and conditions of service or pursuant to scheme approved by the members by special resolution or by a company which is engaged in the business of providing loans or giving guarantees for which the interest charged shall not be less than the Bank rate of Reserve Bank. It is pertinent to note that Section 29 of Insurance Act prohibits loans or temporary advances to Directors, except for loans under insurance policies within surrender value.

Investments by a Company beyond two layers of investment companies prohibited. Further, no company can give loan to or invest in securities of other bodies corporate exceeding it's 60% of share capital and free reserves or 100% of free reserves and share premium amount, whichever is higher.

Appointment and Remuneration of Managing or Wholetime Directors

A Managing Director cannot be appointed for more than 5 years at a time. Further, the person proposed to be appointed shall not be less than 21 years and shall not be more than 70 years of age. The proposal shall be first approved by the Board and subject to further approval by the Shareholders at their meeting. If the appointment is at variance with Schedule, approval of Central Government is required.

Remuneration of all Directors, including Managing Directors, shall not exceed 11% of the Net Profits, except with the approval of Central Government. Within this 11% ceiling, the remuneration to Managing or Wholetime Directors

cannot exceed 5% of the Net Profits or 10% if there are more than one Managing or Wholetime Directors, without the approval of Shareholders. Such remuneration excludes Sitting fees which may be paid for attending Board or Committee meetings. As per the draft Rules, it is proposed to allow Sitting fees to be paid upto ₹ 1 lakh for every meeting of the Board or Committee, as may be decided by the Board. Any premium paid for taking out a Directors' & Officers Indemnity Insurance policy will not be treated as remuneration, unless the Director is proved to be guilty. Where a Company does not have net profits, the remuneration shall be in accordance with Schedule V. Subject to the above conditions, the remuneration can be determined by the Articles of

Association or by a resolution passed in the Shareholders' meeting.

Appointment and remuneration of Managing or Whole time Directors are required to be approved by IRDA under Section 34A of the Insurance Act, 1938, which overrides the provisions of Companies Act. Where an approval from IRDA is obtained, approval from Central Government under Section 196 would not be necessary. However, the said Section 34A still contains references to Section 269 which is now replaced with Section 196 under the new Companies Act. Necessary amendments need to be made in the Insurance Act.

Every Company having a paid up capital above ₹ 100 crores (proposed as per draft Rules) shall conduct a Secretarial audit by a Company Secretary in practice.



CAREER CORNER



Star Health and Allied Insurance Company Limited

Corporate Office: No.1, New Tank Street, Valluvar Kottam High Road, Nungambakkam, Chennai - 600034. Ph: 044-28288800

Position: Manager (Actuarial)

Location: Chennai

Experience: Minimum 3 years actuarial experience in General Insurance (Health Insurance experience would be an added advantage)

Qualification: Strong academic background, preferably all CT Series Exams completed and ability to lead the team

Requirement: We are looking for a senior level candidate with excellent analytical and communication skills, to lead the Actuarial team and supervise all actuarial analyses related to pricing and reserving. The candidate must also be well-versed with regulatory reporting like FCR, IBNR, ALM and EC. Knowledge of predictive modeling techniques desired.

Remuneration: Negotiable

Interested candidates can apply by mailing their resume to

rama.d@starhealth.in & am.hr@starhealth.in



INTRODUCTION TO INTEREST RATE DERIVATIVES

The concept of interest rate belongs to our every-day life and has entered our minds as something familiar we know how to deal with. When depositing a certain amount of money in a bank account, everybody expects that the amount grows (at some rate) as time goes by. The fact that lending money must be rewarded somehow, so that receiving a given amount of money tomorrow is not equivalent to receiving exactly the same amount today, is indeed common knowledge and wisdom. However, expressing such concepts in mathematical terms may be less immediate and many definitions have to be introduced to develop a consistent theoretical apparatus.

An interest rate is the cost of borrowing money. A borrower pays interest for the ability to spend money now, rather than wait until he's saved the same amount. Interest rates are expressed as an annual percentage of the total amount borrowed, also known as the principle. For example, if you borrow \$100 at an annual interest rate of five percent, at the end of the year you'll owe \$105.

The nice thing is that interest rates work both ways. Banks, governments and other large financial institutions need cash, too, and they're willing to pay for it. If you put money into a savings account at a bank, the bank will pay you interest for the temporary use of that money. Governments sell bonds and other securities for the same reason. In this case, you're the lender, and the interest rate is your compensation for temporarily giving up the ability to spend your cash. Unfortunately, savings accounts and government-issued bonds pay relatively low interest rates because the risk of defaulting is close to zero.

A borrower's credit score is only one of the risk factors that affect interest rates. For example, interest rates for **unsecured** credit will always be higher than **secured** credit. Secured credit is backed by collateral. A mortgage

is the classic example of secured credit, because if the borrower defaults on the loan, the bank can always take the house. Credit cards are unsecured credit, because there's no collateral backing the loan, only the cardholder's credit score. Mortgage interest rates are typically much lower than credit card interest rates because they're less risky for the lender.

Long-term loans also carry higher interest rates than short-term loans, because the more time a borrower has to pay back a loan, the more time there is for things to go rotten financially, causing the borrower to default.

Another factor that makes long-term loans less attractive to lenders -- and therefore raises long-term interest rates -- is inflation. In a healthy economy, inflation almost always rises, meaning the same dollar amount today is worth less five years from now. Lenders know that the longer it takes the borrower to pay back a loan, the less that money is going to be worth.

That's why interest rates are actually calculated as two different values: the **nominal rate** and the **real rate**. The nominal rate is the interest rate set by the lending institution. The real rate is the nominal rate minus the rate of inflation. For example, if you take out a mortgage with a nominal interest rate of 10 percent, but the annual rate of inflation is four percent, then the bank is only really collecting six percent on the loan.

INTRODUCTION: Interest Rate – contingent claim such as bonds, options, caps, swaptions and mortgage based securities have become increasingly popular. Pricing of these derivatives is a major area of research in industry and academics.

This article is devoted to standard concepts in the interest rate world. We will define several interest rate curves, such as LIBOR, swaps, forward-LIBOR and forward- swap curves, and the zero – coupon curve. We explain

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the different possible choices of rates in the market. We introduce some fundamental products whose evaluation depends only on the initial given curves and not on volatilities, such as bonds and interest – rate swaps.

BANK ACCOUNT AND SHORT RATE:

A money market account represents a risk – free investments, where profit is accrued continuously at a risk – free rate prevailing in the market

Definition: Bank Account (Money – market account)

We define $B(t)$ to be value of bank account at time $t > 0$. Assume $B(0) = 1$ and the bank account evolves according to the following differential equations:

$$dB(t) = r_t B(t) dt, B(0) = 1$$

where r_t is a positive function of time.

As a consequence

$$B(t) = \exp\left(\int_0^t r_s ds\right)$$

Where r_s is the instantaneous rate at which the bank account accrues. This instantaneous rate is usually referred to as instantaneous spot rate, or briefly as short rate.

A first order expansion in Δt gives,

$$\frac{B(t + \Delta t) - B(t)}{B(t) \Delta t} = r(t) \Delta t$$

From the above equation it is clear that the bank account grows at each time instant 't' at a rate $r(t)$.

Next we consider the non-deterministic nature of r_t

Definition: Stochastic Discount factor

A stochastic discount factor $D(t, T)$ between two instances 't' and 'T' is the amount at time 't' that is equivalent to one unit of currency payable at time 'T', and is given by

$$D(t, T) = \frac{B(t)}{B(T)} = \exp\left(-\int_t^T r_s ds\right)$$

The probabilistic nature of r_t is important since it affects the nature of the basic asset of our discussion, the bank – account numeraire B . In many pricing applications, especially when applying the Black – Scholes formulae in equity or foreign exchange (FX) markets, ' r ' is assumed to be a deterministic function of time, so that both, the bank account and the discount factors at any time are deterministic functions of time. This is usually motivated by assuming that variability of interest rates contribute to the price of equity or FX options by a smaller order of magnitude with respect to the underlying movements of the asset.

However, when dealing with interest – rate products, the main variability that matters is clearly that of interest rate themselves. Hence it is important to drop the deterministic set up and to start modelling the evolution of ' r ' in time through a stochastic process. As a consequence, the bank account and the discount factor will be a stochastic processes.

Zero Coupon Bonds and Spot Interest Rates

Definition: Zero Coupon Bonds

A ' T ' -maturity zero- coupon bond is a contract that guarantees its holder the payment of one unit of currency at time ' T ', with no immediate payments. The contract value at time $t < T$ is denoted by $P(t, T)$. Clearly $P(T, T) = 1$ for all ' T '.

If we are at now at time ' t ', a zero-coupon bond for the maturity ' T ' is a contract that establishes the present value of one – unit of currency to be paid at time ' T '. Now the question is what is the relation between the discount factor $D(t, T)$ and the zero – coupon bond price $P(t, T)$. The difference lies in the two objects being respectively an "equivalent amount of currency" and a "value of the contract". If rates ' r ' are deterministic, then D is deterministic as well and necessarily $D(t, T) = P(t, T)$ for each pair (t, T) . However if rates are stochastic, $D(t, T)$ is a random quantity at time ' t ' depending on the future evolution of rates ' r ' between ' t ' and ' T '. Instead, the zero – coupon bond price $P(t, T)$, being the time t - value of a contract with payoff at time ' T ', has to be known (deterministic) at time ' t '.

$P(t, T)$ can be actually viewed as the expectation of the random variable $D(t, T)$ under a particular probability measure. It is clear that every time we need to know the present value of a future time payment, the zero – coupon bond price for that future time is the fundamental quantity to deal with. Zero – Coupon bond prices are the basic quantities in interest rate theory, and all interest rates can be defined in terms of zero – coupon bond prices. Therefore, they are often used as basic auxiliary quantities from which all rates can be recovered, and in turn zero – coupon bond prices can be defined in terms of any given family of interest rates.

In moving from zero – coupon bond prices to interest rates and vice versa, we need to know two fundamental features of rates themselves:

a) Continuously – Compounded spot interest rate.

Definition: The continuously compounded spot interest rate prevailing at time ' t ' for maturity ' T ' is denoted by $R(t, T)$ and is the constant rate at which an investment of $P(t, T)$ units of currency at time ' t ' accrues continuously to yield a unit amount of currency at maturity ' T '.

$$R(t, T) = \frac{-\ln P(t, T)}{T - t}$$

$$\text{Hence } e^{(T-t)R(t, T)} \times P(t, T) = 1$$

$$\Rightarrow P(t, T) = e^{-(T-t)R(t, T)}.$$

b) Simply – Compounded spot interest rate.

Definition: The simply - compounded spot interest rate prevailing at time ' t ' for maturity ' T ' is denoted by $L(t, T)$ and is the constant rate at which an investment has to be made to produce an amount of one unit of currency at maturity, starting from $P(t, T)$ units of currency at time ' t ', when accruing occurs proportionally to the investment time.

$$L(t, T) = \frac{1 - P(t, T)}{(T - t)P(t, T)}$$

The market LIBOR rates are simply – compounded rates, which motivates why we denote by ' L ' such rates. LIBOR rates are typically linked by zero – coupon bond prices.

INTEREST - RATE CURVES:

"When dealing with curves, nothing ever goes straight"

A fundamental curve that can be obtained from the market data of interest rate is the zero – coupon curve at a given date ' t '. This curve is the graph of the function mapping maturities into rates at times ' t '.

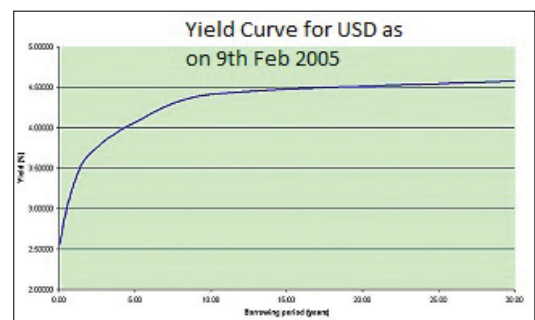
Definition:

Zero – Coupon Curve

The zero – coupon curve (also called yield curve) at time ' t ' is the graph of the function:

$$T \rightarrow L(t, T)$$

Such a zero – coupon curve is also called the term structure of interest rates at time ' t '. It is a plot at time ' t ' of simply compounded interest rates for all maturities T up to one year and of annually compounded interest rates for all maturities T larger than one year.



Zero – Bond Curve : The zero – bond curve at time ' t ' is the graph of the function

$$T \rightarrow P(t, T), \quad T > t$$

Which, because of the positivity of the interest rates, is a T – decreasing function starting from $P(t, t) = 1$. This curve is also referred as term structure of discount factors.

The former is monotonic, while the latter can show several possible shapes. For example, in the continuously compounded case, the zero coupon rates involve a logarithmic transformation of the almost linear zero coupon bonds, which lead to larger a variability than that shown by the bonds themselves.

FORWARD RATES:

Forward rates are characterized by three time instances, namely the time ' t ' at which the rate is considered, its expiry T and its maturity S , with $t \leq T \leq S$. Forward rates are interest rates

which can be locked in today for an investment in future time period, and are set consistently with the current term structure of discount factors. A forward rate can be defined through a prototypical forward – rate agreement (FRA). A FRA is a contract involving three time instances: The current time 't', the expiry time $T > t$, and the maturity time $S > T$. The contract gives its holder an interest rate payment for the period between T and S. At the maturity S, a fixed payment based on a fixed rate K is exchanged against a floating payment based on the spot rate $L(T, S)$ resetting in T and with maturity S. Basically this contract allows one to lock in the interest rate between time T and S at a desired value K, with the rates in the contract that are simply compounded. Formally at time S one receives $\tau(T, S)KN$ units of currency and pays the amount $\tau(T, S)L(T, S)N$ where N is the contract nominal value. The value of the contract in S is therefore $N\tau(T, S)(K - L(T, S))$

where both rates have same day count convention. Clearly, if L is larger than K at time T, the contract value is negative, whereas in other cases is positive. The value of the contract can be written as

$$N \left[\tau(T, S)K - \frac{1}{P(T, S)} + 1 \right]$$

Now consider the term $A = 1/P(T, S)$ as an amount of currency held at time S. Its value at time T is obtained by multiplying this amount A for the zero coupon price $P(T, S)$:

$$P(T, S)A = P(T, S) \frac{1}{P(T, S)} = 1$$

So that this term is equivalent to holding one unit of currency at time T. In turn one unit of currency at time T is worth $P(t, T)$ unit of currency at time t. Therefore, the amount $1/P(T, S)$ in S is equivalent to an amount of $P(t, T)$ in t.

Then consider the other two terms in the contract value. The amount $B = \tau(T, S)K + 1$ at time S is worth $P(t, S)B = P(t, S)\tau(T, S)K + P(t, S)$ at time t. The total value of the contract at time t is therefore

$$FRA(t, T, S, \tau(T, S), N, K) = N[P(t, S)\tau(T, S)K - P(t, T) + P(t, S)]$$

There is just one value of K that renders the contract fair at time t. This value can be obtained by equating to zero the FRA value. The resulting rate defines the (simply – compounded) forward rate.

Definition:

Simply-Compounded Forward Interest rate

The simply compounded rate forward interest rate prevailing at time t for the expiry $T > t$ and maturity $S > T$ is denoted by $F(t; T, S)$ and is defined by

$$F(t; T, S) = \frac{1}{\tau(T, S)} \left(\frac{P(t, T)}{P(t, S)} - 1 \right)$$

It is that value of the fixed rate in a prototypical FRA with expiry T and maturity S that renders the FRA a fair contract at time t. We can rewrite the FRA as

$$FRA(t, T, S, \tau(T, S), N, K) = N P(t, S) \tau(T, S) (K - F(t; T, S))$$

Therefore to value FRA we just replace the LIBOR rate $L(T, S)$ in the value of the contract with the corresponding forward rate $F(t; T, S)$ and then take the present value of the resulting (deterministic) quantity. The forward rate $F(t; T, S)$ may thus be viewed as an estimate of the future spot rate $L(T, S)$, which is random at time t, based on market conditions at time t. In particular $F(t; T, S)$ is the expectation of $L(T, S)$ at time t under a suitable probability measure.

When the maturity of the forward rate collapses towards its expiry, we have the notion of instantaneous forward rate. Mathematically it can be expressed as

$$\lim_{S \rightarrow T+} F(t; T, S) = -\frac{1}{P(t, T)} \frac{\partial P(t, T)}{\partial T} = -\frac{\partial \ln P(t, T)}{\partial T}$$

Definition:

Instantaneous Forward Interest Rate

The instantaneous forward interest rate prevailing at time t for the maturity $T > t$ is defined as

$$f(t, T) = \lim_{S \rightarrow T+} F(t; T, S) = -\frac{\partial \ln P(t, T)}{\partial T}$$

$$\text{where } P(t, T) = \exp \left(\int_t^T f(t, u) du \right)$$

Here we assume smoothness of the zero coupon price function $T \rightarrow P(t, T)$ for all T. Instantaneous forward rates are fundamental quantities in the theory of interest rates. Indeed it turns out that one of the most general ways to express fairness of an interest rate model is to relate certain quantities in the expression for the evolution of f. By fairness we refer to is the absence of arbitrage opportunity.

INTEREST RATE SWAPS AND FORWARD SWAP RATES

The fairness of FRA can be invoked to define forward rates. A generalization of the FRA is the interest rate swaps

(IRS). A prototypical Payer Interest Rate Swaps (PFS) is a contract that exchanges payments between two differently indexed legs, starting from a future time instant. At every instant T_i in a prespecified set of dates $T_{\alpha+1}, \dots, T_{\beta}$ the fixed legs pay out the amount

$$N \tau_i K,$$

Corresponding to a fixed interest rate K, a nominal value N and a year fraction τ_i between T_{i-1} and T_i , whereas the floating leg pays the amount

$$N \tau_i L(T_{i-1}, T_i)$$

Corresponding to the interest rate $L(T_{i-1}, T_i)$ resetting at the previous instant T_{i-1} for the maturity given by the current payment instant T_i , with T_{α} a given date. Clearly the floating – leg rate resets at dates $T_{\alpha}, T_{\alpha+1}, \dots, T_{\beta}$ and pays at dates $T_{\alpha+1}, \dots, T_{\beta}$. We set $\tau = \{\tau_{\alpha+1}, \dots, \tau_{\beta}\}$

When the fixed leg is paid and the floating leg is received the IRS is termed Payer IRS (PFS), whereas in the other case we have a Receiver IRS (RFS).

The discounted payoff at time $t < T_{\alpha+1}$ of a PFS can be expressed as

$$\sum_{i=\alpha+1}^{\beta} D(t, T_i) N \tau_i (L(T_i - 1, T_i) - K),$$

Whereas the discounted payoff at time $t < T_{\alpha}$ of a RFS can be expressed as

If we view this last contract as a portfolio of Fras, we can value each FRA and then add up the resulting values. We thus obtain

$$\begin{aligned} RFS(t, T, \tau, N, K) &= \sum_{i=\alpha+1}^{\beta} FRA(t, T_i - 1, T_i, N, K) \\ &= -NP(t, T_{\alpha}) + NP(t, T_{\beta}) + N \sum_{i=\alpha+1}^{\beta} \tau_i K P(t, T_i). \end{aligned}$$

The two legs of an IRS can be seen as two fundamental prototypical contracts. The fixed leg can be thought of as a coupon – bearing bond, and the floating leg can be thought of as a floating – rate note. An IRS can then be viewed as a contract for exchanging the coupon bearing bond for the floating rate note.

We have seen that requiring FRA to be fair leads to the definition of forward rates. Analogously, we may require the IRS to be fair at time t, and we look for a particular value K such that the above contract value is zero. This leads to the definition of forward swap rates.

Definition:

The forward swap rate $S_{\alpha, \beta}(t)$ at time t for the sets of times T and year fractions τ is the rate in the fixed leg of the above IRS that makes the IRS a fair contract at

the present time, i.e. it is the fixed rate K for which $RFS(t, T, \tau, N, K) = 0$. We obtain

$$S_{\alpha, \beta}(t) = \frac{P(t, T\alpha) - P(t, T\beta)}{\sum_{i=\alpha+1}^{\beta} \tau_i P(t, Ti)}$$

INTRODUCTION TO INTEREST RATE DERIVATIVE PRODUCTS:

Interest Rate Caps / Floors and Swaptions

a) Interest rate caps/floors

A cap is a contract that can be viewed as a payer IRS where each exchange payment is executed only if it has a positive value. The cap discounted payoff is therefore given by

$$\sum_{i=\alpha+1}^{\beta} D(t, Ti) N \tau_i (L(Ti - 1, Ti) - K)^+.$$

Analogously, a floor is equivalent to a receiver IRS where each exchange payment is executed only if it has a positive value. The floor discounted payoff is given by

$$\sum_{i=\alpha+1}^{\beta} D(t, Ti) N \tau_i (K - L(Ti - 1, Ti))^+.$$

Where do the terms "caps" and "floor" originate from?

Suppose a company is LIBOR indebted and has to pay at certain times $T_{\alpha+1}, \dots, T_{\beta}$ the LIBOR rates resetting at times $T_{\alpha+1}, \dots, T_{\beta-1}$ with associated year fractions $\tau = \{\tau_{\alpha+1}, \dots, \tau_{\beta}\}$ and assume that the debt notional amount is one. Set $T = \{T_{\alpha}, \dots, T_{\beta}\}$. The company is afraid that the LIBOR rates will increase in future, and wishes to protect itself by locking the payment at a maximum "cap" rate K . In order to do this, the company enters a cap with the payoff described above, pays its debts in terms of LIBOR rate L and receives $(L-K)^+$ from the cap contract. The difference gives what is paid when considering both contracts:

$$L - (L-K)^+ = \min(L, K).$$

This implies that the company pays at most K at each payment date, since its variable (L -indexed) payments have been capped to the fixed rate K , which is termed the strike of the cap contract, more briefly cap rate. The cap, therefore can be seen as a contract that can be used to prevent losses from large movements of interest rates when indebted at a variable (LIBOR) rate.

A cap contract can be decomposed additively. Its discounted payoff is the sum of a sum of terms such as

$$D(t, T_i) N \tau_i (L(T_{i-1}, T_i) - K)^+$$

Each such term defines a contract that is called caplet. The floorlet is defined in an analogous way.

It is a market practice to price a cap with the following sum of Black's formulas (at time zero)

$$\text{Cap}^{\text{Black}}(0, T, N, K, \sigma_{\alpha, \beta}) = N \sum_{i=\alpha+1}^{\beta} P(0, Ti) \tau_i \text{BI}(K, F(0, Ti - 1, Ti), v_i, 1)$$

where, denoting by Φ the standard Gaussian cumulative distribution function,

$$\text{BI}(K, F, v, u) = F \omega \Phi(d_1(K, F, v, u)) - K \omega \Phi(d_2(K, F, v, u))$$

$$d_1(K, F, v, u) = \frac{\ln\left(\frac{F}{K}\right) + v^2 u^2 / 2}{v}$$

$$d_2(K, F, v, u) = \frac{\ln\left(\frac{F}{K}\right) - v^2 u^2 / 2}{v}$$

$$v_i = \sigma_{\alpha, \beta} \sqrt{T_i - 1}$$

with the common volatility parameter $\sigma_{\alpha, \beta}$ that is retrieved from the market quotes. Analogously the floor is priced according to the formulae

$$\text{Flr}^{\text{Black}}(0, T, N, K, \sigma_{\alpha, \beta}) = N \sum_{i=\alpha+1}^{\beta} P(0, Ti) \tau_i \text{BI}(K, F(0, Ti - 1, Ti), v_i, -1)$$

There are several caps and floor whose implied volatilities are quoted by the market.

b) Swaptions

These derivatives termed swap options or swaptions, are options on an IRS. There are two versions of this product: a payer version and a receiver version.

A European payer swaption is an option giving the right to enter a payer IRS at a given future time, the swaption maturity. Usually the swaption maturity coincides with the first reset date of the underlying IRS. The underlying IRS length ($T_{\beta} - T_{\alpha}$) is called tenor of the swaption. Sometimes the set of reset and payment dates is called tenor structure. We can write the discounted payoff of a payer swaption by considering the value of the underlying payer IRS at its first reset date T_{α} , which is also assumed to be the swaption maturity. Such a value is given by

$$N \sum_{i=\alpha+1}^{\beta} P(T_{\alpha}, Ti) \tau_i (F(T_{\alpha}, Ti - 1, Ti) - K)$$

The option is exercised only if this value is positive, so that, to obtain the swaption payoff at time T_{α} , we have to apply the positive part operator. The payer - swaption payoff, discounted from maturity T_{α} to the current time, is thus equal to

$$N D(t, T_{\alpha}) \left[\sum_{i=\alpha+1}^{\beta} P(T_{\alpha}, Ti) \tau_i (F(T_{\alpha}, Ti - 1, Ti) - K) \right]^+ +$$

Contrary to the cap case, this payoff cannot be decomposed in more elementary products. Indeed we have seen that caps can be decomposed into the sum of the underlying caplets, depending on a single forward rate. One can deal with each caplet separately,

deriving results that can be finally put together to obtain results on the cap. The same does not hold for swaptions. From algebraic point of view, this is essentially due to the fact that the summation is inside the positive part operator, and not outside like the cap case. As a consequence, in order to value and manage swaptions contracts, we will need to consider joint action of the rates involved in the contract payoff. From mathematical point of view, terminal correlation between different rates could be fundamental in handling swaptions. The term terminal is used to stress we are not considering the instantaneous correlations.

Conclusion:

The quality of a derivatives model should be judged not just on the basis of its ability to price today's hedging instruments, but also on the basis of the quality of the hedges it suggests. We believe that these hedges can be good only if the model is rooted in empirical financial reality.

Until recently choosing between fitting today's prices very accurately and being respectful of 'financial reality' entailed making hard choices. For instance, some approaches, such as local-volatility modelling fulfilled very well the first set of requirements (perfect fitting of today's smile). This made local volatility models very popular with some traders. Yet, the dynamics of the smile these models implied were completely wrong. SABR model was introduced to remedy the wrong dynamics imposed by the local volatility framework. This is not just because the SABR model has become the market standard to reproduce the price of European options. It is also because it is a good model for European options. Again, pragmatism certainly played a part in its specification as well. A log-normal choice for the volatility process is not ideal, both from a theoretical and (sometimes) from a computational point of view. However, the great advantages afforded by the ability to have an analytic approximation to the true prices, the ease of calibration and the stability of the fitted parameters have more than offset these drawbacks. The main strength of the SABR model, however, is that it is financially justifiable, not just a fitting exercise.



Shri J. T. Ranadive

Jaysing Trimbak Ranadive, one of the luminaries of the Indian Actuarial Profession was born on 16th December 1913 in Pune. This year is his centenary year and on this occasion it will be in fitness of things to remember him.

Born in a large family, Shri Ranadive was sixth among his siblings. Some of his elder siblings were political activists belonging to the Communist Party.

After his graduation in Mathematics, Shri Ranadive took up the actuarial career and qualified as an actuary in 1947. He was working in the Oriental Government security Life insurance Company as an Assistant Actuary at the time of nationalization of the life insurance industry. He was thereafter posted as an Assistant Actuary in the LIC central office where he was involved in the process of settlement of compensation to private insurance companies whose life insurance business was taken over by the LIC. This was a unique exercise nowhere undertaken on this scale anywhere in the world. This was followed by the process of classifying the with profit portfolios of different companies into suitable groups based on their profit earning capacities for the purpose of future bonus allocation in relation to the profit earning capacity of LIC's own policy. This again was a unique exercise not undertaken anywhere else on this scale. The LIC was given an index of 10 and others were given indices from 0 onwards. A policy with index x was to be given $10x\%$ of the LIC. The policy with index 1 will get 10%, with index 2 will get 20% and so on with policy with index 10 getting bonus equal to LIC. Similarly if index was 12 the policy will get 120% of LIC Bonus. After a lapse of a few years all policies with index less than 10 were brought on par with the LIC policies to give them benefit of LIC management. This process was though generally welcomed was criticized by some, who felt that complete fairness was lacking as the process was not discussed at the forum of the then Actuarial Society of India. The Government made minor revisions in the classification to bring a greater measure of satisfaction.

During the 1950s, Shri Ranadive was taking tuition classes on behalf of the Institute of Actuaries, UK, in Mumbai for students appearing for the Institute, in the subject of life contingencies.

Shri Ranadive was also part of the team set up by LIC to defend its officials before the Justice Chagla commission set up to investigate LIC's investments in Mundhra Group of Companies.

Shri Ranadive was a part of the three member Study Team of officers of LIC who went to the

USA to study the latest developments in the life Insurance industry in the year 1962. All the three members in the team were Actuaries. Shri R. M. Mehta and Shri N. V. Nayudu were the other members. The team on its return presented its report, one of the recommendations was the introduction of computers for the service of the LIC policyholders. After consideration of the recommendations it was decided, among other matters, to install computer based servicing system in two of the then largest divisions of LIC namely, Mumbai and Kolkata, which both had then about 7.5 lakh policies in force. Accordingly Electronic Data Processing Departments were set up for the two Divisions. The Mumbai Department was made part of the Central Office and Kolkata Department was made part of the Zonal office there. The Central Office Department was in control of the Kolkata office. In early 1954 aptitude tests were given by the suppliers of the two computer systems, IBM in Mumbai and ICL in Delhi, to select the teams for the two centres. Shri Ranadive was put in charge of this Department with his office at the central office as Manager (EDP) and Shri Sessa Ayyar as Assistant Manager in Mumbai and Shri D. Basu as Assistant Managers of Mumbai and Kolkata offices respectively. Incidentally they too were Actuaries.

The first batch of officers selected for the Mumbai Department were given training in System Development and programming in Mumbai by the IBM through a programme starting on 24th August 1964. Shri Ranadive himself attended this programme. While the computer machines ordered took some time to reach the LIC the two teams were involved in detail planning of the process of converting the current records into computer based records and developing the policy record maintenance system and processing it through various computer programmes to get the desired outputs from the system. The LIC then decided to send the Shri Ranadive to US and UK along with the Manager in Mumbai and Kolkata to the respective countries. Mumbai was an USA based JBM Machine and Kolkata was UK based ICL System. The Mumbai Team went in July 1965 for a three month period while in October the Mumbai manager returned to Mumbai from USA and Kolkata Manager joined Shri Ranadive in London to return in December. The process of system development gathered momentum after return of Shri Ranadive. The computer system in Mumbai arrived in Mumbai during that period and in the meantime two more batches of officers joined both the centres. After a process of detailed discussions a system was developed under the leadership of Shri Ranadive to daily pass the policy records maintained on magnetic tape through the

system to produce daily documents for office use in respect of policyholder system. The input to the system was in the form of punched cards fed to the in respect of changes in policy records and getting an output in printed form for the use of the LIC. The system was largely based on the Consolidated Functions Ordinary Life being used in USA with changes required for policies in India. It is a tribute to the leadership of Shri Ranadive that the first outputs from the system were welcomed by the employees and policyholders. The first day when these outputs were formally used for policy servicing was 17th July 1967. This was after thorough testing and parallel run over a long period. The entire process of computerization was completed in 1973 and since then the process has continued uninterrupted. Changes had to be made from time to time to take advantage of latest developments in information technology both in terms of software and hardware. We back in the late 60s a blueprint was drawn to utilize telecommunication facilities as and when they were available. The current predominant position of the LIC in the use of MInformation Technology is largely due to the foresight of late Shri Ranadive and other Managers who followed him.

Though the process of computerization in Mumbai went through safely in Mumbai, the same was stalled in Kolkata on account of opposition on behalf of Employees Union supported by Local Government. During that period Shri Ranadive was instrumental in opening the dialogue with the Communist Party of India through his family connections. That ensured a senior leader of the party visited Mumbai for a dinner meeting with the Chairman LIC and others. Though the Unions thereafter maintained their stand to oppose, they did not resist Management's attempts to proceed further.

Another notable contribution of Shri Ranadive was his bold valuation recommendation that any policy changes by Management which had a bearing on cost had to be vetted by the Actuary to assess its impact on valuation surplus and policyholder's bonuses.

After his retirement from LIC he had served as an Actuarial advisor to the Government of Kenya where he contacted some lung infection which ultimately led to his untimely death on 26th December 1978. Had he lived longer, he would have made significant contribution to Actuarial thinking.

In his personal life, Shri Ranadive was a good chess player and loved Indian Classical Music. His wife Dr Mrs. Kamal Ranadive was a renowned cancer researcher and had received international awards. Unfortunately she is also not living. His only son is an Engineer settled in USA.

■■■



MEET MR. BARBER: MODELING GENDER EQUALIZATION FOR DEFERRED ANNUITIES – PART II

THIS IS THE SECOND AND FINAL PART OF THE ARTICLE PUBLISHED IN THE OCTOBER 2013 ISSUE OF 'THE ACTUARY INDIA'. IN THE FIRST PART WE DISCUSSED THE BACKGROUND OF CALCULATIONS INVOLVED IN BARBER ADJUSTMENT. IN THIS ARTICLE WE WILL LOOK AT AN EXAMPLE OF CALCULATIONS INVOLVED.

Example:

In this example, we have assumed that the pension accrual rate (i.e. the rate at which pension accrues to the member) is the same throughout the service period.

Member Details	
Sex	Male
Date of Birth	01/01/1956
Date of joining scheme	01/01/1981
Date of leaving (DoL)	01/01/2006
Equalization date	01/11/1993
Pre Barber NRA	65
Barber window NRA	62
Post Barber NRA	66
Benefits at date of leaving (DoL)	
Pre 88 GMP (guaranteed minimum pension)	200
Post 88 - 97 GMP	800
Pre 97 excess over GMP	4,000
Post 97 Pension	3,000
Total	8,000

Notes:

Pension of a member of pension scheme is normally broken into (i) Guaranteed Minimum Pension (GMP) and (ii) Excess over GMP for earning till 5th April 1997. After 6th April 1997, statute removed the bifurcation of pension in GMP and Excess over GMP. Why GMP is divided into Pre 88 GMP and Post 88 GMP? GMP which accrued prior to 5th April 1988 need not be escalated (i.e. increase after coming in to payment) unless specifically mentioned under the scheme rules. For GMP accrued after 6th April 1988, statute requires minimum escalations as per LPI (0, 3). However, scheme rules can provide for escalations at a higher rate than LPI (0, 3).

Why Excess over GMP is divided into Pre 85 Excess over GMP and post 85 excess over GMP? Excess over GMP accrued before 01/01/1985 need not be statutorily revalued (i.e. increase before coming in to payment) for deferred member. However, excess over GMP accrued after 01/01/1985 has to be compulsorily revalued as per Section 52A of the Social Security Act.

Why is the total pension divided into Post 2005 Pension and Post 1997 pension? After 6th April 1997 bifurcation of pension into GMP and Excess over GMP was statutorily removed. After 6th April 2005 minimum statutory rate of pension escalation was reduced from LPI (0, 5) to LPI (0, 2.5).



When calculating the splits of benefits into Barber/Non-Barber the following 5 steps are used:

Step 1

Service Period Splits

Calculate amount of service during each of the below periods:

- Pre 1978 – Benefits were started to be given in the name of GMP from 1978
- 1978 - 85 – Statute required excess over GMP to be revalued from 1985
- 1985 - 88 - Statute required GMP to be escalated from 1985
- 1988 – 90 – Barber window start date
- 1990 – Equalisation (1993 in example) – Barber window
- Equalisation – 97 – GMP was abolished from 1997

Finer splits may be required to model scheme benefits. For example if the benefit escalation is different for pre 85 and post 85 excess (XS) over GMP then a further split

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of 1978 – 1985 and 1985 – 1988 will be required. For member in example referred above, it results in a service split as illustrated below:

Service Period Splits (in years)								
Pre	to	to	to	to	to	to	Post	Total service
06/04/1978	01/01/1985	05/04/1988	17/05/1990	01/11/1993	05/04/1997	05/04/2005	06/04/2005	
Pre 78	78 – 85	85 – 88	88 – 90	90 – 93	93 – 97	97 – 05	Post 05	
-	4.00	3.26	2.11	3.46	3.43	8.00	0.74	25.00

Yearfrac function of MS Excel is used for computing above splits.

Step 2

Total Pension Split

Calculate proportion of total pre 97 pensions accrued during each service period e.g. pre 1978, 1978-88, 88-90, 90-equalisation, equalisation-97. Note that the total pre 97 pension includes GMP.

Total pension split								
Pre 78	78 – 85	85 – 88	88 – 90	90 – 93	93 – 97	97 – 05	Post 05	Total
-	1,230	1,003	649	1,064	1,054	2,746	254	8,000

Step 3

GMP Split

Calculate separate proportions of pre and post 88 GMP accrued during these periods. The post 88 GMP is the important one as this is the one which will have a post 1990 element i.e. Barber window benefits.

GMP Split				
78 – 85	85 – 88	88 – 90	90 – 93	93 – 97
110	90	188	308	305

Pre Barber (NRA 65)				Barber Window (NRA 62)		Post Barber (NRA 66)			
Pre 85 XS	85 – 90 XS	Pre 88 GMP	88 – 90 GMP	90 – 93 XS	90 – 93 GMP	93 – 97 XS	97 – 05 XS	Post 05 XS	93 – 97 GMP
1,120	1,374	200	188	756	308	749	2,746	254	305

Finally the benefits can be re-arranged as follows:

NRA 65		NRA 62		NRA 66	
Pre 88 GMP	200	Pre 88 GMP	-	Pre 88 GMP	-
Post 88 GMP	188	Post 88 GMP	308	Post 88 GMP	305
Pre 97 XS	2,494	Pre 97 XS	756	Pre 97 XS	749
Post 97 pension	-	Post 97 pension	-	Post 97 pension	3,000
Total Pension	2,882	Total Pension	1,064	Total Pension	4,054

Step 4

Total excess over GMP Split

Calculate the excess over GMP accrued in each service period as 2 minus 3.

Total XS split							
Pre 78	78 – 85	85 – 88	88 – 90	90 – 93	93 – 97	97 – 05	Post 05
-	1,120	913	461	756	749	2,746	254

Step 5

Please refer to table 'NRA of each service period' and columns 'NRA 65, 62 & 66' to understand the age from which benefits in a period will be payable. Cash flow projection for deferred annuity pricing will start from three different dates for different pension components based on that component's NRA.

Assign NRA for each service period and arrange the XS and GMP splits as per their respective NRAs.

NRA of each service period		
NRA 65	NRA 62	NRA 66
Pre 78	90 – 93	93 – 97
78 – 85		97 – 05
85 – 88		Post 05
88 – 90		

These benefits can be valued from their respective NRAs by projecting pension cash

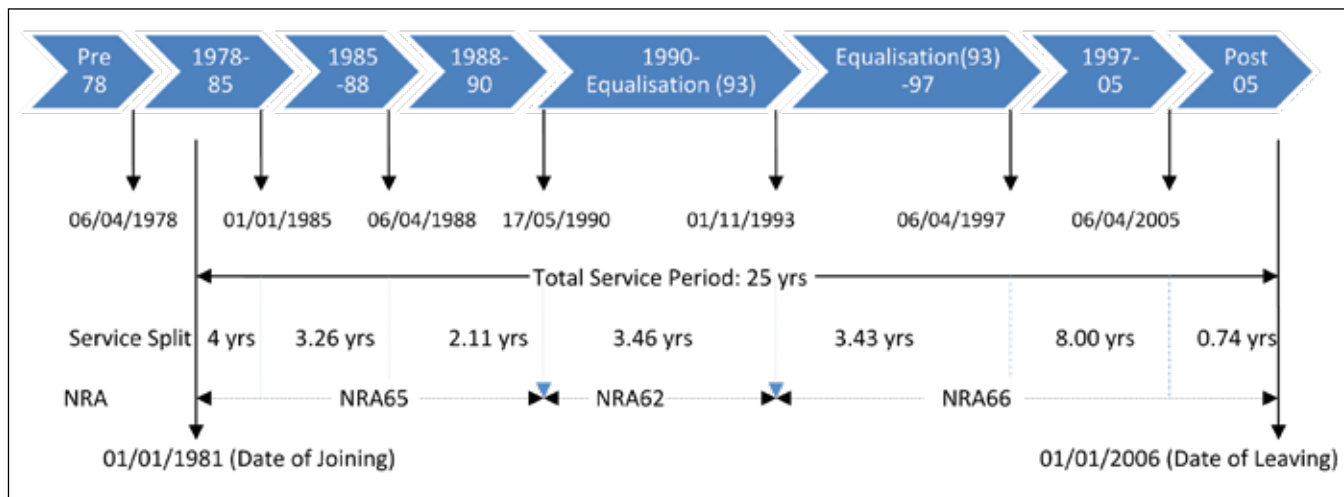
flows from the NRA allowing for the increase that the pension will receive as per scheme rules and statutory requirements and discounting them to the date of valuation. Any increases in benefits because of inflation during the period between member leaving the scheme and retirement are known as revaluation increases. Any increases in benefits because of inflation after a member retires are known as escalation increases. Escalation and revaluation rates normally differ. This is also one of the reasons for splitting the benefits into pre barber period, barber window and post barber period.

The calculation steps can be summarized as shown in diagram on pg 21.

illustration of the calculations in Excel:

The whole issue of calculating splits can become more complicated when the benefits contained in the data are inconsistent with the service dates (e.g. a post 1988 joiner having pre 88 GMP). These normally imply that member has accrued pension in another scheme and then transferred in those benefits to the scheme in consideration. These transferred-in benefits are included within the data without being explicitly stated as transferred-in benefits. These cases should be identified and a sensible approach should be taken for valuation.

Example: There may be members with NRA of 65 who joined after April 1988 but have Pre 88 GMP benefits. At times it will be reasonable to assume that these benefits have been transferred-in from another pension scheme and are payable from age 65.



A	B	C	D	E	F	G	H	I	J	K	L
Start date	End Date	Period	Calculation	GMP split	Calculation	Total		Excess over GMP		Member Details	
01-01-81	01-01-85	4.00	=YEARFRAC(A2,B2,1)	110	=200*(C2/(C2+C3))	1,230	=200+800+4000)*C2/SUM(SCS2:SCS6)	1,120		Sex	Male
01-01-85	06-04-88	3.26	=YEARFRAC(A3,B3,1)	90	=200-E2	1,003	=200+800+4000)*C3/SUM(SCS2:SCS6)	913		Date of Birth	01-01-56
06-04-88	17-05-90	2.11	=YEARFRAC(A4,B4,1)	188	=800*C4/SUM(SCS4:SCS6)	649	=200+800+4000)*C4/SUM(SCS2:SCS6)	461		Date of joining scheme	01-01-81
17-05-90	01-11-93	3.46	=YEARFRAC(A5,B5,1)	308	=800*C5/SUM(SCS4:SCS6)	1,064	=200+800+4000)*C5/SUM(SCS2:SCS6)	756		Date of leaving (DoL)	01-01-06
01-11-93	06-04-97	3.43	=YEARFRAC(A6,B6,1)	305	=800*C6/SUM(SCS4:SCS6)	1,054	=200+800+4000)*C6/SUM(SCS2:SCS6)	749		Equalization date	01-11-93
06-04-97	06-04-05	8.00	=YEARFRAC(A7,B7,1)	0		2,746	=3000*C7/SUM(SCS7+SCS8)	2,746		Pre Barber NRA	65
06-04-05	01-01-06	0.74	=YEARFRAC(A8,B8,1)	0		254	=3000*C8/SUM(SCS7+SCS8)	254		Barber window NRA	62
	Total	25.00	=SUM(D2:D8)	1,000	=SUM(E2:E8)	8,000	=SUM(G2:G8)	7,000		Post Barber NRA	66
										Benefits at date of leaving (DoL)	
	Broad split - period	Finer split - period	Amount	Calculation	Broad split - Amount					Pre 88 GMP	200
		Pre 85 XS	1,120	=I2						Post 88 - 97 GMP	800
		85 - 90 XS	1,374	=I3-I4						Pre 97 excess over GMP	4,000
	Pre Barber	Pre 88	200	=E2-E3						Post 97 Pension	3,000
	(NRA 65)	88 - 90	188	=E4						Total	8,000
	Window	90 - 93 XS	756	=I5							
	(NRA 62)	GMP	308	=E5							
		93 - 97 XS	749	=I6							
	Post	97 - 05 XS	2,746	=I7							
	Barber	Post 05 XS	254	=I8							
	(NRA 66)	GMP	305	=E6							
	Total	8,000	=SUM(C13:C21)		8000						

Conclusion:

The most important assumptions in the above method are that (i) the accrual rates remain the same throughout the service period and (ii) are the same for GMP and Non GMP benefits. The above method provides a simplified approach to value the pension benefits. Data issues and number of deferred scheme members bring in additional complexity in pricing of deferred annuities. Usually for a pension scheme with Barber equalization, the equalization of GMPs and excess over GMP is taken care of separately.

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Vote of thanks:

Our sincere thanks to Jyotsna Kaushik for her inputs.



"Coin Always Makes Sound But The Currency Notes Are Always Silent.
So When Your Value Increases Keep Yourself Calm Silent"

Shakespeare



RISK OF CLIMATE CHANGE-ROLE OF AN ACTUARY

Introduction

"The task is not so much to see what no one yet has seen, but to think what nobody yet has thought about that which everybody sees."

-Arthur Schopenhauer, 1788-1860

The climate change is one such task where little progress has been made. The climate plays a paramount role for the earth's ecosystem. The movie "An Inconvenient Truth" where Mr. Al Gore has shown the effects of global warming extends the perspective that a proper attention is required towards our environment otherwise the consequences could be fatal. By means of detailed presentation, graphics and visuals, Al Gore has tried to convince the world that the environment degradation is reversible if adequate steps are taken in a timely manner. This is also shown by science fiction movie "The Day After Tomorrow" where ocean temperature has dropped and caused massive destruction. Fine, let us talk about the real world and facts. According to a recent World Bank's report, the annual cost of environment degradation in India is about ₹ 3.75 trillion (5.7% of India's GDP in 2009). The recent event of Uttarakhand devastation has shocked everybody. Many have lost their lives and many have become homeless. The scale of devastation has put questions on the environmental norms that have been neglected time and again. As per the latest reports, the size of the losses estimated by insurance companies would be in the range of INR 1500-3,000 crores¹. There appears to be insensitivity to Himalayan ecology. Continuous melting of ice at the Arctic region, if not controlled, would cause entire Arctic sea to be disappeared by 2040ⁱⁱⁱ. All these things point to one fact that there is indeed a potential risk to our environment. Moreover, there are ample stakeholders who are burning the mid night oil trying to study our environment and presenting their

careful analysis to the society. Some of them include academic researchers, scientists, climatologists, energy consultants and **actuaries!!**. The people studying climate change comes primarily from academia, sustainability organizations and actuarial associations.

Impact of climate change on insurance

Table 1 Potential Impact of climate change on various branches

Changes in climate phenomena	Sensitive activities	Sensitive insurance branches
Hot temperature extremes	Electricity, human settlements, forests, agriculture, water resources, industry, health, tourism	Health, life, crop, property, business interruption
Cold temperature extremes	Agriculture, electricity, health, transport, human settlements	Health, crop, property, business interruption, vehicle
Heavy rainfall flooding	Human settlements, agriculture, transport, water quality, tourism	Property, flood, vehicle, business interruption, health, crop, marine
Drought, wildfire	Forests, agriculture, water resources, hydro-electricity, human settlements	Crop, property, health
Storms, cyclones	Forests, electricity distribution, human settlements, agriculture	Property, vehicle, aviation, marine, business interruption, life
Sea-level rise, tidal surge, coastal inundation	Coastal zone infrastructure, agriculture, industry, and tourism	Life, marine, property, crop

Source: Insuring climate risk in India, Are we prepared, TERI 2005

The table broadly represents the effect of various climate change patterns on different branches of insurance industry. Climate change affects the insurance claims as people would file for claims after any disaster. People look at the insurance as an agent for transfer of risk. In US, the insured losses have been increased from US \$5.1 billion in 1989 to US \$27 billion^{iv} over the last two decades. The claims for floods could be £5.1bn^v in central Europe this year. The equivalent figure was £400 million in UK last year. In UK, the government and the industry has

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reached a consensus where the government can cap the premium, linking it to council tax bands. In India where more than 70% of the population lives in villages, there could be a good

market for insurance in rural areas. Hence, crop insurance becomes paramount. The farmers can have protection against climate change events. However, it is the actuary who will determine the pricing of crop products.

Table 2: Natural Catastrophe Worldwid

As we see from the table 2, the insured losses form 21% of the overall losses throughout the world. However, there is a huge variation from the developed to developing nations. While in parts of Africa, this ratio is close to 1%, in

	Average of the last 30 years 1983-2012 (Jan-June)	Top year 1983-2012 (Jan-June)
No. of events	300	2012 620
Overall losses in US\$	61,600	2011 (Earthquake Japan) 302,000
Insured losses in US\$	13,500	2011 (Earthquake, Japan) 82,000

Source: Munich Reinsurance 2013 Half Year Natural Catastrophe Review

developing nations such as China it is close to 4%, indicating potential in at least developing nations where insurance can reach the masses.

Need of actuaries

This clearly reflects huge opportunity in creating products and assessing risks for the climatic pattern. In some parts of the world, there are water problems and soil degradation affecting food chain supply. While in others, there is oil crisis looming around the corner which could affect global economies. According to IPCC, 0.5 degree rise in winter temperature would reduce Indian wheat yield by 0.45 tons per hectare. As we are advancing into future, these life threatening calamities appears to be more frequent and show some sort of correlation among them. There appears to be no historical pattern for these climatic shifts. Hence, there is a need of niche actuarial skills in modeling and predicting future climatic changes. The obvious question might be that why actuaries are needed when climate scientists are also involved. While climatologists, scientists and other researcher might be having deep domain knowledge about the climate, an actuarial skill is useful to quantify the impact of potential risk mitigation using uncertainty management. Actuaries are the experts in risk modelling and can help the scientists by giving data driven useful insights on the occurrence of events. They are also capable of predicting to a certain extent the occurrence of the event. Climate risks hence pose a challenging career for the professionals and actuaries have a great role to play.

Role of Actuary and career

Actuaries are involved in various roles for climate risks. In most of the cases,

the role of actuaries is to do an impact analysis of the climate on the nations' economies, industries and various regions that could be impacted. By understanding these patterns, risks return relationships, they could not only advise the companies on the various products that could be offered in those regions but also advise the governments on various extremes that are likely to take place in the future.

Some of areas are:-

- 1) **Insurance Pricing:** - Here, the actuaries are involved in pricing of weather related claims. Companies such as Weather Risk Management Services Ltd focuses on providing protection again unpredictable weather by providing forecasts and weather index based financial products
- 2) **Micro insurance:** - This requires accounting for various factors such as sowing season, geographical aspects, water usage etc. In India one such mission is called as "Weather Based Crop Insurance". The Agriculture Insurance Company in India provides this insurance to various farmers.
- 3) **Sustainable and Green Insurance:-** This is one such area where insurance companies work on risk avoidance rather than risk mitigation. Some of the work includes^{vi}:-
 - a. structuring the additional coverage after the claim so as to restore the property with environmentally friendly alternatives
 - b. Determining auto insurance and risks for clients who use hybrid electric vehicles

The companies such as The Co-

operators (Canada based company) are involved in home construction with builders advocating higher standards of construction so that the losses in the case of major catastrophes are minimized. Lower losses would release pressure on the insurance companies.

4) **Energy consulting:** The actuaries are involved in the functional areas like various regulatory regimes governing disposal of nuclear waste. From the company's perspective, actuaries can help them in understanding the distribution of emissions (type of waste, future waste in accordance to the facility layout and structure). New areas such as demand forecasting for power during peak load becomes significant. Even though the existing trend analysis techniques are sufficient, the unpredictability of climate change asks for new techniques such as extreme value theory^{vii}.

5) **Carbon trading:** Many countries are serious about the emission reduction and are ready to purchase and trade on carbon credits. This requires a careful attention and is an upcoming area. In India, The Energy Conservation Act 2001 provides some grounding and the need for energy conservation. For this NAPCC (National Action Plan for Climate Change) has been formed with the already launched PAT (Perform, Achieve and Trade) scheme under NMEE (National Mission for Enhanced Energy Efficiency). Already, the government has mandated to reduce the energy consumption of eight industrial sectors of Indian economy. The energy targets have to be based on the relative comparison among the plants. The relative comparison would be in terms of the parameters such as vintage, production capacity, raw material quality, product mix etc. Moreover, for each plant the exposure from future emissions from the waste facility has to be estimated and controlled. The actuarial techniques could be used to model these variables under

various assumptions and to build a framework that optimizes the efficiency for the plants. The techniques such as Data envelopment analysis could be used for comparing the performance of these plants.

- 6) **Insurance Product design** catering to the local markets based on environment assessment
- 7) **Strategic advise/consulting** to the industries, government and to regulator

Various products are coming into the market in the areas of renewable energy, weather derivatives and even political risks and insurance. Apart from the traditional areas mentioned above, a new area of constructing and implementing weather based index is gaining importance.

Some of the prominent actuarial bodies working for climate risk are:-

1. CAS Climate change Committee is the parent committee of Climate Index Working Group (CIWG), US.
2. Society of Actuaries
3. Canadian Institute of Actuaries
4. American Academy of Actuaries' Property/Casualty Extreme Events Committee
5. Institute of Actuaries of Australia
6. Institute of Actuaries of India
7. Institute and Faculty of Actuaries, UK

Apart from that many insurance companies have expanded their business units^{viii} for climate change events. This shows urgency on part of them to understand and capture the business related to climate risk:-

- 1) AIG: "Office of Environment &

Climate change: Advanced Energy solutions"

- 2) Allianz: "Climate solutions"
- 3) AON : "Agri-Fuels Group"
- 4) CHUBB: "Green Energy Team"
- 5) TRAVELERS: "Core Business climate Change Project"
- 6) Zurich: "Climate Change Advisory Council"
- 7) Agriculture Insurance company of India

Some of the companies that have India operations into environmental insurance are:-

- 1) The EI Group Inc. :- environmental, health and safety consulting firm
- 2) WSP Environment & energy: engineering and design consultancies
- 3) AIG Environmental: Environment insurance products to safeguard the clients
- 4) Marsh Inc.: Risk mitigation before and after the calamity
- 5) Environmental Risk Managers Inc.
- 6) Chubb Environmental Solutions

The climate change is a long term planning for insurance companies which are more concerned about short term risks that are bound to happen in a span of one or two years rather than waiting for an event that has to happen after 10-20 years. However, this perception is now changing. For exploring this wonderful career in weather and climate risks, apart from the superior quantitative skills, an actuary would be required to read a lot to keep abreast of the policy framework, regulatory changes and legal issues governing the climate and the country in particular. It would also help if one is aware of the recent works for various international bodies. The leading ones

are IPCC (Intergovernmental Panel on Climate Change), United Nations Environment Programme and World Metrological Organization (for weather agencies). Some sort of technical know-how on various climate events would be a double edged sword!!

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Actuarial real world insights of climate change: The case of Tajikistan

The experiences are as written by Nick silver. The complete article can be found at <http://www.theactuary.com/features/2012/04/actuaries-in-an-adventure-with-climate-change-scientists/>

Objective:- How funds be invested respect of climate science, economics and risk management for Tajikistan (test case for World's Bank's Pilot Programme for Climate Resilience (PPCR)).

About Tajikistan:- Tajikistan is a landlocked country in Central Asia of about 8 million people. It gained independence after the

collapse of the Soviet Union only to descend into a civil war in which around 100,000 people were killed.

Methodology:- Primary research by meeting stakeholders: NGOs, environment agency staff and development organizations, who gave the warning of the true situation of Tajikistan. The group then visited Tajik villages to understand the floods and drought extremes. According to the glaciologist, the floods were caused by small glaciers melting and droughts are caused when the farmers can't extract enough water from the nearby Pyanj river. The farmers in that area used to grow cotton.

Findings:- Cotton economy seems to be a politically-driven Byzantine system which

traps the farmers in perpetual poverty. Most males have left the area, mainly for Russia and remittances is Tajikistan's major source of foreign income – leaving especially vulnerable female-led households. The country has been affected by climate change, the vulnerability owing to the fact that it has declined after the Soviet era. It needed massive investment in terms of infrastructure such as roads, irrigation, power etc. The government does some form of cost benefit but actuarial type skills are urgently required. The country does not have many natural resources, but is abundant in water from the glaciers on the Pamirs – even with severe climate change they will take a long time to melt.



INFLATION EFFECT ON COMMON MAN'S CONSUMPTION

Inflation effect on Common Man through his changing consumption

Unlike the developed countries, India has very low financial literacy. Hence, theoretically there is very high probability of common financially illiterate man not doing his buying decision based on the inflation data. But from the secondary market research, this point is disproved for the recent periods especially when there is a buying and selling decision solely done by a family head over a period. This is a peculiar case in most of the not so financially literate countries.

These secondary market research have shown that, a) from the post opening of Indian economy to the external world, consumers have learned to widely perceive the price changes (could be attributable to the increasing literacy rate), b) Consumers react to the inflationary expectations with the goal of maximising their total utility (consuming now V/S consuming in the future where decision is based on the price discount rates). With reference to the secondary studies, the change in Consumer Consumption behaviour due to inflation for the Indian market could be attributed to movement in present price level and future price expectations. They are primarily of 3 types- **Uncertainty caused by inflation expectations, incorrect price perceptions and inter-temporal substitution of inflation.**

Uncertainty caused by inflation expectations will cause a consumption cliff i.e. major decline in consumption. This major uncertainty about the real income i.e. inflation adjusted nominal income, increases the savings rate for the risk-averse consumers, in general causing a permanent decline in consumption. In the absence of the

robust mechanism in India to contain the inflation uncertainty due to its own complications, the increase in inflation rate represents a shift in the state of the economy, i.e. at a higher rate of inflation there is an overall increased uncertainty. Incorrect price perception in consumption arises due to inability of consumers perceiving the changes in real income w.r.t the changes in nominal prices. If consumers fail to perceive the price increase, then he thinks that his real income is greater than its actual

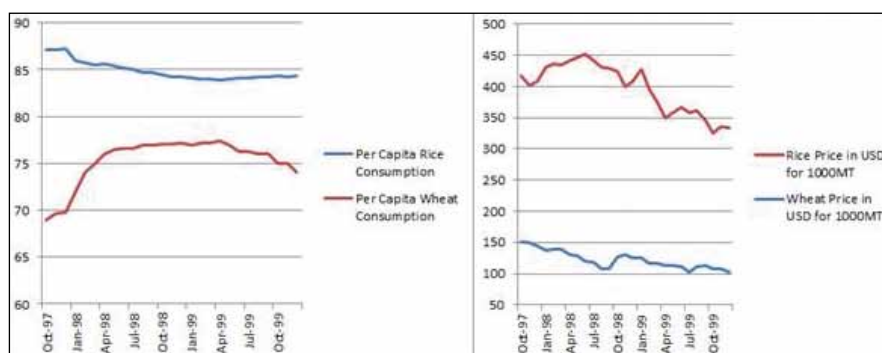


Fig: Depicts the fall in rice consumption as its price raised during 1998; wheat was the substitute of rice (Source of data files- index mundi)

value and hence consumers more or same. For the consumption function as a dependent of income, analysis is denoted by

$\frac{dC}{dP} > 0$ (assuming other parameters remain as constant).

Where C is the consumption function of Income, wages, price co-efficient and Substitution co-efficient, P is the price.

This incorrect price perception implies a permanent increase in the consumption. At last, **inter-temporal substitution**, majorly observed in the larger families or institutional buyers/manufacturers where purchase plans for the actual goods and services are advanced given the price change in positive direction i.e. price increases. If not the consumers will focus on the

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substitutes provided the price increase doesn't apply for the real substitutes.

Thus, unless inflation expectation accelerates, consumers will not increase their stock due to the obvious business gains or utility maximization. But it is less observed in Indian context compare to the developed economies unlike substitution effect. Thus **inter-temporal substitution** provided price raise implies a temporal consumption increase for the real substitutes.

The combined effects all the three types of expected price movement gives the net consumption behaviour changes (refer the graph shown earlier).

Buck does not stop here; inflationary expectations are passed on to the actual inflation with a lag, in a way increasing the difference between the predicted and the actual inflation rates. Expectations on Consumer

wages, interest rates etc. increases, especially in India in the absence of a proper infrastructure i.e. lack of acceptable financial inclusion. In case of small mismatch of expected supply of goods and services, spiralling effect takes place due to unaccounted savings especially from the rural India and from the black market.

Conclusion

In this study the common man's view on inflation is captured in the change in his consumption pattern i.e. through three broad categories a) Uncertainty caused by inflationary expectations, b) incorrect price perceptions and c) inter-temporal substitution of inflation. Below graphical analysis confirms the above analysis for the duration 2004 to 2011.

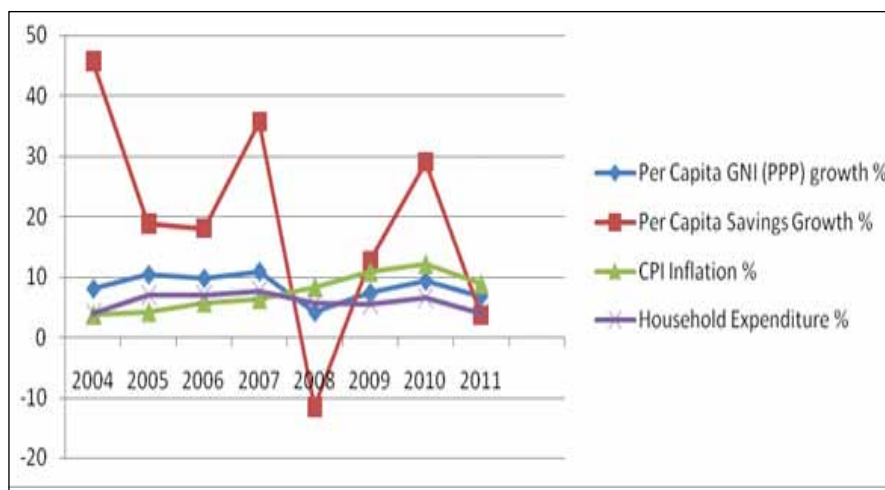


Fig: Depicts how Inflation, Per Capita Income, Per capita Savings, Per Capita consumption expenditure behaved for 2004 to 2011 in India. (Source: World Bank reports)

This has clearly established the necessity for better measurement while designing the economic policies of the country.

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FROM THE PRESS

HIGHLIGHTS OF THE IAA COUNCIL MEETING AND PRESIDENTS' FORUM IN SINGAPORE

October 30, 2013

The International Actuarial Association (IAA) held its semi-annual Council and Committee meetings in Singapore from October 9–13 at the invitation of the Singapore Actuarial Society, one of its Full Member associations.

Highlights of these events were the keynote speeches by two distinguished leaders in the international community. The Council meeting featured guest speaker Peter Braumüller, Chairman of the Executive Committee of the International Association of Insurance Supervisors (IAIS). The Presidents' Forum featured guest speaker Arup Chatterjee, Senior Financial Sector Specialist (Insurance and Contractual Savings) at the Asian Development Bank (ADB).

Mr. Braumüller praised the IAA for its development of model International Standards of Actuarial Practice (ISAPs) in response to the IAIS request of October 2010 encouraging the IAA to

embark on a standard-setting process. He said: "[The IAIS] firmly believes that the development of strong and effective global professional standards is a prerequisite for effective insurance supervision". He announced that the IAIS had recently agreed to develop a global insurance capital standard by 2016. This represents one of the most challenging tasks in the history of the IAIS and he encouraged the IAA to become their partner in this project. The full text of Mr. Braumüller's address is available online.

Reciprocally, IAA President Kurt Wolfsdorf presented to the IAIS Executive Committee in Taipei to update on the work of the IAA as it relates to ISAPs. He was also a speaker on the Financial Stability Panel on October 17 during the course of the IAIS's annual conference where he provided an actuarial perspective on global financial stability.

Mr. Chatterjee spoke about the ADB's objective of inclusive growth in the economy by expanding the insurance sector in developing Asian countries. He said the bank's objectives could be met with innovation, inclusion and integration. Innovation would lead to new products and distribution channels, which encourage inclusivity in the marketplace. The welfare of all workers would be ensured and lead to greater integration within society. The ADB called for the IAA's assistance in managing risks and developing public/private partnerships.

These activities support the IAA's Strategic Objective 1, which aims to strengthen relationships with supranational audiences and provide them with actuarial input to improve the soundness of decisions being made on issues with global impact.

■■■



SUCCESS STORY

Heartiest

CONGRATULATIONS!

from IAI



CA3 – COMMUNICATION APRIL 2013 TOPPER

- Himanshu Garg

ca.hims@gmail.com

Tell us about yourself, your educational background and your hobbies

I'm a Chartered Accountant and an Associate Actuary, currently employed in Mumbai. I enjoy travelling, though much of it happens because of work only. Travel also gives me opportunities to know and network with people from various backgrounds.

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

Their best wishes and support are critical for success in any arena. "Actuarial" as a profession has always made them curious as it was unheard of!

3. How many hours of study on average per day did you put in to top the CA3 result where in only 12 candidates passed out?

CA3 exam is very different from other Actuarial exams. In fact, it is very different from any other professional or academic exam. This exam is not about how many hours you study but it is about how much focussed effort you put in yourself to improve your communication skills. One has to assess his or her own strengths and weaknesses and then work hard to improve them. It helps to remember that for any skill, it takes a few moments to learn but a lifetime to master.

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

I personally never took CA3 exam as an "exam", in fact its a great learning experience. Sooner you start "experiencing" it, better it will be. Further, if someone is not very confident about his or her communication skills, Practice and Candid Feedback from people around are the keys. My suggestion to prospective candidates is that more you sweat in practice, the less you bleed in battle.

5. Did you face any difficulty while studying this subject?

Not really. The course structure is well defined and enough time and guidance is available from the Institute to work on it.

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

First two days are really a great learning experience. The expert takes you through several concepts of effective communication skill and then you are made to practice both individually and in team. Further, your own practice presentation is recorded and analysed so

that you can realize your improvement areas.

These two days help you in preparing well for the third day and you can also sense how you stand relative to others.

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

Effective Communication skills are imperative in every profession, in every aspect of life. The exam helps you in formally evaluating your skills and irrespective of the outcome of the exam, you learn a lot. Further, it's a great opportunity for Actuarial students to network as well.

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

I'm a strong believer that Actuarial skills should not be limited to Actuarial function of Insurance or Consulting companies. I'm trying to promote Actuarial skills among areas or industries in which historically you won't find Actuarial talent. It's difficult but certainly possible. I also coach and encourage folks in this profession on how to "sell" their actuarial skills in domains where they are unexplored.

9. What was your purpose while selecting this course – Communications?

To learn, improve and connect



"When You Are In The Light, Everything Follows You,
But When You Enter Into The Dark, Even Your Own Shadow Doesn't Follow You."

- Hitler



The non-life insurance industry in Pakistan is relatively small compared to its peers. Total volume of non-life insurance premium in 2012 was PKR 56,808 Million¹. At the end of 2012, penetration was 0.28% and density was PKR 330.

There are 38 private sector and 1 public sector non-life insurers in the market². In terms of market share, the private sector occupies 86% while the remaining 14% is occupied by the one public sector insurer. Approximately 65% of the market share in gross written premium rests with the top 3 players³, all of which are in the private sector. Post-2006 the non-life insurance premium volume has grown at a compounded annual growth rate of 8.2%.

While the life insurance industry was nationalized in 1972, the non-life industry stayed in the private sector protected in a tariff market with very little innovation. Tariff was abolished in 2005 bringing severe competition and the market is still going through a transition to non-tariff environment. Unfortunately, unlike many markets, the war on terror and stagnant economic growth has discouraged large international players from entering the country; in fact some of the existing international players have divested their stakes to local players.

About the Author



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Nauman Cheema has been a fellow of the Society of Actuaries since 1982 and is the Chief Executive of Nauman Associates, a firm of consulting actuaries based in Lahore, Pakistan. The firm provides consulting services in all major areas of actuarial practice to clients in Pakistan and other markets including UAE, Saudi Arabia, Kenya and Kazakhstan.

underwritten in 2012 is in the fire and property risks segment. Motor is second with approximately 22%. Marine, Group Health and Miscellaneous lines of business make up the remaining part. The client profile is generally at a higher level on the socio-economic scale with a large number of corporate clients.

The industry was able to absorb substantial losses from riots in 2007 (following the assassination of a national political leader), investment losses in the financial crisis of 2008 and flood losses in 2010/11/12. However, the industry has not escaped these events unscathed.

of the industry which is also suffering from inflationary pressures on expense ratios and a dearth of qualified human resource.

Due to the high cost of distribution in the rural and semi-urban areas in the traditional agency model, the industry is generally present in major cities. Until recently, there were no brokers who could act as distribution points although a few international brokers have appeared on the scene in recent years.

Despite all of the above, the regulator has taken on an increased responsibility through supervision and development of the insurance sector. Minimum capital requirements, approved panel of auditors, new takaful rules, crop and livestock insurance pilot projects and compliance with IFRS are some of the reforms initiatives already completed by the regulator.

Challenges:

While investment income has been a boon for insurance companies following 2008, core underwriting results are growing at a slow pace (or even shrinking, in some cases). Improvement of these results is critical to the industry going forward.

Property risks are mostly ceded to reinsurers in the international market meaning a low retention of risk in

	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012
Real GDP Growth Rate	5.7%	1.6%	3.6%	3.6%	3.00%	4.2%
Nominal GDP Per Capita, PKR	52,907	61,331	74,805	85,496	102,362	115,281
Inflation Rate	7.6%	20.3%	13.7%	13.9%	11.9%	9.7%
Non-Life Premium Volume, in millions of PKR	38,354	41,682	43,588	46,552	54,000	56,808
Non-Life Insurance Penetration	0.4%	0.4%	0.33%	0.32%	0.3%	0.28%

Source: World Bank Data and Swiss Re Sigma Reports

Current Status:

A sampling of the top 3 players indicates that about 40% of the business

Rising reinsurance costs, reduced reinsurance commissions and limited reinsurance capacity are adding to woes

Pakistan. Reinsurers are seen to be setting tougher terms and conditions in the last few years. This trend will likely continue due to reinsurer experience globally and locally in Pakistan. In the face of this, insurers will need to increase retention (and risk appetite) to

1 Swiss Re, World Insurance In 2012 http://media.swissre.com/documents/sigma3_2013_en.pdf

2 SECP 2012 Annual Report

3 SECP 2012 Annual Report

4 World Bank Data

5 SECP: Micro-insurance in Pakistan – A Diagnostic Study on Demand and Supply

be profitable in the property segment.

Low economic growth over the last few years has meant that most insurers are chasing the same business, year on year. This has led to aggressive competition between industry players putting a downward pressure on pricing of premiums, especially in the case of smaller players. Stronger economic growth will be essential for premium growth in the traditional model going forward.

Uncollected premiums (premiums receivable) are ballooning to about 25%-30% of gross written premium. Numerous investment opportunities can be tapped if this premium were timely collected by insurers.

Opportunities:

Roughly 114 million people (64% of Pakistan's population) live in the low-income rural areas⁴. However, non-life insurers have just recently started venturing out into these markets and started marketing products to suit the needs of this rural population (for insurers already in the micro-insurance business, micro-insurance represents under 5% of total premium written⁵). Federal governments, state governments and donor agencies are keenly pursuing various pilots and initiatives which will soon be up scaled offering various insurance products to people below the poverty line or other vulnerable categories. The regulator is seen as encouraging this trend through policy development around micro-insurance. This will be a significant growth area which will lead to an increased insurance penetration.

Alternative distribution channels such as mobile banking and telecom will offer new opportunities for the insurance industry to spread its wings in rural and semi-urban areas. Bancassurance has been largely utilized by life insurance companies with much success; however, an increasing number of non-life insurance companies are developing products to distribute through this channel which offers enormous opportunities for premium growth in personal lines. This should bode well for the industry because

products such as personal accident/terrorism are simpler to understand when compared to the more complex life and savings products.

Insurance Industry Reforms Committee 2012 formed by the regulator is expected to submit its final recommendations soon. It is expected that the recommendations will have a very positive effect on various segments of the industry such as: minimum capital requirements, declining core income, receivables, image building and awareness spread.

Conclusion:

Pakistan's non-life insurance industry is in a phase of recovery following various crises the industry has faced in recent years. Pakistan's challenging economic environment means the traditional model of premium growth will not be viable

in the future. Future growth will require the industry's business models to expand to increase risk retention, development of micro-insurance, setting up of alternative distribution channels and an increased number of personal lines products.

■■■

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Insurance is the subject matter of the solicitation. This is a non-participating anticipated endowment plan. For more details on risk, please refer to the policy document.



M G DIWAN
A GHOSAL
N R KAPADIA
K J PRADHAN

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

BIRTHDAY

Many Happy Returns of the DAY

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



SUDOKU

SUDOKU No. 16 for the month of November 2013

GENIUS

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

HOW TO PLAY

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

- Sudoku Puzzle by Vinod Kumar

Solution of Sudoku Puzzle No. 15 published in the Month of October 2013

SOLUTION

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



CAREER CORNER

Do you have what it takes to be a successful consultant?

Milliman is looking for motivated actuarial students with strong analytical, modelling and communication skills to join our life insurance consulting practice based in Mumbai and Gurgaon. Applicants should be hardworking, a team player and should have a strong work ethic.

Minimum qualifications	Associate	Junior Associate
Experience within the Indian life insurance	Three to four years	Fresh graduate / one to two years
Academic performance	Distinction / First class throughout	
Professional examinations	CT series passed or equivalent	Demonstrable progress through actuarial exams
Modelling skills	Advanced modelling on any actuarial software	Demonstrable modelling skills on MS Excel or other common tools

Working with our teams in Mumbai / Gurgaon / other Milliman offices, you will get an excellent opportunity to build your career and grow with the firm.



Please send your applications along with a detailed CV by 15 December 2013 to:

In Mumbai - Sanket Kawatkar
sanket.kawatkar@milliman.com

In Gurgaon - Shamit Gupta
shamit.gupta@milliman.com

Please note that only shortlisted candidates will be invited for an interview (in January 2014).

For more information about Milliman, please visit:

in.milliman.com

AT HOTEL SEA PRINCESS, MUMBAI



2nd

SEMINAR ON CURRENT ISSUE IN GENERAL INSURANCE

Date : 18th Dec 2013

Timing : 8.45 am to 5.30 pm

The aim of seminar is to have an open discussion on key matters affecting the performance of the industry and further develop the analytical, skill sets available within the industry. The expected audience of various functions such as underwriting, claim, actuarial finance.

The exact contours of the program are being worked out and yet to be finalized. However key highlights of the program are: A keynote address by **Mr. Ramaprasad** (IRDA Member – Non Life) on “Regulator’s perspective on Current Environment”. Other two prominent speakers are **Mr. Raghavan** (CEO – IIB) who would be speaking on “Does Analytics matter in Non-Life” and **Mr. Bhargav Dasgupta** (CEO – ICICI Lombard), who will talk on “Delivering returns – value to shareholders”. Additionally, there would be two panel discussions- one on “Risk Based Capital – When and How?” the other on “Effective Management of Third Party Claim Furthermore there would be a session on Claims and Fraud Analytics by **Mr. Debashish Banerjee** (Deloitte).

Registration Fees: Early bird ₹ 4000 till 10th December, 2013; 11 Dec Onwards ₹ 5000.

4th CAPACITY BUILDING SEMINAR IN GENERAL INSURANCE

Date : 19th Dec 2013

Timing : 8.45 am to 5.30 pm



The intent of the seminar is to build and further strengthen actuarial skill within the non-life domain and is likely to be attended by Appointed Actuaries and head of actuarial function. The key highlights are a speech by **Mr. Raghavan** (CEO – IIB) on “Analytics at Work - For Actuaries”. Additionally interesting sessions are being planned on topics such as “Telematics”, “Catastrophe modeling” and “Reinsurance Structuring and Optimization

Registration Fees: Early bird ₹ 6500 till 10th December, 2013; 11 Dec Onwards ₹ 7500.

Register at: IAI Website

CPD Credit for IAI Members: 4 hrs (As per APS 9)

Point of Contact for any query: Quintus Mendonca (quintus@actuariesindia.org)

For GCA Click Here to register
<http://gca.actuariesindia.org:89/registration/>



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