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Provisioning methods...



## THEME: RISK MANAGEMENT







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A new phase for Risk Management





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**INTERVIEW** 

# FOCUS ON SOLVENCY II

BY MARK HEIJSTER



#### Could you briefly compare the Swiss solvency regulations with Solvency II?

'Both systems are robust and they are very similar at first sight. I think however that the Swiss Solvency Test is more manageable and digestible in terms of governance and reporting efforts. I particularly prefer the framework around the role of Appointed Actuary to the concept of Actuarial Function. It gives you a higher individual responsibility around the assessment of your solvency position and liabilities. This is the best incentive to fulfil your duties carefully, and it is a powerful concept from a governance perspective. In addition, it is a great recognition of the role of actuary in a (re)-insurance company as quantitative risk assessment is core for our business.

Another important difference is that in the European Union the cost to create and maintain internal models seem to be rather discouraging whereas in Switzerland it is much more affordable. <u>NewRe</u> has quite a complex business model with a mix of standard and non-standard risks. Therefore, we have no alternative and depend on the use of an internal model.'

### **66** We need people with pronounced business understanding

#### Could you explain to us in more detail your experience with risk models and reinsurance?

'The use of internal models has always been a key competence in reinsurance long before the existence of today's regulatory requirements. <u>MunichRe Group</u>, our mother company, has been among the pioneer developers of internal models which has been a great asset for us when developing and implementing our internal risk model in accordance with the Swiss Solvency Test (SST) framework.

Internal modelling is a fundamental competence that can also represent a key competitive advantage. As models are used for a variety of processes and decision making, from regulation to investments, from pricing to retrocession strategy, it is an important management tool to ensure efficient use of capital.

In the past years, the investments in modelling have been significant not only in creating the mathematical framework, but also in terms of data availability and quality, processes, governance and reporting. The key investment, however, is on talents: we need people with pronounced business understanding capable to translate that knowledge into a mathematical concept and, at the same time, understand the potential weaknesses of such a translation.

Beyond modelling and risk management, the whole reinsurance business has become more sophisticated from a quantitative perspective: at NewRe about 25 percent of the workforce has an actuarial or mathematical background covering all areas in the front, middle and back office.'

## What is the place of models in your daily life?

'Models are there to help to understand the strengths and weaknesses of your business strategy. For NewRe diversification is a key feature to make good use of our own funds. Already a couple of years ago, NewRe diversified its book of business and expanded the product range to include capital optimisation structures, life and non-life financing solutions, derivatives and parametric trigger covers for weather business as well as variable annuity business.

We are also very attentive to the definition of remote stress scenarios and to the understanding of complex interdependencies among the different risks we assume. The definition of tail dependencies is particularly crucial in risk management as we have only very limited data available and we have to rely on pure expert judgment. Further, we do not only look at remote scenarios but also verify our risk profile for normal return periods. We thereby pay attention to the potential volatility of our annual result also in normal years to protect our dividend policy.'

#### What challenges did you experience? What challenges do you expect going forward?

'One of the key challenges we face is the number of stakeholders

### 66 New types of risks, new covers and new data will have to be assessed

around risk models. It is very high and their background can be diverse: boards, supervisors, auditors, employees and clients. The communication effort is substantial as it is essential to explain a rather complex matter in an intuitive way. It is a long but necessary process to build trust.

Public disclosure is another big challenge as everyone is able to compare the companies' financial strength. However, as the companies may use different more or less prudent risk assessment methods, one may get a wrong picture. I expect that a fair comparability will only be achieved over time.

Our solvency regimes force us to be able to model any risk that we assume. The insurance sector is currently undergoing big changes and many companies focus on innovation which means that new types of risks, new covers and new data will have to be assessed. We will certainly need time to adjust and further develop our risk models and at the beginning, we may be making mistakes when assessing some of the new risks. We will have to manage this process by initially limiting those new risks to a tolerable level until we can build up a reliable assessment.'

# Did the risk models change reinsurance buying behaviour?

'Reinsurance is a capital optimizer since ever. What has changed is that now its effect can be measured with more precision. Some primary insurers are now looking more carefully at the reinsurance effect on their



#### **PAOLO MONTICOLO, CHIEF RISK OFFICER AT NEWRE**

Paolo Monticolo studied at the Actuary University of Trieste in 1994 and after having worked for SCOR in Paris from 1995 to 1997 and in Milan in 1997 to 2001 joined NewRe in 2001 as a Senior Life and Non-Life Underwriter. In 2002, he moved to the newly created risk management department, initially in charge of life and non-life reserving. He was appointed Head of Department in 2004 and became Appointed Actuary in 2008. In this function, Paolo Monticolo developed the internal risk management model in parallel with the development of the Swiss Solvency Test framework. NewRe was one of the first companies to obtain a full internal risk model approval in 2011. In 2013, Paolo Monticolo became Chief Risk Officer and was promoted to the Board of Management.



capital situation and ask for solutions that traditional reinsurance cannot cover. There, we see an increasing demand for tailor made products, both in life and nonlife: sophisticated metrics allow for arbitrage between different instruments.

NewRe has expected that to happen and has adapted its offering already some years ago. We are in a position to satisfy this demand and structure sophisticated solutions as we understand the various complex solvency, accounting and operational implications. At the same time, one should not forget, that these complex product offerings pose an additional challenge on our risk models.

Another effect that we expect is regulatory arbitrage: risks may be placed in countries where the use of capital can be optimized. A lot of jurisdictions will not introduce frameworks similar to Solvency II or the SST, and capital requirements convergence in the insurance sector will not be achieved in the next decade. This may create an unwanted concentration in certain jurisdictions which may cause a new systemic risk.

#### **NewRe**

New Reinsurance Company Ltd. (NewRe) is a Swiss reinsurer founded in 1926 in Zurich. In 1988, NewRe became part of Munich Re Group, one of the leading reinsurers. During its long history NewRe has constantly moved with the changing market environment and client needs. Whereas in the past NewRe focused mainly on traditional property and casualty reinsurance, it became a leading underwriter of structured life and non-life reinsurance solutions in recent years. NewRe now also offers weather derivatives and parametric trigger covers, and successfully specialised in variable annuity reinsurance and capital management solutions for life business.

# A NEW PHASE FOR **RISK MANAGEMENT**

#### BY JOHN OOST, JASPER HOOGENSTRAATEN AND LOES DE BOER

The last few years Solvency II has been an accelerator for insurance companies to strengthen their risk management, often also indicated as Enterprise Risk Management (ERM). After the start of Solvency II per January 1st 2016, the next phase is one of successful operation and optimization. Different methods can be distinguished for supporting this phase, including a risk management maturity model.

Solvency II document	Passage	Contents
Level 1 – Directive (2009/138/EG)	Article 44	General requirements on the risk management system
Level 2 – Delegated Acts (EU 2015/35)	Article 259 Article 260 Article 269	Risk management system Risk management areas Risk management function
Level 3 - Guidelines System of Governance (EIOPA BoS 14/253)	Guideline 17 Guideline 18 Guideline 19 Guideline 20 - 26	Role of the AMSB Risk management policy Risk management function tasks Policy per specific risk area

#### Solvency II

Effective risk management is a central part of Solvency II requirements. It is included by means of articles relating to the risk management system, risk management policies and the risk management function. These articles are part of the different 'levels' of Solvency II regulation. The main articles and guidelines are as follows. The requirements above display a focus on risk management with a wide scope, from specific tasks and risk management areas to general principles laid down in policies and direct involvement of the Board. This strategic approach to risk management is further enhanced by an explicit requirement<sup>1</sup> to have a clearly designed risk management strategy, including

<sup>1</sup> Laid down in article 259 of the Delegated Acts.



risk tolerance limits, that is consistent with the undertakings overall business strategy. Moreover the information resulting from the risk management system should demonstrably be part of the overall decision making process. This requires a high level of maturity for risk management. A current challenge for insurance companies is a shift from the focus on risk reporting and Solvency II compliance to effectively establishing a robust and mature risk management system.

#### From development to successful operation

Although Solvency II has led to enormous progress in the field of risk management, 'silo-thinking' – in which specific risks or related tasks are managed on a standalone basis – is still common within some insurance companies. The risk management function is responsible for monitoring the risk management system as a whole, including the interrelations that exist between the building blocks of the system. This is an important part of the level of risk management maturity.

The **next figure** displays five different levels of maturity as defined by COSO<sup>2</sup>.

It is important that the maturity of the risk management system should be periodically assessed and recommendations formulated, in order to continually improve risk

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  Consultant at Triple A
  Risk Finance, a Dutch
  company specialized
  in risk finance and
  compliance.





management. Different methods can be used for this, such as the participation and internal use of an external benchmark study, defining and monitoring controls on essential risk management processes, and the implementation of an internally developed maturity model with requirements for each maturity level.

Management should be accountable for compliancy to the risk management system and periodically assess the level of compliancy. The risk management function acts as a guardian and has a supportive role in the development of the method used for the periodic assessment, the monitoring itself and the implementation of improvements.

#### The role of the actuary

Traditionally, actuaries have mainly been involved in quantifying financial and underwriting risks. The development of risk management to a more holistic and strategic approach has widened the scope of the actuarial field to risk management and among others includes a role in capital requirements and projections, model validation, reinsurance and the own risk & solvency assessment.

In line with this development actuarial associations worldwide are gradually implementing risk management in the toolbox of the actuary ensuring the professional quality of the actuary in this field. Examples are the incorporation of risk management in the actuarial education, organizing risk management seminars and the publication of best practices and specific standards and guidance.



# AN ACTUARY'S JOURNEY TO RISK MANAGEMENT BY EBERHARD MÜLLER

While studying mathematics in Hamburg in the midseventies I discovered my interest in two further topics: calculators and insurance science. As actuarial science was not yet offered and the personal computer not yet developed I chose insurance economics as additional stream and bought my first scientific calculator: Aristo M75 - for 500 Deutsche Mark! It was nearly the same price I paid for my first car!

> he next machine was the programmable HP 25 (49 program steps) but only until the "revolutionary" Texas Instruments TI 59 was introduced to the market in May 1977: programmable and programs as well as data could be stored on little magnetic stripes. Max. 100 programs steps on two stripes! This machine was my companion through my first job as assistant to Prof. Walter Karten at the Insurance Science Institute of the University of Hamburg between 1978 and 1982. And I brought the TI 59 with me when I started my career at Hannover Re on April 1st 1982.

But then I discovered something "really revolutionary" when visiting the Hannover Fair (industrial fair and computer fair still combined): Sharp's PC 1500. It was a full BASIC programmable machine, programs and data could be stored with an ordinary cassette recorder and the extension unit contained an exciting four color plotprinter with output of figures, graphs and illustrations on paper stripes (like cashier machines use it) - amazing! Within a couple of weeks I wrote many programs, including chain-ladder forecasts for reserve triangles, cash flow analysis with different interest assumptions, pricing applications for reinsurance products and finally I could convince my boss (and CEO of Hannover Re) Claus Bingemer, to purchase 7 machines for Hannover Re where I would educate the users and assist them with the applications and the machine handling. I love this machine until today, as it could be seen as the "predecessor of internal modeling" at Hannover Re, whilst providing still more deterministic than probabilistic applications. The next major step then was the market introduction of the real IBM PC. My "dream model" was an IBM XT, stuffed up to 640 Kb RAM, a 10 Mb hard disk in addition to the 5 1/4 "floppy drive, a Hercules graphics card (monochrome: green on black) with EGA resolution (800x600) and DOS 2.1. as operating system. Together with a 9 needle printer Facit 4512 the price was more than DM 21.000 - but Claus Bingemer agreed and I could continue with my two hobbies:

fancy machines and actuarial applications.

#### The standard software in these

early PC days was from Ashton Tate: "Framework" for wordprocessing spreadsheets and basic visualization, "Chartmaster" and "Mapmaster" for graphics and maps and "dBase" for larger data banks. All major reserving and pricing applications could be run, it was possible to electronically transfer mainframe data for use with PC applications and the widespread decentralized use of centrally developed applications, customized by users brought such an enormous productivity jump as I never ever have seen it again!

And probabilistic dreams became reality! While it might have been quite "elegant" to convolute probability distributions by means of "Fast Fourier" or "Panjer Algorithm", the practical possibilities of Monte Carlo Simulations were overwhelming! One of the most impressive examples for the (re)insurance industry is the success-story of natural catastrophe models which lasts until today. One of the first models, CATALYST, developed by Applied Insurance Research (A.I.R.) in Boston, attracted my interest already in1987 and when the reinsurance Version CATMAP became available two years later Hannover Re was the first continental European user. And it is not overstated to claim that this type of modeling probability distributions for losses from hurricanes and earthquakes (by country, by region, by cedent, by program, by treaty) created a

paradigm shift in how underwriters understood their business. In addition to getting me the title of Chief Actuary by April 1st 1989 it was the foundation of limit and threshold systems (with special attention on peak zones) as well as the basis for risk based capital considerations - finally leading to a minimum margin system showing every underwriter whether his signings are creating or destroying value on the background of the existing overall portfolio and its probabilistics. Also it contributed to the worldwide first securitization, Hannover Re's \$85m "Kover" in early 1994.

The different pieces of quantitative risk management (including reserve controlling, aggregate controlling, credit risk controlling, asset liability management) finally

# AN ACTUARY'S JOURNEY



ended up in a comprehensive internal model. From 1998 the first version was developed internally by using C++, while the entire concept was transferred to a Remetrica based approach in 2005. In September 2008 the "long and stony" preapplication phase of the internal Model under Solvency II started with the German Regulator BaFin finally ending successfully with the first European approval for an internal model by July 31st 2015.

But getting there needed another major ingredient rather than actuarial science and fancy machines: qualitative risk management. And here we had a powerful sponsor in the early 2000s: Standard and Poor's. The Enterprise Risk Management Framework they developed Risk Officer (CRO) by June 1st. Qualitative risk management (incl. operational risk management and risk reporting) was transferred from the controlling department to the newly created division "Group Risk Management" (GRM) and a **Risk Committee with quarterly** meetings was created, consisting of six members (CEO as Chair, CFO, COO L&H, COO P&C, CRO, and Chief Controlling Officer) and the internal auditor as permanent guest. We tried to follow as close as possible the guidance S&P had established for "excellent" ERM and got rewarded by a "very strong" assessment (still the highest rewarded in Europe). In 2011 an additional benefit came through the "M-Factor", i.e. the approval of the internal model by S&P in a sense that allows you to replace a certain percentage

proved to be a cornerstone of our discussion with the regulator through the approval process.

As the steep learning curve on qualitative risk management was a real milestone of my career I got attracted immediately when I came across with Fred Rowley's and Harry Panjer's initiative to create the CERA education. This was exactly mirroring my own experience: take an actuary capable of quantitative assessments, setting priorities and dividing in between "mattering" and "not mattering" and enhance his/her knowledge by qualitative aspects about processes, legal environment, accounting, operational risks and risk culture. Therefore it is not a surprise that I signed the CERA-treaty for the Deutsche Aktuarvereinigung (DAV)

# **TO RISK MANAGEMENT**

and introduced to the market in 2005 as a new and influential rating category presented a comprehensive and challenging catalogue of requirements to (re) insurance companies looking for a favorable rating. First and foremost risk management should be conducted on a holistic basis rather than in "silos", combining all lines of business (Life&Heath, P&C), all risk categories (insurance risk, market risk, credit risk and operational risk) and allocations. And it should rest with an "influential high level officer".

In my (still valid) view that nobody could do this better than an actuary with some additional qualitative skills I wrote a proposal to the board which got accepted and brought me the title of Chief of S&P's capital requirements by your internal model results. This exercise in fact was of outstanding value: not only because of the significant "value creation through risk management" (€ 400m less capital required must not be served any longer or could be used for additional value creating purposes) but because of all the gualitative achievements. This started with the implementation of the main risk management goals in the corporate strategy, the development of a risk strategy, a central framework guideline risk management, a central limit and threshold system and various decentralized guidelines. This system was rolled out through the entire group (each legal entity and major branch) in two waves between 2010 and 2015 and finally in November 2009 and that I am still active in the German CERA education stream. Or to put it into a nutshell: major parts of the steps I had to find on my own can now be made by simply continuing with the CERA education after having passed the regular actuarial education. I sometimes hear that the hurdles are quite high but in my view the prospects are rewarding: CERAs are the CROs of the future!

EBERHARD MÜLLER, Dipl. Math., Aktuar DAV, CERA is retired and has his own enterprise riskmueller consulting GmbH. 11

#### **INTERVIEW**

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A valuable benchmarking tool, the global overview of provisioning methods of non-life insurance has just been published by <u>ASTIN</u>. Three top ranking ASTIN members reveal the most important lessons taken from this vast mapping.



FRANK CUYPERS

### WHAT WAS THE INITIAL MOTIVATION FOR ASTIN?

**Pierre Miehe:** 'We wanted to identify international actuarial practices to enable insurers to benchmark. It was also our ambition to foster links between researchers and practitioners. This demonstrates that ASTIN is not just a research orientated theoretical association, but that it also makes an effort to meet the practical needs of insurers. The project, entitled WPNLReserving, was created by a working party set up by Cuypers a few years ago.'

**Eric Dal Moro:** 'The working parties and this project on benchmarking reserving practices generally fall into the idea of promoting the ASTIN section to its members by increasing the value proposition. It is also trying to attract new members who wish to engage in the profession internationally.'

#### WHAT IS A WORKING PARTY?

**Frank Cuypers:** 'A working party is a work group that is focused on a technical topic or practice. Its objective is to prepare a report that is shared with all members of ASTIN. We started these working parties in 2013. The idea is to enable them to work internationally by making use of the comprehensive global network of ASTIN.'

### HOW DOES ONE START A WORKING PARTY?

**Frank Cuypers:** 'Any ASTIN member may propose one. A short paper, outlining its purpose, its content and procedure is enough. Then it must be submitted to the ASTIN Committee. If the committee decides to set up the new working party, it can help the initiator by recruiting additional participants from members via a call for candidates. Once launched, ASTIN provides logistical and financial support to the working party.'

#### HAVE YOU BEEN SURPRISED BY THE ENTHUSIASM FOR WPNLRESERVING?

**Frank Cuypers:** 'Yes, I certainly was! This proves that the project meets a real need. We have received many applications from more than forty countries. The selection was quite difficult.

**Pierre Miehe:** 'Coordinating people in more than 40 countries, in all time zones and with such different cultures, requires special attention to project management and monitoring deadlines. But I have been particularly surprised by the very high response rate and enthusiasm of the participants. To give you one example: an Australian manager suggested adding a special section to the report on the future of funding and established a working subgroup which issued, in less than a month, a report of that I find to be of excellent quality.'

**Eric Dal Moro:** 'This project is very useful to the profession and explains the enthusiasm observed. The results of this project thus allow each insurance company to make comparisons with their competitors in other countries. These comparisons highlight where there is work to the done for the actuarial profession, like on the methods used concerning individual claims for instance. These methods are similar to questions on big data which currently is one of the hottest topics for the profession.'

#### REGARDING THE RESULTS OF THE STUDY, DID IT CONTAIN ANY SURPRISES?

**Frank Cuypers:** The homogeneity of the methods used! We expected a victory of the Chain Ladder, but certainly not that the method is acclaimed to such an extent.

**Pierre Miehe:** 'The level of use of the Bornhuetter Ferguson method is also very high. When it comes to the more "exotic" methods: it is interesting to note their geographical spread. Thus, the method of Munich Chain Ladder, established in Germany, is mainly used by the neighboring countries and, more surprisingly in Asia (ie Hong Kong, Taiwan), Lebanon and Peru.'

**Frank Cuypers:** 'However, we were disappointed by the little use of breakthrough methods on individual claims. The section on future provisioning clearly mentions the risk that actuaries may well miss the turn on big data issues. Only Switzerland and Sweden are using these methods to more than 20%.

#### **AND FOR NOW?**

**Frank Cuypers:** 'I hope the study will allow insurers to benchmark and better understand the specifics of each country. And it encourages actuaries to try new methods and strengthen their reserving process.'

**Pierre Miehe:** 'Even though we do not plan an annual update, taking into account the principle of stability methods applied in the companies, based on the interest shown and development of big data related issues, we are thinking about relaunching the study between 2018 and 2020.'

**Eric Dal Moro:** 'I think it would be good to add a point on using the ASTIN network.

This project has shown its strength. One lesson I take from this project is that ASTIN has a network of motivated non-life actuaries, covering all insurance markets in the world, professionals who are ready to engage on international issues. At the moment the network is in a more or less sleeping state, it is not used a lot and it is the ASTIN Committee's mission to wake it up every now and then.'



PIERRE MIEHE

FRANK CUYPERS is head of the working groups ASTIN, member of the working parties, ASA and DAV actuary.

PIERRE MIEHE is project manager of WPNLReserving, certified actuary IA

ERIC DAL MORO is chairman of ASTIN.

# A FRAMEWORK FOR MANAGING BEHAVIORAL AND CULTURAL RISK

#### BY COLM FITZGERALD



The narrative of economics theory, even when considering the refinements of behavioral economics, is arguably lacking in depth to adequately differentiate individuals to assess behavioral and cultural risk. For example, the difference between, say, Gabriel Bernadino and a member of ISIS, is surely much bigger than any biases and heuristics. An alternative narrative is outlined below, including a model of the human condition, which enables individuals to be assumed human rather than merely rational (with some biases and heuristics):

### THE HUMAN CONDITION ASSUMPTION:

- Our perceptions are created by our egos. Each person has an ego existing between themselves and reality. The ego can filter and distort reality, to deal with setbacks or other difficulties that they face, in order to keep them feeling good, or at least feeling ok, and keep them going. The healthiest egos are those with the least distortions.
- Life is analogous to a hill, which is initially steep but flattens on ascent. This makes progress more difficult than regression. We progress/ascend according to how much we require of ourselves. Resources can flatten the hill but not change its shape. Our reward for ascending the hill is both that better terrain opens up to us and that future progress is less

difficult and vice versa. Different levels of the hill might be regarded as different levels of human nature, with "full-humanness" at the top of the hill. <sup>1</sup>

- Our psyches have three elements: reason, thought and spirit (in our head, heart and guts respectively).

Human interaction is necessary which creates additional constraints. These can be either progressive or regressive. Other factors also limit us – knowledge, understanding, expertise, time, energy, etc. All of these can limit the constitutive elements that we have to build the world we live in and also the way we look on things.

These limitations imply a proportionate degree of humility is always necessary if we are to have

<sup>1</sup> This term is taken from Maslow and is discussed at length in his 'Towards a Psychology of Being'.

Colm Fitzgerald is lecturer in Actuarial Science at UCD

some realism. Additionally, to be going in the direction of ascending the hill, our reason needs to be pessimistic (due to the nature of the hill) and ego critical (to overcome ego distortions). But we also need to be positive overall so any 'negativity' from reason needs to be overcome by courage, patience, confidence and optimism from our heart and guts.

The most common example of ego distortion is seeing the route to progress as coming from getting more resources. Those further up the hill typically have the more progressive perspective that their route to better things is what they require of themselves.

## ASSESSING AND MANAGING BEHAVIORAL RISK

The 'Know Yourself Test' is an actuarial method to assess the degree of distortion in a person's ego that might be considered an indication of the degree of their behavioral risk. The test works in the following way:

 Egos can be assessed because we are mostly unaware of our own egos, otherwise the distortions would not have the desired effect. The test uses a method that uses a person's ego against itself to reduce gaming.

- Different psychological perspectives are assumed to be associated with different positions of the hill. For example, Gabriel Bernardino sees the world differently from a member of ISIS.
- An individual's position on the hill is assessed according to the extent to which they hold certain different perspectives. Forty such perspectives are the basis of the questions in the test. Answers to these questions are scored to quantitatively assess the extent to which an individual is reaching their psychological potential.

Four coefficients are output. One indicates where the person is on the hill. The second indicates the quality of the person's logical and rational thinking – differentiating between rationality and pseudodoxia (distorted logic). The third coefficient indicates the degree to which an individual is taking thought and the fourth indicates the degree to which the person is behaving merely prudently or in a superiorly prudent manner.

The methodology has been tested in focus groups and trialed to enable statistical testing of the results that indicate moderate to strong levels of reliability and validity. A number of companies have recently begun using the test as a tool for assessing and managing behavioral risk in individuals. Feedback is also provided by the test regarding changes in perspective that can better help a person reach their psychological potential through achieving better levels of selfrealisation.

#### ASSESSING AND MANAGING CULTURAL RISK

Culture in an organization has many elements and many factors contribute to it, e.g. the openness of the communication. Cultural risk can be assessed using the 'Know Your Team Test'. This works by assessing the degree of health in the team ego, by comparing the health in the team ego with the average health of the team members' egos. It can be used to quantify dominance risk, to highlight those members of a team who are adding to or taking from the quality of the culture, and it can propose self-realisation and other remedial actions to improve the progressive nature of a culture.

The original research that led to the creation of these two tests was funded by the Society of Actuaries in Ireland.

# THE IMPACT OF EDUCATION

#### BY RON HERSMIS AAG

Throughout the centuries there have been several philosophers, psychologists and pedagogues who have dealt with the learning phenomenon. Learning is the transfer of knowledge but also the transfer of cultural skills. From a social point of view, learning is seen as a major force to bring about fundamental changes. New ideas, new values can be passed on by education to the next generation. Here lurk both opportunities and dangers.

#### The actuarial profession

Since the beginning of the 18th century actuarial professionals have been involved in quantifying and underwriting risks. The actuarial profession is an old profession. Because of developments in the insurance and pensions industry over the centuries it is essential that actuaries continue to adapt constantly. In the last decade attention has increasingly come to lie on risk management. In Europe, the introduction of Solvency II contributed largely to this. But even outside of Europe, there is increasing focus on risk management, not only in the financial industry, but also in other industries.

#### The actuary as risk manager

Risk management is about identifying, qualifying and quantifying risks and taking appropriate measures to reduce the impact of these risks. In the domain of insurance and pensions the actuary is no longer the only quantitative specialist. Applied mathematicians and econometricians are contributing as well in these domains. In the course of time actuaries have lost some of their uniqueness. However, because of their knowledge and expertise actuaries can also make an important contribution in quantifying risks.

The role of risk manager is therefore often carried out by actuaries in insurance companies. However, the initial training of actuaries is not directly aimed at fulfilling this role. Therefore, the CERA (Chartered Enterprise Risk Actuary) qualification was introduced. CERA is intended as additional training for qualified actuaries. It is important that these risk management actuaries have more or less the same professional educational level. As a condition, therefore, these actuaries must be members of a professional organization which is a member of the International Actuarial Association (IAA).

Actuaries who have completed the CERA theoretical education program have a good basis for becoming a professional risk manager, both inside and outside the traditional insurance industry.

#### **Future of CERA**

Since its founding in 2009, the CERA Global Association (CGA) has grown to include 21 actuarial associations as members and there are 3362 actuaries worldwide who hold the additional CERA designation.

CERA's future depends on a number of factors. At present, it is the aim of the CERA Global Association to make this number grow in the coming years to 6000, 10% of the global qualified actuarial community. In addition, as the CERA qualification is facilitated by the IAA, so the CERA Global Association must adhere to developments regarding the new IAA syllabus. Because CERA intends to offer additional training, adaptations of the initial training curriculum directly affect the content of the CERA curriculum.

#### **CERA in Europe**

There are twelve European actuarial associations and over 800 CERAs working in Europe.

CGA is happy with the initiative of the European Actuarial Academy (EAA) of developing a CERA curriculum which can be offered to interested associations. I'm aware that actuaries of the smaller associations are as motivated for the CERA credential as members of larger associations. The EAA solves the problem for those smaller associations to develop and maintain their own educational program. Recent AAE discussions are looking to coordinate initiatives in the field of ERM. This could be a platform for discussing the role of the actuary in risk management, in the traditional domain as well as in the so-called wider fields. The more actuaries are involved in risk management, the more need there is for adequate education. I'm happy to see that CERA is recognized as a standard.

Ron Hersmis is chairing the board of the CERA Global Association.



# MANAGING PROJECTS BETTER

#### BY PETER TOMPKINS

Press stories abound about new capital projects, usually in energy or infrastructure, failing to meet expectations. Lateness is a risk all large efforts face. The surprising thing is that so many other things go wrong, mainly because of an inadequate focus on risk at the start.

The UK actuarial profession has worked hard with the engineering profession in the development of an approach to the delivery of largescale projects with a formal structure known as RAMP deployed by combinations of actuaries and engineers. Risk Analysis and Management for Projects (RAMP) is the guiding rulebook published jointly by the Institution of Civil Engineers and our own actuarial profession.

Spearheading much of this work over many years has been Chris Lewin, an actuary with a broad range of roles during his career. We caught up with Chris for a discussion on how the profession is playing its part in getting projects to deliver. Chris emphasised two parts to the work on which actuaries are engaged. One is the assessment of infrastructure developments, where the actuarial insight can help investors and those running the construction to get a better handle on the value being created. The unique combination of actuarial understanding of finance and risk combined, together with an ethical professional framework for doing so is helping to roll out the RAMP approach to increasing numbers of large projects.

The main recent focus according to Chris has been on front-end issues because it is in failing to address a project at the start that many of the later problems arise.

Lord Browne of Madingley, former Chief Executive of BP, poignantly pointed out in 2013 that "the lowest standards that are set at the



9 key issues

#### **SEQUENCE OF ISSUES**

First thoughts Clarifying the Purpose Understanding the project context Deciding on governance Choosing methods of appraisal Designing the project development process Exploring alternative projects Developing the favoured project further Making key decisions

start of a project are the highest standards that can be expected for the rest of the project".

In a recent discussion of project failures, the Risk Group of the UK actuarial and civil engineering professions set out a number of case studies of project failure. Examples include:

• SNCF bought 2,000 new trains. In 2014, after delivery of the first trains, it was discovered that, although they were compatible with newer stations, they were too wide for many of the stations built over 30 years ago to different standards. They were also too tall to fit some tunnels in the Alps.

Contributing factors as reported in the press: Bad assumptions. Failure to address details. Communications breakdown between organizations.

• An automated baggage handling system at a new airport in Denver, USA was intended to be the most advanced in the world. However, it suffered severe problems and resulted in the completed airport sitting idle for 16 months. Despite efforts to remedy the problems it never worked properly and in 2005 it was scrapped altogether, because it was found that using a manual system would cut ongoing costs.

Contributing factors as reported in the press: Underestimation of complexity. Complex architecture. Changes in requirements. Underestimation of schedule and budget. Dismissal of advice from experts. Failure to build in backup or recovery process to handle situations in which part of the system failed. The tendency of the system to enjoy eating people's baggage.

To address potential failures better, the Risk Group recommends a structure developed around **9 key issues** in the front-end assessment of a project.

Essentially as a new paper from the Risk Group "Major Infrastructure Projects. Front-End Issues" discusses, the work is a sort of brainstorm of thoughts and hypotheses about what might happen. Each of the issues to be discussed over such a session will need to be addressed by a group discussion of all relevant parties and combined with a numerical measure where possible as to the figures which might be put on costs and benefits of taking particular courses of action. I am very optimistic as to the role which actuaries will have to play in this area in the coming years. Large scale energy and transport infrastructure are clearly key proposals warranting the need for a rational analysis of this kind. With the impact of climate change, flood and other weather defences are taking increasing prominence – and have a high public attention when they go "wrong", ie exhibit extremes of the outcomes which can be predicted.

Peter Tompkins is an editorial board member of The European Actuary.



PETER TOMPKINS

# **COLUMN OF THE AAE**

On 21 and 22 April 2016 the AAE organised the second European Congress of Actuaries.

The congress took place in the Radisson Blu in Brussels and attracted more than 200 actuaries from all over Europe. Actuaries of 23 Member Associations registered for the congress. The highest representation came from the Icelandic Actuarial Association (77.8%: 7 out of 9 actuaries), which shows that for an interesting congress distance does not play a role.

The congress had as overall theme "The Actuarial Profession spreading its Wings".

During the congress the professional challenges and opportunities in the area of new technologies, big data and cyber risks, behavioural finance, consumer protection, independence, capital standards, actuarial skills in wider fields, were discussed.

The plenary sessions were moderated by Rens de Jong, a Dutch journalist and television presenter and winner of the "Moderator of the Year" award in 2014. During the congress he used the BuzzMaster tool. With this tool the audience can actively participate using their smartphones or tablets. They can ask the speaker questions, comment on content, fill out polls and this all in real-time.



Based on the responses to the survey and on the feedback we received, the ECA2016 has been a very successful event. The attending actuaries particularly liked the interactive plenary sessions which resulted in lively, sometimes unexpected discussions.

In the wide range of parallel sessions the participants were especially interested in presentations on the wider fields and maximising ones skills as actuarial professional.

All presentations are available on the congress website: www.eca2016.org

A quote from one of the participants: "I would like to thank you for the organization of the ECA2016: I enjoyed to take part, I enjoyed the sessions and all the people I met, the location and the perfect organization. I was a really great event for me! Thank you very much."

So without any doubt: "See you at ECA2020".

Ad A.M. Kok AAG Hon FIA Chief Executive Actuarial Association of Europe

### COLOPHON

The European Actuary (TEA) is the bi-annual magazine about international actuarial developments. TEA is written for European actuaries, financial specialists and board members. It will be released primarily as e-mail newsletter. The Editorial Board welcomes comments and reactions on this edition under contact@theeuropeanactuary.org.

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#### **NEXT ISSUE**

In April 2017 the theme is Pensions. Suggestions can be e-mailed to contact@the-european-actuary.org

EUROPEAN AGENDA Please check http://actuary.eu/forthcoming-events/ for the most actual forthcoming events.