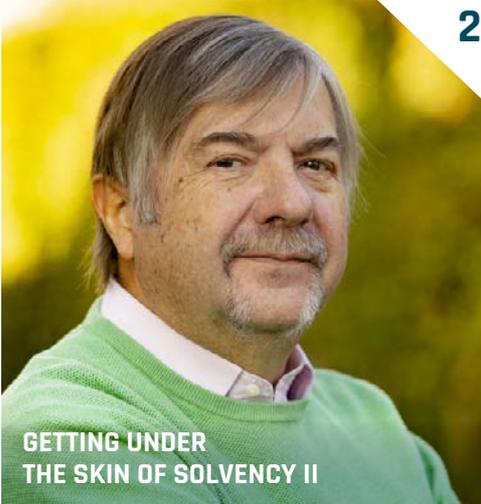
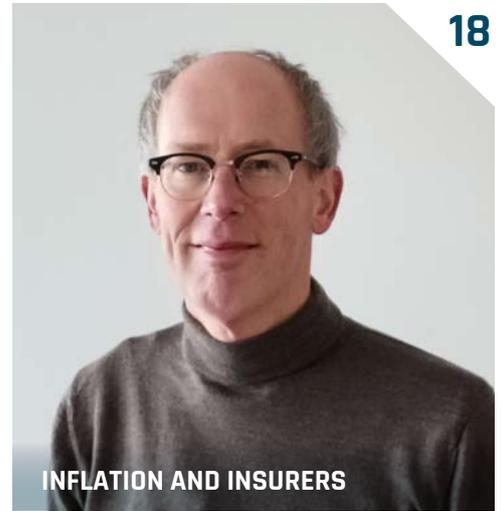


THE EUROPEAN ACTUARY

QUARTERLY MAGAZINE OF THE ACTUARIAL ASSOCIATION OF EUROPE



THEME THE NEW ROLE OF THE ACTUARY



N^o 32
DEC 2022



GETTING UNDER THE SKIN OF SOLVENCY II

INTERVIEW BY
JENNIFER BAKER



KAREL VAN HULLE

Karel Van Hulle, Professor Emeritus at KU Leuven, and honourable professor at Goethe University Frankfurt, was closely involved with the development of Solvency II. After his retirement from the European Commission in 2013, he became a member of the Public Oversight Board and serves now as a Director at the Bermuda Monetary Authority. He sat down with **The European Actuary** to talk about the current state of the profession, the Solvency II review and what we need for the future. >



We need to know what the actuary really thinks both in quantitative and qualitative terms

Let's start with a big broad question. In your opinion, what is the main role of the actuary?

'Actuaries are professionals who have deep expert knowledge about the measurement of risk in a forward-looking perspective. That is the reason why the role of the actuary is particularly important today, in a time of sustainability. Actuaries need to think about duration – about how long things will last in terms of assets and liabilities.

So, for me, the main role of the actuary is to help understand and measure future developments. But it's also important to accept that life includes a lot of uncertainty. And as the future is uncertain, actuaries must avoid giving the impression that they can control the future through their calculations. Their mathematical skills should therefore be combined with qualitative assessments in order to place the data in a proper context.'

You mentioned data. Actuaries deal more and more with data science, especially for pricing new products. Do you think the actuarial function on the reporting side could also benefit from data science? Or should we make reporting simpler, more uniform and transparent?

'That's a good question. Data science can help actuaries to address future challenges and help them to develop new, innovative technologies and solutions. For instance, actuaries should be involved more in the design and pricing of new insurance products. There is too little innovation in the insurance industry and too little concentration on risks that really matter. Data science and the validation of data might help to increase the

insurability of risks. This is particularly important in ensuring the insurance sector remains relevant. Actuaries should assist in better assessing likely future developments and in finding opportunities for insurers to reduce the expectation gap.

In terms of reporting, data science can certainly contribute to making the reporting more fit for purpose and help actuaries in translating the complexity of data into language which is understandable for decision-makers. I would be hesitant to call for more uniform reporting particularly from the actuarial function. We need to know what the actuary really thinks both in quantitative and qualitative terms.'

Very few companies use internal models. Has Solvency II placed too many constraints on their use in your opinion?

'I don't think it's the constraints of Solvency II that result in fewer companies using internal models. Internal models are an essential feature of Solvency II. Under a risk-based solvency regime, it is for the insurers to know and to manage their risks. A standard formula is only a helpful tool and is by definition wrong, as it can never capture the risks of every single insurance undertaking or group.

Of course, one can argue that all models are wrong and that it is not correct to state that internal models are by definition right. Nevertheless, I believe that an internal model, if it is construed using all the safeguards that were introduced by Solvency II, is likely to better reflect the true risk position of an insurer.

If I take you back to the early stages in the development of Solvency II, you will recall that >



I am therefore worried about attempts by EIOPA to streamline internal models so as to make them more comparable

there was a lot of criticism when the European Commission proposed the use of a full internal model by insurers. This happened just after the financial crisis when banks were criticised for having abused internal models for lowering their capital requirements. But we still went for this approach, because we believed that only an internal model can capture the true risk position of an individual insurer.

I do not believe that Solvency II places too many constraints on the use of internal models. The problem is that the model can only be used for solvency purposes if it has been approved by the supervisor. Approving an internal model is a complex process and I can imagine that supervisors are not always keen to get involved in that process. Supervisors should however be able to assess whether an internal model has been construed properly. If that has been the case, there is no reason why supervisors should believe that the model provides less guarantees than the standard formula.

I am therefore worried about attempts by EIOPA to streamline internal models so as to make them more comparable. That goes against the letter and spirit of Solvency II. If all internal models are the same, we are creating a new systemic risk. The advantage of allowing for the use of internal models is that we avoid creating such a systemic risk. The use of an internal model should incentivise insurers to improve their risk management. There is obviously always some subjectivity in risk assessment. This should be recognised. Judgement is important and should not be overruled by regulation.

Similarly, I also find it wholly inappropriate, as proposed by the European Commission upon

EIOPA's advice, to require internal model users to communicate to their supervisor the solvency position calculated on the basis of the standard formula. That goes against the idea of a risk-based solvency regime. It sends the wrong signal and should be seen as an example of over-regulation. The best way to ensure that the difference between internal models and the standard formula does not grow too widely, is to regularly review the standard formula and to update its calibrations.'

And what do you think of the Solvency II review? What is the most important point according to you? Are there still areas you think should be reviewed?

'It's almost impossible to identify things that are not included in the review, because the review is so huge. But let me first of all say that I am happy that all parties concerned share the view that Solvency II is working well and that there is no reason to depart from the risk based approach that was agreed in 2009. Solvency II should therefore not become Solvency III.

It was always envisaged that the solvency regime should be reviewed from time to time so as to ensure that it remains fit for purpose. Personally, I believe that too much has been included in this review. Looking at the negotiations in the Council and in the European Parliament, I fear that the regulatory regime will become even more complicated than it is at present. The more complicated a regulatory regime is, the less likely it is that it will be properly applied and supervised.

To me, the following points are important in this review: ensuring that proportionality >

means something in practice; finding a better solution for the valuation of long-term liabilities by taking account of the long-term nature of insurance; removing some exaggerated prudence; introducing a requirement for insurers to take account of the development towards a more sustainable society; and enhancing the regulatory regime by adding liquidity risk and systemic risk.

I am not at all convinced that we need to introduce a new chapter on macro-prudential supervision, nor do I believe that we need a complex regime for recovery and resolution. It is not good to add more rules to an already complex regulatory regime. It would be more appropriate to come back at a later stage with a more holistic view of the solvency regime of insurers by placing that regime in a broader context that includes insurance guarantee schemes, recovery and resolution and systemic failures. That would mean, for instance, that the confidence level in Solvency II might have to be lowered, as policyholders would receive additional protection from the backstop offered by an insurance guarantee scheme and that special

measures could be taken by supervisors where certain activities carried out by insurers might lead to a systemic failure.

What is presently missing is an update of the whole standard formula and a review of those calibrations that are largely based on UK data. Missing is also a clear requirement for supervisors to act in a European spirit.'

There is an ongoing discussion about whether the actuarial profession is sufficiently protected, for example compared to accountants? Do you think it worth changing the 'protection' approach to a 'recognised by authorities' approach?

'This is not a new debate. I believe the answer to that question is that the profession's protection depends to a large extent, from its own behaviour. If actuaries are well trained, if they have the skills, which are needed in order to make the solvency regime work, there is no need for legal recognition. >





Solvency II should therefore not become Solvency III

When we discussed the development of Solvency II, I was a strong advocate of giving more prominence to the role of actuaries. That has led to the creation of the actuarial function. I believe that this was a good idea and I am sure that the actuarial profession has greatly contributed to the success of Solvency II. In those early days, the actuarial profession also lobbied for a legal recognition of the profession. I opposed this then and I am still opposed to it now. I do so because of my experience with the regulation of the audit profession, for which I was responsible in an earlier part of my career.

The profession should focus on substance rather than legal form. To the extent that people with an actuarial qualification are properly educated and that they follow professional standards, it is obvious that they will be the preferred experts to occupy the actuarial function. That is presently happening in most Member States. Legal recognition will open up the debate about qualification and equivalence. That is usually an unpleasant debate in a European context. I believe that the profession should concentrate on making sure that it attracts the right people with the right skills and on ensuring that more people are interested in acquiring an actuarial qualification. We need more actuaries and should therefore be careful not to create a new monopoly.'

We often say that the actuary is the fuse in case something goes wrong. So what's your advice for the profession in the future? How do you see the next 10 years in terms of an evolution?

'I think it's very important that the actuarial function which we presently have under Solvency II fully plays the role which was assigned to it.

It is very important that actuaries actually speak up! The actuarial function is meant to be a control function in its own right, i.e. with the same importance as all other key governance functions. It is therefore important that the actuary delivers the actuarial report directly to the Board and that this is not left to the chief risk officer. There is a tendency for actuaries to hide behind the back of the chief risk officer. I regret that. If the actuary believes that technical provisions are not calculated appropriately or that the internal model is not properly reflecting the true risk position, the actuary must act, identify the deficiencies and give recommendations on how such deficiencies can be remedied.

I have had the pleasure of working closely with the actuarial profession during my career with the European Commission and I have been involved for many years in the education of students who wanted to qualify as actuaries. I therefore have great respect for the actuarial profession.

Looking at the future, I have three messages for the actuarial profession. First of all, do not limit your role to calculating and modelling. But get involved in real decision making. That's to say, put your technical work in a broader context. A second message is: improve your communication skills. Make sure that people actually understand what you are talking about. Very importantly, and lastly, do not give in to pressure, and say what you think, because you are too intelligent, to deprive society from the benefits of your thinking.' <

THE FUTURE ROLE OF THE ACTUARY

BY **GIAMPAOLO CRENCA**

In recent years the development of the actuarial profession has increasingly featured consolidation and growth of the traditional fields (insurance and pension), although broader fields have also experienced significant movement; in some cases we can already see an impact from this. This situation clearly illustrates that actuaries cannot remain closed but must continue broadening their view to include all risks – to the extent that they are quantifiable – for evaluation of their impacts.

But the first issue is to change the entrenched actuarial mentality. This is often too closed to everything regarding mathematical aspects: formulas, models, etc. While these are, of course, always of paramount importance, actuaries also need to embrace the need to open up to more factors. This means consulting all kinds of participants in the system, such as legal and IT experts, distribution networks, politicians, board members, press, public opinion, other professionals, and anyone else who may have relevant input. This is necessary to address the main underlying issue: people need to understand what an actuary is, what they can do, and what kind of problems

they are able to solve. Dialogue and transparency are required of us; what we say, report and present must always be easily understood.

The two other main areas in which we need to advance are education and communication.

THE EDUCATION IS RATHER SIMPLE TO SAY, but very complicated to implement. Without education we can do nothing! That means education is an essential measure if we wish to further develop traditional fields and build on the wider fields. In practice, this requires continuous implementation of a core syllabus encompassing new fields and emerging risks,

to ensure actuaries' quality standards are as high as possible.

IN TERMS OF COMMUNICATION, the main mission is to let the world know actuaries exist, and from there to expand understanding of actuarial activities. We need to break out of the 'shell of the numbers' and broaden perspectives on what we do, explaining that we are primarily assessors – not clairvoyants, nor simple calculators. We don't claim any crystal ball: the actuarial profession is a science! The way we communicate must be tailored to each audience, though the language used should always be clear and easy to understand. >

WE CAN GO ON to identify contexts in which the role of the actuary could be expanded, bearing in mind the basic consideration that actuaries are equipped for evaluating uncertainty. So they can work with any kind of risk, as long as it is quantifiable; to put it another way, there must be sufficient data available, including qualitative information.

There is already a large list of such risks/fields and they represent our challenge for the future; some of them are already established, some are just getting started, some are in progress. A few well-established examples from the list include: systemic risks including climate, catastrophic, sustainability and similar; new data processing techniques (for instance machine learning, artificial intelligence); supplementary private health funds; IFRS17 in insurance. We can also add cyber risk and operational risks to this, not to mention data science, which constitutes *a new approach to a very old problem* – that ‘problem’ being the data, the essential starting point for every actuary and something any evaluation must contend with.

THE LIST OF AREAS in the early stages of development includes internal actuarial audit, capital management, welfare plans and advanced finance,

while exploratory work is being conducted in respect of project management, planning and control, strategic marketing/distribution plans/customer analysis.

WORTHY OF SPECIFIC MENTION is the governance which these days increasingly involves an ‘actuary manager’, especially in the fields of insurance and pension funds. The governance mechanism here may be indirect or direct. For instance the Actuarial Function concept is an example of indirect governance, because in it the actuary supports the decision-maker (board) with respect to solvency. By contrast, when an actuary sits as a member of a pension fund board, this represents direct governance because the actuary themselves decides.

A MENTALITY CHANGE is needed, as mentioned at the beginning, but it is also necessary for actuaries to be able to broaden their own experience and skills to other areas (balance sheet, legal, IT, administration, etc.) – while never forgetting their actuarial focus and approach – to enter into dialogue with all other parties and to be fully involved in the governance process. This adjustment to the role is a very important step forward and one which some actuaries have already put into action.

SO THE FUTURE ROLE of the actuary could be extensive and significant. Actuaries can be more and more essential in supporting decision makers and any kind of stakeholder (including governments and corporations) in taking decisions, meaning that the actuarial role is destined to expand. To do this successfully there are very significant challenges to overcome, though in all scenarios the profession must keep another critical goal in mind: the general wellbeing of society. <



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REIMAGINING THE PROFESSION

BY **MATT SAKER**

When I became President of The Institute & Faculty of Actuaries (IFoA) in June this year, I spoke about my vision to see the profession continue to flourish for the next generation of actuaries. In this article I explain what the IFoA is doing to make this vision a reality and ensure that the profession continues to grow, influence and lead in what continue to be very challenging times.

WHAT ARE THE KEY CHALLENGES?

In keeping with all other professions, the actuarial profession is having to adapt to the changing world around us. It is estimated that the half-life of professional skills has reduced over the past generation from around 30 years to a mere 6 years; this means that the value of our skills will be halved after this short time. In this context, we need to ask ourselves whether it remains reasonable to expect new entrants into the profession to plough through examinations that may take 5-6 years to complete, in the knowledge that by the time they reach the destination the goal posts may have moved. There is also the looming risk that technology developments may replace the role of professionals. We are already seeing this within the legal profession where online resolution services are handling millions of disputes a year, with not a lawyer in sight. There is also much

talk of medical professionals being replaced by Artificial Intelligence (AI) beings with access to the collective diagnosis of millions of patients, far more than any one doctor could ever achieve. The equivalent of this for the actuarial profession is the replacement of much of the analytical work that we currently carry out by AI or Machine Learning tools which could result in a decline in the demand for actuaries within our traditional fields.

WHAT IS THE IFOA DOING TO ADDRESS THESE CHALLENGES?

None of the challenges described above are new and at the IFoA we believe they can be addressed, provided the right actions are taken now to course correct the profession. This was the thinking behind the first pillar of the IFoA's current strategy, namely to 'Reposition the >

profession'. But what does this mean in practice? In simple terms repositioning the profession means moving away from the stereotypical view of actuaries as highly analytical individuals working predominantly in the fields of insurance and pensions. For example, while we believe that insurance and pensions will remain important areas of employment for actuaries for many years to come, they are unlikely to accommodate our ambitious plans to grow the profession and ensure that it continues to flourish well into the future. For this to happen the IFoA believes

that we need to break free of these traditional strongholds and spread into wider fields, both inside and outside of the financial services sector. >

'There is also the looming risk that technology developments may replace the role of professionals'



MATT SAKER
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Institute and Faculty
of Actuaries

One example of where this is starting to happen is in the banking industry where we are seeing more and more actuaries working. To facilitate this growth and support our members, earlier this year the IFoA created a new banking pathway to Fellowship.

Similarly, both inside and outside of the financial services sector, there are huge opportunities for actuaries to add value on climate and sustainability issues. In essence climate and sustainability are risk management challenges which are similar in nature to risks such as mortality that we have traditionally considered to be 'owned' by actuaries. For example, both risks emerge over a long period, in excess of 30 years. Similarly, both risks require the analysis and interpretation of large amounts of data. And, perhaps most importantly, in order to maximise the value we can add, both risks require actuaries to work closely with other subject matter experts.

'The IFoA believes that we need to break free of these traditional strongholds and spread into wider fields'

In the case of mortality risk, this is with epidemiologists and other medical experts, and with climate risk it is with climatologists and sustainability experts. As actuaries we do not need to be deep experts in the drivers of either mortality or climate change, but we do need to work hand in hand with those who are, complementing the analytical and risk management skills that we possess, to add value for the whole of society. Given that climate and sustainability are issues that will impact all sectors of business, the opportunities for actuaries are huge. That is why, as demonstrated by the launch of our [Climate Risk and Sustainability Course](#) earlier this year,

the IFoA is investing so much time and resource in this area.

WHAT DOES THE FUTURE HOLD?

At the IFoA we recognize that providing appropriate learning materials is only part of the equation and that, to be successful in these new domains, there are other pieces of the puzzle that need to fall into place. We need to create both a steady supply of actuaries, but also stimulate a demand for them in these new domains.

On the supply side, as well as providing them with the necessary learning materials, we need to encourage our members to rise to the challenge and empower them to take the plunge to enter these new areas. Part of this involves telling the stories of the actuarial trail-blazers who have already made a success of moving into these new areas. Similarly, we need to stimulate demand by explaining to employers in these new areas why they should be seeking to employ actuaries, what skills we have that could be useful to them and how actuaries can add value to their business.

'Given that climate and sustainability are issues that will impact all sectors of business, the opportunities for actuaries are huge'

If we get all these things right, and I am confident that we will, then I am sure this will lead to a bright future for the next generation of actuaries, and one in which the demand for our skills and insights will grow beyond our traditional areas of expertise. <

CHALLENGES OR CHANCES

A CHANGING MARKET LANDSCAPE FOR ACTUARY VERSUS DATA SCIENCE

BY **YIRU (EVE) SUN, ROGER YUAN** AND **MARK SPONG**

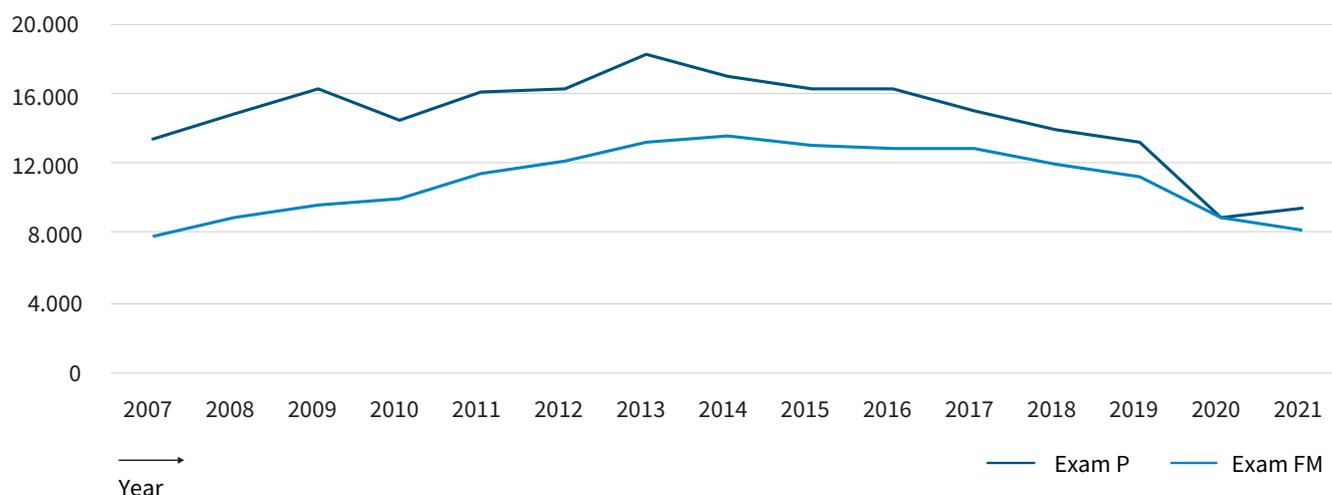


MARK SPONG, FSA, MAAA, is a Senior Manager at Oliver Wyman

Few college students are aware of the actuarial profession. Of those that are aware, many are becoming interested in data science and other non-actuarial careers. The offer of more money, absence of professional exams, and potentially more numerous employment opportunities has had a fundamental impact on entry level actuarial recruiting.

We recently engaged with actuarial clubs' leaders, professors, recent graduates of fifteen U.S. universities, scoured observable market data, and tapped into our extensive library of intellectual capital to understand the core challenges faced by actuarial employers today, and identify opportunities to address them. This article contains a summary of this effort.

FIGURE 1: NUMBER OF SITTINGS FOR SOA ENTRY LEVEL ACTUARIAL EXAMS



CHALLENGES IN THE ACTUARIAL RECRUITING MARKET

The number of candidates sitting for U.S. Society of Actuaries (SOA) first two exams Probability (P) and Financial Mathematics (FM) decreased almost 50% over the past eight years (*Figure 1*),^{1,2} with an average decline of 7% per year, although the number of candidates had increased steadily before 2013.

This trend is consistent with the public perception of the actuarial profession which had been consistently ranked top 3 in national job lists for multiple years before 2013, then the rank quickly dropped to 10 or beyond since mid-2010s, which coincides with the timing when the need for data science emerged.³ *Table 1* compares the ranking of actuary, software engineer, and data scientist, out of top 200 jobs from CareerCast over the past decade.⁴ Other sources showed similar trend, i.e., actuary was ranked #1 by CNN⁵ and Wall Street Journal⁶ around 2010, while currently U.S. News ranked actuary #20, behind software developer (#5) and data scientist (#6).⁷ >

TABLE 1: TREND OF JOB RANKINGS OF ACTUARY, SOFTWARE ENGINEER, AND DATA SCIENTIST FROM CAREERCAST⁴

Year	Rank of Actuary	Rank of Software Engineer	Rank of Data Scientist
2009	2	5	Out of rank
2010	1	2	Out of rank
2011	3	1	Out of rank
2012	2	1	Out of rank
2013	1	3	Out of rank
2014	4	7	Out of rank
2015	1	8	6
2016	10	7	1
2017	11	8	5
2018	10	11	7
2019	10	11	1
2021	9	10	1

There is no 2020 job ranking on careercast.com.

¹ Actuarial-lookup: exam p

² Actuarial-lookup: exam fm

³ CareerCast: Ranking 200 Jobs

⁴ CareerCast: jobs-rated

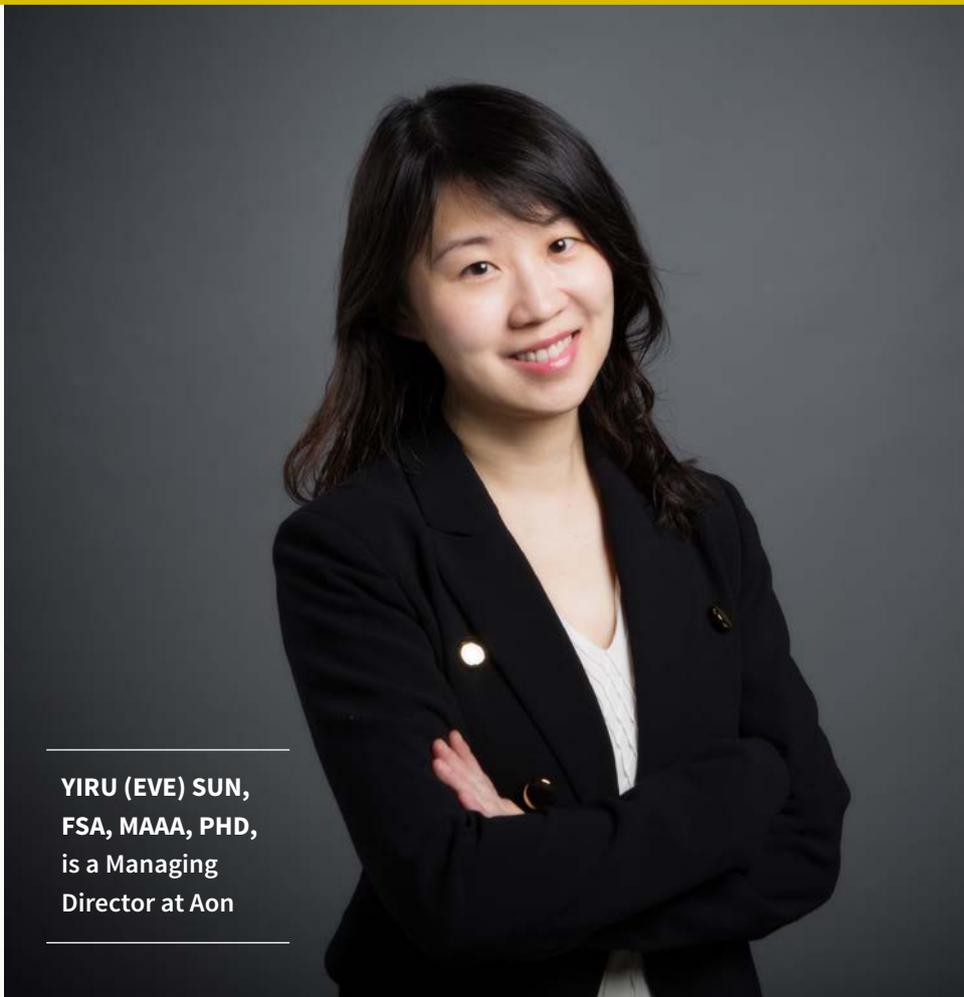
⁵ Ten jobs that pay \$80,000 a year

⁶ WSJ: The Best and Worst Jobs

⁷ 100 Best Jobs

One hypothesis is that data scientists and similar job openings are drawing potential actuaries away from the profession. We queried fifteen colleges, actuarial clubs, and their recent graduates to see if this trend was noticeable.

Table 2 illustrates the distribution percentages of actuarial graduates moving to various career paths that we collected through interviews or other communication channels. Several other schools that could not share the distribution percentages with us also provided their qualitative observations. Some key learnings summarized below:



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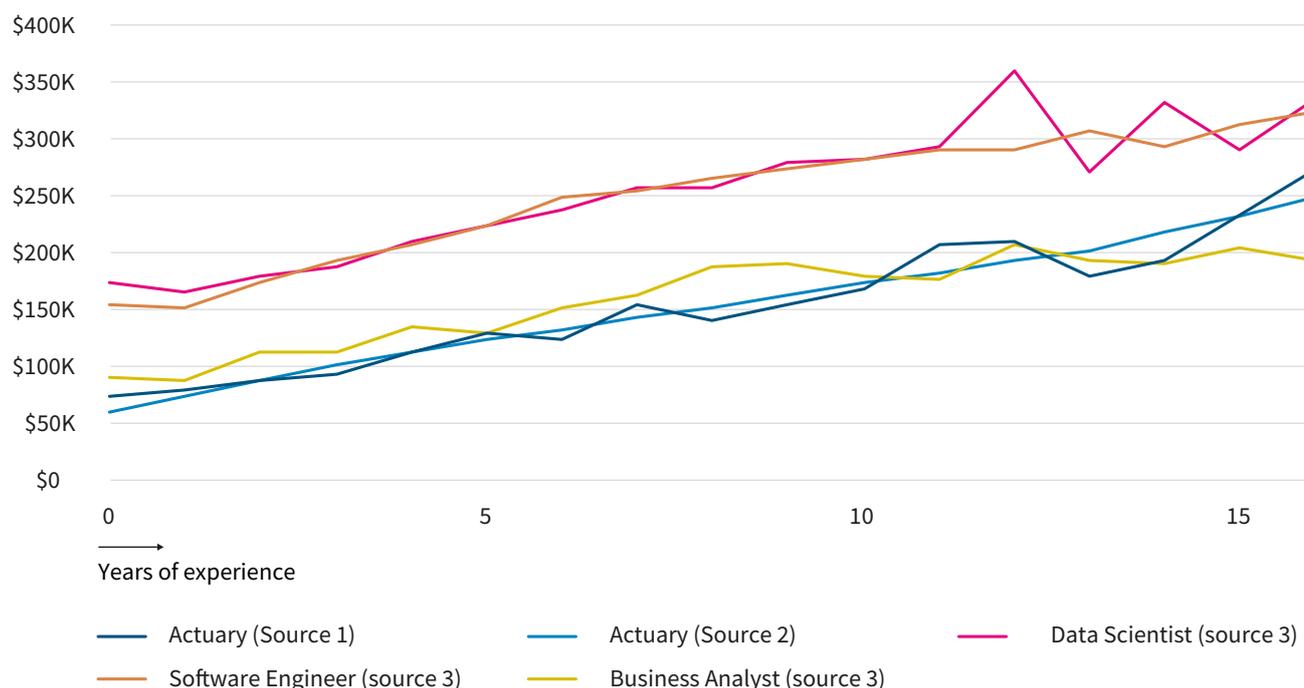
- Candidates at schools with SOA’s Centers of Actuarial Excellence (CAE) recognition are more than twice as likely to remain on the actuarial career path, than schools that SOA recognized as Universities and Colleges with Actuarial Programs - Advanced Curriculum (UCAP-AC) or Universities and Colleges with Actuarial Programs - Introductory Curriculum (UCAP-IC). Further, the strongest programs appear to attract other majors due to the top-tier program and resources.
- Recently established data science majors are pulling some students away from actuarial science. Although the percentage of such change has been low so far, quite a few interviewees perceived that the popularity of the actuarial science program is declining.
- For international students in U.S., there is a general perception that it is harder to get an actuarial job that provides working visa sponsorship, while most data science jobs still provide sponsorship. >

TABLE 2: DISTRIBUTION OF ACTUARIAL STUDENTS TO VARIOUS CAREER PATHS IN RECENT YEARS

School	SOA Recognition Tier	Region	Actuarial function	Data science	Financial/bank	Other or unknown	Master program
A	CAE	Northeast	70%	5%	15%	0%	10%
B	CAE	Northeast	77%	0%	0%	19%	4%
C	CAE	Midwest	84%	0%	5%	7%	5%
D	CAE	Midwest	60%	2%	5%	26%	7%
E	UCAP-AC	Northeast	50%	30%	10%	10%	0%
F	UCAP-IC	Midwest	30%	0%	50%	20%	0%
G	UCAP-IC	South Atlantic	20%	5%	40%	15%	20%

Sources: Data were obtained from interviews with schools’ actuarial clubs, or professors, or recent graduates.

FIGURE 2: COMPARISON OF AVERAGE TOTAL COMPENSATION BY YEARS OF EXPERIENCE



The mixed results between the first two findings suggest that the strongest college actuarial programs are becoming stronger while schools with fledgling or small programs may be struggling. For example, actuarial career fairs tend to be successful only after achieving a level of scale so that they are well attended by both prospective hires and recruiters.

In addition to qualitative interviews and historical sitting numbers, we also investigated average compensation and location. These two factors can be benchmarked explicitly and can provide some insight into

the perceived *attractiveness* and *ease of entry* of the two career paths.

We compared the trends of total compensation (base salary plus bonus) among actuaries, data scientists and its related careers in *Figure 2*.^{8,9,10} The actuaries' average incomes are lower at both entry level and experienced management levels.

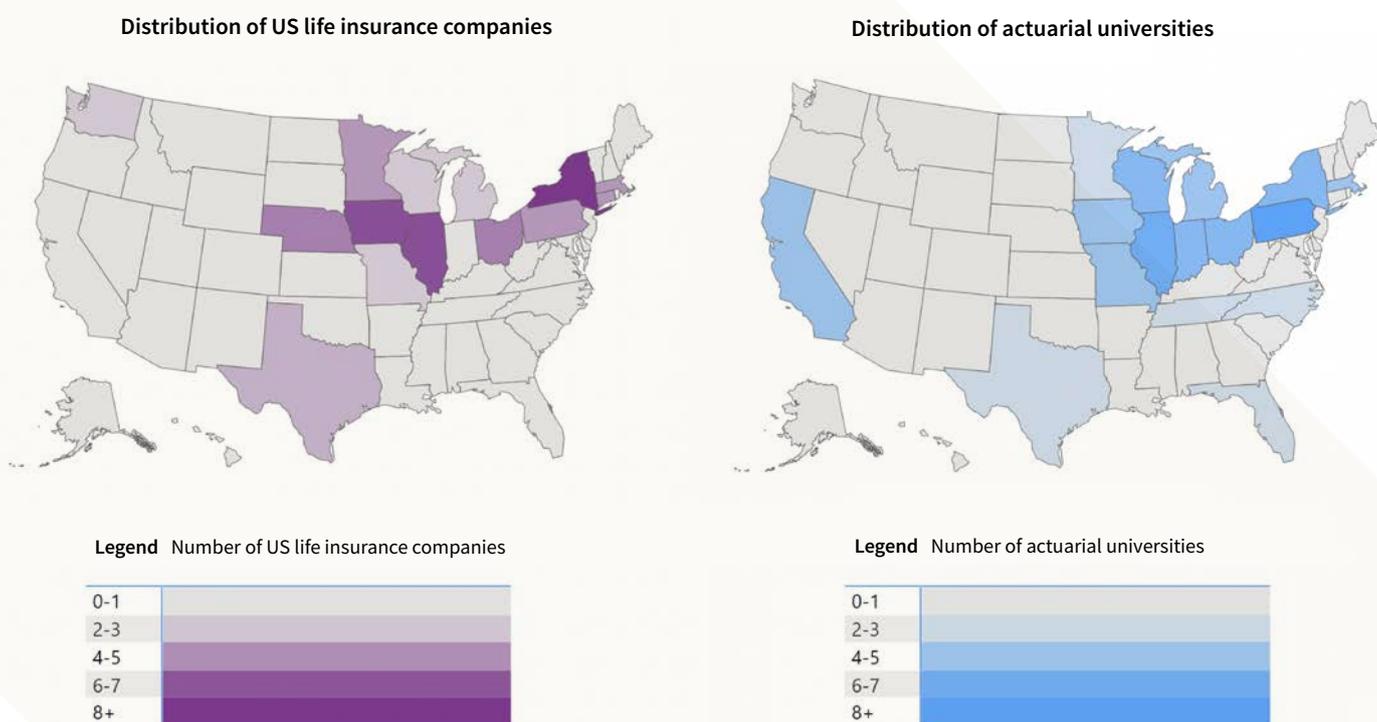
Regardless of accuracy or bias in these figures, they are still important to review because they shape public perception and influence candidate decisions. >

⁸ **Compensation source 1**
Average total compensation for actuaries in Life and Annuities specialization

⁹ **Compensation source 2**
Individual salaries plus bonuses from a survey organized by actuaries on Reddit

¹⁰ **Compensation source 3**
Levels.fyi was used to track total compensations for data scientists, software engineers, and business analysts in technology companies

FIGURE 3: DISTRIBUTION OF U.S. LIFE INSURANCE COMPANIES AND U.S. ACTUARIAL UNIVERSITIES



These two heatmaps plot the geographic distribution of 79 life insurance companies' headquarters in U.S., and all 77 universities and colleges that have actuarial programs with SOA recognition of CAE or UCAP-AC in U.S.

In addition to compensation, location is also one of the fundamental factors that influence candidate decisions.

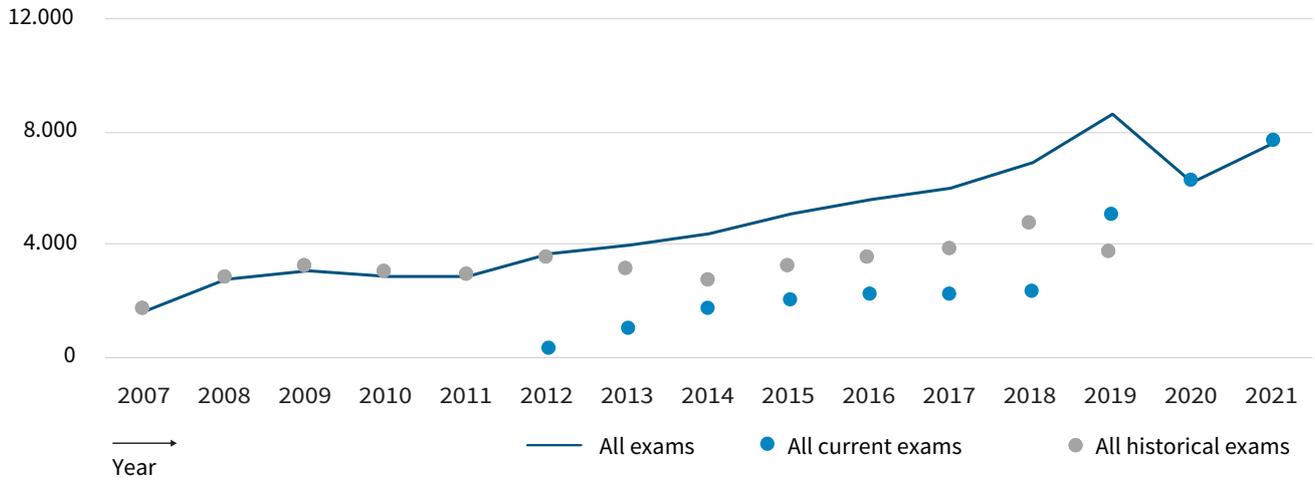
Figure 3 plots the distribution of 79 life insurance companies' headquarters in U.S., and all 77 U.S. universities and colleges that have actuarial programs recognized by SOA as CAE or UCAP-AC. The distribution highly overlaps with each other. Both life insurance companies' headquarters and actuarial schools

concentrate in the Midwest and Northeast states. It is notable that not all actuarial functions located in the same state as the company quarters, however the maps still tell a meaningful story.

For states with high population like Texas, California, and Florida, there may be only one to three life insurance companies, while a great many companies hire data scientists and/or software engineers across most states.

The maps highlight another key factor that, for states with fewer actuarial employment opportunities, the lack of a professional network or role models may effectively act as a barrier to build the awareness of actuarial profession among students and professors. This may explain why high percentage of potential candidates never fully explore actuarial opportunities. >

FIGURE 4: NUMBER OF SITTINGS FOR SOA ACTUARIAL FELLOWSHIP EXAMS (INCLUDING ALL 6 TRACKS)



On the bright side, although the number of candidates sitting SOA entry-level exams decreased considerably, the total number of sittings for high-level exams aiming toward Fellowship of Society of Actuaries (FSA) continues to increase (Figure 4).¹¹

This indicates that the broad horizon of actuarial career still attracts and engages a lot of talented actuarial students to explore the depth of it.

With forward looking talent management, insurance companies can better shape recruiting, retention, and the future of their organization. Recruiters may not perceive a shortage of entry level actuarial candidates (yet), but there are still plenty of opportunities to enhance actuarial programs to tailor to the diverse background and interests of the candidates. <

¹¹ Actuarial-lookup: SOA



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INFLATION AND INSURERS

BY **WILBERT OUBURG** AND **PIETER BOUWKNEGT**

This article has been [published](#) in De Actuaris of October 2022

One word is turning up everywhere at the moment: inflation. After many years of a general belief that high inflation was definitively over, it has undeniably returned. We are noticing it at the bakery, in the beer garden and when we book travel.



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Writing as insurance actuaries, inflation is deeply relevant to each of us in different ways based on our role and responsibility. From our experience we contend that actuaries should also be concerned with recognising and assessing inflation, and incorporate it into risk management. Inflation may be difficult to predict and model, but it represents a crucial risk factor. Several insurers have recently given their attention to the issue – for example by undertaking inflation hedges – and it has also been cited as a source of increased uncertainty in half-year reporting.

This article examines the ways inflation is relevant to insurance companies and considers what role the actuary has as a consequence.

INSIGHTS FOR YOUNGER READERS

Inflation in the Netherlands has not been above 5% since the second half of the 1980s, so only older readers will have memories of inflation being newsworthy. But if we look further back, we can confirm that high inflation has been a reality here too.

The aftermath of the 1973 oil crisis caused inflation in the 1970s to exceed 10 per cent; at that time interest rates were also high, which meant the loss in value of savings was rather limited. Furthermore, many collective agreements in place then still automatically linked salaries to inflation – this eased the pain for workers, but resulted in inflation that did not evaporate when energy prices came back down. The fiscal and monetary >

FIGURE 1: INFLATION IN THE NETHERLANDS SINCE 1963



Source: CBS

policies implemented in the first half of the 1980s successfully brought inflation down, and those policies were continued in the agreements governing introduction of the Euro. Inflation could be consigned to history!

Now we know better. Fiscal and monetary interventions to relieve coronavirus-related pain, alongside the effects of energy policy in conjunction with uncertainty concerning Russian gas and oil supplies, have dealt a sharp shock to commodity prices. Energy price rises are the most eye-catching, but costs are now going up across a broad front.

INFLATION IMPACTS FOR INSURERS

Insurance companies encounter inflation at two points: in their own operational costs and in payouts under the insured service. Own operational costs primarily consist of staff costs, and also some external procurement. In the short term the trend of own operational costs may diverge from that of external inflation, for instance because procurement contracts and collective agreements do not contain an inflation clause and have a longer duration. But in the longer

term, higher inflation will certainly impact on an insurer's costs.

How inflation affects servicing of insurance claims depends on the type of insurer.

Life: Most life insurance policies have a nominal benefit guarantee which is not affected by inflation. However, there are also (pension) contracts where the benefit is (partially) indexed on the basis of an external index, such as the Dutch CBS consumer price index, or the European HICP, the price index set by Eurostat for the entire Eurozone. The inflation allocation will be able to use a floor or cap, which may introduce complex optionalities into the contract. For pension insurers, higher inflation will lead to higher premium income due to indexations.

Funeral plan: The insured service is provision of a funeral. Not only will funeral costs rise with the general price level, but they will also be subject to specific developments related to the funeral industry, such as regulations around burials or cremations. These insurance contracts have often been concluded in the (distant) past, with a fixed nominal premium. >



Fiscal and monetary interventions to relieve coronavirus-related pain have dealt a sharp shock to commodity prices

Loss: Most non-life insurance policies offer restitution for the financial consequences of an insured event (fire, theft, car accident, liability etc.). The amount to be paid out will therefore include an inflation component specific to the type of insurance. ‘Legal inflation’ may also play a role here, where court decisions increase the amounts to be paid out. On the claims side there are also cover situations (such as disability) which are explicitly linked to an external inflation benchmark. However, repair obligations covered by non-life insurance also carry an inflation component. For instance, the growing complexity of car repair leads to increased costs: electric cars can no longer be fixed by a mechanic with a spanner. Damage repair has become more expensive.

Healthcare: Health insurance is a politically driven insurance. The health insurer manages its expenditure by entering into purchasing contracts. Health insurance covers various healthcare needs. As a result, cost inflation in the short term will depend not only on the cost per insured event, but also on the overall use of care. It is difficult to distinguish between ‘pure inflation’ and an improvement in the care provided, though both contribute to cost increases. This can be seen, for example, in the rise of complex and expensive treatment options or the more frequent use of private clinics for treatments.

RATING

How inflation will develop in future is inherently uncertain. It is a variable that can affect the level of insured benefits, and in the longer term cumulative effects can have a significant impact.

We identify two ways of incorporating inflation into the assessment of insurance liabilities.

- **Historical estimation:** Draw on historical experience, assuming that past price trends are a good predictor for the future. The use of extrapolation techniques based on historical data is widely accepted in non-life business, and this method implicitly includes an inflation assumption. The approach seems appropriate for inflation processes which have their own dynamics, including some that are independent of external developments. The main disadvantage of the method is that it does not take new developments into account, such as the current increase in inflation. Also, effective selection of which historical period to be guided by requires considerable expertise.
- **Market pricing:** Inflation swaps and inflation bonds are traded in the financial markets, which refer to HICP inflation. You can use their pricing to estimate future inflation. Market prices are also published for options on inflation, which you could use to generate market-consistent inflation scenarios that allow you to evaluate (complex) inflation options. Market-price-based valuation of inflation elements is especially appropriate for benefits that refer to the same inflation as the index of inflation instruments used for the valuation scenarios, given that the method requires you to implicitly assume that prices are reliable and reflect liquid trading. With respect to inflation options and for longer durations, there are good reasons for doubt here: the trade is not liquid. For Solvency II, you are additionally left with the issue of whether to build in a UFR-like convergence by analogy with the yield curve. >

The graph below shows the daily evolution of 'implied inflation' for inflation-linked swaps (ILS) with durations of 1, 5, 10 and 20 years. Implied inflation reflects the inflation that has been priced into those instruments during that period. We can see from the chart that the market expectation for the long-term remains around 2%, but an increase in inflation is also expected for the longer term. It is interesting to note that short instruments traded below long instruments for a sustained period. This may indicate higher inflation expectations in the long term, or a structural risk premium for long instruments.

FINANCIAL RISK MANAGEMENT

There are several ways to mitigate inflation risk. Own operational costs can be influenced by management. You can match the length of procurement and outsourcing contracts with the length of insurance contracts, and personnel costs can be adapted by means of the organisational set-up in place. Salary development can be stipulated in the collective agreement, with the employer as one of the signatories.

The cost trend of insured benefits is harder to modify, although keeping claims repair and settlement in-house can help. The contractual duration of the policy is a natural risk mitigator, and capping benefits (as in travel insurance) may be useful.

Inflation-linked investments can be implemented by means of inflation-calibrated bonds or swaps. In both of these the principal amount is indexed to the underlying inflation rate (European HICP). Inflation-linked bonds impose a credit risk on the issuer. For inflation-linked swaps, the credit risk is mitigated by the obligation to deposit collateral, though this does introduce significant liquidity risk.

Other asset classes have a direct or indirect link to inflation. Consider equity or real estate: shares represent a claim on the real economy, and as such will be somewhat inflation resistant. For many properties, the rental charge is subject to an inflation clause, even though the value development of the property may not follow inflation. Interest rates are also assumed to >

FIGURE 2: IMPLIED INFLATION ILS



Source: Bloomberg

correlate with inflation over the longer term. Such instruments are not suitable for a precise (short-term) hedge, but in the longer term they will provide protection. For insurers, the long-term inflation protection of these instruments cannot count towards mitigation of inflation risk on account of fundamental risk; the short-term differences in value trends are too large for that.

RISK MEASUREMENT

For Solvency II goals, risk measurement is important. This is evident at two points: first, in the required solvency SCR. The standard formula has no explicit charge for inflation, though it does require capitalisation for unfavourable cost development. If an insurer uses an internal model, inflation will have to be considered there. Second, inflation belongs in the ORSA. We can expect more attention to inflation in next year's ORSAs. It is interesting to see how many ORSAs already included relevant inflation scenarios that are indicative of the current development.

For risk measurement, you can apply inflation impacts to the balance sheet. But on what basis do you calculate those impacts? That is a difficult choice. If you have a time series, you can use it to generate shocks based on developments over that period, or to derive key figures that reflect confidence intervals. Choosing the right time series is crucial. Whichever period is selected, the inherent implication is that the inflation probability process demonstrated in that period is expected to also be valid for the near future as well. This gives rise to a structural problem, as we tend not to consider that a trend reversal may be occurring. In the case of Dutch inflation, it may be attractive to start the time series from 1985, after all that is when a change in monetary policy had

been introduced. But now we know that policy can subsequently change again, causing inflation to climb once more.

Moreover, it is generally better to work with a shorter time frame for which we have frequent data: the implied inflation graph shows that the data in question have been readily available on a daily basis since 2017. In our view, the advantage of more frequent data outweighs the disadvantage of not including other inflation scenarios.

INFLATION AND THE ACTUARY

The current inflation trend is proving more persistent than had been assumed. The ECB and DNB are also concerned, and now (September 2022) the market expectation is that the ECB will raise interest rates to combat inflation. Appeals are being made to counteract inflation for certain groups in society. It appears that economic operatives are starting to respond to the prospect of elevated inflation, which may create its own dynamics in turn. We are evidently not expecting to get rid of inflation overnight.

Inflation warrants the attention of insurers from many angles. Actuaries will be involved here to provide various functions: actuarial assumptions on costs, product design, hedging, balance sheet valuation and capital requirement determination.

As actuaries, we have perhaps spent too long thinking that inflation risk was a thing of the past. After all, one thing history has taught us is that just when you think a problem is under control, it can return with unexpected force. We are experiencing that now with inflation – so let's be well prepared for the next risk. <

IFRS 17

REVISITED

BY **SERVAAS HOUBEN**

While the final steps are taken in the IFRS 17 implementation which will go live as per 1 January 2023, it would be a suitable time to sit back and evaluate the lessons learnt over the past years and how this could be used in the future when implementing other (accounting) standards.

1. THE GOOD

One of the key goals of IFRS 17 was to create to a more universal standard for valuation and reporting of insurance liabilities. Under the previous IFRS 4 standard, multiple interpretations were ranging from the strict rules-based US GAAP regulations to more relaxed and principle-based applications. Due to this wide range of interpretations, comparing IFRS 4 numbers between geographies or even within the same Group can become problematic. IFRS 17 has delivered in consistency, and more relevant valuation compared to IFRS 4:

- **Current assumptions:** where under IFRS 4 the use of locked-in or past pricing assumptions was allowed, IFRS 17 uses current assumptions as starting point and requires companies to motivate their choice of assumptions. While the GMM method does allow for locked in interest rates, it still requires other assumptions to be current and hence is a big step forward compared to other frameworks based on statutory or pricing assumptions.
- **Stochastic valuation/valuation of guarantees:** under IFRS 4, the valuation of guarantees or profit sharing was limited to a liability adequacy test which did not consider the full scope of probable future scenarios. IFRS 17 prescribes scenario testing resulting in a more accurate valuation of insurance liabilities.
- **Risk based thinking:** IFRS 17 stimulates risk-based thinking due to the valuation and disclosure of scenario analysis and the requirement to aggregate products with similar risks into portfolios.
- **Cooperation actuaries, accountants, and other finance functions:** IFRS 17 has clear links with other accounting standards like IFRS 9, 15 and IAS19 and therefore requires interaction between finance functions. Especially under the VFA method where there is a clear link between assets and liabilities, understanding of balance sheet and P&L effects is essential. >

2. THE BAD

Although IFRS 17 has produced clear benefits mentioned in the previous section, there are some less beneficial implications:

- **Copy paste SII?:** as IFRS 17 is a market consistent framework, the tendency to use existing Solvency II assumptions, methodologies and processes is tempting, thereby reducing the additional benefit and insights IFRS 17 can provide. Could IFRS 17 become 'Solvency II plus P&L' and therefore become just another market consistent metric?
- Are the standard approaches IFRS 17 proposes also standard in practice?
 - **Transition:** At transition, the full retrospective approach is viewed as the standard method. However this approach requires past information on challenging nonpublic available assumptions like expenses, lapse rates, or disability rates. Hence for most companies applying the full retrospective approach is not feasible which makes it less logical to use this as a starting point
 - **Measurement model:** although GMM is considered by the IFRS 17 legislation as the standard model, there is a tendency to use VFA instead as this allows for more stable CSM and P&L patterns. The standard measurement model, might therefore become the exception in practice
- **Asymmetric treatment gains and losses** resulting in unintended consequences as there is a tendency to modify portfolios, allocate assets, or apply measurement models resulting in avoiding a loss component at transition.

3. THE UGLY

Some parts of IFRS 17 have been less of a success:

- Dual reporting (comparative figures) required during 2022 has led to an increase in work stress and the comparison between reporting frameworks which cannot be easily compared. A more impact study approach like Solvency II where different studies were performed before implementing would have resulted in a more gradual implementation and a better mutual understanding of the framework.
- Limited guidance and role for expenses:
 - The result on expenses is included in the IFRS 17 disclosures in the operating result which also includes the result on actuarial assumptions therefore making it harder to assess result on expenses.
 - The standard spends limited guidance on inflation. In hindsight, when the standard was drafted inflation was not much of a big topic and hence providing guidance on nominal vs real rates and the use of inflation indices as market assumptions was sufficient. However as the inflation environment has changed dramatically in the last year, additional guidance on inflation would be appropriate.

CONCLUSION

Although the IFRS 17 ride has been a rocky ride with the standard being postponed multiple times, the overall principles of the framework are sound and will result in more interaction between finance functions, more recent assumptions, and improved risk awareness. When the current inflation climate could pertain, additional guidance on expenses and in particular inflation would be beneficial to ensure trust and reliability in the IFRS 17 results and disclosures. <



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FIT AND PROPER

AN OPPORTUNITY FOR THE ACTUARIAL PROFESSION

BY **LUTZ WILHELMY** AND
CHRISTOPHE HECK



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GENERAL CONTEXT

'Fit and Proper tests' have been introduced at the beginning of the millennium as supervisory tests for those that run a financial undertaking (e.g., a bank, an insurer, or a pension provider). The 2005 IAIS '**Supervisory standard on fit and proper requirements and assessment for insurers**' keeps the responsibility with supervisory authority but extends the scope to key functions of insurance undertakings. While the succeeding and in-force Standard of IAIS Insurance Core Principles (ICPs) avoids the notion of 'Fit and Proper', it effectively lists requirements for being 'Fit and Proper' while requiring supervisors to ensure that insurers have effective key functions, including an actuarial function. So, the ultimate responsibility is shifted to the insurance and reinsurance undertaking. The ICPs are soft laws that are applicable for European supervisory systems and regularly assessed by the IMF's Financial Sector Assessment Program (FSAP).

EUROPEAN UNION CONTEXT

More directly, applicable to EU supervisors and undertakings, more recent European banking, insurance, and pensions regulations set out 'Fit and Proper' requirements. Thus, it is cross-sectorial regulation. In insurance and pensions, the EU regulators assign responsibility for ensuring 'Fit and Proper' to insurance and reinsurance undertakings and institutions for occupational retirement provision – not to supervisory authorities. This is not to be confused with supervisory >

‘Fit and Proper’ tests, that remain required in many jurisdictions. In contrast, the requirements and the compliance process assigned to the insurance and reinsurance undertakings and institutions for occupational retirement provision are not public, even though at least insurance and reinsurance undertakings are asked by direct delegated regulation (SII Delegated Reg. Art. 273, 294) to establish a (non-public) policy on ‘Fit and Proper’ and report on their requirements for ‘Fit and Proper’ as well as on their processes for the assessment in their public Solvency and Financial Condition Report.

COUNTRY LEVEL CONTEXT

In some countries, some actuarial services are regulated by local laws, and some are not regulated. For the services regulated by local laws, the appointment of a body controlling the provider of the actuarial services can either be delegated to a professional body (e.g., local actuarial association), or it can be kept within the realm of the supervisor or regulator. In some Member States the regulator has legally recognized a local professional actuarial organization (i.e., full members of the AAE (FMAs)) as a source of persons who are automatically considered basically ‘Fit and Proper’ to hold key actuarial functions as the required checks are made by the local professional actuarial organization. That, however, does not waive the responsibility of insurance undertakings or pensions providers in the context of SII and IOPR II.

DEFINITION

According to [Art 42](#), Solvency II Directive, persons are:

- **‘Fit’**: if their professional qualifications, knowledge, and experience are adequate to enable sound and prudent management, and
- **‘Proper’**: if they are of good repute and integrity.

According to [Art 22](#), IORP II Directive, persons are:

- **‘Fit’**:
 - For persons who effectively run the IORP, this means their qualifications, knowledge and experience are collectively adequate to enable them to ensure a sound and prudent management of the IORP;

- For persons who carry out the actuarial or internal audit key functions this means their professional qualifications, knowledge and experience are adequate to properly carry out their key functions;
 - For persons who carry out other key functions this means their qualifications, knowledge and experience are adequate to properly carry out their key functions.
- **‘Proper’**: they are of good repute and integrity.

CHALLENGES ARISING FROM EUROPEAN UNION VERSUS COUNTRY LEVEL LAWS AND REGULATIONS

EU regulation reflects this flexible approach by requiring that Member States shall require insurance or reinsurance undertakings (Solvency II, Art. 42 et seqq.) or institutions for occupational retirement provision (IORP II, Art. 22 et seqq.) to ensure that persons who carry out key functions for the undertaking or institution are **‘Fit and Proper’**. Insurance and reinsurance undertakings should (SII Delegated Reg. Art. 273, 294) establish a policy on ‘Fit and Proper’ and report publicly on their specific requirements for ‘Fit and Proper’ as well as on their processes for the assessment. It should be noted that this may mean a duplication of ultimate responsibility in some Member States with, on the one hand, supervisory, regulatory, or professional bodies remaining responsible for some actuarial services and, on the other hand, the undertaking or institution assuming quite a comprehensive responsibility for all providers of key functions, including the actuarial function, but also the actuarial components of other key functions under the main prudential systems, namely SII and IORP II. Solvency II and IOPR II do not interfere with or overwrite some local supervisors’ decisions to recognize a local professional organization (such as FMAs) as a source of persons who are automatically considered as ‘Fit and Proper’ to provide key actuarial services. It just complements them with an overarching EU-wide requirement for undertakings and institutions to ensure that their key function holders are ‘Fit and Proper’. In those Member States, where the supervisor or regulator recognizes a local professional organization (such as FMAs) as a >

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source of persons who are automatically considered as 'Fit and Proper' to provide key actuarial services, undertakings or institutions may choose to base their 'Fit and Proper' assessment on the assessment done by the regulator, supervisor or a professional organization. This does not lift the responsibility from the undertaking or institution, but it makes it easier for the undertaking or the institution to meet the responsibility. In other Member States, where there is no such official recognition, undertakings and institutions often reference actuarial credentials of the local professional organization in their public reports. But it appears challenging for undertakings and institutions to be specific on their 'Fit and Proper' requirements and assessment processes.

WHAT ARE ACTUARIES AND ACTUARIAL ASSOCIATIONS DOING

The AAE and local FMAs have established requirements for Fully Qualified Actuaries (FQAs):

- Core education syllabus: defines the minimum education requirements to be a Fully Qualified Actuary (FQA);
- The CPD guidelines (as of 01.01.2024): defines requirements for FQA to develop their skills over time;
- Code of professional conduct: defines the principles of conduct for FQAs when providing actuarial services.

Probably, the most compelling requirement perhaps is mentioned in the code of professional conduct: 'An actuary must perform specific professional services only if the actuary is competent and appropriately experienced to do so'. Therefore, a FQA should not

perform an actuarial task in case she is not 'Fit and Proper' to do so. In addition, if an FQA doesn't comply with those requirements, FMAs have a disciplinary process in place defining appropriate sanctions.

These requirements ensure that actuaries are 'Fit and Proper' at any time to perform any actuarial tasks.

WHAT COULD THE FUTURE LOOK LIKE?

One of the challenges which can also be seen as an opportunity for the actuarial profession is that there are roles (Actuarial Public Interest Role) in which a person assumes responsibility for an actuarial service that materially contributes to the public interest which are not always subject to 'Fit and Proper' requirements. Consequently, for some of those roles, there is a mismatch between the impact and the importance of the role and the requirements to which the professional is subject to. Consequently, the AAE and the local actuarial association should take advantage of 'Fit and Proper' requirements to promote the actuarial profession and ensure that any Actuarial Public Interest Role tasks are provided by actuaries and non-actuaries who are subject to the same 'Fit and Proper' requirements.

Finally, we would like to thank the AAE Task Force on 'Fit and Proper' for the work done on this topic and the time spent in analyzing European legislation (Solvency II, IORP II and so much more). <

WHERE IS THE ACTUARIAL JOURNEY HEADED?

We are currently experiencing how society is changing. One crisis seems to follow the next. First came the financial crises at the beginning of the 2000s, now we have just survived Corona, the economy in Europe is stumbling due to Russia's war of aggression against Ukraine and we cannot yet fully assess what effects the climate crisis will have.

Actuaries are playing an increasingly important role in insurance companies and pension funds in dealing with all these crises. In a variety of roles ranging from product developers and sales controllers to valuation experts, risk managers and auditors, they ensure that decisions are made on a factual and professional basis, and using data and scientific evidence.

The actuaries' methods for this have developed significantly in recent decades.

- With Solvency II, a market-consistent and principle-based framework was introduced, which was implemented by actuaries in an appropriate and company-specific manner for the respective situation on both the assets and liabilities side of the balance sheet.
- Data science and improved computing power now allow actuaries to use sophisticated statistical methods and stochastic simulations to master large-scale, data-based analyses for complex situations.
- In order to transfer highly interlinked assessments for climate scenarios to individual companies, expertise in a wide range of disciplines such as meteorology, physics, chemistry, medicine and biology is also necessary in order to be able to transfer the models to the situation of insurers and pension funds.

The Actuarial Association of Europe has a very special role in this by providing objective, independent, professional advice to European institutions and stakeholders, by enhancing the development and standing of the actuarial profession in Europe, and by providing opportunities for networking and encouraging sharing of best practice among actuaries across Europe.

I couldn't imagine a better time than now to become an actuary and be a volunteer at the Actuarial Association of Europe. It has never been so varied and challenging. And we have the opportunity to actually help shape the fortunes of the companies, the industry and even society.

Frank Schiller

Member of the Board of the Actuarial Association of Europe

COLOPHON

The European Actuary (TEA) is the quarterly 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 views and opinions expressed in TEA are those of the authors and do not necessarily reflect the official policy or position of the Editorial Board and/or the AAE. The Editorial Board welcomes comments and reactions on this edition under info@theeuropeanactuary.org.

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NEXT ISSUE

The next issue will appear 1 March 2023.

Suggestions can be e-mailed

to info@theeuropeanactuary.org

The deadline is 1 February 2023.

EUROPEAN AGENDA

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