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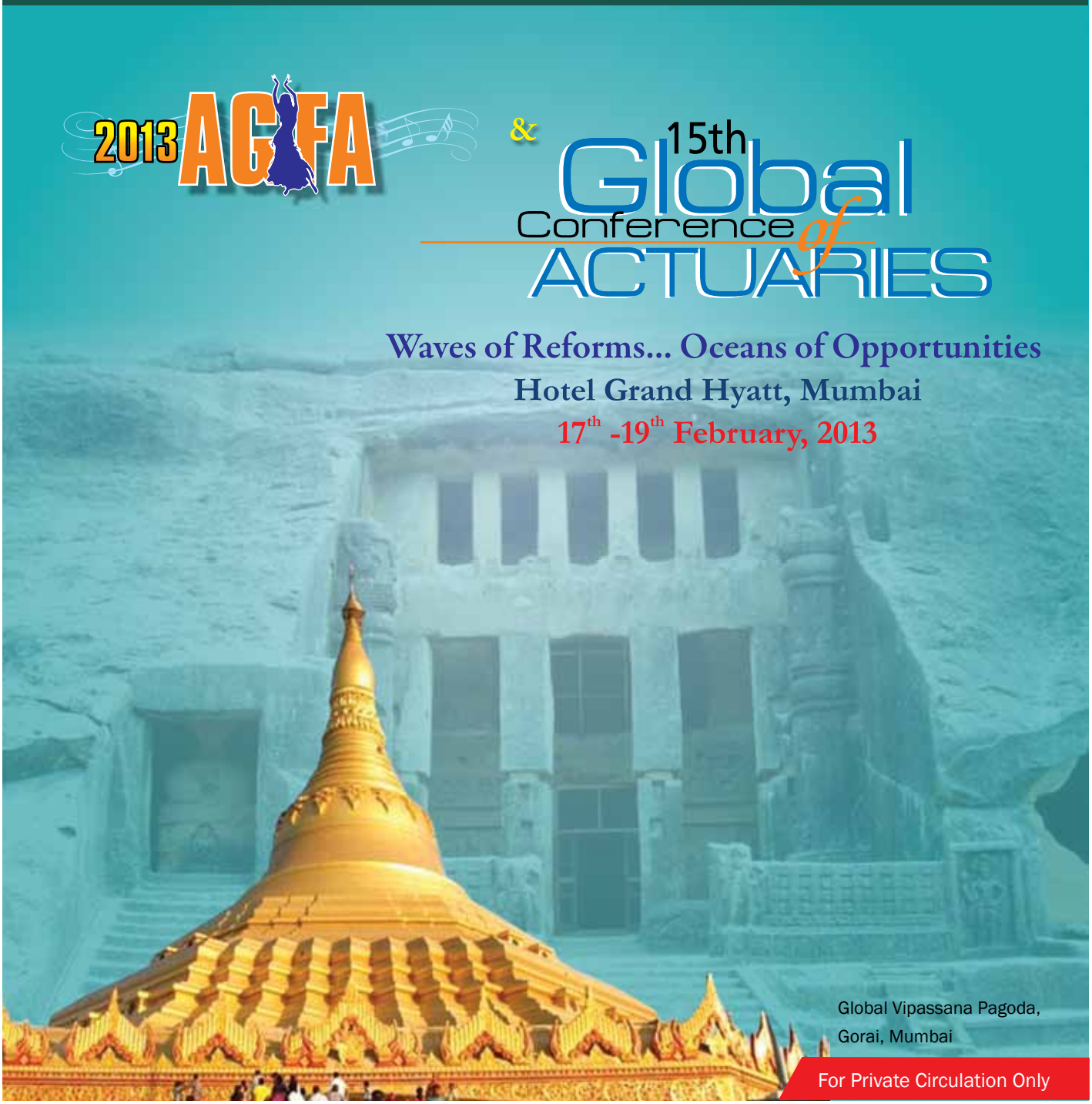

Council of Institute of Actuaries of India, in its meeting on 24th August, 2012 adopts Vision, Mission and Value Statement

Institute of Actuaries of India

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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FACE TO FACE WITH

OFFSHORED ACUTRIAL WORK IN INDIA - SUCCESS STORIES

DEBASHISH BANERJEE

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amit.kumar@xlgroup.com

Experience:
Debashish has over 12 years of experience in variety of actuarial and analytics projects in the insurance industry. Most of his contribution is in the actuarial, data mining and predictive modeling space. He started his career with GE and was instrumental in establishing and leading the non-life reinsurance pricing team for GE Insurance in India. Deba was looking after the pricing team in India and slowly expanded his technical skills to oversee the reserving processes. He was awarded the most prestigious "Summit Award" by GE. He moved to Deloitte in 2005 with the primary goal to set up the Insurance Advanced Analytics practice in India. Deba has contributed heavily in cross service line integration working with the strategy and technology teams and contributed towards building the new service offerings & tools on workforce planning, underwriting and claims modeling, retention analytics, consumer analytics and business simulation game. He has the expertise in reinsurance pricing, statistical & parameter studies, stochastic reserving, building pricing models, exposure curves & market studies. He is the Practice Lead for the Actuarial, Risk & Analytics group of Deloitte Consulting LLP, Hyderabad, India. Deba has started the Hyderabad center for conducting exams on behalf of Casualty Actuarial Society, USA and Institute of Actuaries, UK. He has bachelors and masters degrees in statistics from Indian Statistical Institute, Kolkata

PERSONAL

What jobs and experiences have led you to your present position?

I helped start one of the first non-life actuarial outsourcing practices in India way back in 2000 with GE Insurance. A bunch of 14 of us got picked up from various campuses by GE leadership. Within a couple of years, we established a matured actuarial practice of about 25 practitioners and then moved to grow it to about 50 before I left GE. I was focusing primarily on reinsurance pricing and a little bit of reserving.

Describe your current roles and responsibilities?

I lead the actuarial, risk and advanced analytics (ARAA) practice in Deloitte's Global Delivery Center in India. So, all P&L responsibilities on these offerings roll up to me in India. Revenue growth, Controllable margin, Client relationship and People management are the key components of my roles and responsibilities.

What are the key qualities required in your position?

Most importantly, in my mind, is the leadership quality and being able to think beyond 3-5 years. Having a vision and being able to motivate and influence people around you. When I joined Deloitte the only ask was to get the US projects served from India. I soon realized and educated the firm not to be myopic. Started exploring the UK, Australia, South Africa, Hong Kong etc. marketplace from an outsourcing, consulting and collaboration perspective. More interestingly, started the actuarial and analytics consulting market in India for Deloitte. First assignment in the Indian marketplace for our practice came in about 2007.

Most significant career moment in your life?

Back in GE, there was a time when my manager and his supervisor left the organization. We did not have HR, legal, operations person on board as well. I told myself, someone has to do this, why not me? As Jack Welch says, "control your destiny otherwise someone else will". My efforts were recognized and the then CEO, Ron Pressman invited myself and family to Mexico to give me the most prestigious Summit award. In Deloitte, my first sale was the most memorable one.

How did you balance your job and personal time?

I typically try and spend the weekends with my family. I work hard and then party hard with my family and friends. Given I have to travel quite often, whenever I am in Hyderabad I try to give quality time to my family and kids.

PROFESSION

Please describe a typical day at work?

Ah! Tough one, but let me try. Either I am travelling i.e. to client on proposal or sales. Or, I am traveling to manage team members across the locations. In case, when I am in office, I devote about 50% of the time on my projects and deliverables. Rest of the time, about 30% or so is with people and ensuring people are motivated at work. Remaining 20% is generally practice development and operational roles that I play in the firm i.e. insurance industry, overall consulting, other advisory offerings etc.

What can you tell me about the employment outlook in your occupational field?

We are growing. I know that for a fact. I hear from the industry that the actuarial market place has reached saturation. However, we at Deloitte do not see that. We are in the growth mode. So, employment outlook is bright in my mind. For us, the main focus and growth area currently is the life actuarial, which is the latest offering we added fairly recently here in Deloitte.

How much demand is there for people in this occupation? How rapidly is the field growing?

We have grown more than 30% CAGR every year for the last 7 years in Deloitte. I think the growth was a little stalled during the recession but it has picked up back again. Given the work is mostly for foreign clients, we are also seeing a lot of foreigner or NRI's wanting to move to the Indian marketplace. I think it is an extremely good sign for the industry.

What do you consider to be the key areas where actuaries add value to the business?

Pricing and reserving are of course traditional areas where actuaries add tremendous value and that should continue. Other big focus areas were I think actuaries should get in is around predictive modeling and risk management. I think these two areas are really critical where by an actuary can showcase his / her skills and expertise to the other functions e.g. underwriting, claims, risk etc.

What impact do actuaries have on consumers and society? What should they do to connect with the society?

I do not think actuarial as a profession has a big direct impact on consumers or society. With a penetration percentage so low, not right now in India for sure. Of course multiple related and indirect impact (policy premium, product features etc. are all indirect impact). However, I do agree, like any other profession, actuarial should also try and give back to the society in whichever way it can. It can be individual driven, however, I have seen many take part in educating and teaching the underprivileged children via NGO's etc. On a lighter note, actuaries can themselves buy more insurance policies to give a boost to the marketplace.

How do you think IAI can support better its members?

I feel IAI is doing a lot of things to improve the support for its members. I was in touch with the past president Mr. Liaquat Khan and I got to learn about the initiatives. A few suggestions, I had were to connect with the broader communities and forums e.g. Underwriting, Accounting, etc. would help. Joining hands with the corporate or global associations to discuss and publish hot topic series, India relevant thought ware, etc. would be helpful in my mind.

You have not moved too often and too many jobs and yet we see growth and success story around you. This is very much unseen of in the Actuarial community. What is the secret?

You said it already- the first and foremost secret is that I have not moved too often. I truly believe that pays off. It's extremely easy to say "I Quit" and move out for better pastures. It's challenging to take the developmental feedback, work on them and conquer.

Second, clearly is a "right time right place" and following the Jack Welch mantra of "controlling the destiny". Third, is doing the right thing for yourself and the practice without fear. Giving the personal space to the employees and respecting their needs.

INSURANCE INDUSTRY IN INDIA

What trends do you see for this industry in the next 3 to 5 years?

In my mind, the FDI moving up to 49% and beyond would see a lot of money pumping into the market place. That would certainly call for big growth opportunity. A lot of us are working on innovating new products and features and I anticipate a lot of new / variety of product launch. The penetration ratio of insurance is still fairly low in India and I think the consumer mindset has to change – which is on the right direction.

Are there things that the IRDA or the Government should have or should not have done to assist the industry?

As I noted earlier, I think FDI is much delayed. From a government and regulatory perspective, I think the industry stepped back a bit due to the tussle on ULIP products. The non-life market suffered a lot due to the third-party pool, that again is something politically driven and the inability to do a correction or 'right pricing' on commercial vehicles. So, clearly, more could be done. However, there are a lot of right steps. I appreciate government and IRDA for that.

What market share do you see the private sector players having in ten years time?

My guess would be double as today's.

What are the top three issues facing the Financial sector, Pension provision & Insurance sector in India.

- Not enough capital in the market
- Consumer not willing to buy insurance, if not made mandatory by the government. I think the reason is infrastructure and judiciary not supporting consumer as they should.
- On the pension side, I think it is huge inflation and unpredictable economy. There are new companies e.g. PFG etc, which have shown a great interest in entering the marketplace. Look forward to seeing this sector improving.

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

Strength is clearly the large population of India. The ability to live-in and manage chaos. Expectation level is fairly low and hence satisfaction is high. In terms of inefficiency, I believe it's minimal or naïve use of the data analytics and predictive modeling techniques. The world expects a lot from actuaries and we need to go with an open mind, help each other and share knowledge and best practice to help grow the overall marketplace.

OFFSHORED ACTUARIAL WORK IN INDIA

Your current area of responsibility is managing actuarial work that belongs to Insurance Entity of the USA. Can you expand on this?

I am afraid not. It's majorly US, I agree. However, we have significant portions of UK, Hong Kong, etc. with a small portion of India as well. Deloitte is a partnership firm and it's almost like outsourcing for different companies when you work with different partners. They have their own processes, methods and likings. My vision is to develop the practice as a global delivery center and having a significant base in Indian marketplace. The challenge is that the markets are different. The approach is to collaborate with local teams and help clients across the globe. Unlike all outsourcing firm, at Deloitte we do not have any FTE rate. We work on projects and practitioners travel to the client site as other consulting teams. The global CEO for Deloitte as the strategy around "As One" and we emulate that very well as the actuarial practice. For example, offerings like US GAAP, M&A etc., we have our experts from US and HKK who come in to help Indian clients.

What are your views on such work being carried out within India: its volume, spread over countries, its challenges etc?

Most significant advantage is the experience to work in mature markets. The learning is immense and one is exposed to many new techniques and gets a chance to work with multiple eminent actuaries across the globe. One can easily take these learnings to the Indian or other developing marketplace on an appropriate time based on project needs. Challenges are of course there, time zone is a big factor. Readiness to travel abroad is a critical component to this. Sometimes because of the remote location, the work might not be challenging – however, once you prove that you can handle complex assignments, there is no turning back.

Any specific challenges facing actuarial workers in this area of employment within India?

Technically, the actuarial students learn similar techniques and are at par with UK standards. US follows a little different approach with the CAS and SOA exams, but those are minor and can be overcome, if the individual is bright. On the professional side, maybe punctuality (respecting the deadline) and communication would help.

Suggestions for the IAI which can support better such work in India?

I think IAI is doing a lot of good stuff. As I mentioned before, new thought papers, more focus on eminence, communication and professionalism in the curricula would really help. Last but not the least, affiliation and recognition with major actuarial societies, especially CAS/SOA would help. The world is becoming smaller and smaller, so, why create barriers.

Disclaimer: Views expressed in this interview are personal.

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.

OFFSHORED ACUTRIAL WORK IN INDIA - SUCCESS STORIES

SANDEEP PATIL FSA,CERA,MAAA

SENIOR MANAGER,
GLOBAL TALENT HUB – ACTUARIAL, ERNST & YOUNG

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FACE TO FACE WITH

Experience:
Sandeep Patil is leading the Insurance and Actuarial Advisory Services (IAAS) team in Ernst & Young's Global Talent Hub (GTH) group in Bangalore. We are focused on supporting global E&Y offices in providing Actuarial and analytics services to financial services clients. Prior to joining E&Y, He worked with The Hartford Insurance and Deloitte consulting in the USA. His experience includes economic capital, US GAAP & statutory valuations, Enterprise Risk Management (ERM), and Actuarial audit support. He is a Fellow Life Actuary and he did Masters in Mechanical Engineering from The University of Connecticut, USA.

PERSONAL

What jobs and experiences have led you to your present position?

I worked in an actuarial consulting firm and an insurance company in the USA in the areas of Economic capital, Enterprise Risk Management, life insurance and annuity products, actuarial audit, and actuarial modeling.

Describe your current roles and responsibilities?

I currently lead an actuarial team in E&Y's Global Talent Hub to support its global offices in the areas of actuarial modeling and audit support. My key responsibilities include business development, team management, address global offshoring demands, and provide training and technical guidance to the team.

What are the key qualities required in your position?

Key qualities required are clear understanding of global actuarial requirements, strong communication and organizational skills, and effective team management skills

Challenges that you faced on the route to becoming an Actuary?

One of the major challenges was to maintain the work-life balance while effectively studying for exams and getting appropriate work exposure

How did you balance your job, studying for exams, and personal time?

I planned for my study time ahead of time along with some contingency plan especially while working in a consulting firm where I had to travel with no prior notice

PROFESSION

Please describe a typical day at work?

The typical day at work involves addressing team issues (technical and non-technical), provide guidance to team members in effective communication with onshore teams, develop and implement team strategy, and communicate with global E&Y actuarial leads for business development

What can you tell me about the employment outlook in your occupational field?

There is an increase in demand for actuarial offshoring to India due to aggressive focus by companies globally in improving operational efficiency while meeting changes in customers and regulatory requirements

How much demand is there for people in this occupation? How rapidly is the field growing?

Due to this offshoring demand, there is a great need for people with strong analytical, communications, and people skills and the growth in demand is going to increase as companies globally experience the benefits of this offshoring model

What do you consider to be the key areas where actuaries add value to the business?

Actuaries contribute as a Subject Matter Experts (SME) and they can further add value by effectively communicating their complex analyses to the senior management so that the management can take appropriate decisions

What impact do actuaries have on consumers and society? What should they do to connect with the society?

Actuaries need to understand the dynamic nature of consumer's behavior and their needs along with market behavior so that they can develop and price the products that suit consumer needs while understanding the risk appetite of the company.

How do you think IAI can support better its members?

IAI can actively focus on providing global financial industry knowledge to their members in the areas of regulatory requirements and product development by conducting periodic conferences. IAI should also focus on improving the results of their higher-level exams so that the students can achieve credentials with the pace that is at par with global actuarial institutes

You being a fellow member of IFA as well as IAI, what do you see commonality of approach amongst these two organizations?

I am the fellow member of the Society of Actuaries, USA and I think the curriculum of both organizations is evolving to meet the industry demand

OFFSHORED ACTUARIAL WORK IN INDIA

Your current area of responsibility is managing actuarial work that belongs to Insurance Entity of the UK. Can you expand on this?

My current work focuses on US, UK, Middle East, and Bermuda

areas. We work with local EY actuaries to help them provide actuarial solutions to clients in these countries.

What are your views on such work being carried out within India: its volume, spread over countries, its challenges etc?

The volume of this work is bound to grow in near future with countries like Australia, Japan, and other European countries entering the list. Some of the key challenges are

- Finding people with specific skills set and provide opportunities in further upgrading these skills
- Developing the understanding of local products and regulatory requirements

Any specific challenges facing actuarial workers in this area of employment within India?

Major challenges in India are

- Knowledge building on global markets
- People retention
- Keep people motivated in finishing their exams to achieve credentials

Suggestions for the IAI, which can support better such work in India?

Partner with global actuaries institutes and tailor the curriculum of exams to suit global needs. Improve the frequency and performance of exams so that students can finish these exams at reasonable pace and contribute effectively as credentialed actuaries

CAREER OPPORTUNITY

WHAT YOU DO TODAY...THE DOORS YOU OPEN, THE OPPORTUNITIES YOU MEET, THE WORK YOU DO, THE DECISIONS YOU MAKE, THE LOVE YOU EXPRESS, ETC. DETERMINE THE SUCCESSES YOU WILL HAVE TOMORROW. THERE IS AN INDESCRIBABLE FORCE THAT TAKES PLACE INSIDE YOU WHEN YOU CONNECT INTENTION WITH ACTION THAT WILL BRING ABOUT THE RESULTS YOU DESIRE TOMORROW.

EXISTING CHALLENGES TO THE IMPLEMENTATION OF MICROINSURANCE IN SERBIA

by Svetlana Cavoski

ABSTRACT: The topic of this paper deals with the problems actuaries in Serbia will face while implementing microinsurance in their country and the Western Balkans region. Until now no adequate legislation has been created that could regulate the field of microfinance and microinsurance, although all necessary socio-economic preconditions do exist: growth of unemployment, urban and rural poverty etc. Therefore, an initiative has been launched to pass a law on cooperatives that might become the cornerstone of the PPP model. This model assumes the engagement of the whole infrastructure and logistics of the existing commercial insurance, which could influence the reduction of product prices. No need to say, this would imply comprehensive corrections of different legislature and the re-organization of the insurance supervision bodies of the National Bank of Serbia. Thus, this paper will analyze all possibilities of the successful implementation of microinsurance models in Serbia and the region.

KEY WORDS: rural poverty, social cooperatives, PPP model

When taking into consideration the implementation and further development of microinsurance in practice, at the level of creation of a particular product, as well as in general field, or at the level of meeting market requirements, level of informing and educating insurers, creation of new or expansion of the existing legal and financial regulations in the sphere of microinsurance, introduction of new technologies and creation of new distribution channels- all these steps following the breakthrough of microinsurance in the developing countries' markets are met by a number of challenges and problems that have to be both identified and solved simultaneously.

In the past twenty years the ex-Yugoslavia territories were disintegrated, its republics- members of the Federation- became independent, its self-managing socialist system with market elements shifted towards the principles of total market economy. Those hard and very painful radical economic and political changes produced reciprocally hard consequences in the social sphere as well. Some of the hardest ones, which lasted with more or less the same intensity for twenty years were rapid decline of urban middle class, further devastation of Serbian rural areas, followed by disproportionate migration of rural population to the largest cities, which resulted in an increased number of old households, as well as constant migration of highly educated young people abroad.

In such an environment insurance was facing changed circumstances. It was based on unique principles valid for the whole of Yugoslavia and conceived long ago as an active factor in large areas, in more favorable and functional economic environment, with logistics able to serve the market of 22 million people, with an advanced statistics-actuarial system[1]. It was then, when insurance in Serbia was faced with a complex task: to find out *modus operandi* and materialize relatively satisfactory business results in new circumstances additionally deteriorated by the world economic crisis.

According to the OECD classification a rural area is any territory with less than 150 inhabitants/km2. In Serbia, level of poverty is the most pronounced in rural areas, where population density is less than 63 inhabitants/km2. Rural areas represent 85% of the territory with 55% of the total population of the Republic of Serbia.

The general and common characteristics of the rural areas in Serbia are:[2]

- Intensive migration due to protracted exodus of population over a few decades continued, further emptying rural areas / although there was some influx of population, such as internally displaced persons or refugee. At the same time, age rate of rural population gets higher, what is particularly characteristic for the south-east part of the country/ 1,28[3].
- Low level of diversification of economic activities in rural areas points to high dependence on primary agricultural production, what narrows substantially employment opportunities in other spheres. This speaks of the existence of "distress push" factors of diversification, that are characteristic for underdeveloped rural area.
- The lack of employment opportunities resulted in high unemployment rate, 21%/ in the rural areas, what is particularly favored by negative educational pattern of the rural population that cannot be placed in the labor market.
- In the course of ownership transformation, agricultural processing capacities were considerably reduced, partly due to obsolete technologies and partly due to closing down production plants.

About the Author

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Ms. Cavoski is the Certified actuary at Kompanija Dunav Osiguranje ADO. She is a Member of the Serbian Actuarial Association (a full member of the IAA) as a president of the Superior Council and an individual member of the IAA (Actuaries Without Borders) - AWB.

1 May I mention that I belonged to the first generation of educated actuaries who, in the late 7o'ties, were taught in Belgrade by Prof. Hans Buhlmann, Dr Erwin Straub and Prof Marc Amsler.

2 Rural Development Strategic Plan, 2009-2013, Ministry of Agriculture, Forestry and Water Resources of the Rep. of Serbia, January 2009, pp4-6; Draft of the Rural Development Strategic Plan 2010-2013, August 2009, pp.10-20 passim

- Social and economic infrastructure is very underdeveloped, what immobilizes to a great extent social activities in rural areas.
- Rural poverty is one of the most essential characteristics of poverty in Serbia (61% of the total number of the poor); the ratio between rural versus urban population increased to 2.3. The most endangered categories of rural population are people living solely on primary agriculture, elder people, retired, women, children and displaced people. With a view of ownership pattern (majority of estates are up to 5 hectares), undeveloped capital market and low level of education of rural population- all this makes a clear picture of exceptionally hard socio-economic situation. Poverty is shown by a drastic drop of GDP share of the rural population in the national average, which amounts to 74% at the moment. In absolute terms, about one million of the rural population leave under the poverty line with only US$ 2 daily.
- Living environment of rural areas is still exceptionally rich and preserved (due to the low use of input), what might further deteriorate, if the existing production pattern is changed.

General conclusion is that more than 1/3 of population in the rural areas in the country are exposed to some kind of deprivation- financial material, communal, or are in permanent poverty.

The situation is slightly better in urban areas in Serbia, so it might be considered that there exist socio-economic, demographic, cultural parameters, as well as other differently expressed ones, justifying the introduction of micro financing institutions and microinsurance programs in the country.

So far, there are no legal regulations relating to activities of micro financing institutions; very few of those presently existing are not entitled to collect deposits, or get engaged in any independent financial activities; they operate exclusively as banking distribution channels, so that the types of their activities are changed and aimed towards other target groups. For the moment being, there are no initiatives to introduce microinsurance.

So, at present, overall insurance activities in Serbia are strictly connected with the commercial insurance; the National Bank surveys insurance organizations' activities , as well as other institutions dealing with insurance on the basis of The Insurance Law; it deals with overall external revision and control regulated by The Law on Accounting, as well as internal control within insurance organizations, exercised by actuarial, legal, financial and compliance functions.

Only now the Parliament of the Republic of Serbia should pass a set of laws on cooperatives, - social cooperatives among others- what will make a solid basis for introduction of some models of microinsurance (PPP model primarily) and a start-up of another concept for protection of poor population. These laws should be followed by a number of by-laws setting up precisely control mechanisms and competencies of state bodies, thus ensuring legal safety and protection against abuse of such concept. By their nature, by-laws are more flexible and may easily follow social development dynamism, although they depend on the law functionally and existentially.

All the above mentioned should be followed by adaptation of other existing laws to the new situation, first of all Tax Law that is expected to bring about high incentives.

The Bill on Cooperatives sets forth as its target reduction of poverty and realization of cooperation between public and private sector in solving social matters; such an approach represents excellent legal basis enabling inclusion of cooperatives in microinsurance operations on the PPP principles Even more so, for the social cooperation operations are defined as delivery of social, health and education services and the operations thereof; bearers of public functions are given opportunity to establish partnership as a form of lasting cooperation between public and private sector, with a view of solving social issues.

In order to enhance anticipated programs realized by social cooperatives and to ensure missing funds, financial means will be provided by the budget of the Republic of Serbia. It represents a crucial element in favor of the application of the PPP model, because at the very beginning only this model has got financial power to start up such a project.

This would mean that social cooperatives represent a legal and equal partner in the PPP model.

Who are participants in this model?

Based on the fact mentioned above, the assumed PPP model might be the most suitable approach towards microinsurance; psychologically, it could be easily accepted, for it relies on the public sector represented by the Government (what provides a serious note to the whole concept), on private sector, i.e. commercial insurer (someone well known by the insured), who would provide from its side all available actuarial, technical, technologic, mathematics-statistical, information, legal and other infrastructure and logistics, thus enabling microinsurance models be properly chosen and set up. A commercial insurer starting up such project, should establish a special department dealing exclusively with microinsurance.

In our opinion, in the case of Serbia one should start with the PPP model as less radical turn from public health and pension insurance- model that would engage already existing both material and expert resources of public and private sector, what would mean some savings when forming final product price, for such resources should not be engaged elsewhere.

Proper choice in selecting distribution channel is of paramount importance for survival of any model of microinsurance. In our case, this role should be played by cooperatives. With a view of future legal regulations, negligible probability of misuse, predictable good organization which will be attributed to it, such cooperatives would provide an excellent distribution channel with high throughout put and efficiency.

What would be challenges of microinsurance department of a commercial insurer and what would be the new role of an actuary?

The profession of an actuary is of a paramount importance for good business operations in both commercial and microinsurance operations. Actuaries are irreplaceable as experts in insurance practices, especially when it goes for

3 Age rate is defined as ratio of elderly people over 65 and number of children up to 14 years old

theory of probability, mathematics-statistics methods, management of risks and estimation of financial consequences for business decisions on the results for insurers.

With the development of microinsurance based on the same principles as in the world of commercial insurance, but which addresses to different target groups, the issue of sustainability of microinsurers' operations in very sensitive, sometimes chaotic markets, has been raised. One of indispensable prerequisites for achieving this goal and for overcoming problems is to get actuaries involved in microinsurance operations.

But, as microinsurers' operations deal with poor population, what has been characteristic for developing countries, a crucial problem of the lack of experts should be pointed out.

Education and licensing procedures of an actuary take years, along with constant upgrading, which is a permanent obligation that understands high IT knowledge- features that cannot be ensured easily in the developing countries. Hence, numerous difficulties arise when a microinsurer operates in these markets.

A microinsurer, deprived of services of an actuary, fully or partly employed, or when a case arises, is in a constant danger to make wrong business decisions of any kind and at any level.

In the most frequent cases, he might make a wrong estimation of possible genesis of a harmful case, for he is unable to make an expert estimation based on the principles of theory of probability and theory of risks. Such a failure leads directly to an error of either underestimation, or overrating premium rates, or reduction of insurance coverage or its volume, due to unreal high price of risk. Simultaneously, validity of statistic history in the data base is being disturbed, what will have long lasting negative consequences.

Within this range of decisions, from extremely high to extremely low premium rates and product prices, microinsurer makes his business decisions, permanently in danger to make a fatal mistake. Such a situation would hamper not only his survival in the market at the moment, but in the long run, he destroys his clients' confidence and he could hardly return to the market even when recovered.

What is the position of an actuary in microinsurer's operations?

If we start from creating a particular, single product, our first steps should be directed towards its designing. If we wonder about real meaning and the essence of the step, it would direct us unavoidably toward preliminary analyses of market conditions, identification of a target group for which the product is created, and the balance of its price with the real needs of the group.

This has been a stage that could be easily passed in Serbia, given the fact that the State statistics and overall follow up of data are well developed. Besides, there exist good marketing agencies that could make a relatively easy studying market prospects, so that there should be no big problem to define target groups. At the same time, commercial insurers have got enough statistics data on operations in their portfolio.

In the process of creating and designing a product, it is of substantial importance to achieve long term stability of operations for an insurer in all insurance schemes.

This means that insurers should always be able to make accurate assessment and claim settlement first of all through financial managing, permanent risk survey, particularly in the categories which are subjects of actuary's final account.

As it goes for setting adequate price, which is an issue directly connected to the role of an actuary, the problems may be considerably mitigated by promoting a proper way in collecting and managing data, what justifies the responsibility of the actuary. In our opinion, such a validation increases the credibility of the assessment and reduces room for error, at all levels and in all systems.

The same as all insurance operations, microinsurance is technically established and based on historical statistics data, emphasizing the need for continuous data monitoring and recording.

Opposite to a product stands a target group for whose needs the product is made. In our opinion, such a group might be considered as a sub-group of population defined by their common characteristics that are subject of studies.

Our practice is short of permanent work on education and knowledge about a target group- a feature required to enable microinsurance be successful. Data collected in this fashion should be not only quantitative but qualitative as well (wishes, intentions, fears, resistance, ways to overcome problems, target group's plans, means of generating revenue) and could be used as mechanisms for correction in determining product price, its sales and liquidation of damages. In such a manner a more detailed range of data would be set up, to serve at actuary's best use.

This understands maintaining permanent communication with target group, for, in our view, all marketing parameters are rather unstable, susceptible to unexpected changes, when low-income population is concerned.

In our opinion, development of mutual confidence would be even greater challenge. For it relates to a category hardly acquired, but unbelievably easily lost, with lasting consequences; on "Doppler effect" principle, relevant information spreads quickly both in space and time. Therefore, both participating parties should agree how to realize operations efficiently and timely. This has been a great challenge for a successful implementation of both insurance and microinsurance in Serbia. After hard times we went through, this issue might be the most sensitive one in Serbian insurance.

Added to the above is more or less present competitions, which have been suddenly growing, thus making new challenges to microinsurers' operations. We believe that these challenges are not negligible at all, because foreign insurance houses with the latest logistics and first class experts have entered developing countries' markets and Serbia as well.

The relationship between the microinsurer and the target group represents a constant shifting of interests, where the activities of both sides are aimed at their reconciliation and achieving balance. If we consider the target group as a group of individuals with similar social status, interests and wishes, that it number varies- sometimes is smaller, sometimes bigger, we realize then to what extent is important for a micro-insurer to find out the best approach to the group. The crucial question for us is whether the

insurance should be compulsory or not.

This is a common and a very old dilemma, made more prominent, due to resource constraints in the microinsurance process. It has got its advantages, but its shortages as well.

Thanks to its widespread pattern, compulsory insurance reduces expenditures substantially, thus becoming attainable for those insured, while some of its anomalies, such as selection of risks are practically annulled. Besides, microinsurer's staff is under strong surveillance what reduces cases of fraud. However, some problems remain unsolved (e.g. cases of moral hazard) and they are, so to say, encouraged by such solutions.

With all that in mind, one can say that communications deteriorate, flow of information in both senses is being reduced, the slogan "it is understood" often becomes present, thus making weak the insurance itself and, in the long term, it can lead to its fading.

All these effects might be minimized with systematic follow up of the insured, with the existing legal measures and those to be introduced, emphasizing measures of both internal and external surveillance. It is crucial that, once accepted model of micro-insurance be covered by surveillance measures, what the PPP model ensures by including commercial insurer.

Therefore, the dilemma: whether to permit long term insurance? may be easily solved by its acceptance, given the fact that legal regulations do limit negative consequences of its implementation.

Exact actuarial and statistics projections on insurance parameters records in general, and microinsurance operations in particular, do require adequate level of statistical data both in terms of quality and quantity, to be kept at the level of the insured. The same goes for both commercial and microinsurance. Special attention should be paid to series of qualitative data ensuing from market analyses, in terms of their proper evidencing and information availability. Most probably that it could be performed, given the staff and technical readiness of IT functions, when commercial insurers in Serbia are concerned.

As for microinsurance operations, reserves serve as a fund which ensures means for future obligations, what is identical to insurance itself. Actuarial definition of notion for the reserves, meaning present values for future obligations of insurer's vis-à-vis the insured is identical to the one in microinsurance, where level of reserves is estimated by actuaries.

This principle understands constant follow up of all damages, their trend of development and all problems through surveillance, assessment of engagement of the actuary in creating data base.

Permanent monitoring of compensation requests offers exceptional possibilities to notice how to resolve certain anomalies.

By analyzing compensation requests, in terms of their frequency and individual values and projecting their development trends in future, one can get more precise parameters for creation of new products and making better managerial decisions.

The role of an actuary is here indispensable, particularly in claim reservation programs and re-insurance.

The aim of all these activities is to qualify microinsurers to become able as to fulfill their essential purpose- to pay off fair and on time compensation damage; hence the conclusion that each step in the process of gathering and managing data must be carefully carried out.

In case when data base is not adequately up-dated, we believe that the basic support for actuary's assessment is in his experience and the ability to function in the absence of information, in his proper communication with the portfolio, may we say: in his imagination. In the case of the proposed PTT model in Serbia, there might be inadequate quality market data and information provided for by the State statistics service. That would require the need to expand the existing base, what would mean their adequate definition. The existing base should not be a big problem.

In our opinion, communication is of paramount importance, for it makes possible the trend of growing awareness among the insured about the importance of microinsurance. The better and more substantial communication- the higher level of the insured in this matter.

The knowledge of the insured in terms of their rights has evolved, what leads to an increased number of damages reported. This contributes to enlargement of data on damages, what directly contributes to quality level of actuaries' assessments, what, in turn, helps the development of microinsurance itself.

CONCLUSION

Given the fact that there is a negligible number of actuaries in the world, dealing with microinsurance (40- 100 actuaries[4], more or less specialized), what makes substantial shortage, it is difficult to maintain the existing portfolio, not only from actuaries' point of view, but there are serious obstacles for further spreading of microinsurance. In our opinion the consequences are a lot of voluntarism, improvisations and "gambling" in bringing relevant business decisions.

While waiting relevant legal decisions that would encourage the development of micro financing institutions, different sorts of cooperatives and a start-up projects to introduce microinsurance in Serbia, our actuaries have to get acquainted with respective foreign practices, what would enable them to become theoretically ready for the new era that is knocking at our door.

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ROLE OF PRACTICAL APPLICATIONS OF APPLIED ECONOMETRICS/ STATISTICS IN THE INSURANCE INDUSTRY IN DETERMINING FUTURE GROWTH OF THE GENERAL INSURANCE INDUSTRY

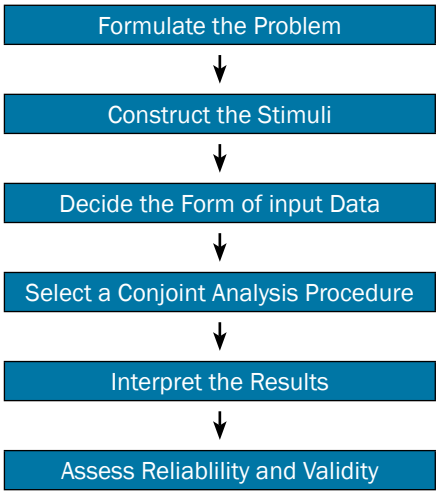
by Dr Amarnath Ananthanarayanan

How Insurance Works?

As we can see these are some of the things that go to determine the overall profitability of a general insurance organization. Pricing is no longer a mathematical technique but involves more of human behavior , choices and psychology of both buyer and seller of insurance in competing marketing environment and we look at how that effects the functioning of insurance company . Now let us know at each one of these probabilities & understand how we can use applied econometrics techniques to estimate these. For the purposes of this paper we will not look at the probability of losses, revenue & costs as they are more well developed in India.

Probability of Buying: One of the areas which determine this probability are Product Design and how customer centric it is, This involves both Qualitative & Quantitative research which involves use of various sample selection techniques and design of experiments. In product design one of the important things is to decide the pricing & product features basis modular pricing which can be done by Conjoint analysis. Conjoint analysis attempts to determine the relative importance consumers attach to salient attributes and the utilities they attach to the levels of attributes. The respondents are presented with stimuli that consist of combinations of attribute levels and asked to evaluate these stimuli in terms of their desirability. Conjoint procedures attempt to assign values to the levels of each attribute, so that the resulting values or utilities attached to the stimuli match, as closely as possible, the input evaluations provided by the respondents. As example of how Conjoint analysis would work is to estimate the price a Motor Insurance customer is willing to pay for a Zero Depreciation Add On cover.

CONDUCTING CONJOINT ANALYSIS



The other important area is to understand if there some customers who may as a group behave similarly and can be clubbed together but there may be many such distinct groups within an organization. This helps in creating separate customer value propositions and is called segmentation. Segmentation can be done through cluster analysis. In cluster analysis the groups (clusters) are determined and the objective is to determine the best way in which customers may be clustered into distinct segments. But cluster analysis does not provide any explanation of why/how the groups are distinct. The greater the similarity within a group & more the difference between the groups, the better is the clustering. There are various ways to do cluster analysis and most of them are available as canned programs in various software. The next logical step would be to have the ability to predict which customers have a higher chance of buying a particular product offered though a particular channel. This is done via creation of propensity or response models that frequently use Logistic regression as the estimation technique to ensure that the probabilities stay in the [0,1] range.

Creating a Logistic Regression Model?

Probability of Lapsation: We can look at modeling propensity to predict lapsation & predicting attrition rates for customers. The econometric technique involved is similar to modeling propensity to buy & Logistic regression can be one of preferred modes of predicting lapsation. The usual suspects that will determine the independent variables or predictors can be classified into: Descriptive – Demographics, Product parameters, Behavioral – Claims utilization pattern and Interactive – Other product holding, x-sell history. The normal checks for model fit & improved model performance would be to look at Interaction between predictors, functional form, and variable classification/transformation.

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Dr. Amarnath Ananthanarayanan (Amar) is the Chief Executive Officer and Managing Director of Bharti AXA General Insurance.

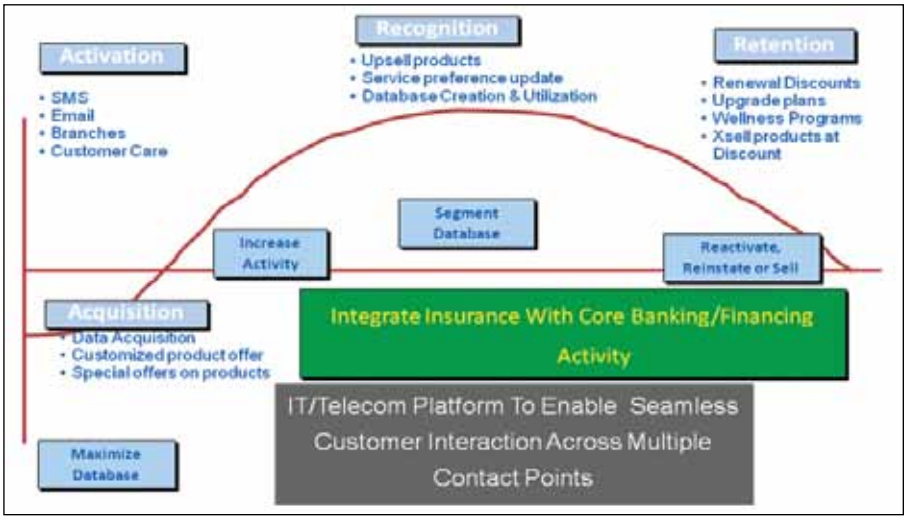
Amar brings with him over a decade of experience and in-depth understanding and knowledge in retail insurance & consumer finance, varied functional proficiencies and cross country exposure.

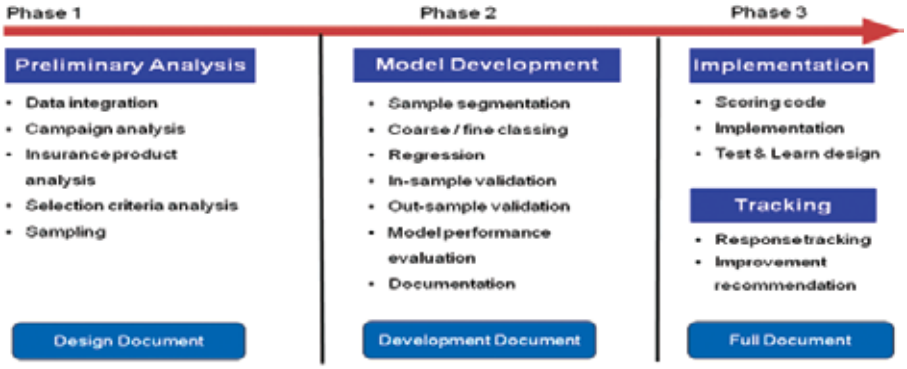
Probability of Cross Sell: We can create both Life Cycle Models as well as Life Time Value models that encompass the entire span of a customer's age. The econometric techniques used have been described before and the salience lies in bringing all these together via a Customer Relation Management engine in the organization. This gains relevance especially when Insurance companies are now working with Banks & other financial institutions to increase the penetration of insurance in India.

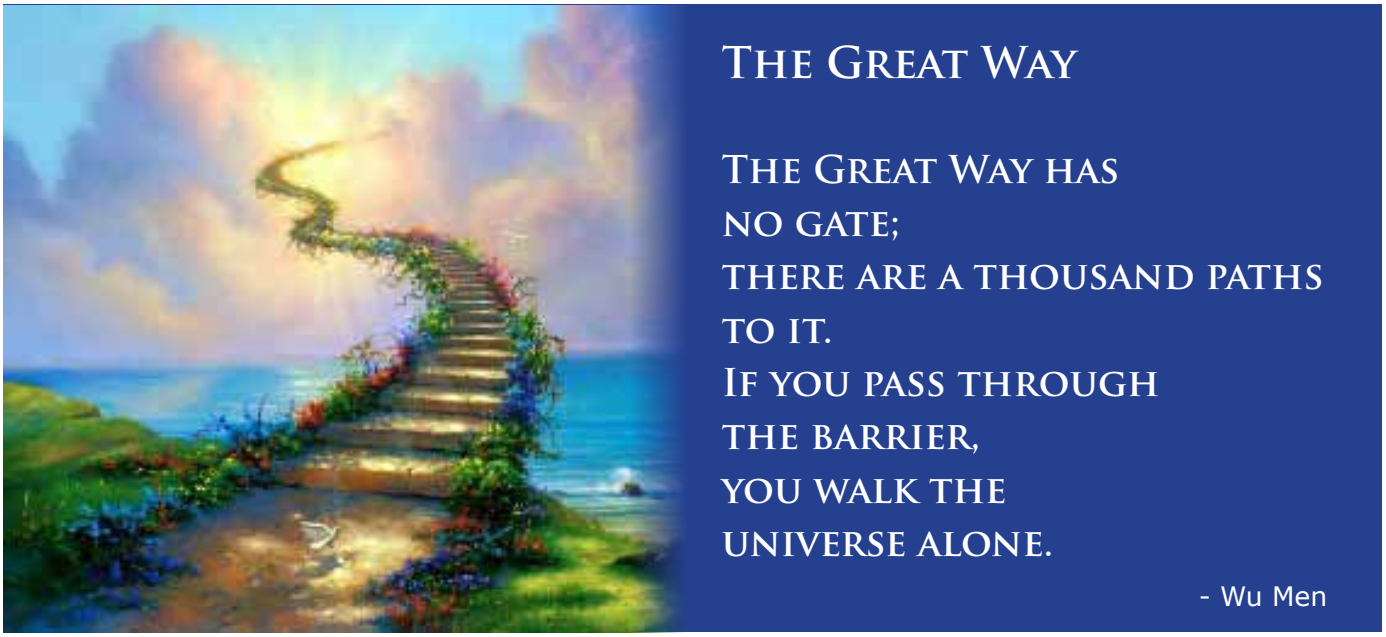
Life Cycle Model Example for a Bancassurance partner

Maximizing Life Time Profitability

The attempt in this paper has to been to emphasize the need to understand our customer & how various applied econometric techniques can go a long way in helping us do exactly this. The implementation of a successful econometric led analytics program in any insurance knowledge firmly rests on the availability of customer data so it is very critical for every organization to make every attempt to collect all possible customer data at all the customer touch points. There was also an attempt to focus on value as opposed to price to help the general insurance industry gain profitability. The Indian insurance market is huge and there will be many new entrants but the successful ones will the ones that embrace the use of various econometric techniques that go beyond the normally seen risk assessment & risk based pricing approaches in the Indian market.







THE ACTUARY INDIA SCHEME OF AWARDS

The Actuary India Scheme of Awards for Best Article & Reportage for the Calendar year 2012 and thereafter till amended

The objectives: recognition of the efforts put in and encourages members to write for the Actuary India magazine either in the form of Articles and/or reportage for various IAI events.

Process of selection: Three member Selection Group will be appointed by the President in Dec. 2012 and every December thereafter to set parameters for selection and recommend best two Articles and best two Reportages in order of merit.

The Awards and recognition: Based on the Selection Group's recommendations, the following rules shall apply;

a) The awards will be given by the Chief Editor during the AGFA held immediately after the end of the calendar year 2012. The awards will be in the form of **cash prize and recognition plaque**.

b) The three member selection Group will send its recommendation by January each year based on editions published in a calendar year 2012 and each Calendar year thereafter.. Every member of the selection Committee will come out with his/her own list of best five articles/reportages. Thereafter, the Group will meet in the second week of January and come out with a commonly agreed upon best two. In the event there is no unanimity the Selection Group will decide on how to select the best two (e.g. going by majority view, draw of lots from the five best drawn by each or any other). This list, along with justifications, will be sent to the President well in time for him/her to announce.

c) The Author/s of first best Article and Reportage will receive a prize of ₹ 10,000/- for the Article and the Reportage and the next best will receive ₹ 5,000/- accordingly. In case there are more than one Authors, the amount will be allocated equally, however the recognitions plaques will be given to each.

d) In order to qualify each article/reportage should meet the following minimum criteria;

   I. at least about 500 words.

   II. should not be reproduced from articles elsewhere (while sending the article the author should give a declaration to this effect.

   III. Should be written by a member of the IAI (in the case of joint authors, all should be members of the IAI) at the time the article is published.

   IV. Reportage should be based on event organized by IAI only.

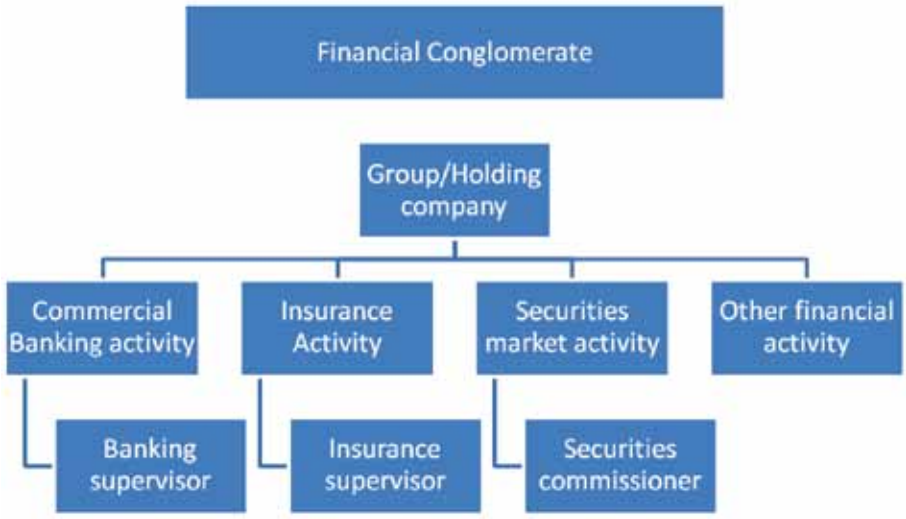
e) The award winning authors along with the Selections Groups key points on selection will be published in the **March** issue of **the Actuary India** each year.

PRINCIPLES FOR SUPERVISION OF FINANCIAL CONGLOMERATES

by C. S. Kumar

Background: Financial conglomerates play significant role in the stability of global and local economies. The rapid growth of financial conglomerates which cut across the banking, securities and insurance sectors, raises questions as to whether the traditional approach to prudential supervision whereby each supervisor monitors institutions in one constituency without much contact with supervisors responsible for other parts of the group is still appropriate. Various developments in the financial sector have led to an appreciation of the limitations of the segmental approach to supervision in addressing the following potential risks associated with conglomeration:

The moral hazard associated with the 'Too-Big-To-Fail' position of many financial conglomerates; Contagion or reputation effects on account of the 'holding out' phenomenon; Concerns about regulatory arbitrage, non-arm's length dealings, etc. arising out of Intra-group Transactions and Exposures (ITEs) both financial and non-financial.



This article presents the principles for supervision of financial conglomerates and their historical development which will effectively help the supervisors with insight into group's risks. This also discusses the Indian scenario with regard to supervision of financial conglomerates.

1999 principles:

The Joint Forum on Financial Conglomerates was established in early 1996 under the aegis of the Basel Committee on Banking Supervision (Basle Committee), the International Organisation of Securities Commissions (IOSCO) and the International Association of Insurance Supervisors (IAIS). The Tripartite Group of Banking supervisors, Securities commissions and Insurance Supervisors, unanimously accepted that, while the solo supervision of individually regulated entities should continue to be the foundation for effective supervision, there is a need for the various supervisors to establish a coordinated approach to supervision so that a prudential assessment can also be made from a group-wide perspective. This is essential in order to provide supervisors with a realistic insight into a group's risks and the respective capital coverage; it also enables supervisors to prevent, or at least to assess the extent of, any excessive or double gearing.

The Joint Forum published various reports in 1999 that together provided an initial framework for the supervision of financial conglomerates called as "1999 Principles". The Joint Forum published papers on each of the following principles. They are:

A. Capital Adequacy Principles
B. Supplement to the Capital Adequacy Principles
C. Fit and Proper Principles
D. Framework for Supervisory Information Sharing
E. Principles for Supervisory Information Sharing
F. Coordinator
G. Supervisory Questionnaire

The paper on Capital Adequacy Principles outlines measurement techniques and principles to facilitate the assessment of capital adequacy on a group-wide basis for financial conglomerates. The Supplement to the Capital Adequacy Principles paper illustrates situations that can be faced by supervisors in practical applications of the measurement techniques.

The Fit and Proper Principles paper provides guidance to ensure that supervisors of entities within a financial conglomerate are able to exercise their responsibilities to assess whether those entities are soundly and prudently managed.

The Framework for Supervisory Information Sharing paper sets out a general framework for facilitating information-sharing between supervisors of regulated entities within internationally active financial conglomerates.

The Principles for Supervisory Information Sharing paper provides supervisors involved in the oversight of regulated financial institutions residing in financial conglomerates with guiding principles with respect to supervisory information sharing.

The Coordinator paper provides to supervisors guidance for the possible identification of a coordinator or coordinators and a catalogue of elements of coordination from which supervisors can select the role and responsibilities of a coordinator or coordinators in emergency and non-emergency situations.

About the Author

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C. S. Kumar is currently working as Deputy Director, Insurance Regulatory and Development Authority.

The Supervisory Questionnaire is a tool to assist supervisors in better understanding each others' objectives and approaches.

Background for 2012 principles:

In a subsequent internal review meeting in 2009, The Joint Forum recommended that the 1999 Principles be updated and expanded. The Internal Review suggested that the Principles dealing with capital adequacy, risk concentrations, and intra-group exposures needed updating to reflect industry developments and to provide greater focus on special purpose entities and the holding companies of financial conglomerates. It also suggested that the "Fit and Proper Principles" required updating and expansion to encompass the broader areas of corporate governance. Thus, the 2012 Principles build on the 1999 Principles in a number of ways and are organised into five sections.

The objective of these Principles is to provide national authorities, standard setters, and supervisors with a set of internationally agreed principles that support consistent and effective supervision of financial conglomerates and in particular those financial conglomerates active across borders. The aim is to focus on closing regulatory gaps, eliminating supervisory "blind spots," and ensuring effective supervision of risks arising from unregulated financial activities and entities.

These Principles emphasise the importance of recognising structural complexity and the potential risks it poses, including risks arising from all entities that affect the overall risk profile and financial position of the financial conglomerate and the individual entities within the group. The five sections of principles are:

- Principles of Supervisory powers and authority
- Principles of Supervisory Responsibility
- Principles of Corporate Governance
- Capital Adequacy and liquidity principles
- Principles of Risk Management

2012 principles:

Principles of Supervisory powers and authority:

These Principles set up new high-level principles directed to policy makers and supervisors that could be viewed as pre-conditions for effective group-wide supervision of financial conglomerates. The Principles highlight the need for a clear legal framework that provides supervisors with the necessary powers, authority and resources to perform, with independence and in coordination with other supervisors, comprehensive group-wide supervision. Comprehensive group-wide supervision should particularly include access to relevant information relating to risks posed by unregulated entities (including the head of the financial conglomerate where it is not regulated) and the ability for supervisors to take corrective supervisory actions as may be deemed necessary.

1. Comprehensive group-wide supervision

   The legal framework for the supervision of financial conglomerates should grant supervisors (including the Group-level Supervisor) the necessary powers and authority to enable comprehensive group-wide supervision.

2. Cooperation and information sharing

   The legal framework should grant the necessary power and authority to supervisors to enable efficient and effective cooperation, coordination and information sharing among supervisors in order to facilitate group-wide supervision.

3. Independence and accountability

   The legal framework should provide supervisors with operational independence while ensuring accountability for the discharge of their duties.

4. Resources

   Supervisors of financial conglomerates should be adequately resourced in a manner that does not undermine their independence.

Principles of Supervisory Responsibility:

These Principles reaffirm the importance of supervisory cooperation, coordination and information sharing, clarifying the importance of identifying a Group-level Supervisor whose responsibility is to focus on group-level supervision and the facilitation of coordination between relevant supervisors. They set up new high-level principles which relate to the role and responsibilities of supervisors in implementing minimum prudential

1. Group-level Supervisor

   Supervisors should ensure there is a clear process in place for coordinating various roles and responsibilities with clearly delineated responsibility for ensuring effective and comprehensive group-level supervision, including a coordination process to identify a group-level supervisor.

2. Supervisory cooperation, coordination and information sharing

   Supervisors should establish a process to confirm the roles and responsibilities of each supervisor in supervising the financial conglomerate, and to ensure efficient and effective information sharing, cooperation and coordination in the supervision of the financial conglomerate.

3. Prudential standards and coverage

   Supervisors should establish, implement and maintain a comprehensive framework of risk-based minimum prudential standards for financial conglomerates

4. Monitoring and supervision

   Supervisors should develop and maintain a sound understanding of the operations of financial conglomerates through undertaking a range of appropriate supervisory activities.

5. Supervisory tools and enforcement

   Supervisors should, when appropriate, utilise supervisory tools to compel timely corrective actions and/or enforce compliance of financial conglomerates with the prudential framework.

Principles of Corporate Governance:

The 1999 Principles were limited to fit and proper principles and did not address broader corporate governance issue. The new Principles reaffirm the importance of fit and proper principles, through a high-level principle relating to suitability of persons involved in the management and control of financial conglomerates. They also provide, through a series of new high-level principles, guidance for supervisors intended to ensure the existence of a robust corporate governance framework for financial conglomerates. These new high-level principles relate to the structure of the financial conglomerate, the responsibilities of the board and senior management, the treatment of conflicts of interest and remuneration policy.

1. Corporate governance in financial conglomerates

   Supervisors should seek to ensure that the financial conglomerate establishes a comprehensive and consistent governance framework across the group that addresses the sound governance of the financial conglomerate, including unregulated entities, without prejudice to the governance of individual entities in the group.

2. Structure of the financial conglomerate

   Supervisors should seek to ensure that the financial conglomerate has a transparent organisational and managerial structure, which is consistent with its overall strategy and risk profile and is well understood by the board and senior management of the head company.

3. Suitability of board members, senior managers and key persons in control functions

   Supervisors should seek to ensure that the board members, senior managers and key persons in control functions in the various entities in a financial conglomerate possess integrity, competence, experience and qualifications to fulfil their role and exercise sound objective judgment.

4. Responsibility of the board of the head of the financial conglomerate

   Supervisors should require that the board of the head of the financial conglomerate appropriately defines the strategy and risk appetite of the financial conglomerate, and ensures this strategy is implemented and executed in the various entities, both regulated and unregulated.

5. Remuneration in a financial conglomerate

   Supervisors should require that the financial conglomerate has and implements an appropriate remuneration policy that is consistent with its risk profile. The policy should take into account the material risks that organisation is exposed to, including those from its employees' activities.

Capital Adequacy and liquidity principles:

The new Principles carried forward concepts from the 1999 Principles, in particular the importance of addressing the full spectrum of risks. The 2012 Principles highlight the role of the supervisors in assessing capital adequacy on a group basis, taking into account unregulated entities and activities and the risks they pose to regulated entities.

They include new high-level principles relating to capital management. These new principles provide guidance for supervisors intended to ensure that financial conglomerates develop and implement robust capital management policies on a group-wide basis. The Principles provide guidance on internal capital planning processes that rely on sound board and management decisions, incorporate stressed scenario outcomes, and are subject to adequate internal controls.

They also introduce a new high-level principle on liquidity assessment and management. This principle provides guidance for supervisors intended to ensure that financial conglomerates properly measure and manage liquidity risk so as to fully accommodate funding needs at all levels of the financial conglomerate in normal times and during periods of stress.

1. Supervisors should require that the financial conglomerate:

- Maintains adequate capital on a group-wide basis to act as a buffer against the risks associated with the group's activities;
- Develops capital management policies that are approved and regularly reviewed by the board, and that include a clearly and formally documented capital planning process that ensures compliance with capital requirements on a group-wide and regulated entity basis; and
- Considers and assesses the group-wide risk profile when undertaking capital management.

2. Supervisors should require that the capital adequacy assessments undertaken by the financial conglomerate consider group-wide risks, including those undertaken by unregulated entities within a financial conglomerate, and that these assessments soundly address third party participations and minority interests.

3. Supervisors should require that capital adequacy assessment and measurement techniques consider double or multiple gearing.

4. Supervisors should require that capital adequacy assessment and measurement techniques address excessive leverage and situations where a parent issues debt and down-streams the proceeds in the form of equity to a subsidiary.

5. Supervisors should require that assessment and measurement techniques evaluate any limitations on intra-group transfers of capital, taking into account potential impediments to executing such transfers that could constrain their suitability for inclusion in the assessment of group capital.

6. Supervisors should require that the head of the financial conglomerate adequately and consistently identify, measure, monitor, and manage its liquidity risks and the liquidity risks of the financial conglomerate. Supervisors should require that liquidity be sufficient across the financial conglomerate to meet funding needs in normal times and periods of stress.

Principles of Risk Management:

The new Principles reaffirm the importance of this guidance by setting out the need for a financial conglomerate to have a comprehensive risk management framework, including effective systems and processes to manage and report group-wide risk concentrations and intra-group transactions and exposures. They place greater emphasis on the conglomerate's ability to measure, manage and report all material risks to which the financial conglomerate is exposed, including those stemming from unregulated entities and activities.

They set up new high-level principles which provide guidance for supervisors intended to ensure that financial conglomerates have in place processes and procedures to develop a sound group-wide risk management culture, to establish a risk appetite policy and define appropriate group-wide risk tolerance levels, to address risks associated with new business areas and outsourcing, to perform group-wide stress tests and scenario analyses, to prudently aggregate risks, and to bring off-balance sheet activities within the scope of group-wide supervision.

1. Risk management framework

Supervisors should require that an independent, comprehensive and effective risk management framework, accompanied by a robust system of internal controls, effective internal audit and compliance functions, is in place for the financial conglomerate.

2. Risk management culture

Supervisors should require that the financial conglomerate have in place processes and procedures to engender an appropriate group-wide risk management culture.

3. Risk tolerance levels and risk appetite policy

Supervisors should require that the financial conglomerate establishes appropriate board approved, group-wide risk tolerance levels and a risk appetite policy.

4. New business

Supervisors should require that the financial conglomerate carries out a robust risk assessment when entering into new business areas.

5. Outsourcing

Supervisors should require that, when considering whether to outsource a particular function, the financial conglomerate carries out an assessment of the risks of outsourcing, including the appropriateness of outsourcing a particular function.

6. Stress and scenario testing

Supervisors should require, where appropriate, that the financial conglomerate periodically carries out group-wide stress tests and scenario analyses for its major sources of risk.

7. Risk aggregation

Supervisors should require that the financial conglomerate aggregate the risks to which it is exposed in a prudent manner.

8. Risk concentrations and intra-group transactions and exposures

Supervisors should require that the financial conglomerate has in place effective systems and processes to manage and report group-wide risk concentrations and intra-group transactions and exposures.

9. Off-balance sheet activities

Supervisors should require that off-balance sheet activities, including special purpose entities, are brought within the scope of group-wide supervision of the financial conglomerate, where appropriate

Indian Context:

To address the supervisory issues relating to financial conglomerates an inter-regulatory Working Group had been constituted in the year 2003-04 with members drawn from Reserve Bank of India (RBI), Securities Exchange Board of India (SEBI) and Insurance Regulatory and Development Authority (IRDA).

The working Group was mandated to propose a list of Systemically Important Financial Intermediaries (Financial Conglomerates) SIFIs based on set criteria and advise on a monitoring/ reporting system encompassing the following:

- A reporting system for SIFIs on financial matters of common interest to RBI, SEBI and IRDA;
- The reporting of intra-group transactions of a Financial Conglomerate; and
- The exchange of relevant information among RBI, SEBI and IRDA.

The working group recommended a complementary strand to the already existing regulatory structure

- Supervision of individual entities by respective regulators viz. RBI, SEBI, IRDA and the system of

Consolidated Prudential Reporting introduced in regard to banks. This framework covers the segments under the jurisdiction of RBI, SEBI, IRDA, and NHB and in due course the segment covered by Pension Fund Regulatory and Development Authority would also be included. The working group proposed criterion for identifying financial conglomerate. The criterion is:

A group would be designated as a 'Financial Conglomerate' if:

- Any group entity coming under the jurisdiction of specified regulators and having a significant presence in the respective financial market segment; and
- The group is having operations in at least one more financial market segment.

Group entity is defined for this purpose as an arrangement involving two or more entities related to each other through any of the relationships: Subsidiary – parent, Joint venture, Associate, Promoter-promotee, a related party, Common brand name, and investment in equity shares 20% and above. The specified regulators are RBI, SEBI, IRDA and NHB for the present.

The criterion for deciding significant presence is:

Financial market segment	Significant presence
Bank	Included in the top 70% of the segment in terms of asset base
Insurance Company	Turnover more than ₹ 100cr;
Mutual Fund	Included in the top 70% of the segment in terms of asset under management (AUM);
NBFC (deposit taking)	Included in the top 70% of the segment in terms of deposit base;
NBFC (non-deposit taking)	Asset base more than ₹ 2000cr;
Primary Dealer	Included in the top 70% of the segment in terms of total turnover

The working group has also recommended the "Reporting Framework", "Threshold limits for intra-group transactions", "Inter-regulatory exchange of information", "Ensuring internal controls and risk management systems".

The recommendations of the working group have some similarities with the principles proposed by Joint Forum. Based on the emerging new international standards and best practices, further fine tuning of the Indian regulatory and supervisory structure would strengthen the financial stability framework.

Summary:

The 2012 principles for supervision of financial conglomerates are based on principle that solo supervision of individual regulated entities should continue to be the foundation for effective supervision, there is a need for the various supervisors to establish a coordinated approach to supervision so that a prudential assessment can also be made from a group-wide perspective.

These principles provide supervisors with a realistic insight into a group's risks and the respective capital coverage; it also enables supervisors to prevent, or at least to assess the extent of, any excessive or double gearing. Based on international standards, the Indian regulatory and supervisory structure also strengthened to meet any challenges.

References:

Thus, the 2012 provide comprehensive principles for the supervisors engaged in supervision of financial conglomerates. The article is mainly based on the following reports:

- Supervision of Financial Conglomerates – Papers prepared by the Joint Forum of financial conglomerates – February 1999
- Principles for the supervision of Financial conglomerates – September 2012
- Report of the Working Group on Monitoring of Systemically Important Financial Intermediaries (Financial Conglomerates) – www.rbi.org.in
- FIAI, Deputy Director, IRDA. The views expressed in this article are of personal and doesn't represent the Authority's view.

THE GOVERNANCE STRUCTURE AND LEADERSHIP OF IAI

Council in its meeting held on 22-09-2012 elected following office bearer, under Section 17 (1) of the Actuaries Act, 2006.

1) M Karunanidhi - President

2) K S Gopalakrishnan - Vice President

3) Rajesh Dalmia - Honorary Secretary

Following Committees were formed :

UNDER SECTION 21 COMMITTEES

Investment Committee

1) N Kalpana - Chairperson
2) Vibha Bagaria - Member
3) Rajesh Dalmia - Member

CPD/CoP Committee

1) M Karunanidhi - Chairperson
2) K S Gopalakrishnan - Member
3) Liyaquat Khan - Member

Audit Committee

1) Dr. K Sriram - Chairperson
2) Vibha Bagaria - Member
3) Saket Singhal - Member
4) Viren H Mehta - Member (External Member from Accounting Profession)

Strategic Finance and Budget Committee

1) Liyaquat Khan - Chairperson
2) GLN Sarma - Member
3) Chandan Khasnobis - Member

Gautam Shah, Advisor to the Committee and nodal point of contact for the IAI in respect of inputs that may be required from time to time for the Committee to function effectively.

Gururaj Nayak, Head-Operations and/or any other officer designated by him, to act as nodal point of contact within IAI office so as to provided support to Gautam Shah and the Committee.

Education Committee

1) M Karunanidhi - Chairperson
2) GLN Sarma - Member
3) K Sriram - Member

UNDER SECTION 26 COMMITTEE

Disciplinary Committee

1) K S Gopalakrishnan - Presiding Officer
2) Uttam Prakash Agarwal - Member, Govt. Nominee
3) Lalit Kumar - Member, Govt. Nominee
4) Liyaquat Khan - Member
5) GLN Sarma - Member

ADVISORY GROUP ON OFF-SHORED ACTUARIAL FUNCTIONS

As constituted and effective from 06 Nov 2012:

Members

1) Aditya Tibrewala, Chair
2) Ankur Agrawal, Secretary
3) Neil Narale, Member
4) Amit Mehra, Member
5) Amit Kumar Gupta, Member
6) Sandeep Patil, Member
7) Alexander John, Advisor

Functions

- To be responsible for addressing issues in respect of Off-shored actuarial work carried out within India that are referred to it or the Group considers appropriate to address and advise the Institute for appropriate action.
- To be responsible for examining issues that requires addressing by the IAI so as to enhance capabilities of actuarial service delivery.
- To design and carry out Continuing Professional Development Programs including seminars and workshops for enhancement of skills of actuarial staff working in off-shored units.
- To be in know of and advise the Institute on emerging issues affecting Offshored actuarial industry within India.
- To advise the Institute on any regulatory or market issues that potentially may affect the status of the Indian actuarial profession.
- To promote India as a preferred destination for carrying out actuarial work

Executive Assistant: Binita Rautela, Marketing Manager - responsible for all administrative support and to be the nodal point of contact within office of the Institute.

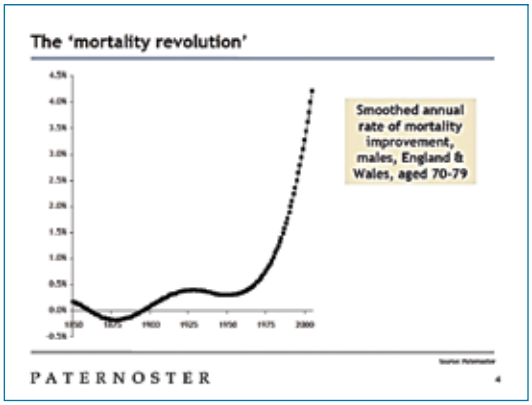
Reporting: The Advisory Group reports to the President

by Order
M. Karunanidhi
President

ASSESSING RELIABILITY OF MORTALITY ASSUMPTIONS

by Saket Vasisth & PS Durga Prasad

Increasing life expectancy due to medical advancements is a major concern for mortality actuaries. Below graph shows that post 1975, life expectancy has shown tremendous rate of improvement. As a result defined benefit providers have to reconsider the funding position and contribution rates. It therefore becomes very important to assess the best possible mortality rates which take into account the past trends in mortality as well as the future improvements in life expectancy.



The best estimate mortality assumptions are determined using the mortality experience data of the pension fund and suitable standard tables (e.g. S1PXA produced by the Continuous Mortality Investigation (CMI) in the UK). CMI tables: http://www.actuaries.org.uk/research-and-resources/pages/base-mortality-tables-produced-cmi

Mortality tables prescribed by Indian profession: http://www.actuariesindia.org/publication/mort_eff_05.html?ml=1&ml=1

Generally the following approaches are used for determining best estimate mortality assumptions:

- Actual versus Expected
- Maximum likelihood estimation
- Survival Models

In all of these cases, the best estimate assumption is expressed as a multiple of the standard mortality table. In this article we are going to present an overview of the "Actual versus Expected" approach.

Actual v/s Expected (A/E analysis)

A/E analysis is the traditional analysis method by which actuaries determine mortality assumptions for a given block of lives.

At the simplest level, this approach involves comparing the actual number of deaths that occurred over a given period against the expected number of deaths based on a suitable standard mortality table. Note that the observation period must be an integer number of years.

In this approach, the A/E is determined as a percentage. Best estimate mortality assumption then becomes the multiplication of the A/E % and the standard mortality table rates. For example, if the ratio of A/E is 110% for a given block of lives, the mortality rates for that block will be set equal to 110% of those detailed in the standard table.

Calculation of expected deaths:

In order to calculate the expected number of deaths we must calculate the "exposure" at each age for each individual during the whole observation period. For illustrative purpose, we consider a 5 year observation period starting on 1 January 2005 till 31 December 2009 and consider the exposure created by the following 3 individuals.

Member	Date of Birth	Date of retirement	Age at 1 January 2005	Date of Death
A	25 November 1929	25 May 1990	75.1	Alive till 31 December 2009
B	13 September 1930	17 November 2001	74.3	17 May 2007
C	13 September 1932	01 July 2007	72.3	Alive till 31 December 2009

Let us analyse the calculation of exposure at each age for member A. Please refer to the figure below. At the start date of the observation period (i.e. 1 January 2005), the age last birthday of member A is 75.Member A turns 76 on 25 November 2005. So the exposure period at age 75 (last birthday), is the period between 1 January 2005 and 25 November 2005 i.e. 0.9. At age 76, member A has one complete year of exposure, however that exposure is split between year 2006 (0.1 part) and year 2007 (0.9 part).Similarly at age 80, the exposure period would be the period between 25 November 2009 and 31 December 2009 (the end date of the observation period).Please note that for member C, the start date of the observation period will be 01 July 2007 (date of retirement) rather than 1 January 2005.

The exposure period for each member at each age (age last birthday) is as follows:

Note that in the case of member B, we allow for a full year of exposure at the age (defined as age last birthday) at which death occurs. B's death occurred at 76.67(i.e. 13/09/1930 to 17/05/2007), but we give a full year of exposure at age 76.Even if the member was only exposed to risk for just a part of year (e.g. died a month after the start of the exposure period or retirement), we will still allocate full year of exposure at member's age last birthday at death.

To calculate the expected number of deaths we multiply the exposure figures by the probability of death at each age based on the standard table. For example:

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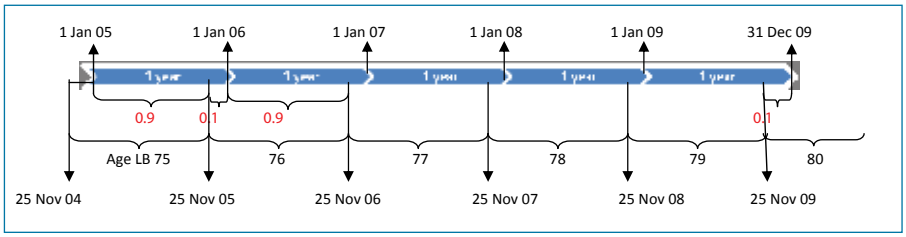
PS Durga Prasad has extensive experience in the UK pensions de-risking market particularly in the pricing of various de-risking products like buy-ins/buy-outs, synthetic buy-ins, longevity swaps etc. He is a student member of IAI.



The total number of expected deaths in this case is 0.39 (0.0261+0.0957+0.111+0.0533+0.046+0.052+0.0058). Given that there was one death, the A/E ratio in this simple example is 1 / 0.39 = 256%.

In a more realistic example involving more lives A/E comparison will look something like the following:

Allowance for historic longevity improvements:

Above example considered only base mortality tables for computation of expected deaths. Rather than calculating the expected number of deaths based on a single mortality table (i.e. as in the example above), it may be preferable to calculate the expected number of deaths using a different mortality table for each observation year taking into account historic longevity improvements. For example, rather than calculating the expected number of deaths based simply on S1PMA, we can use the projected S1PMA rates by applying improvement factors. After the application of improvement factors we can have the S1PMA mortality rates for each year at each age.

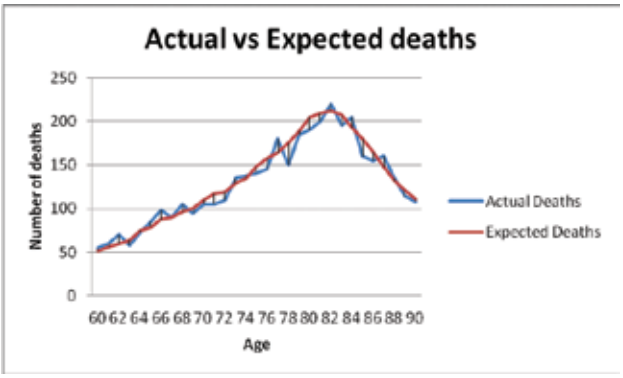
Age	Member A	Member B	Member C	Total Exposure
74	0.0	0.7	0.2	0.9
75	0.9	1.0	1.0	2.9
76	1.0	1.0	1.0	3.0
77	1.0	0.0	0.3	1.3
78	1.0	0.0	0.0	1.0
79	1.0	0.0	0.0	1.0
80	0.1	0.0	0.0	0.1

Under this approach we must calculate the exposure for each individual split by age and year. Using the example set out above, we would have the following exposures:

Age	Total Exposure	QX standard Table	Expected Deaths
74	0.9	2.9%	0.0261
75	2.9	3.3%	0.0957
76	3.0	3.7%	0.111
77	1.3	4.1%	0.0533
78	1.0	4.6%	0.046
79	1.0	5.2%	0.052
80	0.1	5.8%	0.0058

(Note: Qx is the probability that a person aged X will die within one year)

In this case the expected number of deaths in each year will be calculated by reference to a standard mortality table applicable to that year. We would therefore have an A/E for each year and an overall figure.



Please note that best estimate mortality rates (A/E % multiplied by standard table rates) calculated in the above way will still have the same effective date as the original standard table. The application of improvement factors is solely for the purpose of calculating A/E ratio. For example, if the standard table used is S1PMA, the best estimate mortality rates table will have the effective date 1 September 2002, same as that of S1PMA.The fact that the improvement factors have been used in the calculation of A/E ratio, will have no effect on the effective date. We still have to apply improvement factors from 1 September 2003 to the best estimate mortality rates while performing valuation.

Amounts versus lives Analysis:

The above approach under which all members are treated equally is referred to as a "lives" approach. Although, lives approach is useful (e.g. it allows us to more easily calculate credibility factors and fitting errors), it is better to carry out an analysis on an "amounts" basis under which each life is weighted by a pension amount. In amounts approach the analysis is weighted towards the most financially important pensioner members.

The amounts approach is very similar to the lives approach; the only difference being that the exposures and deaths are multiplied by the individual's pension amount (pension amounts at death are increased to the valuation date, in order to be consistent with the effective date of the in-force pension amounts).

Going back to our original three members, we now include the following pension data:

	Member A					Member B					Member C				
Age	`05	`06	`07	`08	`09	`05	`06	`07	`08	`09	`05	`06	`07	`08	`09
74						0.7							0.2		
75	0.9					0.3	0.7						0.3	0.7	
76	0.1	0.9					0.3	0.7						0.3	0.7
77		0.1	0.9												0.3
78			0.1	0.9											
79				0.1	0.9										
80					0.1										

The corresponding aggregate exposure figures by age are then as follows:

Applying the same standard Qx rates as before, the expected reduction in pension amount due to death is 3227.25 GBP. It is the sum product of total exposure and Qx standard table column.

Given that member B died, the actual reduction was 5000, giving an A/E ratio of 155%.

It is expected that amounts analysis is normally lesser than lives analysis by around 10%-15%.

Credibility Factor: The higher the number of deaths the more reliance can be put on the results of A/E analysis. A very simple credibility factor can be calculated as follows, where N is the number of deaths

in the sub-group being considered.

Credibility factor = Min (1, $\sqrt{(N/3007)}$)

(Please refer to http://www.actuary.org/pdf/practnotes/life_credibility08.pdf for a detailed explanation)

If the credibility factor is equal to 1 (i.e. the data contains at least 3007 deaths) then it implies that the A/E analysis can be relied in full. If it is less than 1, then it implies that the A/E analysis should be combined with a standard table. E.g.

Member	Date of retirement	Age at 1 Jan 2005	Date of death	Pension Amount
A	25 May 1990	75.1	Alive till 31 Dec 2009	10,000
B	17 Nov 2001	74.3	17 May 2007	5,000
C	01 July 2007	72.3	Alive till 31 Dec 2009	7,500

Age	Member A	Member B	Member C	Total Exposure	Qx standard table
74	0	3,500	1,500	5,000	2.9%
75	9,000	5,000	7,500	21,500	3.3%
76	10,000	5,000	7,500	22,500	3.7%
77	10,000	0	2,250	12,250	4.1%
78	10,000	0	0	10,000	4.6%
79	10,000	0	0	10,000	5.2%
80	1,000	0	0	1,000	5.8%

if the credibility factor is 40%, it implies that we should use a table consisting of 40% of the fitted table values and 60% of the standard table values.

Fitting the parameters:

While calculating A/E ratio, there are a number of parameters to be set:

- Exposure period (start date and number of years)
  - This will be dictated by the quantity and reliability of the data available with the analyst (e.g. the pension scheme may have only reliable data of past 5 years)
  - Deaths occurring more than 10 years ago are of little relevance to the mortality of current pensioners.
  - In setting the exposure period we should allow for the fact that there is typically a lag of 3-6 months between date of death and the reporting of death, this will be visible in a plot of the number of deaths by month.
- Age range over which the standard table will be fitted
  - Again the decision will be dictated by the data.
  - Availability of statistically significant number of deaths at all ages is unlikely.
  - In most cases we will limit the analysis to ages 60-90 for immediate annuity portfolio.
  - We should examine the sensitivity of the results to small changes in the age range.
- Standard table to use
  - A range of tables should be considered. There are different tables available for males, females, pensioners, deferred members, dependents, amount weighted, lives weighted, normal health or ill health pensioners etc.
  - The table giving rise to the best fit can be used at times to defend assumptions!
  - Whether to carry out "Lives" or "Amounts" analysis: "Lives" analysis is used for credibility and standard error analysis. "Amounts" analysis is primarily used for determining the actual table to use for liability valuation.
- Whether data should be sub-divided into smaller groups
  - For example, a separate A/E analysis could be carried out for various sub groups of the population (executives and workers or data split into pension size or postcode).
  - The amount of data will decide whether we can credibly split it into sub groups.
  - Sub groups can be determined on an ad-hoc trial and error basis

In each case we should consider a range of inputs and examine the sensitivity of the results. These sub groups can be based on geographic location of annuitants. In case of life companies, analysis can also be divided in to A/E analysis of underwritten policies and A/E of policies which are not underwritten.

Conclusion:

Before starting out the A/E analysis, we need to carry out an initial review of the available experience data based on a range of factors including:

- Total number of deaths
- Age range over which deaths occur
- Age range with significant liability exposures
- How credibly data is split in different sub-groups

Some statistical tests may also be required based on the levels of actual to expected number of deaths to determine the best fitted standard mortality table. Each of these tests attempts to assess whether the values of actual to expected deaths for different age groups are independent of each other. Following tests are usually used and are explained in subject CT-4:

- Signs test
- Runs test
- Kolmogorov –Smirnov test

References:

http://www.actuariesindia.org/gcadata/10thGCA/Modern%20techniques%20for%20analysing%20mortality%20risk%20_Richard%20Willets.pdf

http://www.actuary.org/pdf/practnotes/mortality_oct09.pdf

Our sincere thanks to Devidas Nare and Manoj Bhudolia for their inputs.

A drop of water in lake, there is no identity, But if it is on leaf of lotus, it shines like pearl, Be in d best place where U can shine.

SOLVENCY II: AN OVERVIEW OF UNDERLYING PRINCIPLES

by Kunj Maheshwari

Solvency II is the new regulatory regime proposed for insurers in Europe that, when implemented, will fundamentally change the framework for management of insurance business and supervision by the regulators. Solvency II was initiated in 2000 and is effectively an overhaul of the existing regimes currently in-force in different European countries that were first developed in the 1970s. The Solvency II project, at a Europe-wide level attempts to replace the multiple regulations in different countries with a single consistent regulatory environment for insurers across Europe in what is hoped will result in a level playing field for transnational companies (although Solvency I does currently apply across all of the EU, inconsistencies exist in local regulations where some regulators have sought to incorporate additional local requirements, for example, the Individual Capital Adequacy Regime in the UK, leading to significant differences in capital requirements across different countries).

In developing the Solvency II framework, policymakers in Europe have adopted emerging practices in insurance management over recent years, including valuing liabilities on a market consistent basis, determining an economic risk based capital measure and implementing governance using recognised Enterprise Risk Management (ERM) principles. In this introductory paper, I discuss briefly how Solvency II has adopted these themes to meet the over-riding regulatory objective of providing a transparent system of governance whilst ensuring protection of policyholder interests and providing greater financial stability by making the failure of insurers (whether defined as insolvency or otherwise) less likely.

Valuation of liabilities and determining capital requirements

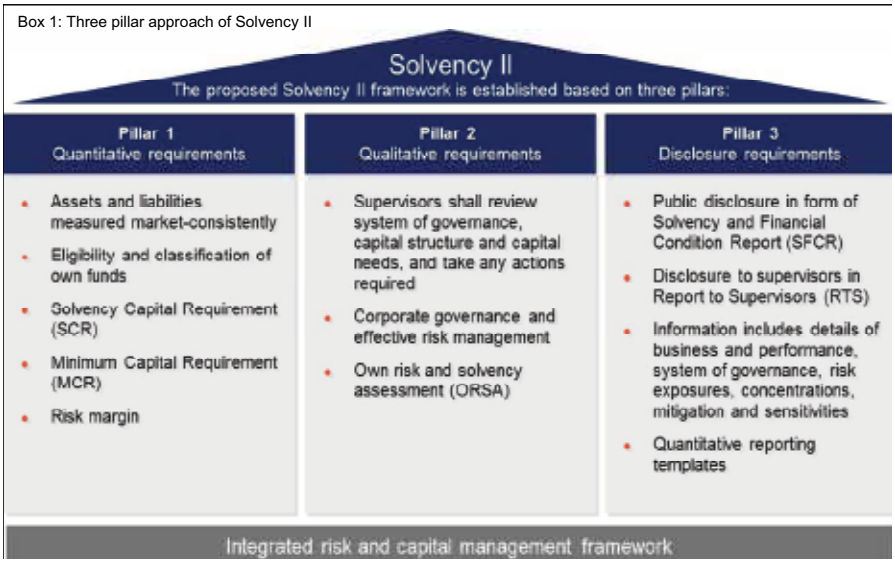
As with any other regulatory regime, Solvency II is, first and foremost, a way of determining the value of the assets and liabilities of an insurance company and of assessing the amount of risk capital necessary to meet future claims, taking into account the inherent volatility and uncertainty associated with any form of insurance. In this regard, Solvency II has seen a decisive move towards market based valuation of the balance sheet, wherein assets and liabilities are valued using a market consistent valuation approach. This is in sync with the underlying principle of fair value as a constant theme as seen in emerging accounting practices such as US/UK GAAP, IFRS as well as recent changes to insurance regulations elsewhere in the world.

By market consistent we mean that the fair value of an asset or liability is equal to the price that a willing buyer would pay in the market to purchase the underlying asset or liability. For most assets that are regularly traded, this value can be readily observed. However, in the case of most insurance liabilities, there is no easily available reference market to compare against and determine the 'market price'. Therefore, this must be estimated by considering the full economic value of the liabilities. Under Solvency II, this amount is known as the 'technical provision' and is calculated as the sum of the best estimate liabilities plus cost of capital (the cost of capital element is called the 'risk margin', although it should be noted that this additional margin is to ensure that the full economic value of the liabilities is captured within the technical provision and it is not a margin to allow for uncertainty or variance in the best estimate cash flows).

This manner of calculating the insurance liability is different from many existing regimes where firms are obliged to calculate reserves by including some additional margins of prudence in their valuation, and hold additional capital requirements determined by a series of simplistic formula based approaches (as in the case of calculating the Solvency Margin in India). On the contrary, under Solvency II, the insurance liability is calculated on a realistic (or best estimate) basis and additional capital to cover uncertainty in the best estimate is then captured by considering the tail of the risk distribution for each individual risk.

To illustrate this, let us consider an example of a typical life insurance product. Within the current regulatory environment, the actuary will determine the reserves for this by setting prudent assumptions. Typical valuation assumptions may entail, say a +10% margin for mortality over best estimate, a +5% margin for expenses, -1% in the valuation rate of interest and so on. Using this basis, a single value for the reserve will be determined as the present value of net cash flows subject to some artificial, albeit prudent, floors (e.g. zeroising negative reserves or setting a floor for the reserves to equal the

Box 1: Three pillar approach of Solvency II



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minimum surrender value etc.). With a formula approach, the capital requirement would then be a (fixed) percentage of this reserve or a related quantity (such as sum at risk). In contrast to this, under Solvency II, the base liability will be calculated using realistic assumptions or as the 50th percentile value from a stochastic run and then various stresses will be performed to estimate the change in the value for each risk scenario individually. The implied loss under the given scenario, or the change in the net asset value, is then the risk capital for the particular risk scenario. The scenario could be a deterioration in mortality or an in increase in expenses or other such scenarios each representing a single risk factor. These scenarios are determined so as to ensure that the insurance company has sufficient capital resource for a given confidence interval, typically set at 99.5%. The risk capital for each individual risk is then aggregated, allowing for diversification between risks, to determine the overall risk capital (known as the 'Solvency Capital Requirement' or the SCR). This manner of determining the capital requirement essentially captures the fundamental principles underlying a Risk Based Capital approach, or more widely, an Economic Capital approach.

There are several advantages of calculating liabilities on a market consistent basis and then determining the required capital using the approach above:

1. A market consistent valuation of liabilities provides more transparency for investors and analysts as well as helping to identify the nature and sources of the insurance risks within a given portfolio explicitly, since the best estimate of liability and the risk capital for individual risks is identifiable separately.
2. Separating individual risks also provides a more sophisticated framework for managing changes to the risk profile or reacting to developments outside the firms' control and provides supervisors with crucial early warning indicators.
3. The approach also allows for a more accurate alignment of risk capital with risk profile.
4. It is possible to increase efficiency in the use of capital and improve returns by providing a clear link between risk and return.

The above provides a high level description of the principles underlying the quantitative requirements under Pillar 1, Quantitative Requirements of Solvency II (see boxed text). More in-depth consideration of the proposed requirements in respect of market consistency and using the cost of capital approach to technical provisions; selecting individual risks and determining appropriate calibration for calculating capital requirements (whether using the 'Standard Formula' or 'Internal Model') require separate dedicated discussions.

Own Risk and Solvency Assessment ('ORSA')

Whilst the Pillar 1 quantitative requirements in respect of calculating technical provisions and capital requirements is the flesh and bones of Solvency II, it is the Pillar 2 ORSA (Own Risk and Solvency Assessment) that lies at the heart of Solvency II. It is also this aspect of Solvency II that distinguishes it from being a merely compliance driven regulatory regime to one focussing on robust governance and risk management of the insurance business. ORSA requires firms to have in place a form of Enterprise Risk Management framework, proportionate to the nature, scale and complexity of their business, and puts the accountability of running the business according to best practices firmly with the senior management. As part of their ORSA, firms must demonstrate good risk and capital management practices, account for risks and business issues not captured within the quantitative Pillar 1 requirements as well as identify solvency needs both present and future. The Solvency II directive is intentionally light on setting out prescriptive requirements so as to enable firms to establish governance systems that best reflect the nature of their respective business. At the same time, the regulator has the authority to carry out a supervisory review and challenge firms if they are perceived to be falling short in their own assessments. This has the advantage of providing a regulatory oversight, whilst providing firms with the flexibility to establish internal controls and benchmarks as they deem fit for their business (so long as they can justify it to the regulators). In what could be seen as a positive response from the insurance industry, many firms appear to have embraced the ORSA framework and seem to take the opportunity provided to carry out many internal developments in line with best practices that may have been on their wish-lists for a while but they never found the adequate time, budget or 'buy-in' from the various stakeholders internally. However, given the regulatory push in the direction of establishing an appropriate ERM framework, companies seem to have found that it is in their own interest to embed the ORSA within their businesses rather than view it as a compliance overhead.

Latest news on Solvency II

It should be noted that Solvency II is still a proposal and has not yet been adopted as law. Although the high level framework has been agreed to by the various member states of the European Parliament, significant disagreements remain in respect of some details, particularly relating to the definition of the risk free rate, and thetreatment of long term guarantees. Given this current political uncertainty, many believe that Solvency II will not be implemented in its current form. In fact, Solvency II is currently stated to be effective 1 January 2014, but most in the industry as well as some local regulators have accepted that this as unrealistic. An announcement of a further delay in Solvency II is inevitable and it currently remains unclear when Solvency II will eventually get enforced.

SEE THE CLOCK ONLY WHEN YOU DON'T HAVE WORK,
DON'T SEE CLOCK WHEN U R WORKING,
CLOCK IS A LOCK FOR SUCCESS.

Bill Gates

THE NEW PRIVATE PENSION SCHEMES ACT 2012 IN MAURITIUS

By Bernard Yen

A decade-long process around legislative reforms of the private pension sector in Mauritius was concluded recently when the Private Pension Schemes Act 2012 was voted in parliament. This article describes its key objectives, features and potential difficulties in achieving the right balance between improving the security of beneficiaries and encouraging employers to sponsor occupational pension schemes.

The current legislation

Mauritius has a multi-tiered pension system. The first tier is the Basic Retirement Pension which is paid out of general taxation, in tier two we have the National Pension Fund and the National Savings Fund for example and finally the third tier is the voluntary private pension sector. While the first two tiers are clearly defined under their respective legislations, the legislation and supervision of the third tier has been fragmented and subject to a wide variety of regulators.

The private pension sector consists of about 1,500 private pension schemes approved by the Mauritius Revenue Authority under the Income Tax Regulations. However, only around 50 of these schemes are registered with the Registrar of Associations under the Employees Superannuation Fund Act, some 15 schemes are set up under the Trusts Act and the vast majority are schemes managed by insurance companies and forming part of their long term insurance business. These private schemes cover more than 100,000 employees with funds estimated at more than MUR 34 billion and are expected to grow further.

Proposed changes

The new legislation is expected to provide a comprehensive and modern regulatory and supervisory framework for the operation of private pension schemes in order to ensure the protection of members and beneficiaries and the soundness of such pension schemes. While it is a general framework defining the roles and responsibilities of each stakeholder, the important aspects of the legislation will show up with the rules and regulations to be issued by the Financial Services Commission (FSC) or the Minister of Finance in due course. This article is therefore general at this stage, pending the issuance of such rules and regulations.

The Act is a well thought over framework capturing all private pension schemes in or concerning Mauritius. Besides the local pension schemes, it will also cover external pension schemes (private pension schemes set up as global businesses in order to promote Mauritius as an international centre for the provision of pension scheme services) and foreign pension schemes (private pension schemes registered in foreign jurisdictions but authorized to operate in Mauritius so as to cover, for example, Mauritian employees who become members of those schemes rather than purely local pension schemes). The foreign and external pension schemes will enjoy greater flexibility in the sense that they may be exempted from certain provisions of the Act by way of regulation or consultation with the Minister of Finance and the FSC as unique regulator.

Under the general framework laid down in the Act, the FSC will be able to license, approve, monitor, supervise and control the private pension industry in Mauritius so as to meet international standards. The Act includes the following regulatory objectives:

- maintain a fair, safe, stable and efficient private pension industry for the benefit and protection of beneficiaries;
- promote confidence in the private pension industry;
- ensure fair treatment to beneficiaries;
- mitigate the risk that the pension business is used for a purpose connected with a financial crime, and
- ensure orderly growth of the private pension industry in Mauritius.

The Act lays down requirements as regards the types of private pension schemes and the basic requirements for the licensing of each type of scheme. I understand that the current intention is for the FSC to license or authorize pension schemes that are set up as trusts or foundations only in the future. In particular, the Employees Superannuation Fund Act is being repealed and funds already registered under that Act can continue to operate but no new funds will be registered under that Act. We also understand that the assets of occupational pension schemes that are managed by insurance companies within their long term insurance business will have to be transferred to master-trust type arrangements to comply with the FSC Rules, which can help to improve transparency in these plans.

The Act provides for FSC Rules to be made regarding the constitution and management of private pension schemes, duties and functions of the pension scheme governing bodies, administrators and professional advisers, the rights and obligations of members and requirements of providing financial statements. Every private pension scheme will have to be administered by a pension scheme administrator licensed by the FSC for this purpose. Alternatively, and subject to FSC Rules, the scheme's governing body or a long-term insurer licensed by the FSC may be authorized to administer the scheme.

Quoted Companies	Pension plan assets (A) Rs M's	Pension plan liabilities (B) Rs M's	Funding ratio (A/B) %	Funding surplus/(deficit) (A-B) Rs M's	Injection required to bring funding ratio	
					to at least 100% Rs M's	to at least 90% Rs M's
Mauritius Commercial Bank Ltd	3,786	4,060	93%	(274)	274	0
State Bank of Mauritius Ltd	616	590	104%	26	0	0
New Mauritius Hotels Ltd	1,854	2,541	73%	(686)	686	432
ENL Land Ltd	120	228	53%	(107)	107	85
Terra Mauricia Ltd	220	410	54%	(190)	190	149
Rogers and Company Ltd	1,154	1,145	101%	9	0	0
Ireland Blyth Ltd	600	810	74%	(210)	210	129
Bramer Banking Corporation Ltd	21	40	53%	(19)	19	15
Omnicane Ltd	143	180	79%	(37)	37	19
Vivo Energy Mauritius Limited	190	242	79%	(51)	51	27

The Act provides for further FSC Rules regarding the management and valuation of the assets and obligations, expenses, qualifications and experience of the actuary and auditor as well as their appointment, resignation, removal, powers and duties. Furthermore, there may be restriction or regulation of the investment and borrowing powers of private pension schemes. In terms of record keeping and communications, maintenance of records on transactions and financial position as well as preparation of periodical reports and communication of those reports to the FSC and the beneficiaries will be covered.

It is expected that, with this new legislation, the governing bodies will have a clearer view of their roles and responsibilities in looking after the funding and investment needs of the plans leading to greater security for the beneficiaries. The beneficiaries can expect more regular information on how their plans are doing and what they can expect from them in terms of benefits. Increased member confidence and transparency should help the industry flourish in a controlled and healthy business environment.

What we hope will be addressed in the FSC Rules and other regulations

Several sections of the Act refer to a new technical funding requirement aimed at improving the security of members' benefits. This is in line with my previous recommendations, when consulted, that private pension schemes be subject to regular funding assessments and corrective measures be applied in cases of serious underfunding. However, we are aware that, for historical reasons, many private pension schemes in Mauritius have funding deficits when measured in line with the IAS 19 accounting standard for example. In general, we hope that the FSC Rules will provide for such funding deficits to be corrected over a number of years instead of just a few years or even immediately, which could cause significant upset and perhaps trigger the winding-up of such schemes to the detriment of the long-term interest of the members.

For example, we set out in the table below a summary of the funding position of the main pension plans sponsored by several large listed companies according to the IAS 19 disclosures in their latest available annual reports which show the significance of some of the funding deficits. In some countries, the timeframe for eliminating any funding deficits may be several years (we would recommend the average remaining service of employees which would typically be 15 to 20 years) but the timeframe for reducing the funding deficit to a maximum acceptable level (e.g. 10% of the liabilities or minimum funding ratio of 90%) may be only one year. The last column in the table shows that this may be too drastic a requirement for many listed companies in Mauritius.

Another area of potential concern relates to the investment rules and restrictions to be covered in FSC Rules. In general, I welcome the introduction of prudential limits on self-investment and concentration of investments so as to improve the security of members' benefits, but again setting these limits and the timeframe for achieving them at the right level will be important.

For example, self-investment occurs when a pension scheme invests part or all of its assets in the sponsoring employer's securities, loans or property used by the employer. The risk here is that, if the sponsoring employer gets into financial trouble, the members may lose both their jobs and their pension benefits. Some countries advocate zero self-investment but most accept an upper limit of 10% for example on self-investment, which may be right for Mauritius as long as there is also a reasonable transition period for bringing down higher levels of self-investment to the upper limit.

Concentration of investments occurs when the pension scheme invests more than, say, 10% or 15% of its assets in a single security or property investment. Here, the risk is that, if such an investment fails, the funding ratio would go down significantly and reduce the members' security of benefits accordingly. Again, it is important that a balance is struck between a limit which is too low and impractical for Mauritius or too high to be effective.

Finally, I hope that the fees imposed by the FSC on private pension schemes or their licensees would be rational and well thought out. High compliance cost may have a negative impact on the pension industry.

Conclusion

The decade-long process of Government consulting with the different stakeholders around the legislation of the pension industry, together with local and international advisers, is bearing fruit. I appreciate the fact that the Ministry of Finance and Economic Reforms and the Financial Services Commission have actively engaged all stakeholders and seem to have taken on board most of my previous comments and suggestions. I hope to continue in the same line and to provide my support and experience towards consultation regarding the FSC Rules and other regulations to follow later this year or next year.

About the Author

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Bernard Yen is an actuary and the managing director of Aon Hewitt Ltd, an actuarial, benefits and investment consulting firm in Mauritius and part of Aon Hewitt worldwide. He has over 25 years' experience.

A BIRD'S EYE VIEW OF THE LIFE INSURANCE INDUSTRY

by Vivek Jalan

The Indian economy recorded a growth rate of 5.5% in the first quarter of FY2012-13 (April 2012 to June 2012), slipping further from the moderate growth rate of 6.9% experienced in FY2011-12, as per figures released by the Asian Development Bank (ADB). Inflation levels, although lower than the peak of around 10% observed in the previous two financial years, still remained a cause of concern, driven primarily by high food prices. Further to the downgrades on India's economic outlook by prominent credit rating agencies Standard & Poors and Fitch, several other analysts including the ADB and Moody's have lowered India's Gross Domestic Product ("GDP") growth forecasts for 2012 down from their previous estimates, to around 5.5%.

The nearly 3% drop in weighted new business premium (measured as regular premium plus 10% of single premium) in FY2011-12 led to a fall in India's ranking in the world insurance market to 15th from 11th in FY2010-11. Latest data released by the Insurance Regulatory and Development Authority (IRDA) indicates continuing growth challenges for the industry this year, reflected in the 7.5% year-on-year contraction in weighted new business premium in the first half of FY2012-13. State-owned Life Insurance Corporation of India (LIC) witnessed a decline of 10.9% in its weighted new business premium collections during the stated period, entirely on account of regular premium group business which contracted by 88%. Private life insurers registered a marginal year-on-year decline of 0.3% in weighted new business premium collections in the first half of FY2012-13. This relatively small decline indicates some recovery this fiscal from the effect of earlier regulatory changes which led to a sharp contraction in new business premium since late 2010.

In a deliberate move to boost the insurance sector, the government has revived the long stalled measures to increase the foreign direct investment (FDI) limit to 49% from the current limit of 26%. The proposition has been approved by the Union Cabinet and is now awaiting parliamentary approval. The IRDA believes that the suggested increase in the FDI limit may draw nearly ₹300 billion of capital into the insurance industry over the coming five years which could help the sector grow at a rate of 11% to 12% per annum. The move has also been received very positively by private insurers who believe the additional capital will satisfy the immediate capital requirements of smaller companies and generally enable all companies to tap the market more actively. The potential increase in the FDI limit, if implemented, may also lead to shareholding changes with some foreign insurers augmenting their stakes, changes in domestic ownership and / or the entry of new foreign players.

In another move to emphasise capital availability, the IRDA has indicated to potential entrants that it considers the mandated ₹1 billion minimum initial capital requirement insufficient and new companies could be asked to launch their operations with an initial capital of at least ₹ 2 billion to ₹ 2.5 billion.

As per press reports, the IRDA is backing a proposal made by several life insurers to the Ministry of Finance, seeking a separate tax exemption limit of ₹ 50,000 on insurance premiums. Currently, a combined tax deduction of ₹ 100,000 is available on insurance contributions and other investments such as pension plans, provident fund amongst others. A lowering of service tax on some product classes and on first year premiums is among the other favourable tax reforms suggested by the Finance Minister for the life insurance sector.

With the aim of providing increased flexibility in investments and long-term investment options primarily to hedge longevity risk, the IRDA has introduced draft guidelines on investments in various derivative instruments and short-term securities market. In its latest exposure drafts for traditional and unit linked products released in October, the IRDA has proposed some key requirements relating to commission structures and surrender values, which life insurers will need to conform to by 31 March 2013. While discussions are still underway, the final guidelines may require life insurers to refile or withdraw several of their existing products over the coming months. The IRDA has indicated the possible adoption of a "use and file" system for some standard life insurance products – a shift from the current "file and use" system.

Reports suggest that the HCL group, may be looking to venture into the life insurance sector by acquiring a 51% stake in DLF Pramerica Life from the DLF Group. The IRDA has granted approval to the transfer of a 30% equity stake in MetLife India to Punjab National Bank (PNB) after which MetLife would be called PNB MetLife. Following a move to create a uniform identity of AIA-affiliated companies post its listing on the Hong Kong stock exchange in October 2010, Tata AIG Life has been renamed as Tata AIA Life.

Despite the overall slowdown in premium collections, the sale of online policies saw significant year-on-year growth with around 55,750 policies sold online in the first half of the current financial year as compared to 49,500 plans sold online in the whole of FY2011-12. Private insurers like AEGON Religare Life, Aviva Life, HDFC Life, ICICI Prudential Life and Kotak Life remained considerably active in this segment and a number of online products have been launched during the period under consideration with the leading state-owned insurer LIC also introducing its first online product. MyInsuranceClub.com has recently obtained regulatory approval to become the first web aggregator for insurance policies in the country. Life insurers are seen to be working on developing customer-centric post sales services to maintain relationships with existing customers and sustain growth.

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Vivek Jalan is Director - Risk Consulting at Towers Watson in India and leads the life insurance consulting practice.

INDUSTRY PLAYERS EMERGE FROM DISASTERS AS WINNERS

ASIA Insurance Review, 29 October 2012

Asia's insurance players shine brighter as they rise from the catastrophes of 2011 and emerge as winners in this year's Asia Insurance Industry Awards.

Leading the crop of 14 prestigious winners and bagging the General Insurance Company of the Year is Tokio Marine Holdings, which bounced back robustly and posted record growth after suffering its two largest losses in the same year. The Life Insurance Company of the Year award goes to AIA Singapore. The company impressed the judges not only for its initiatives to address the protection gap in Singapore, but also for its innovation to increase the ease of customers' insurance buying experience.

This year's General Reinsurer is Swiss Re, for showing strong industry leadership, extraordinary commitment to clients, and nimble response to their needs in a year that saw the second largest insured losses from catastrophes. Clinching the Life Reinsurer of the Year award is RGA with its leveraging of global expertise and local insights to help clients grow their bancassurance business in Asia.

In a market where innovation is king, Indian's Apollo Munich Health Insurance has made itself a clear winner for coming up with a coverage-restoring indemnity health plan, earning it the Innovation of the Year award. And in the field of education, the Malaysian Insurance Institute won the judges' votes for providing much-needed human capital development solutions to Asia's insurance industry.

Winning the Personality of the Year award is Chairman & CEO of Kyobo Life Insurance, Dr Chang-Jae Shin, a visionary and well-rounded leader who has earned the high regard of the Korean insurance industry for his leadership in change management and his business strategy. Mr Chandra Thomas Adolphus Schaffter, Chairman & Director of Janashakthi Insurance, has won the Lifetime Achievement Award for dedicating the past 60 years of his life to developing the various facets of the insurance industry in Sri Lanka. Organised by Asia Insurance Review since 1996, the Awards honoured the winners yesterday in Kuala Lumpur, where the 26th East Asian Insurance Congress is currently taking place. This year's winners are:

Life Insurance Company of the Year
AIA Singapore

General Insurance Company of the Year
Tokio Marine Holdings

Educational Service Provider of the Year
Malaysian Insurance Institute

Innovation of the Year
Apollo Munich Health Insurance

Service Provider of the Year
BELFOR Asia

Risk Manager of the Year
Boning Tong

Broker of the Year
Unison Insurance Broking Services, India

Reinsurance Broker of the Year
Guy Carpenter

General Reinsurer of the Year
Swiss Re

Life Reinsurer of the Year
RGA

Corporate Social Responsibility Award
Fubon Life

Technology Initiative of the Year
Agriculture Insurance Company of India

Personality of the Year
Chang-Jae Shin

Lifetime Achievement Award
Chandra Thomas Adolphus Schaffter

For more details, visit www.asiainsurancereview.com

Heartiest Congratulations

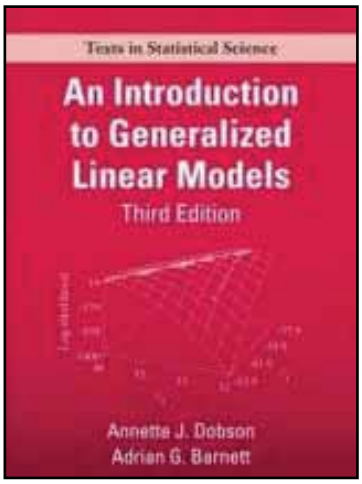
IAI Students Event Theme Contest winner - Vishnu Bhardwaj

vish23bhar@gmail.com

It was jointly decided to have a separate sub theme for IAI student event. We are glad to announce that the theme suggested by A. Vishnu Bhardwaj "Uncharted territories ..... Unimagined Treasures" was found to be most apt as it was felt that there are unexplored fields that hold countless opportunities for the Actuaries. This is about the movement of actuaries into non-traditional roles, expanding into new, rich fields suited for their innumerable skills.

Vishnu is a student member of IAI and is currently studying MSc (Actuarial Economics) at Madras School of Economics. An aspiring actuary, he has cleared 4 CT series papers. He is a BCom Graduate and an NTSE scholar. His hobbies include business quizzing and following sports.

"The past is to prove that no one is perfect and the future is to prove that everyone can change..!"



AN INTRODUCTION TO GENERALIZED LINEAR MODELS BY ANNETTE J. DOBSON AND ADRIAN G. BARNETT; PUBLISHED BY CHAPMAN & HALL/CRC PRESS

Book Number : B13114
Status : Available at IAI Library

Reviewed by R. Jayaraman
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This book presents a conceptual framework for statistical modelling aimed at undergraduate students and researchers in other fields. This book begins with the theoretical framework for Generalized Linear Models and main ideas behind the classical statistical modelling. The writer further focuses on key statistical distributions, Generalized Linear Models, Classical Estimation, Model Fitting Methods and Hypothesis Testing. Subsequently it covers, Normal Linear models, Logistic Regression, Poisson Regression, Survival Analysis and Analysis of Clustered and Longitudinal Data are covered. In the last three chapters, the writer deal with Bayesian Analysis, Markov Chain Monte Carlo methods and examples of Bayesian Analysis. Each of the chapters in the book contains practical applications of the concepts covered.. the writer has also very well covered the way analysis can be done using statistical software like Stata, R, S-Plus, SAS, Genstat and WinBUGS and can be very useful for quickly applying the concepts in real-time.

Main highlights of the Book

This book provides an excellent introduction to Generalized Linear Models. Readers are assumed to have a basic knowledge of regression and ANOVA. The background theory is covered in the first 5 chapters. The book is well structured and concise. As such, it is ideally suited to the intermediate audience and also to researchers who wish to quickly understand and use GLMs. The second part of the book focuses on applications and interpretations with some more theory - this overlaps and uses the work of the earlier chapters. The key material is covered and the author quickly explains what the results mean and how they should be interpreted. Once again the exposition is thorough but brief at the same time and therefore, it is suited to a course work environment or the researcher doing self-study/refreshing their knowledge, but it's not for those starting out in statistical modelling.

Chapter-wise contents of the Book

Introductory Chapter provides an overview of the contents of the book. It also contains a section on notations followed in the book to help the readers. This is followed by a section on statistical distributions related to the Normal Distribution and quadratic forms. Chapter two covers the statistical principles behind model fitting followed by examples. The exponential family of distributions and generalized linear models are very well covered in chapter three. This chapter also covers the relationships among distributions in the exponential family which have been explained through a diagram. The next chapter covers classical estimation methods like MLE followed by examples and exercises. It is in chapter five where the author covered the Taylor series approximations, sampling distribution for MLE's and Hypothesis Testing. Chapter six is on Normal Linear Models and covers topics like multiple linear regression, Analysis of Variance, and Analysis of Covariance. Chapter seven is on binary variables and logistic regression and contains goodness of fit statistics and residuals. The multinomial distribution, nominal logistic regression and ordinal logistic regression are very well covered in chapter eight. Chapter nine to ten deals with Poisson regression, log-linear models, inference for log-linear models, survival analysis, survivor functions, hazard functions, estimation and inference. The multi-level models, repeated measures models for Normal data and non-Normal data are dealt with in chapter eleven. Finally Chapter twelve to fourteen covers Bayesian Analysis including usage of WinBUGS software for Bayesian Analysis, Monte Carlo integration, Markov Chains, Bayesian Inference examples of Bayesian Analysis and includes binary variables and logistic regression, Nominal logistic regression, latent variable model, survival analysis, longitudinal data analysis and random effects.

Usefulness of the Book

The book is very concise and has a clear objective and focusses on practical applications of statistical modelling. Author gives us an overview of the each chapter in the introduction so that readers can directly select the chapters which they want to read. Each chapter contains examples of how the concepts dealt in the chapter can be applied in practical situations. The examples included covers business, medicine, engineering and the social sciences. This book can be useful as reference book for CT3 and CT6 Exam. Generalized Linear Models, Bayesian Statistics of CT6 are covered. Remaining areas covered mainly pertains to CT3.

Conclusion

The book is useful for practical application of statistical concepts and to improve the level of understanding. It is helpful in identifying the statistical method to be used for analyzing the data in a particular scenario and how to implement it using statistical software.

Shilpa's Puzzles

Puzzle No 179:

Although at first you may not think so, this paragraph is unusual. A quick study will show that it has capitals, commas, and full stops so that punctuation, as far as I know is satisfactory. But this paragraph is unusual, in fact unusually unusual, and I would hazard my opinion that you do not know why. Should you try it backwards, or in a mirror, or both, you will find just rubbish, so obviously that is not a way to a solution. Ability at crosswords and similar things may assist you, but I doubt it. If you still do not know what this paragraph is all about you could go back and start again; you should not find it that difficult. I warn you to watch for your sanity though, as this paragraph is unnatural. Can you work out why? Good luck!

Puzzle No 180:

Brandon is a fig counter. The figs are kept in five boxes. Using the following clues, see if you can figure out how many figs are in the boxes today. (There are no fractions of figs; whole figs only!)

While you are at it, figure out the number of figs in each of the five boxes A to E.

The total number of figs in box C is 1/3 of half the total of those in box E.

Box B has twice as many figs as C and E combined.

There are 120 figs in one of the boxes.

Box A has half as many figs as E, which is also 10 fewer than D.

D has 1/4 as many as B.

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SUDOKU

puzzle No. 5 for the month of November 2012

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

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

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 2012**

M. G. Diwan
A. Ghosal
N. R. Kapadia
K. J. Pradhan

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

Solution of Sudoku Puzzle No. 6 published in the Month of Oct. 2012

MEDIUM SOLUTION

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

HARD SOLUTION

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

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