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THE MAGAZINE OF THE INSTITUTE OF ACTUARIES OF INDIA

Pages 16



Glimpses from 14th GCA Expect more of these during 2013 AGFA - 15th GCA

Council of Institute of Actuaries of India, in its meeting on 24th August, 2012 adopts Vision, Mission and Value Statement



VISION MISSION VALUE

THE VISION

IAI to be globally well recognised professional organisation, developing enduring thought leadership to manage uncertainty of future financial outcomes.

THE MISSION / OBJECTIVES

- To educate/train risk professionals
- To enhance and maintain high professional standards
- To shape Public Policy and Awareness
- To engage with other professional / regulatory / government bodies
- To promote/build IAI as a respected Brand of risk management globally
- To promote Research, to advance actuarial science/application

THE VALUES

- Integrity
- Respect for others' views
- Accountability
- Continuing learning/Research oriented learning
- Transparency
- Be responsive/ sensitive

VISION, MISSION AND VALUE STATEMENT

(Excerpts from the book: Bootstrap leadership – 50 ways to break out, take charge, and move up by Steve Arneson)

Vision & Mission provides purpose and direction to an organization and paves way for road to success

VISION – Vision is the dream – the future state, where you want to go. Think of it as the why – as in, "Why does our group exist?" The vision should be aspirational and motivational; something the team can rally around..... Aim high and make it aspirational. A great vision can unify a team and give its members a reason to come to work every morning.

MISSION - Mission is the goal: the objective in front of you. Think of it as the what – as in: "What are we trying to accomplish?" The mission should be challenging and should describe the business you're in and the customers you are trying to serve (whether internal or external). The mission should be connected to the vision; that is, by accomplishing the mission, you move closer towards making the vision a reality.

DEVELOP STRATEGY – Think of Strategy as the how – as in "how are we going to complete the vision?". Strategy describes the specific plans taken to meet the objective, and should be clear and measurable. Good strategy includes detail about how the work will be accomplished, and includes resources, responsibilities, budget, metrics, and milestones.

VALUES - Value statements are often referred to as "guiding principles". A value statement is an expression of a company's or individual's core beliefs. It allows for the company's staff to be aware of the priorities and goals of the company.

The value statement, along with a mission and vision statement forms the corporate culture and climate.



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Sharad Shrivastva



BEST ARTICLE & BEST REPORTAGE AWARD IN THE YEAR 2012

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- Relearning our actuarial A, B, C'S, by **Gavin R. Maistry**
- GDP Based insurance Density
 by Meera Radhakrishnan

KOTAK LIFE INSURANCE

) WELCOME

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CAREER OPPORTUNITY

Edelweiss Tokio Life Insurance Company Limited

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Sharad Shrivastva, born in the year 1960 at Faizabad, Uttar Pradesh, is Secretary General of Institute of India since February 2010. He is a Graduate in Arts (B.A) from Allahabad University. He is also an Associate Member of Insurance Institute of India. He Joined Life Insurance of Corporation in 1983 as direct recruit officer & held various positions in the corporation. Some of them are – Marketing Manager at Ajmer, Senior Divisional Manager at Gandhinagar. Before joining Insurance Institute of India on deputation, he was Principal – Zonal Training Centre, LIC of India, Agra.

The areas of Interest of Shri Shrivastva are Corporate Governance, Organizational Behavior & Customer Service. He is keen observer of Indian Theatre. He is also interested in Indian Literature & Contemporary History.

PERSONAL

Describe your current roles and responsibilities

For many decades the Insurance Institute of India was largely seen as an examination body that prepared members of the clerical cadre of public sector insurance companies to attain to supervisory and managerial positions. In the present competitive and liberalised environment of Indian insurance however, the expectations of the industry, the regulator and the government have changed a great deal. The mandate for the institute, as it was expressed reiterated by the Finance Minister of India, while inaugurating our new premises at BKC. The institute has to develop and disseminate knowledge to guide the scientific practice of insurance in India and also spread the message of insurance among the broad masses.

The industry needs our support in developing leaders and professionals, who are sound in the basics of Insurance and related domains and capable of adding value to customers in their respective roles.

The above expectations define my role and outcomes to be achieved today.

During the last three years we have embarked on a number of new initiatives towards this end. We have streamlined the examination system so that it becomes online and on par with international standards. We have initiated new courses like the Course on Health Insurance and the Certificate Programme in Advanced Insurance Marketing [CPAIM], which are directly related to developing the competencies of large groups of industry participants today. We have sought to activate the 91 affiliated institutes of III across the country so that they could become centers for dissemination of knowledge and building our footprints across the country. We have developed our journal so that it becomes theme based and research oriented. We have organized a number of national and international seminars to usher new knowledge and direction to the industry, like the seminar on "Back to the Basics" and the latest conference on "Principles for Sustainable Insurance", which we have launched along with the United Nations [UN-EFP]. In the months to come our focus would continue to be on building research capabilities, developing professional competencies and knowledge dissemination.

What trends do you see for this industry in the next three to five years?

If there is one thing I could say about the future, it is that tomorrow is not going to be easy. High loss ratios and challenges posed by motor and health claims would continue to be cause of high concerns. The decline in life insurance premiums coupled with low sales productivity and bottom line impact have already led to a churn in the industry. If the cap on foreign partnership stake goes, it would mean direct entry of giant international players in the Indian market. Finally, we have yet to fully feel the catastrophic effects of global warming and depletion of the ozone layers. Can we assume that they will spare us for long? These are just a few random concerns that occur when I go crystal glazing.

What are the top three Issues facing the Financial Sector. Pension provision and Insurance sector in India?

The issues are multiple but let me sum up three which are fundamental.

All retail financial products including Insurance and pensions ultimately must add relevant value to customers. When individuals and households save and invest in various kinds of assets, they are making an inter-temporal allocation of their income and wealth to meet various life contingent needs that arise along the life cycle. These arise with varying degrees of incidence and impact as one goes through the cycle. They are impacted by different environmental and social factors ranging from global warming and terrorism to stagflation, life style diseases and aging and erosion of traditional family structures. Are we really present to the concerns that people face today and have appropriate responses? Or are we caught in what Thedore Levitt long ago called Marketing Myopia?

Secondly, each kind of financial product is rendered distinctive by one or another dominant mathematical principle which goes in designing it. Mutual Funds are defined by the principle of diversification while Insurance and Pensions are both defined by application of the Pooling Principle to address various situations that arise in the wake of life contingencies like mortality, morbidity and longevity. Have we retreated from these principles? Do they make sense today? Do we need to relook at how to apply them more intelligently? The third issue stems from the fact that all financial products are ultimately promises made on pieces of paper. The worth of a promise depends on the belief that it would be fulfilled. Are we doing what it takes to build trust and give credence to our promises?

What do you believe are the inefficiencies in the insurance industry? How do you think such inefficiencies can be overcome?

Let me begin with a well known distinction made between efficiency, which means doing things right, and effectiveness, which means doing the right things. I think we need to ask hard questions about both aspects.

For instance, in the life insurance industry, the biggest challenge is the decline in premiums, plaguing not only India but the global life insurance market as well. The question is, have we got value propositions that customers are excited about? What have we been selling in the name of life insurance? Would customers be excited if we went back to selling traditional products?

There is also the question of how life insurance was sold. Over the last one decade there has been a rapid rise in selling infrastructure, with proliferation of channels and large numbers of sales persons entering the industry. Has there been a corresponding rise in Selling Competence? Low productivity per head and huge costs in building infrastructure has considerably impacted bottom lines. Could we just write all this off as New Business Strain?

Closely linked to productivity is the question of how human resources, including sales people, have been nurtured. Is insurance a preferred career today and if not, why?

Finally the large loss ratios in General Insurance point to the question of how risks have been priced and managed. Have we fully understood the implications of the changing landscape of our customers, like the shift from corporate to retail individual business and from property lines to personal lines?

There is no easy answer to the above questions. The only point I would like to make here is that these are not problems that can be resolved with temporary and cosmetic measures. They would call for much reflection. Let me just suggest a few points in this direction.

Firstly can we reflect on the changing profiles of risks that are

emerging, as a consequence of elements in the environment, society and governance? Very recently, III had conducted a seminar on the subject of "Principles for Sustainable Insurance" in partnership with the United Nations – EPF. It highlighted just a few of the numerous questions already confront us and would continue to do so in future. A key insight which emerged was the need to look at insurance as involving more than the pricing of risks and making benefit payments. What can we do and are doing towards managing risks?

Secondly can we explore multiple ways in which the principle of Pooling can be applied to address various life situations? For instance, we have always accepted that insurance is about risk pooling. Can we also apply pooling to create opportunity?

Thirdly, much of our focus in building distribution channels has been on how to somehow sell to customers and rapidly build business. Have we looked at how to go beyond the transactional and build long term relationships with them. When we look at top MDRT agents for example, the one thing that stands out is their ability to build relations which customers. Can we learn lessons from this?

Finally, I believe there is a great need to develop a large number of leaders and professionals at various levels in the industry, who would be sound in the fundamentals of insurance and able to relate effectively with customers. We at III are today looking at how we can partner the Industry for this purpose.

We have a better fit of actuarial knowledge and actuarial practice?

Actuarial science, I believe is a combination of two core disciplines – Probability and Compound interest. With the advent of the computer and advanced programming, the technical aspects of number crunching, which once engaged the minds of actuaries, have become relatively simple. The questions today are more about what kind of benefit offerings would be relevant to meet the needs that are emerging today. How are we going to make products that are competitive as well as viable and profitable? These are questions that could be addressed by being more and more involved in the mainstream of marketplace practice. I believe III and the Actuarial Society of India could do a lot together in partnership, towards providing solutions and developing paradigms that would help the industry meet many of its challenges.



OBITUARY

MR. R. K. CHANDAK

Mr. Radhakrishna Kundanmal Chandak passed away to his heavenly abode on August 26, 2012. Mr. Chandak was 86 years old and was suffering from multiple illnesses for over a year. He is survived by his wife, a son and a daughter. Mr. Chandak qualified as an Actuary in 1960 and was also an Associate of the Society of Actuaries, USA. He worked with LIC of India from 1956 to 1986. After his retirement, he worked as a Consulting Actuary with First Life Insurance Company in Jamaica as well as other consulting assignments.

AWARD

BEST ARTICLE & BEST REPORTAGE AWARD IN THE YEAR 2012

BEST ARTICLES:

1st Best: very detailed analysis of mortality assumptions with lot of research and relevant examples



SAKET VASISTH

Student ASSESSING RELIABILITY OF MORTALITY ASSUMPTIONS NOV'12 VOL. IV, ISSUE NO. 11



PS DURGA PRASAD Student ASSESSING RELIABILITY OF MORTALITY ASSUMPTIONS NOV'12 VOL. IV, ISSUE NO. 11

2nd Best: good analysis of internal risk reporting that is assuming lot of significance in an insurance company



ABHISHEK KUMAR

Student INTERNAL RISK REPORTING FOR INSURANCE COMPANIES APR'12 VOL. IV, ISSUE NO. 4





KAILASH MITTAL

Advisory Group On Life Insurance 14TH GCA - CONCURRENT SESSIONS ON LIFE INSURANCE MAR'12 VOL. IV, ISSUE NO. 3



Actuar



BHARAT VENKATARAMANI

Advisory Group On Accounting And Solvency-Insurance And Pension Funds UNDERSTANDING LATEST DEVELOPMENTS IN IFRS FOR INSURANCE INDUSTRY AUG'12 VOL. IV, ISSUE NO. 8



MAKING SHARPE RATIO SHARPER

FEATURES

A fund has a mandate to track a benchmark index. The benchmark return is uniformly distributed between 3% and 7%. The risk free return in the country where the fund manager operates is 4.5%. He is planning to follow either one of the following strategies described below

- Strategy A: Track the benchmark index as per the mandate.
- Strategy B: Invest the fund in a special asset that gives twice the growth in the benchmark index with probability 0.5 and half the growth in the index with probability 0.5.

Use the Sharpe ratio to determine the strategy that provides a higher risk-adjusted return.

This is a question taken from the Institute of Actuaries of India ST5 paper for November 2012¹. I am not going to attempt solving this question at this juncture.

From the time Nobel laureate William F Sharpe put forward what he then conceptualized as the reward to variability ratio (R/V) in 1966, Sharpe ratio, as it is known today is widely used for comparison between funds². Seldom do you find an academic book on investments without a mention of Sharpe ratio. It is also a part of the core reading for subjects like ST5.

Sharpe Ratio – A primer

The Sharpe ratio (S) is defined as follows:

$$S = \frac{r_p - r_f}{\sigma_p}$$

The numerator of this equation gives the excess returns i.e. the returns from the asset / portfolio over and above the risk free rate. The denominator is the standard deviation of the returns from the asset / portfolio which is a proxy for the riskiness of the asset/portfolio.

Sharpe ratio is now considered an objective way to compare the

performance of several funds with different investment strategies on a *risk adjusted* basis.

There are several assumptions that go into it which is explained at length in many of the academic text books on the topic. Being a value investor who firmly believes that standard deviation is simply a depiction of how volatile the price is and not a proxy for risk, I have my own reservations about the notion of risk being quantified into one single number called standard deviation. But that is again not the point of discussion in this article.

A problem of Financial Mathematics

The use of mathematics in finance is increasing by the day. The financial community is one which abhors ambiguity. The design of our education system is such that people associate precision with numbers. So all out efforts are being made to reduce variability of all forms into one number or the other. One needs to be very careful when mathematics is used to make inferences in the world of finance.

During my Business school days when my derivatives Professor wrote down the Black-Scholes equation I was so excited to see an equation similar to what I learnt in the sessions on heat transfer as a part of my chemical engineering course earlier. Later I found so many criticisms about the applicability of Black Scholes equation to long dated options, adjustments needed for fat tails and so on. Not much change has been made to the heat transfer equation though.

Similarly the area of project finance started using IRR to evaluate projects. Mathematics simply considers the IRR equation as a polynomial and strictly abides by Descartes' rule – multiple real roots are possible. It doesn't care for the fact that this is a project cash flow that is being modeled and we need only one IRR.

A similar issue is encountered when we use Sharpe ratio for comparison – a

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problem associated with the application of mathematics to finance.

Illustration

Let us take an example:

	Fund A	Fund B
Return	10%	10%
Risk Free Rate	7%	7%
Std. deviation	25%	15%
Sharpe Ratio	0.12	0.2

The conclusion is pretty straight forward. Fund B is better because Sharpe ratio is higher.

Now consider a situation where excess returns are negative

	Fund A	Fund B
Return	-10%	-10%
Risk Free Rate	7%	7%
Std. deviation	25%	15%
Sharpe Ratio	-0.68	-1.13

Does it mean that Fund A which has a higher Sharpe ratio is better. Intuitively we know that this is not the case as Fund A has a higher standard deviation which means it has taken more risk to generate the same return as Fund B. This is again an example of a pitfall of using mathematics straight into finance.

¹ http://www.actuariesindia.org/Downloads/exampapers/Nov-2012/ST5_QP.pdf

² Sharpe, W. F. (1966). Mutual fund performance. *Journal of business*, 119-138.

Adjustments

As what happens usually in finance we now need to look for adjustments so that we can continue to use Sharpe ratio. The past decade has seen several periods of negative excess returns and this is expected to recur in the future too. One needs to be careful if Sharpe ratio is being used as a performance measurement tool.

One adjustment suggested by Craig Israelsen involves calculation of a modified Sharpe ratio³. This is defined as

follows

$$Adj.S = \frac{r_p - r_f}{\sigma_p^{\left\{\frac{(r_p - r_f)}{ABS(r_p - r_f)\right\}}}}$$

This ensures that a slight modification is automatically made when excess returns are negative while it remains unchanged when excess returns are positive.

Let us now see if this works in the examples mentioned above

	Fund A	Fund B
Return	10%	10%
Risk Free Rate	7%	7%
Std. deviation	25%	15%
Adj. Sharpe Ratio	0.12	0.2

	Fund A	Fund B
Return	-10%	-10%
Risk Free Rate	7%	7%
Std. deviation	25%	15%
Adj. Sharpe Ratio	-0.042	-0.026

We can see that we get consistent results in both the cases. Thus using the adjusted Sharpe ratio we are able to rank funds in a better manner irrespective of whether the excess returns are positive or negative.



3 Israelsen, C. (2005). A refinement to the Sharpe ratio and information ratio. Journal of Asset Management, 5(6), 423-427.

Never break four things in you life trust, promise, relation & heart because when they break they don't make noise but pains a lot?

-Charles



FEATURES

RELEARNING OUR ACTUARIAL A, B, C'S,

Roko Ko

by Gavin R. Maistry

Gavin R. Maistry has been with Munich Re, based in Singapore, for almost 5 years. Prior to this, Gavin worked as a Corporate Actuary and Regional Pricing Actuary for Swiss Re in Zurich for close to 8 years. He held earlier Client Management roles for Partner Re's Life business in the UK, Israel and South Africa. Gavin has more than 20 years of experience in re/insurance. He started his insurance career at direct company Old Mutual in South Africa working in various actuarial product development and pricing roles. Gavin holds the Fellow of the Society of Actuaries (FSA) and Chartered Enterprise Risk Analyst (CERA) designations from the US Society of Actuaries. In addition, he is a Fellow of the Singapore Actuarial Society (FSAS) where he chairs the Education Committee. Gavin is also a CFA charterholder and a graduate of the University of Cape Town and University of KwaZulu-Natal (Durban) in South Africa.

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ctuarial Science is an evolving discipline. When the profession first appeared in the 17th century, actuaries were mainly involved with determining life expectancies for the life insurers of the day using deterministic methods. It took around 250 years before actuaries started to get more involved in the property & casualty space and to start to use stochastic techniques. Only as recently as the 1980's have investment actuaries started to employ financial economics techniques - prompting the famous Swiss actuary Hans Bühlmann to coin the phrase - actuary of the 3rd kind. In the last decades or so actuaries have started to become more involved in the risk management area and in particular ERM - which Paul Embrecths from the ETH in Zurich now terms the actuary of the 4th kind. So what new technical skills - beyond the standard probability, mathematics, statistics, demography, finance, economics, financial economics, and computer programming - will the actuaries of the 5th kind and beyond need to use to deal with the increasing complexity of the areas we work in? This is not an easy question to answer - but here are some interesting fields that actuarial science should look to embrace in future...

a. Accelerating Technologies – the futurist Ray Kurzweil (www.kurzweilai. net) postulates a law of accelerating returns in which the speed of technological change increases exponentially. This has already been borne out in many fields like computing power (Moore's law); artificial intelligence and medical science. This dynamic has huge implications for the long term predictions that we actuaries have to make - and implies that the past experience will likely not be a good indication of the future. As an example, a major reason for actuaries consistently underestimating future mortality improvements is the accelerating pace of medical advancements. In his book The Singularity is Near Kurzweil discusses the concept of accelerating technologies and the advent of the singularity. The word "singularity" is borrowed from astrophysics and it refers to a point in space-time at which the rules of ordinary physics do not apply. Similarly, with technology, technological change can be so rapid and so profound and its impact so deep that there will be a fundamental shift from the normal rules - making long term predictions very difficult. This is a fascinating area and to study it further the Singularity University was established in cooperation with NASA & Google in Silicon Valley with the stated aim to "assemble, educate and inspire a cadre of leaders who strive to understand and facilitate the development of exponentially advancing technologies and apply, focus and guide these tools to address humanity's grand challenges." It would be good if we actuaries could also participate in this ambitious goal.

b. Behavioral Economics – this field studies the effects of cognitive and emotional factors on the economic decisions of individuals and institutions and is gaining increasing attention in actuarial circles. The June 2012 issue of the American Academy of Actuaries' magazine *Contingencies* headlined with



About the Author

Gavin R. Maistry is currently the Chief Actuary & CRO for Munich Re's Life business in the Asia Pacific region.

an article on why cognitive science matters to actuarial science. Fundamental concepts in insurance & actuarial science - like risk aversion; information asymmetry; anti-selection; moral hazard and misalignment of interests - have their roots in behavioral science. Indeed, there are a myriad applications of behavioral economics in actuarial science - like product innovation (see upcoming talk); pricing strategies; policyholder buying & lapse behavior; behavior of risk managers and also the erratic behavior of stock markets at certain times when the neo-classical economic assumptions of rationality fail. This idea is expanded on in many good articles such as The End of Rational Economics by Duke University's Dan Ariely in the August 2009 issue of Harvard Business Review. A more recent book by Daniel Kahneman's (Nobel Economics Laureate in 2002) called Thinking, Fast and Slow exposes the many flaws in our thinking & decision making - due to cognitive biases and heuristics or simplifications that prevent us from making rational decisions. The book has been described as alarming and intellectually aerobic at the same time and will appeal to us actuaries with various numerical examples on flawed deductions from data; misestimation of probabilities and the wonders of Bayes' theorem. Looking at actuarial problems through a behavioral economics lens should add another dimension to our analysis. In his seminal work on multiple intelligences, the American psychologist Howard developmental Gardner talks about multiple types of intelligences (logical-mathematical; linguistic; interpersonal; intrapersonal; musical; spatial; etc.). The dimension that actuaries excel at is obviously logical-mathematical intelligence - we are number/reasoning smart. Newer fields like Behavioral Economics should help us gain greater insights into important interpersonal (interaction with

others) and intrapersonal (introspective and self-reflective capacities) dimensions that are also very important for success.

c. Complexity Science - recently a speech given by the Prime Minister of Singapore, Lee Hsien Loong, stressed the importance of an "appreciation of complexity" by graduates. This remark seems to underscore the fact that Complexity Science, together with Behavioral Economics, is now much the rage in government and public policy. This has been backed up by the recent establishment of the Singaporean Institute for Complexity Sciences at NTU. Complexity Science involves the scientific study of complex systems - systems with many individual parts that interact to produce interesting global or emergent phenomena that cannot easily be explained by analyzing the individual constituent elements. Complex systems include IT networks (e.g. the Internet), biological ecosystems, human biological systems, stock markets, traffic patterns, etc. The insurance markets can also be viewed as a complex systems - making it ripe for applications of complexity science. Some progress in this area has already been made e.g. in the modeling of price cycles in the P&C insurance market; the dynamic lapse assumptions variable annuities in Life under insurance; etc. - but more can be done. The domain of actuaries are contingencies and their financial - areas of great consequences complexity. The leading think-tank in the world for Complexity Science is the Sante Fe Institute or SFI (www.santafe.edu). At an SFI seminar that I recently attended on how Complexity Science can help us understand the recent Global Financial Crisis - the program covered an intellectually rich range of topics including network theory: human behavior: neuroeconomics: neural networks; evolutionary economics and systemic risks. The September 2011 issue of Harvard Business Review was devoted to how companies should embrace complexity - the article mentions that we cannot avoid complexity in today's hyperconnected business world - but we need to study and understand it and we can then profit from it.

d. Big Data – is another hot topic and certainly an area that we actuaries need to embrace. *Harvard Business Review's* October 2012 issue tackles the topic of Big Data in detail and how these vast new streams of information are changing the art of management. Companies like

Google and Amazon are data driven organizations and build competitive advantage with their ability to collect, analyze and apply the findings from very large data sets. For the insurance industry, the volume of the information now stored in data warehouses is also rapidly increasing - but are we doing enough with this treasure of information? Sophisticated analytics on big data can substantially improve the decisionmaking and risk management of companies. In addition, the big data findings can be used to improve the development of the next generation of products and services. With the exponential growth in data available there will be a shortage of talent necessary for organizations to analyze big data. The abovementioned Harvard Business Review issue also has an article on data scientists - touted as being the sexiest job of the 21st century - the data scientists today are akin to the Wall Street "quants" of the 1980's and 1990's . Actuaries have long been analyzing large data sets for experience studies; pricing & valuation data; etc. and have the necessary skill set to be the leading data scientists of the future. Areas like Predictive Modeling; Data Analytics and Data Visualization that actuaries have already utilized fall within the ambit of big data analysis.

e. Evolutionary & Biological Theories there are many parallels between systems biological economic and evolutionary theory. Based on evolutionary principles, new theories like the Adaptive Markets Hypothesis (AMH), put forward by MIT's Andrew Lo, provide a more realistic alternative for stock market behavior to the battered and bruised Efficient Market Hypothesis (EMH) of classical financial economics. This model applies the principles of evolution to financial interactions: competition, adaptation and natural selection. There is an increasing acceptance of this modeling approach as evidenced by Andrew Lo's appearance amongst Time magazine's 2012 list of the 100 most influential people in the world. Lo states in the Time write article that he believes markets are less rulebased and more like messy biological systems. Moving to computer science, there are evolutionary & genetic algorithms which generate solutions to optimization problems using techniques inspired by natural evolution, such as inheritance, mutation, selection, and crossover. This technique is routinely

used to generate useful solutions to difficult optimization and search problems – like those that we may increasingly observe in actuarial practice – and where simple analytical techniques fail. In the business world companies like Amazon now describe their business model as an ecosystem it is not just a product – but a combination of product, software, services and infrastructure.

f. Fractals - Fractal geometry is the mathematics of roughness - ubiquitous in nature; biology and financial markets. The pioneer of this field is the famous French mathematician Benoit Mandelbrot. His book aptly titled The Misbehavior of Markets - A Fractal View of Financial Turbulence gives a good overview of the fractal or rough nature of financial markets and he challenges the standard models of modern financial theory (CAPM, EMH, Black Scholes; etc.) with their simplifying techniques and assumptions. The result is a revolutionary reevaluation of the standard tools and models - replacing the outdated assumptions of smoothness; normality and independence with the roughness of fractals; power laws; fat tails and dependence. Mandelbrot's 17 minute TED Talk on Fractals (available on YouTube) is a brilliant introduction to this topic.

In conclusion, the above list of new fields and techniques that will be useful to actuaries in future is by no means exhaustive. The topics are also not independent but overlap - e.g. Complexity Science often includes ideas **Economics** from Behavioral 8, Evolutionary Biology; the latest Singularity Summit on Accelerating Technologies (singularitysummit.com) included topics on Behavioral Economics & Complexity Science. The above list also focuses on the technical skills & analytical problem solving skills which we as actuaries need to regularly update and master. However, we also need to recognize that we must sharpen our softer skills like communication & other business savy skills (to borrow a few from the Society of Actuaries competency framework - Industry Knowledge; Leadership; Professional Values; & Strategic Insight & Integration). It would be interesting to hear from readers on what other new areas they think we as a profession should be exploring?

an

Source: Economic Review and Life Insurance Council

It will be seen that there is no proportionate relationship between the GDP growth - rate and the premium collection rate. Insurance premium collections may rise or fall due to independent factors unrelated to the GDP (eg political instability and governance - deficit, increasing crime rate, natural disasters, corruption in high places, inflation ,fiscal deficit, terrorist attack, war-threat etc.). There is a need for spatial penetration index and this should be area -specific.

of society with a new middle class rich enough but not interested in the traditional life insurance. The emergence of nuclear families in cities and towns is another factor; concern over the marriage of daughters was one of the motives that drove heads of families to take insurance policies in the old order.

The will and capacity of individuals to save has long been recognized as a sustaining factor of insurance business. But this source is steadily being eroded by the 'unacceptable level' of inflation that

by Meera Radhakrishnan

There is, of course, no cause for alarm. IP is still in single digit and there is still a vast area to be explored. Yet it is worth considering whether linking insurance premia with macro -economic indicators is or can be helpful in drawing conclusions about insurance business situation. The GDP is an abstract data compiled through a complicated process of assumptions and projections. Insurance is related to individuals in different income strata and in specific areas. Generally, the agent, who holds the key to the success of the insurance business, gets at his customers mostly information obtained randomly on or casually. He rarely finds adequate statistical data about the income pattern of households in the areas in which he operates.Premia collection seems to be related mainly with liquidity preference which Keynes related to interest.

There are, however, restrictive factors which are beyond the agent's control. One of them is the changing pattern

Year	GDP Growth Rate (%)	Premium Growth Rate (%)	
2006 - 07	9.6	95.04	
2007 -08	9.3	23.87	
2008-09	6.7	-6.8	
2009-10	8.4	25.83	
2010-11	8.4	15	
2011-12	6.9 (expected)	-14	

GDP BASED I NSURANCE DENSITY

nsurance Density (ID) and Insurance

Penetration (IP) are the two national

indices that reflect the level of

development of the insurance sector

in our country. While ID is per capita

premium (total premium collection

during a year divided by the adult

population), IP is the total premium as a

percentage of the GDP. According to the

latest Annual Report for 2011-12 of the

Insurance Regulatory and Development Authority (IRDA), the ID declined from

INR 3063 in 2010 to INR 2695 in 2011.

Compared to 5% in 2010 the IP in

2011 was only 4.1%. Thus both indices

indicate a decline in insurance business

which .since 2001 has been steadily

increasing. However, during 2010-11,

the Life Insurance Corporation (LIC)

increased its market share from 69.8%

to 70.7%; the private insurers lost by a

margin of 0.9% (from 30.2% to 29.3%)

Correlating the GDP growth rate with

premium collection rate we get the

following picture:

Never tell your problems to anyone...20% don't care and the other 80% are glad youhave them.

- Lou Holtz



Meera

from January to October, 2012, the average rate of inflation is 9.7% (based on the Consumer Price Index). Fiscal deficit which fuels inflation, is another disruptive source: it was estimated at 5.3% in the budget for 2012-13. The cash transfer scheme under the PDS and other poverty- alleviating measures, is said to be another potential source of inflation.

About the Author

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Radhakrishnan

Associate member of the Institute of

Actuaries of India currently working in

The craze for gold is taking away a large chunk of savings which would otherwise have found its way to the insurance sector.(India imported 204.8 tonnes of jewellery ,gold bars and coins during July -Sept 2011 and 223.1 tonnes during same period in 2012).

Insurance comes low in the priorities of the small saver, after PPF, postal schemes, industrial shares, real estate, and gold and jewellery. The insurance sector may yet benefit by injection of funds through the budget outlays on infrastructure,rural housing, Rashtriya Krishi Vikasyojana, agricultural credit, irrigation, education, employment, disinvestment of Central Public Sector Enterprises, Rajiv Gandhi Equity Savings Scheme, capitalisation of banks, the Swabhiman campaign, creation of National Investment and Manufacturing Zones etc.

The field -worker is the prime mover. Catch him young and let him do the pump-priming. The insurance sector can become a major source of employment of the unemployed youth in the country.

THE PRESS

ROM

BEST'S REVIEW RECOGNIZES RGA FOR SUCCESSFUL INNOVATION

R GA Reinsurance Company, a subsidiary of Reinsurance Group of America, Incorporated (NYSE: RGA), a leader in the life reinsurance industry, has been recognized for innovation by A. M. Best for the second consecutive year.

RGA has been recognized in the Innovation Showcase, published in the January 2013 edition of Best's Review magazine, for evidence-based research that confirmed the value that driving behavior holds as a factor in underwriting life insurance. RGA researched the correlation between motor vehicle records and mortality rate, the results of which have led to a more-nuanced approach for using those records for life insurance underwriting, including risk stratifications by age and gender, number of violations, and the type and severity of violations.

The MVR study analyzed the all-cause mortality experience of a large cohort of applicants linked to the number and severity of their recent driving infractions, and verified that significant excess mortality risk exists for applicants with a recent history of either major or frequent driving violations.

Innovation Showcase is a forum for recognizing forward thinking among insurance organizations. A panel of insurance industry experts assessed the relative merits of the submissions. In reviewing the RGA submission, Bill Jenkins, Managing Partner, Agile Insurance Technologies, said, "This organization is using data, internal and external, for innovative information insight. This innovative use of data (motor vehicle records to mortality tables) is providing insurers the ability to accomplish more granular risk segmentation, customer segmentation and find correlations between data and risks/customers. They seem to be the leading cusp in the use of data in the life industry."

"One of RGA's core strengths is our ability to share new ideas, insights and solutions with our clients and the industry. We have demonstrated innovation in many ways throughout our history, and I am very pleased to see the innovative work of our associates recognized by industry experts in Best's Review," said Greig Woodring, President and Chief Executive Officer, Reinsurance Group of America, Incorporated.

To read about this innovation,

visit:http://www3.ambest.com
bestweek/getpublication.
asp?issueid=9c3baaf9&pageid=18

The full MVR study can be viewed at:

http://www.rgare.com/media-center/ Documents/Motor%20Vehicle%20 Records%20and%20All-Cause%20 Mortality.pdf

RGA continues to drive innovation in the insurance industry, life recently sponsoring an Innovation Series of presentations at the 2012 Society of Actuaries Annual Meeting, and nationwide launching а Market Innovation Challenge designed to increase awareness among young Americans of the value of life insurance. More information on RGA innovation initiatives can be viewed at: http://www.

ST. LOUIS, Missouri, January 3, 2013

rgare.com/knowledgecenter; and information on the Market Innovation Challenge is available at: <u>www.rgare.</u> com/rgainnovation.

About Best's Review

Best's Review is published by the A.M. Best Co. for insurance professionals, including home office executives, agents and brokers. Founded in 1899, A.M. Best Co. is the world's oldest and most authoritative insurance rating and information source.

About RGA

Reinsurance Group of America. Incorporated (NYSE: RGA) is among the providers largest global of life reinsurance, with operations in Australia, Barbados, Bermuda, Canada, China, France, Germany, Hong Kong, India, Ireland, Italy, Japan, Malaysia, Mexico, the Netherlands, New Zealand, Poland, Singapore, South Africa, South Korea, Spain, Taiwan, the United Arab Emirates, the United Kingdom and the United States. As of September 30, 2012, the company had approximately \$2.9 trillion of life reinsurance in force and assets of \$39.9 billion.

For further information, please contact:

Sally Smith

Vice President, Corporate Communications RGA Reinsurance Company T +1.636.736.8167 E ssmith@rgare.com

Source: Reinsurance Group of America, Incorporated





MS. QUINTUS MENDONCA HAS JOINED ON 25/10/2012 AS MARKETING EXECUTIVE. SHE IS B.COM AND CARRIES 3.7 YEARS OF EXPERIENCE. HER HOBBIES INCLUDE BADMINTON & READING.

> WE WELCOME QUINTUS MENDONCA TO THE FAMILY OF INSTITUTE OF ACTUARIES OF INDIA.

> > CAN BE REACHED AT, PHONE: 67843366

RGA REINSURANCE COMPANY OF AUSTRALIA NAMES NEW MANAGING DIRECTOR

R GA Reinsurance Company of Australia Limited ('RGA Australia'), a subsidiary of Reinsurance Group of America, Incorporated (NYSE: RGA), is pleased to announce the appointment of Mark Stewart to the position of Managing Director of RGA Australia, effective immediately.

"Since launching operations in Australia in 1996, RGA has become known as a reinsurance partner that understands the challenges and opportunities facing insurers, and delivers innovative ideas and expert solutions to support their profitable growth," said Alain Néemeh, Chief Executive Officer, RGA Canada and Global Head of Mortality Markets, with executive responsibility for RGA Australia. "Mark shares our vision of working closely with our clients in Australia and New Zealand to drive their growth and success, and I expect he will lead our team to even greater achievements."

Mark has been Interim Managing Director of RGA Australia since November 2012, managing all of the unit's business activities. Prior to his appointment, he was RGA Australia's Chief Financial Officer and Appointed Actuary. He has nearly 20 years of experience in the Australian and New Zealand insurance markets. Mark is a Fellow of the Institute of Actuaries of Australia, the New Zealand Society of Actuaries and the Financial Services Institute of Australia. He was recently appointed to the Life Board Committee SYDNEY, Australia, 8 February 2013

of the Financial Services Council.

"RGA has grown to a substantial business in the Australian and New Zealand markets over the past several years. We are confident that our clients will be in good hands, going forward," said Greig Woodring, President and Chief Executive Officer, Reinsurance Group of America, Incorporated (RGA).

Operating in Australia since 1996, RGA Australia today has staff located in Sydney, Melbourne, Brisbane and Wellington. Through these offices, RGA Australia provides reinsurance support to almost every life insurer in Australia and New Zealand, across all major lines of business.



THE PRESS

FROM

THE ACTUARY INDIA – EDITORIAL POLICY (VER. 2.00/23RD JAN 2011)

Version history;

Ver. 1.00/31 01 2004

Ver. 2.00/23rd Jan. 2011

- A: "the Actuary India" published monthly as a magazine since October, 2002, aims to be a forum for members of the Institute of Actuaries of India (the Institute) for;
 - a. disseminating information,
 - b. communicating developments affecting the Institute members in particular and the actuarial profession in general,
 - c. articulating issues of contemporary concern to the members of the profession.
 - d. cementing and developing relationships across membership by promoting discussion and dialogue on professional issues.
 - e. Discussing and debating issues particularly of public interest, which could be served by the actuarial profession,
 - f. student members of the profession to share their views on matters of professional interest by way of articles and write-ups.
- B: The Institute recognizes the fact that;
 - > there is a growing emphasis on the globalization of the actuarial profession;
 - there is an imminent need to position the profession in a business context which transcends the traditional and specific actuarial applications.
 - > The Institute members increasingly will work across the globe and in global context.
- C: Given this background the Institute strongly encourages contributions from the following groups of professionals:
 - Members of other international actuarial associations across the globe
 - Regulators and government officials
 - Professionals from allied professions such as banking and other financial services
 - Academia
 - Professionals from other disciplines whose views are of interest to the actuarial profession
 - Business leaders in financial services.
- D: The magazine also seeks to keep members updated on the activities of the Institute including events on the various practice areas and the various professional development programmes on the anvil.
- E: The Institute while encouraging stakeholders as in section C to contribute to the Magazine, it makes it clear that responsibility for authenticity of the contents or opinions expressed in any material published in the Magazine is solely of its author and the Institute, any of its editors, the staff working on it or "the Actuary India" is in no way holds responsibility there for. In respect of the advertisements, the advertisers are solely responsible for contents of such advertisements and implications of the same.
- F: Finally and most importantly the Institute strongly believes that the magazine must play its part in motivating students to grow fast as actuaries of tomorrow to be capable of serving the financial services within ever demanding customer expectations.

Puzzle No 185:

Continue the sequence.. 2 4 6 30 32 34 36 40 ? ?

Puzzle No 186:

In the equation, each letter represents a different digit:

- TIM × SOLE = AMOUNT
- i) Is LEAST more than MOST?
- ii) Expressed in letters, what is the difference between LEAST and MOST?

Solutions to Puzzles:

Puzzle No 181:

The two missiles approach each other with combined speeds of 30,000 miles per hour, or 500 miles per minute. By running the scene backward in time we see that one minute before the collision the missiles would have to be 500 miles apart.

Puzzle No 182:

19 cubes

Correct solutions were received from: Puzzle No 181:

- 1. Parag Gupta
- 2. Sameer Mehta
- 3. Sushant Jain
- 4. Gyanesh Jain
- 5. K.S. Pujare
- 6. Nikhil Sheth
- 7. Pushkar Deodhar
- 8. Rushabh Shah
- 9. Ajay Shekhar
- 10. Anupama Kataria
- 11. Manoj Barbhaya
- 12. C.R.Narasimha Krishna Sai
- 13. Koushik Dasgupta
- 14. Harshul Taneja
- 15. Neha Podar
- 16. Aditya Ojha

Puzzle No 182:

- 1. Parag Gupta
- 2. Sameer Mehta
- 3. Sushant Jain
- 4. Gyanesh Jain
- 5. Nidhi Verma
- 6. Pushkar Deodhar
- 7. Ajay Shekhar
- 8. Manoj Barbhaya
- 9. Koushik Dasgupta
- 10. Neha Podar



shilpa_vm@hotmail.com



puzzle No. 8 for the month of February 2013

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.

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

- Sudoku Puzzle by Vinod Kumar



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 **February 2013**

K. Hanumantha Rao	M. Venkatesan
A. P. Peethambaran	Chandan K. Khasnobis
V. Rajagopalan	A. Venkatasubramanian

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

HARD SOLUTION

Solution of Sudoku Puzzle No.7 published in the Month of January 2013

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

SHILPA'S PUZZLE

ACHIEVE YOUR GOAL... RIDING ON INTELLECT... POWERED BY VALUES

Exam will take place on 14th & 15th June, 2013 in 41 cities across India. http://actuariesindia.org/subMenu.aspx?id=4&val=ACET

> Actuarial Common

<u>Entrance</u>

Test

Gateway to the W rld of Actuary

We are interested in you, the brightest and the best Your love for Mathematics or more generally skills in numeracy can lead you to a rewarding and satisfying career as an Actuary.

Registration Starts from 1st March 2013 till 7th May 2013.

Who?

- Have a degree in or are studying for **Mathematical Sciences: Maths**, **Statistics, Econometrics** or any other
- An **Engineer** or studying for it.
- A Management Graduate or studying for it,
- A Chartered Accountant, Cost Accountant or a Company Secretary OR studying for any of these,
- Have a degree in **Finance** or studying for it, OR any other, but you have love for Mathematics and skills in Numeracy.

With minimum of 10+2 or even a maximum of a Phd in Maths or Stats or any other.

What?

An Actuary is a business professional who analyzes the financial consequences of risk. This is a niche profession with strict standards for qualifying and is also a global profession as it is recognized in most countries. The actuaries attract competitive salaries globally. It has consistently been rated as one of the best jobs in America, US News and World Report, the jobs Rated Almanac, CNN Money, and many others.

How?

Statistics Pack, Actuarial Mathematics Pack and Online Tutorial for ACET would be made available on registration. Once successful, you can take admission as a student member and pursue the actuarial course.

Where

List of Cities for Examination : Agra, Ahmedabad, Bareilly, Bengaluru, Bhopal, Bhubaneswar, Chandigarh, Chennai, Coimbatore, Dehradun, Delhi, Faridabad, Goa, Gurgaon, Guwahati, Hyderabad, Indore, Jaipur, Jalandhar, Jammu, Jamshedpur, Kanpur, Kochi, Kolkata, Lucknow, Ludhiana, Mumbai, Nagpur, Nasik, Patna, Pune, Raipur, Ranchi, Secunderabad, Srinagar, Surat, Thiruvananthapuram, Udaipur, Vadodara, Varanasi, Vizag.

Try and prove your skills in Numeracy... Take Actuarial Common Entrance Test (ACET)



Institute of Actuaries of India

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Contact : 022-6784 3300/3355 E-mail : acet@actuariesindia.org

ananaa



Insurance se badhkar hai aapki zaroorat

Edelweiss Tokio Life Insurance Company Limited is a joint venture between Edelweiss Financial Services, one of India's leading diversified financial services companies with business straddling across Credit, Capital Markets, Asset Management, Housing finance and Insurance and Tokio Marine Holdings Inc, one of the oldest and the biggest Insurance companies in Japan now with presence across 39 countries around the world.

We are a new generation insurance company looking out for talented individuals for the following positions...



Role : Pricing – Actuarial Team Position: Manager / Sr Manager Reporting To: Head, Product Pricing

Job Description

- Modelling and pricing of the products
- Preparation of file & use and benefit illustrations
- Provide support in the preparation of
- Product brochures
- Policy documents
- Set-up of products in policy administration system
- Product training material
- Ensure compliance to all product related regulations / circulars as laid down by IRDA

Qualifications and Technical Skills

- Should have cleared at least 8 10 Actuarial exams
- Shall have experience of around 5 years in actuarial work with preferably 2 years in the product pricing team
- Good knowledge of Excel, Macros and VBA tools



Role : Valuation – Actuarial Team Position: Manager / Sr Manager Reporting To: Head, Valuation

Job Description:

- Statutory Valuation
- Determining capital requirement (Solvency & Risk Based)
- IRDA reporting
- Experience analysis
- Business planning
- Prophet maintenance
- **Qualifications and Technical Skills**
- Should have cleared at least 8 10 Actuarial exams
- Shall have experience of around 5 years in actuarial work with preferably 2 years in the valuation team
- Prophet and DCS skills



Edelweiss

Role : Risk Manager Position: Manager / Sr Manager Reporting To: Chief Risk/Investment Officer



- Risk Recognition & Prioritization
- Setting up a risk management framework and risk tolerance limits
- Quantification of risk (including VaR calculations, Duration/Convexity and Beta calculations)
- Managing ALM and Investment Risks
- System capabilities to monitor and report risks
- Support ALM and Risk Committees (Board Sub Committees)
- **Qualifications and Technical Skills**
- Candidates should have cleared at least 6 exams
- Additional qualifications like MBA/CFA/CA/or Risk
 Qualifications like FRM/PRM are preferred
- High levels of Numerical and Analytical Skills preferably an Engineering/Mathematics background
- Good knowledge of Excel, Macros / VBA and Power-point tools
- Eye for details and good communication / interaction skills
- 4-5 years of Life Insurance experience and/or Investment/ ALM experience is desirable

Contact Person : Meghna Karkera (+91-22-4342 8695)

Please send your resume to: meghna.karkera@edelweisstokio.in

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