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AAG[ii]

CERA: Wider opportunities for actuaries[iii]

Introduction

In 2019 we will celebrate the 10th anniversary of the CERA Global Association (CGA).

Thanks to the efforts of Fred Rowley and Harry Panjer, the initiative was taken to establish a global credential for risk managers with roots in the actuarial profession.

The timing of this initiative, ten years ago, was excellent. The insurance industry in Europe was awaiting the introduction of Solvency II and many actuarial associations were starting discussions about the future of the actuarial profession

Since its foundation the CGA has established a strong position in the global actuarial community. The main focus of the CGA is now on wider opportunities for actuaries, preferably with the CERA credential.

This article gives an overview of the development of the CERA over the past ten years and presents the new opportunities, as we see the, in the years to come.

Taking into account what we have learnt from the past, we are looking forward to a new decade.

History

As a Dutchman, I'm proud to consider that the origin of actuarial mathematics comes from a publication in 1671 of Johan De Witt. This Johan De Witt is one of the Netherlands' most famous historical figures of the Golden Age.

He was both a politician and mathematician and in 1671 he published, for the members of the parliament, his book "Waardije van Lyf-renten naer Proportie van Los-renten" (Valuation of annuities in proportion with repayments).

Since the Middle Ages, an annuity was used as a pension provision. In addition, a sort of financial annuity was seen as a government loan. De Witt showed - by applying probability - that with an equal amount, a release rate of 4% yielded the State on average as much as an annuity of 6.25%, or: for every 17 guilders deposited, one annuity per annum could be paid: 5.89% (17: 1). The crucial point was that, for the first time, calculations with compound interest where combined with probability and life expectancies.

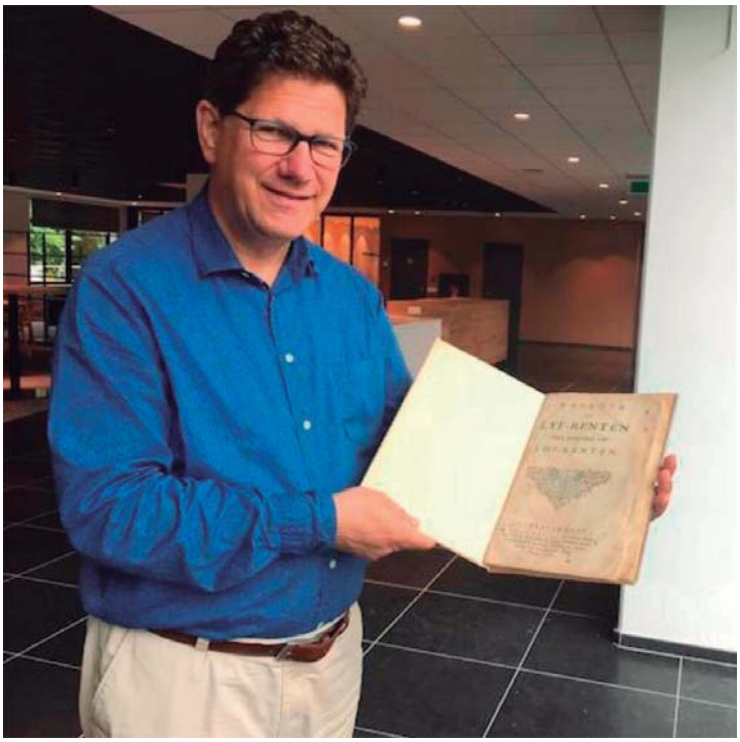
> “ Actuaries must become aware what their added value should be outside these traditional areas. ”

This pioneering work is regarded as the beginning of insurance mathematics.

Following De Witt's calculations, the annuity was reduced. The sudden reduction in what was seen as a "widow's facility" contributed to the bad name that the De Witt brothers already had because of their political reign. Johan De Witt and his brother Cornelis were brutally slaughtered in 1673. Though this was seen as the first political murder in the Netherlands, some say his theory on annuities contributed to his death. It is remarkable that after the violent death of the brothers, new annuity policies were issued at the old rate of 14: 1. You might say innovation was a tricky business in the Golden Age.

In my opinion Johan De Witt is the example of how to use knowledge and expertise in “wider fields” in the seventeenth century.

In the picture below, I feel privileged to hold one of the remaining copies of the first print of De Witt’s publication.



Later developments

In the centuries that followed the publications of De Witt’s book, international trade developed further, especially in countries where shipping played an important role. Because damage or loss of cargo often had major financial consequences, the need for new ways to mitigate such risks was developed. Non-life insurances were introduced, giving a strong impetus to the development of the international trade. In those days the so-called bottomry was very common, a system of merchant insurance in which a ship was used as security against a loan to finance a voyage, the lender losing the investment if the ship sank.

Traditionally life insurance actuaries were responsible for the valuation of provisions for insured obligations. As long as there were sufficient assets, the domain of the actuary was limited by the liabilities of an insurer. A step forward was made in the second half of the 20th century, when actuaries became involved in matching assets and liabilities. With guaranteed interest rates on the liability side and fluctuating yields on the asset side of the balance sheet, matching between assets and liabilities became more important. This was a significant advancement for the actuary.

> “ It is now well known that actuarial techniques can be applied in other industries as well. ”

Another important development was that actuaries became more and more involved in developing new types of insurance products and had a pivotal role in pricing and estimating profitability.

In the last decades of the previous century, new technology boosted the development of actuarial models. Actuaries became specialists in embedded value calculations and other calculations based on expected future cash flows. Little by little they became real modeling specialists.

It was not only the programming where actuaries were expected to show their expertise. The determination of assumptions and the sets of scenarios for the future cash flows portfolio was the other area where they played a key role as well.

Technological developments cleared the way for other professionals to use the actuarial domain. Skills and the expertise in modeling work offered them the opportunity to distinguish themselves in what was considered as an actuarial domain.

Developing risk management

In the fifties Harry Markowitz developed the Modern Portfolio theory (MPT). The MPT assumes that - under ideal market conditions - there is a link between the expected return on investments and the risk to be incurred, whereby high returns can only be achieved when accepting a larger risk. The total (portfolio) risk can be mitigated by diversifying over investment opportunities that are not (completely) correlated with each other.

The economist William Forsyth Sharpe, together with John Lintner, has slightly modified the Markowitz model so that it can be used for more practical portfolio matters. His Capital Asset Pricing Model (CAPM) states that part of the risk, the so-called systemic risk, of each individual investment object is inevitable. The other part of the risk, that is specific and non-systematic, can be eliminated through diversification.

The specific risk concerns the sensitivity of the return of an investment object to factors that relate specifically to the investment item in question. The systematic risk concerns the sensitivity of the return of an investment object to the uncontrollable risks arising from the general (macroeconomic) developments of the market. The systematic risk is therefore also referred to as the market risk and is expressed by means of the beta and the symbol β. Since, according to the CAPM theory, the systematic risk cannot be eliminated by diversification in the investment portfolio, only this part of the risk must be compensated in the yield requirement to be met.

This return requirement on a certain investment property (for example a share) is calculated by adding the risk-free yield to the product of the beta times the market premium.

This market premium is the difference between the relevant market return (for example an index) minus the risk-free return (eg long-term government bonds), or algebraically displayed:

$$E(R) = R_f + \boldsymbol{\beta} \times (E(R_m) - R_f)$$

Where

$E(R)$ is the expected return (required return),

R_f is the risk free rate,

β is the beta coefficient (systemic risk),

$E(R_m)$ is the expected return on the market (expected market return).

The above formula quantifies the price of risk.

It follows directly from the above that the investor, who is exposed to a higher risk, wishes a higher return.

The challenge for actuaries was how to incorporate this theory into traditional actuarial thinking.

The traditional actuarial approach

When deriving premiums for new insurance products, actuaries use the expected loss as a starting point. The expected loss is equal to the expected value of a certain probability distribution function which represents the losses of the specific insurance.

This works quite well with large portfolios and over a large number of years. However in every specific year the insurer could be hit unexpectedly hard.

In that case, the distinction between systemic risk and non-systemic risk is of importance as well. If claims are exceeding the received premiums, insurers need additional reserves to cover the unexpected losses. If premiums were based on expected losses, obviously, insurers need methods to quantify the unexpected losses too.

> “ Actuaries all over the world need to be aware that the traditional actuarial areas of practice might disappear even faster than expected. ”

To illustrate the importance of taking in account systemic and non-systemic risks, we would do well to bear in mind the story of Godfried Bomans, a popular Dutch writer, about a man who was looking out over the Dutch countryside from the bank of a river. He noticed a sign in the river indicating the average depth of the river was 1.5 m. Because his height was 1.85 m, he immediately thought that he could walk through the water to reach the other side of the river. Unfortunately, he drowned.

He fatally experienced that the risk cannot be simply measured by the expected value E[X]. The variance Var[X] is the metric needed.

Solvency II

With the introduction of Solvency II, the insurance industry became aware that insurance companies are exposed to various types of risks. Thanks to Solvency II, all European insurers are fully aware of their risk exposure, how to quantify and how to manage those risks.

All of these risk types need to be quantified and insurers are required to keep solvency capital on their balance sheet.

According to Solvency II there has to be enough capital for a one in two hundred-event. This means that in 99.5% of all cases there is enough capital to cover for events, while at the same time, there is a 0.5% possibility for a failure.

So, the crucial question is:
Are actuaries with knowledge of the theory of CAPM, and more advanced knowledge of mathematical statistics, and Solvency II experience, able to apply their expertise outside the financial industry, in the so-called “wider fields” or “wider opportunities”?

In my opinion, actuaries are well equipped to enter the wider fields. However, they must take care of their own marketing.

Founding CERA

I consider Fred Rowley and Harry Panjer to be pioneers.

They took a step forward for actuarial community, showing another way in dealing with risk. With the foundation of the CERA Global Association, it became clear that the future of the actuarial profession cannot be limited to insurance and pensions only. Actuaries must become aware what their added value should be outside these traditional areas.

It is now well known that actuarial techniques can be applied in other industries as well. Actuaries have earned the right to contribute. Actuaries all over the world need to be aware that the traditional actuarial areas of practice might disappear even faster than expected.

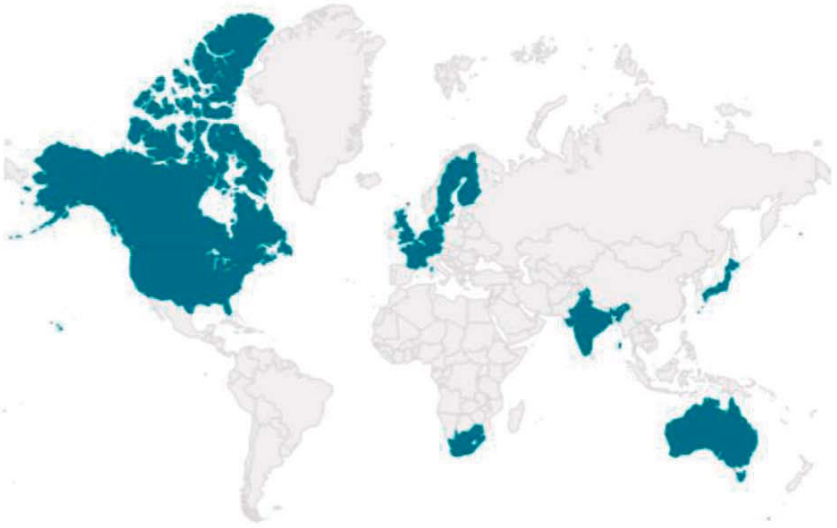
This is indeed the debate about the role of the actuary or about the future of the actuary.

In the future it will become less and less self-evident that actuaries will find their jobs in the insurance industry.

CERA is founded for actuaries who are aware of what is going on in the world and want to be well-prepared for future developments.

Now in 2018, CERA Global Association is a well-functioning organization which ensures the maintenance of a worldwide standard credential for actuaries who are specialized in enterprise risk management.

CERA holders at end of 2017



Actuaries Institute	369
Canadian Institute of Actuaries	14
Den Danske Aktuarforening	1
Suomen Aktuaariyhdistys	1
L'Institut des Actuaires	195
Deutsche Aktuarvereinigung e.V.	175
Institute of Actuaries of India	2
Institute of Actuaries of Japan	61
Het Actuarieel Genootschap	57
Actuarial Society of South Africa	104
Svenska Aktuarieföreningen	6
Schweizerische Aktuarvereinigung	15
Institute and Faculty of Actuaries	747
Casualty Actuarial Society	148
Society of Actuaries	2,320
TOTAL	**4,215**

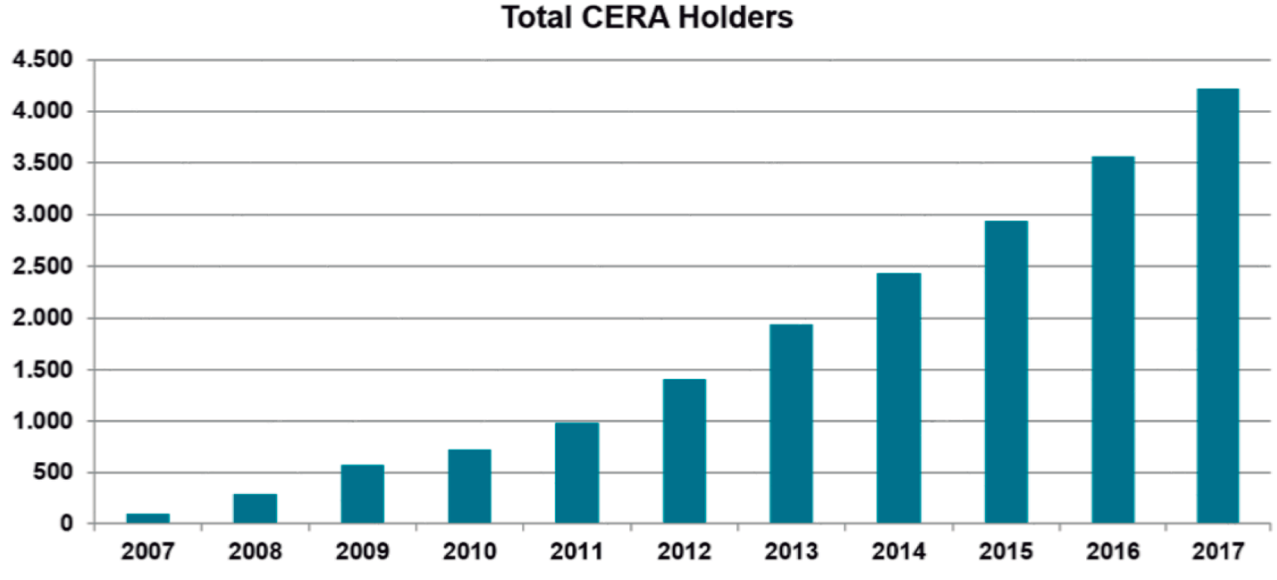
As a result of strategic debates during the last year, CGA presented its point of view on the wider opportunities for actuaries at the ICA 2018 in Berlin.

At the end of this presentation three main remaining questions were:

- What are the key messages of the CGA?
- How to enter in the so-called wider fields?
- How to engage possible employers?

The answers to these questions determine the strategy of the CERA Global Association in the coming years. What makes the CERA Global Association unique is that the CGA develops and administers a rigorous ERM credential, based on a mastery of one set of learning objectives, with accreditation applied on a consistent basis worldwide.

CERA: the numbers



OUR VALUES

Our values articulate the aims and objectives of the CERA Global Association and ensure that we will continue to honour the principles of the CERA Global Treaty.

As the CERA Global Association we are:

- Aligned with new developments: we ensure that the CERA credential continues to instill the highest professional standards, with an impeccable code of conduct and rigorous educational requirements by developing progressive syllabus content by maintaining a strong quality assurance program to monitor delivery.
- Unique: we underpin the only global risk management credential, based on mastery of one set of learning objectives, with accreditation applied on a consistent worldwide basis.
- Collaborative: we are dedicated in fulfilling our active partnership role by working with and supporting Treaty Member Associations to develop and promote the CERA credential as the desirable attribute for employers and regulators are seeking to engage ERM skills.

Recently the Catalonian Institute of Actuaries (Col·legi d'Actuaris de Catalunya) joined the CGA.

This shows that the board of the Col·legi recognizes the added value of the CERA credential for the members.

I congratulate the Col·legi d'Actuaris de Catalunya on this important step. Together with the other member associations the Col·legi can build on the future of CERA and write a new page of the history for the actuarial profession.

[ii] Ron Hersmis (1959) is fully qualified actuary and member with distinction of the Royal Dutch Actuarial Association. He is Chairman of the Board of Directors of the CERA Global Association since October 2015. In the past he fulfilled various positions in the IAA and the AAE, representing the Dutch Actuarial Association. He works as consultant and trainer with a focus on risk management, Solvency II and IFRS 17.

[iii] This article is written in a personal capacity. It does not necessarily reflect the vision of the CERA Global Association or the Royal Dutch Actuarial Association.