THE EUROPEAN ACTUARY

QUARTERLY MAGAZINE OF THE ACTUARIAL ASSOCIATION OF EUROPE

2

ADAPT
TO SURVIVE

5

CULTURE EATS
SUSTAINABILITY FOR BREAKFAST

9

GERMAN PENSIONDASHBOARD:
FINALLY GETTING STARTED

12

REFORM, RESILIENCE AND RECOVERY:
EUROPE'S WAY FORWARD

16

HOW TO MONITOR ACTUARIAL
ASSUMPTIONS REGARDING CLAIM
FREQUENCY IN PRACTICE?

THEME:
SUSTAINABILITY

18

INTRODUCTION TO
CLIMATE-RELATED
SCENARIOS

20

MONETARY POLICY -
THE CURRENT TRAJECTORY
IS NOT SUSTAINABLE

24

COLUMN:
ACTUARIAL PROFESSION IN THE
EVOLUTIONARY MOVEMENT

aae
actuarial association of europe

Nº 26
JUNE 2021

INTERVIEW

ADAPT TO SURVIVE

INTERVIEW BY
JENNIFER BAKER

As we emerge from the Covid19 pandemic many things will look different, in particular how we built back better and become more resistant to risks. It has also put the looming threat of climate change centre stage. We spoke to Elena Višnar Malinovská, the Head of Unit in charge of adaptation to climate change, cities and international cooperation, within DG CLIMA at the European Commission.

Could you give us a general introduction to the European Green Deal and a status update on the work to reach climate neutrality commitments for 2050 and on the 2030 emission reduction target as well? How's it all going?

'I would say the Green Deal is the top political priority we continue to deliver on. And just before Earth Day on 21 April, the climate law was agreed between the two co-legislators – the European Parliament and the Council – which means we are the first continent that is putting the political commitment into law. This includes the increased ambition for 2030 for cutting emissions by 55 percent. So it's going beyond the benchmark of halving emissions. We now have a legal instrument and not only the politics of climate targets. We have collectively committed as European Union and Member states, to go on a pathway towards climate neutrality. And we will have to report and to check whether we are on this pathway every five years, whether the measures adopted are adequate. So as I said, all is going at the right speed and in the right direction.'

Obviously, I imagine the work has been affected by the Covid19 outbreak. If so, how and what knowledge has been learnt from the outbreak that you could take into account for future planning? Has the goal or the timeline changed because of the pandemic?

'Everything changed! Everything came a bit fast, so we have realised that the risk of not being prepared is huge. When you see the stalemates around the economy because we don't have the health systems that can support us, there was no trust in science or lack of transparency in international cooperation. Consider that for the covid pandemic, we have put in billions and a huge effort, and now we have the vaccine. Imagine the climate risks that are now unfolding. And it's not just the emissions of today, it is also the sum of the past, it's today, it's tomorrow. So we really feel that the pandemic has shown us the cost of inaction, the cost of not being prepared. And this is why the whole work has been very much accelerated, I must say.

What has also happened also during the Covid pandemic is that real investment went forward into areas like cycling paths, our green spaces, or energy efficiency measures for renovation because we are sitting at home much more than we used to before. So I would say in real life it has very much accelerated, but also in legislative terms. Let's not forget that DG CLIMA in the Commission has been sitting at home during lockdown, as you and I, and I don't think we have ever been more efficient than right now. We are really progressing on the impact assessments – the analytical work underlying the legislation – but also on the changes that will be put into the different parts of the trading scheme, effort sharing, how member states will share the new ambition and so on.'

It's good to hear there is some silver lining to the horrible pandemic. I suppose analytical work is one thing you can do quietly if you're at home. Now the Commission President's Mission Letter to Frans Timmermans, the commissioner responsible, doesn't explicitly mention insurance or pension companies or pension funds. How do you see these companies may be able to support reaching the goals of the European Green Deal? Can you see any role for them?

ELENA VIŠNAR MALINOVSKÁ

'Absolutely. Because the Green Deal is about these sorts of longer-term goals where we often have to put costs upfront that are concentrated on a few parts of the society. But the benefits then are for the whole of society. And where we very much need insurance is when we look at the cost of mispricing the risks. If you underestimate the risk that is out there, and you act in the market as a reckless cowboy, then of course, maybe in the short term it pays off, but definitely not in the long term.

Now imagine you are a pension fund, you are more or less depending on clients that invest into you over 20, 30, 50 years. And they want to see this patient capital pay off. They want to see where the money is. So they have an interest in seeing this invested into something that is indeed good, that is futureproof, as we say in our jargon. These are typically the portfolios of new energy, new technologies, but also natural capital. We don't speak about it too much. We often underestimate how much a drop of water costs until we are out of the water. So I would say, insurers have it in their way of thinking. They should get insulated against climate risks because they see it in their daily life. Insurers have to pay based on claims after a situation has happened.'

Is there anything that you think that the individual actuaries should bear in mind on a day-to-day basis? An approach they could take that would keep the goals of the Green Deal or the sustainability aspirations front and centre?

'Definitely, I think we are now looking at allocating the financial responsibilities. In the past, we had the sort of thinking as a whole society. It means when something happens, at the end of the day, it will be public funds that come to rescue. But I think we are over this stage. Actuaries or professionals working in the system already work with climate scenarios or climate risks. They know what losses have been incurred in the past. They work with modelling with state of art techniques. So definitely, if you look towards the new professions of the future, for me, it's not just the construction worker that will insulate your house. For me, it will be an army of data analysts that will support the financial sector to move the economy.
I think if we fix the financial system, we will also fix the real economy. We always look towards the financial sector: what they are doing, what they are thinking. In the past there has been hesitation, but hopefully now the regulation is there and the financial actors will start to exercise their muscle to actually avoid some of the polluting activities.'

Let's talk about the EU sustainable finance taxonomy. I'm wondering how much investment held by insurers might fall into this. Perhaps only a small proportion of insurers' investments are made in economic activities that might be eligible. So can I ask you just to comment on how that may help insurers identify sustainable economic activities?

'It is really a tool to say this is a sustainable activity, these are the criteria you need to fulfil to satisfy to be classified as a sustainable activity, and this is how you can report on it. Now, if you ask me directly, how much or what proportion is investment versus underwriting, which are the main activities for insurance? The response is I don't know exactly. Insurance Europe tells us it's around 50-50. I think what is more important than how much investment is now covered by taxonomy, is how they can move forward, so they cover more and more activities. I would be worried to hear that they are not moving in this direction, because if you do the underwriting and you do the pricing of a climate risk, you immediately see what you would have to change in your investment strategies – like investing more into nature-based solutions. I hope that insurance companies don't do something with the left hand that the right hand then contradicts. But definitely based on the practices of a risk manager, sometimes even a crisis risk manager, you will then be encouraged to be a good investor.'

Obviously some of this is about reputation management because we do see the practice of greenwashing and it's about how much security you can have in products. But I was very struck recently by one interviewee saying this isn't about managing risk anymore. If we don't act now, this will be about managing certainty rather than risk for the sort of climate disasters that we may see in the future. What do you think the European actuarial industry, the insurance and pensions industry should be thinking about over the longer term?

'It's very nice to hear that it's no longer about the likelihood of risk, but it is perceived as a certainty, that there is urgency, because in the past we have been very much faced with the question: should we take decisions, even if uncertainty is out there? And now I see that indeed this is what will happen. My business model depends on whether I take risk management into account and more and more I see it becomes a sort of a teamwork. And it should be a team effort. Imagine you are a city. You need a lot of preventative measures against different hazards that trouble your city and your citizens. So you sit with insurance or with actuaries, and you agree that as a city you will very much be pushing adaptation regulations. Please do not build in the floodplain, please insulate your houses, etc. And this is actually also to the benefit of the actuaries and the insurance business, because they are on safer grounds as the level of claims is going down. So I think that this is the sort of teamwork and partnership I would like to see more and more in the future.'

CULTURE EATS **SUSTAINABILITY** FOR BREAKFAST

In line with the Paris agreement, the insurance sector has decided to give climate risk a formal role in the Solvency II framework. Although the inclusion of climate risk in Own Risk and Solvency Assessment (ORSA) and standard formula will induce insurance companies to be more aware of the effects of climate risk, the authors believe that without a change in culture it will be hard to embed climate risk into the DNA of insurance companies. Besides regulatory incentives like capital relief, a change in habits is required to not merely comply, but excel on the topic of sustainability.

BY **GUS BADRAN** AND **SERVAAS HOUBEN**

WHY NOW?

Climate risk has risen in importance over the past couple of years. Where in the global risk report of the World Economic Forum, none of the risk were climate related in 2012, in 2021 4 of the top 7 risks are climate related [1]. Furthermore, each of the climate risks scores high on both the likelihood and impact scale, hence we are not only referring to high impact low frequency risks.

Also the financial sector has formalized the importance of climate change: in 2020 the Sustainable Finance Taxonomy was launched showing if an economic activity is environmentally sustainable. Companies will be required to report which percentage of a product can be considered as 'green'[2]. Although the taxonomy will make it more objective to determine which activities are sustainable, a concentration risk could occur where there is focus on a particular type of assets resulting in a lack of diversification. Furthermore as per 10 March 2021 the Sustainable Finance Disclosure Regulation (SFDR) has been enacted. This regulation prescribes disclosure requirements for financial product manufacturers and for financial advisors on sustainability levels. Furthermore central banks, like the Belgium national bank, have increased their attention to climate risk as can be seen from their annual reports.

[1] **The Global Risk Report of the World Economic Forum**

[2] **De EU taxonomie: de noodzaak tot een duurzame transitie**

Also the insurance sector has picked up on the importance of climate risk: EIOPA has written several consultation, discussion and opinion papers on how to include the effects of climate risk into the standard formula, ORSA, stress testing and pricing.

QUO VADIS?

From the latest EIOPA consultation it seems most likely that the insurance industry will include climate risk through scenario analysis (ORSA), capital requirements or relief (standard formula) or through updates in pricing. The latter will happen by default as insurance companies will change their price setting based on new insights and risk due to climate change. On the asset side, one can think of capital relief for green assets, like green bonds. These assets could receive a preferential regulatory treatment by capital relief such as currently EU government bonds. On the liability side, options exist for mainly non-life insurance, e.g. in case insurance companies refrain from insuring highly polluting commodities coal energy plants, or cruise ships.

Furthermore there are still considerable challenges on how to measure the effects of climate risk. Metrics like the CO2 index may provide an indication of sustainability however might not provide the full picture [3]. Also it will be challenging to achieve a look-through-analysis to understand the source of production materials: e.g. although the use of electric cars by itself might be beneficial for the environment, the extraction of materials to build electric cars comes with a higher human and health cost[4].

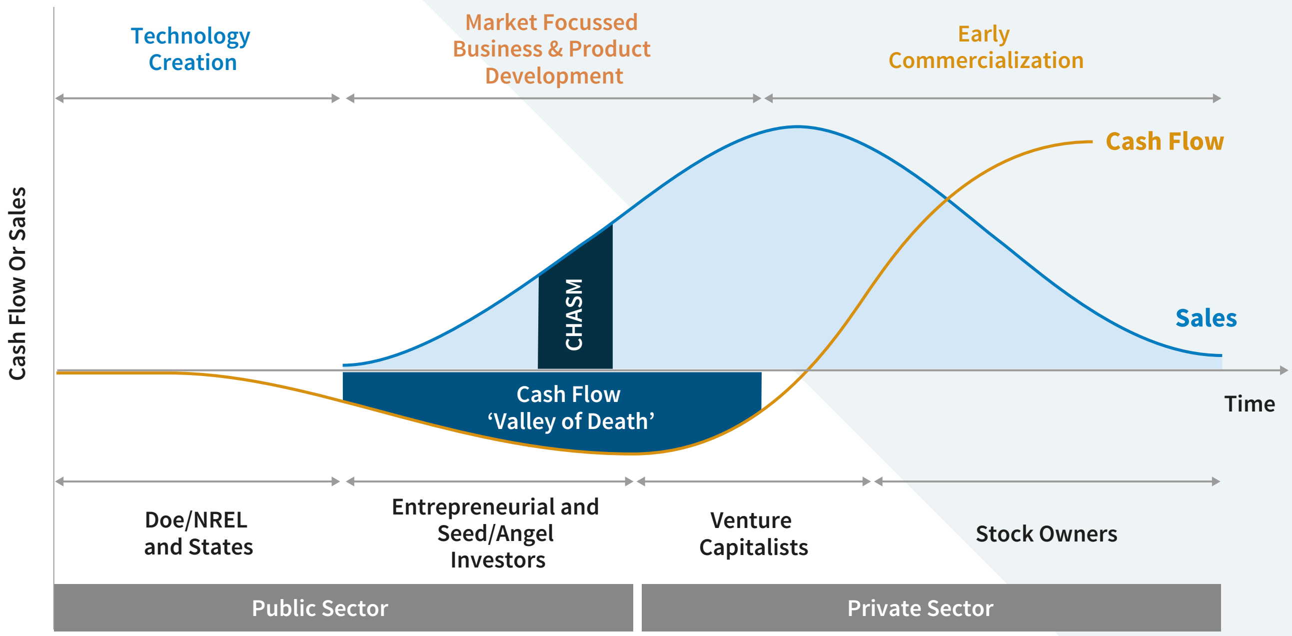
COMPLY OR EXCEL?

The current focus of climate risk thus seems to be coming from a governance perspective. In ESG terms (Environmental, Social, Governance) the G dominates the discussion. Although governance will help create more awareness for climate risk, it is not clear if this will be sufficient to go the extra mile and embed the importance of climate risk into an organization or industry. As climate risk is a long term challenge, this does align with the time horizon of the insurance industry which is also long term. What changes would be required instead to not only comply but instead excel on sustainability?

HABITS

Taking lessons from the disrupted technology companies and building habits techniques we can explore ways to implement ESG and learn from

FIGURE 1. CROSSING THE CHASM TEMPLATE



success stories from other industries.

We all heard for the lifecycle of adoption of new products from early adopters to early majority. However, what we have not been taught is that there is a chasm[5] between each stage. In other words a major investment in resource are needed (valley of death) to develop the product in order to reach the next stage of customers. This investment will be focusing on adopting the product to the masses in term of lower cost, higher quality, performance, customer service, standardising process, training and support in order to compel customers to purchase.

In order for habits to develop to an automatic response[6] the environment has to be designed. The environment allows every action to cast a vote in the direction of the habit. In essence the environment needs to adopt the following:

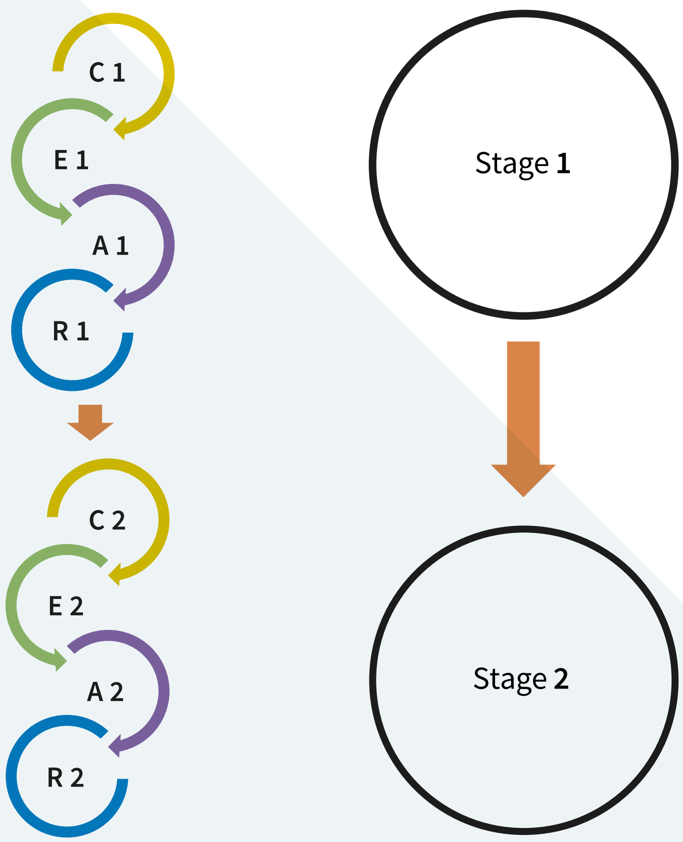
1. Cues that catch attention by making the action obvious, available, visible
2. Actions that can be easily adopted with other existing habits
3. Attractive actions could be associated with the final outcome
4. Rewards reinforce the action that leads to the habit to be reinforced.

There are two major hurdles in moving from Stage 1 to Stage 2 in Figure 2:

1. Within the stage. (e.g. from C1 to E1)
2. From one stage to the next. (e.g. from stage 1 to stage 2)

Hence, with the habit model we can reduce the effort to move within each stage and the step to the next stage. The general idea is that forming habits is challenging (stage 1 to 2) and by making smaller subsets it is easier to make progress.

FIGURE 2
C = Cue , E = Easy, A = Attractive, R = Reward



[3] **Climate Transition Risk – A Quantitative Impact Study for ORSA Scenarios**

[4] **Nickel mining: the hidden environmental cost of electric cars | Guardian sustainable business | The Guardian**

[5] See the book **Disruption Crossing the Chasm** by Geoffrey A. Moore

[6] See the book **Atomic habits** by James Clear

CULTURE – RECYCLING AS AN EXAMPLE OF A SUCCESSFUL HABIT

Recycling in the Europe is now fully accepted and widely applied. However to get to the current habit of recycling the following steps were necessary:

1. Make it clear what can and can't be recycled. Images on recycling bins, and colour of bin Black (anything), Green (Glass bottles), Brown (plants, food). Unfortunately, depending where you go in the Europe the colour indication is different which can be standardised. Schools educate the children which indirectly forces parents to recycle, everywhere
2. Wide enough to fit through narrow doors, wheels, handle and right volume
3. Feel good help the environment
4. Financial reward to individual and companies

COMMON CULTURE TO CREATE CONSISTENT HABITS

Unfortunately, there were and still are mistakes or areas to develop. One such example is each EU country and region within a country adopted slightly different colour scheme due to type of recycling plant installed. When different regulations or cues are applied across different regions, it requires more effort to enforce the habit with customers as more effort is required by them to do the right thing:

CREATING SUSTAINABLE AND PERMANENT CHANGE IN BEHAVIOR IN THE INSURANCE SECTOR

Rules alone are not enough, cultural change and habits are required.

A successful ESG policy can be implemented as follows:

1. Find visionary (innovators/early adopters) customer to develop new products and these customer will be the evangelist for your product for the early majority.
2. Implement the habit process with your visionary customers.
   a. Easy to differentiate between good vs bad policy: Create labels for investments and insurance products showing the level of sustainability so it is easier for the client to distinguish a green vs brown insurance policy. Create a consistent framework and labelling within the EU which allows companies and consumers to get familiar with the different sustainability levels allowing them to do the right thing without too much additional effort from their side
   b. Few steps to implement: limit the number of steps required from both the insurance company perspective and the policyholder
   c. Show benefit: consider both financial benefits (like capital or tax benefits) and non-financial benefits
   d. Reward customers: Ensure there is a financial reward for both the insurance company (capital relief) and the customer/policyholder (lower premium, tax deductible premiums)

We therefore believe that in the current sustainability discussion within the insurance industry, focus should not only be on the governance aspect, but instead building sustainable habits and culture should be central instead to enable long term change.

GERMAN PENSION DASHBOARD: FINALLY GETTING STARTED

BY **ANDRÉ GEILENKOTHEN** AND **STEFAN OECKING**

A team of actuaries was mandated by the German Federal Government in 2018 to develop the conceptual basis for a digital cross-pillar pension dashboard. After a draft legislation in the summer of 2020, the *'RentÜG'*, the *'Act on the Development and Introduction of a Pension Dashboard'*, finally passed German Parliament at the end of last year.

ANDRÉ GEILENKOTHEN

The '*Central Office for the Pension Dashboard*' (ZfDR), based under the roof of the Statutory Pension Insurance of Germany (Deutsche Rentenversicherung, DRV Bund), officially started its work when the law came into force in February 2021 and is preparing a first operational phase of the Pension Dashboard by the end of 2022. In this first twelve-month test and evaluation phase, pension schemes can initially connect themselves voluntarily to the dashboard, before mandatory connection of those schemes that are already legally obliged to provide at least annual status reports is expected to be realised in 2024. The preparations of the ZfDR are supported by various expert advisory boards, which contribute a wide range of expertise on all aspects of old-age provision. The German actuaries of the German Association of Actuaries (DAV) and the German Institute of Pension Actuaries (IVS) are significantly involved in these advisory boards.

The Pension Dashboard is overdue. Digital tools already provide us with a quick overview in many areas of our daily lives - but for pensions, many different status reports on paper still prevail. Moreover, experience shows that the expectations of German citizens regarding their standard of living in retirement unfortunately often deviate from reality. Therefore, an early, comprehensible and realistic presentation of the expected retirement income is beneficial for the individuals to take any necessary savings decisions in a timely manner. Experience from other countries that have already established a pension dashboard solution (e.g. in the Nordic or the Benelux) shows that such an easily accessible source is highly appreciated by individuals and helps to promote financial literacy.

HIGH LEVEL OF COMPLEXITY

Old-age provision in Germany is complex and diverse. Accordingly, it is an ambitious goal to create a platform in the next 21 months that is able to provide an overview of expected old-age provision in a comprehensible and reliable manner for every individual. A central challenge will be to create comparability across

STEFAN OECKING

the different and very diverse claims and to aggregate them appropriately.

In order to achieve this ambitious goal and to leverage existing infrastructure, the ZfDR was established at the DRV Bund. Based on its broad experience in the field of old-age provision, especially with regard to data exchange with a large number of pension funds, the DRV Bund can contribute directly to the ZfDR. Thus, a timely start of the ZfDR could be prepared by a project team of the DRV Bund and other experts from the various pillars of old-age provision. Accordingly, the ZfDR hits the ground running immediately after the law came into force - and it now has the task to bring the Pension Dashboard to life.

ENSURING BROAD ACCEPTANCE

In the future, the ZfDR will decide on important design issues for the Pension Dashboard in consultation with a central steering committee, which by law will be composed of representatives of the three pillars of old-age provision, the Ministry of Labour and Social Affairs and the Ministry of Finance, and Consumer Protection Organisations. This body has not yet been implemented, but a corresponding legal act is in preparation, so that the members of the body will be appointed and begin their work shortly. In accordance with the recommendations of the baseline study, close involvement of all key stakeholders - and above all the umbrella organisations of the various pension institutions - will be achieved. This is essential in order to create efficient and customized solutions for both German citizens and pension schemes and thus to maintain and further expand the already existing acceptance for the Pension Dashboard.

FIVE ADVISORY BOARDS ESTABLISHED

The fundamental decisions to be made by the steering committee are prepared by the ZfDR in cooperation with the so-called expert advisory boards anchored in the law. The first advisory board which focuses on the necessary data from an actuarial and benefits perspective as well as on comparability and aggregation of different pension benefits has already started its work. The second advisory board has also been constituted and deals with the data structure and the technical interfaces. It will also define and develop the corresponding reporting processes.

The scientific monitoring of the project and the continuous evaluation of the effectiveness and comprehensibility of the Pension Dashboard as well as the quality of the information are subject of the third advisory board. As the project progresses, the fourth and fifth advisory boards will deal in particular with communication issues and the design of the portal solution.

Actuaries have been appointed to all advisory boards, and they are thus significantly contributing to making the Pension Dashboard project a success. The German Association of Actuaries DAV and the German Institute of Pension Actuaries IVS will actively support the members of the advisory boards and thus the ZfDR as a whole.

NEXT MILESTONE WITHIN REACH

The pilot phase, in which pension funds can participate voluntarily, is scheduled to start at the end of 2022. Until then, the advisory boards will have a lot of work to do. The ambition to achieve the target is very clearly noticeable among all groups involved - the next milestone is within reach!

ANDRÉ GEILENKOTHEN
is a partner at Aon in Germany and has been advising and supporting various large German and multinational companies in the area of occupational pensions since 2009.

STEFAN OECKING
is a partner at Mercer in Germany. He serves and advises several internationally active German corporations in Germany and globally. He is also Chairman of the Board of Mercer Pensionsfonds AG.

INTERVIEW

REFORM, RESILIENCE AND RECOVERY:

EUROPE'S WAY FORWARD

INTERVIEW BY
JENNIFER BAKER

PAOLO GARONNA, Secretary General, Italian Banking, Insurance and Finance Federation is also Professor of Economics at the Luiss G. Carli University in Rome. He spoke about how sustainability and resilience are key to the future of Europe.

What is your overall view of the EU's approach to a) the European Green Deal and b) the post-Covid recovery funds?

'The answer to your question and the secret of the EU's approach is in reforms. Because the only way of coming out of this pandemic crisis is through reforms. So far, we have dealt with emergency interventions, and effectively. But now we are getting to the stage where we must move on from emergency to recovery. And therefore, reform is the keyword. If the EU, through the various Next Generation EU, the Green Deal, the energy-, the green- and the digital-transitions, and the other policy measures, manages to go through a real and bold reform process, then there will be success that will bring about a promising and bright future.'

You said that reform is the keyword. The other keyword we've been hearing in recent months is resilience. How important is that?

'Sustainability and resilience are fundamental dimensions that characterize the transition from the *'old world'* before the pandemic, to the *'new normals'* Through the crisis we have learnt that sustainability has many aspects. There are 17 sustainable development goals (SDG) of the U.N., 169 targets and a list of no less than 232 indicators to track progress. Then we have the Environment Social and Governance (ESG) criteria. Therefore, sustainability is a complex set of different interconnected aspects that have to be considered to make development a holistic and inclusive process. But on top of that with the crisis we have added the notion of resilience. Resilience to unexpected shocks is an additional element of performance because we do not only have systemic and global risks, but we also have tail risks that we cannot ignore.

The notion of tail risk has changed significantly. We used to think of it as an extreme departure from

PAOLO GARONNA

normality (i.e. the *'average'*) that is very rear, comes gradually and can be prepared for. Something like a slow train that we see approaching from the distance. Think for instance of the prospects for climate change in 2050 or the next century. But tail risks we have seen can happen and do happen! With an increasing frequency. They occur often abruptly and unexpectedly like black or green swans. And when they happen, they can have a devastating impact. How do we deal with this kind of *'tail risks'*? We must prepare to deal with such shocks. We did not prepare for the pandemic one, and we have seen the consequence. Getting ready for the next shocks, whether they come from epidemics, natural catastrophes, climate change, wars conflicts or geopolitical disorder, is imperative. The new risk scenarios we are facing behave not only like slow-moving trains, but often like high-speed ones that run over and disrupt lives and livelihoods of people communities and whole nations. In the case of the pandemic the whole world.'

Let's talk about those post-Covid recovery funds. What's your advice on them and your expectations from them?

'In funding the recovery, and the transitions that the recovery implies – the digital and the green transition, the resiliency transition –, we need to highlight several factors that in the past we have by-and-large neglected. First, the need to have a long-term vision and thinking capacity, and second, the focus on sustainable finance. We need to shift the emphasis of decision-making towards the long-term. This is particularly true for the world of finance. Banks, insurance and capital markets must shift away from the short term, from the obsession with mark-to-market and quarterly profitability, and steer towards the longer term. This is required when investing in infrastructure, the recapitalization of small firms, the financing of innovation, high tech and disaster risk reduction. An important challenge we are struggling with now in funding the *'real economy'*, is that of making the financial system work in terms of an *'ecosystem'*. We need a *'financing ecosystem'*, where we have big banks, investment banks, but also small banks and small insurers;

where we have private capital and listed companies, liquid and illiquid investment, mid-caps that wish to expand, etc. It is a complex and integrated world, where we need to look at not only specific tools and vehicles, but at the funding requirements as a whole. We need a *'funding escalator'* capable of accompanying firms in all stages of their life cycle, for which they need specific and tailor-made financing instruments: starting from start-ups, then scale-ups, the expansion phase, the restructuring phase, up to restructuring and insolvencies. In an effective funding escalator, all the various components must be present, and join efforts. In the Silicon Valley for instance, you certainly have a lot of venture capitalists, but you also have the big banks, the credit unions and the global financial institutions. In sum, the whole strength of the US financial market. We need the whole ecosystem of financial intermediaries, well developed and capable of working effectively together.'

In terms of sustainability, you've already talked a bit about what the finance sector is looking at, but what will be the effect on the insurance sector and the banks?

'The insurance sector and banks must be fully involved in green finance. Struggling through the crisis, we have seen that business models can, and should be adjusted, even reconceptualized. We coped with lockdowns and social distancing by relying on smart and distance working. We saw how banks and insurance companies throughout the crisis did not, and could not, stop or slow down. Financial intermediaries continued to provide their services to customers. We have also discovered what great opportunities digitalization offers to enable e-commerce, smart working, communication, webinars. A new environment that will not go away after the crisis. So definitely there were, and there will be more, adjustments in the business models of banks and insurance companies. Which implies more risks – obviously – but also more opportunities for doing things differently, possibly better. The fact is that as we get out of this pandemic, we will not get back to the old habits. We will have to live in a new world. We need to get adjusted and accustomed to this new world to survive. But we can also build a better world, better ways of doing business, exploiting all the opportunities that are emerging.'

Of course, dealing with risk is the job of the insurance sector. I had a lovely quote saying that the actuary is the risk manager of your country. Looking ahead, do you expect other big shocks like Covid19?

'We must accept, and prepare for, the fact that unexpected and unprecedented shocks occur, more frequently and more disruptively than in the past. But we must learn to learn the lessons. We did not learn in the last decades the lesson of SARS, MERS and other epidemics preceding this one. Or better those countries that did learn the lesson were much more successful in dealing with Covid 19. The first relevant lesson concerns the importance of science, and decision-making relying on science, data, analytics and experienced professionals. On this, the role of actuaries comes to the fore as becoming of increasing importance. Actuaries use science to support decision making, to identify, monitor, manage and price risk. We have seen risk management placed at the heart of the crisis, but also being fundamental for getting out of the crisis. And actuaries hold the key to the science of decision-making under uncertainty.'

You say that in the recent past, we have not learnt so many lessons. What lessons would you like society, but also in particular the three sectors, banking, insurance and finance to learn and perhaps if we were to find a silver lining, what would that be?

'Definitely, we need to invest more in science, research, training and education. Not only we must make use of the traditional technical tools – the models, the forecasting, the algorithms that are in the standard toolbox of actuaries and other professionals, but also we must improve extend and adapt those tools. The job of risk managers, actuaries in particular, has become much more complex and challenging, but also much more important and exciting. There are new dimensions,

> ## *This strategic role of actuarial work is more recognized and respected by policymakers, CEOs and all stakeholders*

new responsibilities and a new awareness of the strategic importance of risk management and actuarial work. That is a challenge not only for actuaries, but for insurers banks policy-makers and the public opinion at large. Having to deal with the new risk scenarios implies reaching out to new skills, engaging in new partnerships, acquiring new competencies. It implies becoming more strategic and more innovative in the approach to problems. It implies also that this strategic role of actuarial work is more recognized and respected by policymakers, CEOs and all stakeholders. Hard work, but also exciting work!'

And do you see a role for the Actuarial Association of Europe in helping to foster this? I'm thinking perhaps in terms of ongoing training or perhaps creating this new identity of actuaries of the future.

'The Association has a unique role because the tasks we mentioned above cannot be done by individual actuaries or firms alone. A business association can invest in research, in skills acquisition and development and in human capital. I believe the essence of this new phase and new mission for actuaries is partnerships. They must engage more in partnerships through the association both upstream (with researchers, analysts, statisticians, data and ICT providers), and downstream (with end-users, retailers, the whole world of public opinion). So, they must become more visible vocal and authoritative. Their voice must be heard more.

There are three areas where the Association has a fundamental role to play:

- Invest in the education of the public. It's important that people appreciate the work that actuaries are doing and that they want to become involved.
- Highlight the social role of actuaries, their contribution to inclusiveness and social cohesion. Inclusiveness should be a primary policy concern for the Association.
- And finally, Europe. The Association must promote European integration. In facing the new risks, a national perspective is not enough. We have discovered through the pandemic the importance of the European perspective in a field like health, which was not considered before a European domain. Without linking health to the European economy and society (one health), we would not be effective in managing the recovery.

Besides, allow me to show a little bit of European pride. In the fields of the net zero transition, sustainable finance, the circular economy and the like, Europe is a frontrunner and a global leader. Actually, Europe is taking the lead and more responsibility in the global exchequer to promote cooperation and dialogue on sustainable development and resiliency. I think the upcoming appointments related to the COP 26 and the G20 under the Italian presidency, are great opportunities for giving more visibility and recognition to the European green leadership.'

Finally are you optimistic, what are your hopes for the future?

'Well, we are coming out of a difficult period. Quite a few of the old certainties of the past have been undermined. We are faced with structural (not simply parametric) uncertainty. But we struggled through, showing adaptability, innovation and solidarity. The recovery underway is vigorous, and the new world that is emerging out of the pandemic looks quite promising. Greener, more digital and more resilient. Giving more value to being together, meeting and participating in person, sharing and caring. It is up to us now - as Churchill put it - "not to let a good crisis go to waste".'

HOW TO MONITOR ACTUARIAL ASSUMPTIONS REGARDING CLAIM FREQUENCY IN PRACTICE?

BY **STÉPHANE LOISEL**

STÉPHANE LOISEL holds a PhD in applied mathematics from the University of Lyon, an MSc in actuarial science and finance, and is a fellow and former member of the board of the Institut des Actuaires. He is now full professor and head of LSAF research lab at ISFA, Université Lyon 1.

In insurance, it is important to continuously monitor actuarial assumptions, and particularly the ones regarding claim frequency. If one does not react quickly enough to a claim frequency increase, then one may face adverse selection. In the case of a claim frequency decrease, competition is at stake. With my colleagues, Nicole El Karoui (Sorbonne Universités) and Yahia Salhi (ISFA, Université Claude Bernard Lyon 1), we have identified the optimal monitoring strategy in a so-called modified Lorden criterion framework: under a false alarm constraint (expressed as a minimum average number of claims before false alarm), the goal is to find the optimal stopping time that minimizes the conditional expectation of the number of claims between the changepoint and the detection time, in the worst case scenario (without any a priori assumption on the time at which the change may occur).

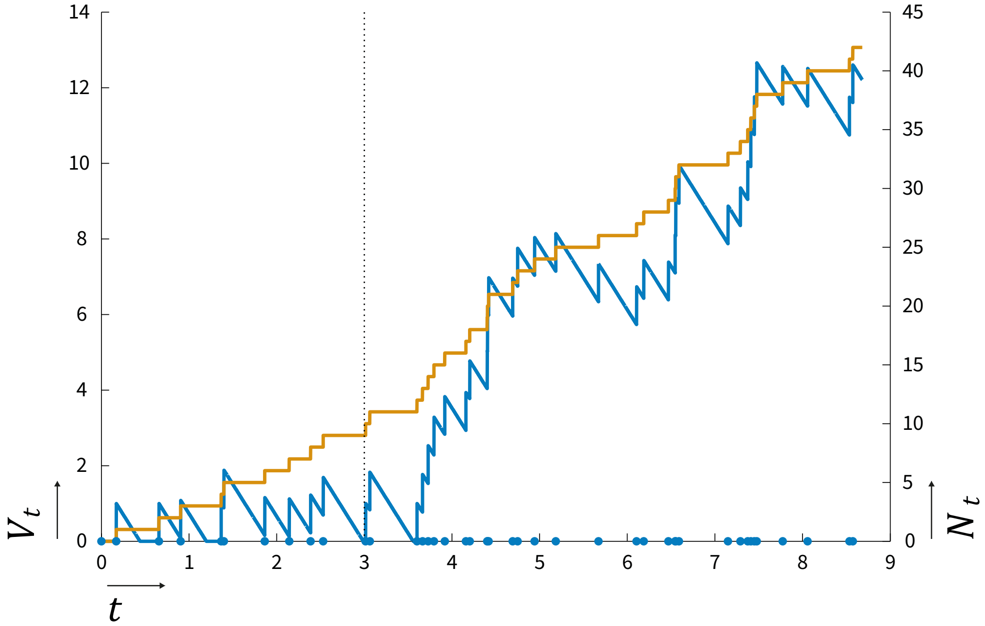


FIGURE 1
Claim arrival process (Nt) (*yellow*) and associated cusum process (Vt) (*blue*) when an increase of claim frequency occurs at time t=3. Before t=3, the cusum process remains close to zero. After the change, there are more upward jumps and the cusum process naturally goes up.

We have proven that the cusum (cumulated sums) process was the optimal tool to monitor claim frequency in this robust optimisation setting. The cusum process corresponds to the logarithm of the Radon-Nydodym density of the probability measure associated to the new model with respect to the one of the initial model. Pathwise speaking, it corresponds to an affine transform of a classical or dual ruin theory process with dividends, where each claim incurs a jump.

When one wants to detect an increase in claim frequency, each claim breeds an upward jump in the cusum process. If claim frequency does increase, then the cusum process is likely to go up (see Figure 1). For a decrease in claim frequency, each claim generates a downward jump in the cusum process. If claim frequency does decrease, then jumps are no longer enough to maintain the cusum process low, and it is likely to increase. In both cases, the alarm is sounded when the cusum process overshoots some upper horizontal barrier, whose level can be determined by the false alarm constraint in closed form thanks to ruin theory computations.

Even if the proof of optimality is a bit technical, the optimal solution is both visual and easy to understand. Besides, the plot of the cusum process can be prolonged as new information comes in. Another merit of the approach is that it provides objective knowledge about optimal opportunities to statistically differentiate a change from pure noise.

Our proof works for a very general class of claim arrival processes, including the ones featuring seasonality, trends (like in mortality patterns for death arrival process monitoring), uncertainty (doubly stochastic Poisson processes for example) or self-exciting properties like in the case of the Hawkes process, very often used to model cyber risk.

Nevertheless, many open research questions remain. What if the change occurs gradually and not in an abrupt manner? What happens if there are multiple or temporary switches from one model to the other? How to handle a portfolio with multiple risks that need to be jointly monitored ?

This research has been supported by the French ANR project LoLitA (Longevity with LifesTyle Adjustments) and the research initiative Sustainable Actuarial Science sponsored by Milliman Paris. To know more :

N. El Karoui, S. Loisel, Y. Salhi, **Minimax Optimality in Robust Detection of a Disorder Time in Poisson Rate**, **Annals of Applied Probability** (2017), Vol. 27(4), 2515-2538.
P. Laub, N. El Karoui, S. Loisel, Y. Salhi, **Quickest detection in practice in presence of seasonality: an illustration with call center data**. In: Data analytics and Models for Insurance, Economica (2020).

INTRODUCTION TO CLIMATE-RELATED SCENARIOS

BY **MICHELINE DIONNE**

The International Actuarial Association (IAA) recently announced the publication of the paper **Introduction to Climate-Related Scenarios** developed by its Task Force on Climate Risk.

Identifying a strategic need to respond in a timely and proactive manner to promote the role of actuarial approaches and contributions to addressing climate-related risks, the IAA Executive Committee established the Climate Risk Task Force to deliver on several IAA activities over a five-year time horizon relating to climate-related risks. The objective of these activities is to contribute to the valuable global efforts to further identify, measure and manage climate risks, thereby serving the public interest.

This paper is the second of a series of papers that will be developed, aimed at creating awareness and promoting actuarial approaches in climate-related risk management and reporting.

The first paper - **Importance of Climate-Related Risks for Actuaries** – was released in September 2020. Recordings of the webinars to present these papers are available on the **IAA's YouTube channel**.

Climate-related risks are getting more and more attention worldwide. Whether those risks arise from more frequent and severe weather events, or the transition to a net-zero-carbon economy, they have the potential to trigger substantial impacts with consequential implications for the work carried out by actuaries. Actuaries therefore need to stay up to date with the science underlying climate change, and with the political and economic responses to it.

Scenario analysis is an important tool that can be used to assess the potential financial and business impacts of climate change in a decision-useful way. In a world of uncertainty, scenarios are intended to explore alternatives that may significantly deviate from the basis of 'business as usual' assumptions.

Actuaries are increasingly involved in considering the potential business and financial impacts of climate-related risks on an organization, its customers and society. There is also an increasing demand for actuaries to use scenario analysis to ensure these risks are identified, measured, monitored, managed and reported. This work will form a basis for mitigation/adaptation strategies, as well as building resilience.

The main conclusions of this paper are summarized in the following points:

1. In the sphere of climate change, the focus of the actuarial profession is on climate-related risks and opportunities, rather than the multiple broader impacts of climate change.

2. Climate-related risks can be analyzed into main categories

comprising physical risks, transition risks, and legal and reputational risks. Each of these will be affected by initiatives from governments, enterprises and individuals.

3. Climate-related risks are complex and entail a high level of uncertainty as to both the timing and intensity of their impacts. There is an abundance of material, tools and data that can be used by actuaries to assess and monitor these risks in cooperation with climatologists and other professionals.

4. Analysis of scenarios covering a wide range of potential futures is best suited to developing fact-based policy options for governments, and management information for enterprises. This approach aims to maximize the sustainability of their policies, strategies and business models.

5. The main source of basic research information about climate change is the Intergovernmental Panel on Climate Change (IPCC). 1

6. Scenarios need to accommodate interactions between the risks that are not linear but take place at multiple levels. They can occur on different timelines and horizons, and their impacts can be at the global, regional or enterprise level. Actions may be taken by a variety of stakeholders, each controlling only segments of the risks, but should be coordinated at both the local and global level.

7. Actuaries should not necessarily aim to create scenarios by themselves. They should be able to work in multi-disciplinary teams to develop scenarios that are appropriate to a set of circumstances. Parameters should be customized to produce results that are relevant, credible and aligned to the needs of the users.

8. Guidance is provided on the criteria and components of, and requirements to be met by, scenarios as well as on the process, which must be iterative.

In order to address the needs of actuaries, more papers are scheduled to be released over the following years, such as:

- a paper designed to further stimulate development of effective and globally applicable links between climate-related risk scenarios and insurance and pension risks and costs;
- a paper on the application of climate-related risk scenarios to asset portfolios with an important subsidiary goal of encouraging consistency between assets and liability modelling;
- advice on climate-related risk management and addressing emerging third-party regulatory/reporting/disclosure requirements;
- a paper on the potential effects of transition and adaptation steps; and
- a paper on the link between climate-related risk scenarios and social security.

A review of existing IAA publications is also planned to identify and address any gaps related to climate-related risks. The IAA Climate Risk Task Force welcomes and encourages input and involvement in these activities. To learn more about the work of the IAA on this topic, contact the Director of Technical Activities at the **IAA Secretariat**.

To access the paper, and other papers published by the IAA, please visit their **website**.

MONETARY POLICY- THE CURRENT TRAJECTORY IS NOT SUSTAINABLE

BY **ROB VAN LEEUWEN**

In the abbreviation 'ESG' most attention goes to the first letter: the environment and climate change in particular. However, the 'G' stands for 'governance', and should not only apply to business, but especially to government.

During recent years, central banks around the developed world (I focus on the ECB and the FED, but the central bank of Japan has already operated in this mode for at least two decades) have first decreased interest rates to near zero or even into the realm of negative rates, and subsequently engaged in a form of 'money printing' called Quantitative Easing (QE). At the same time, governments have racked up debt levels that are unsustainable at historically prevalent real interest rates (say, between 2% and 4%).

Currently, the ECB has a balance sheet that amounts to around 70% of Eurozone GDP. The FED balance sheet is at a level of 40% of GDP. This would suggest that the monetization of debt has progressed even further in the Eurozone than in the USA. On the other hand, while the USA has a trade deficit that is in the order of magnitude of 3% - 4% of GDP, the Eurozone has a trade surplus of a similar magnitude.

Pure fiat currencies (which the developed world has 'enjoyed' since Nixon decoupled the world's reserve currency from gold in 1971) have historically always faltered, with a lifespan that can be calculated in decades rather than centuries. Since the decoupling from gold, the value of currencies has been guaranteed by independent central banks, with a mandate to ensure price stability (and in the USA: low unemployment).

Currently, this central bank independence is under threat, or has effectively been abolished:

- Central banks have decided that promoting green policies, stimulating gender diversity and offsetting the effects of epidemics in selected countries are also part of their mandate.
- There is a revolving door between central banks and politics: Janet Yellen (ex-chair of the FED) is now Secretary of the Treasury; Mario Draghi

'The actual implementation of Ben Bernanke's previously theoretical concept of 'helicopter money' may provide a trigger for the velocity of money to increase.'

(former chair of the ECB) is now prime minister of Italy, the main beneficiary country of monetary support; Christine Lagarde (former minister of Finance of France) is now heading up the ECB, having come from the IMF.

- In funding budget deficits, the pretence that there is no direct monetary support to certain states has de-facto been abandoned, while de-jure it still exists. As an example: in April and May 2020, the ECB purchased the full bond issuance of Italy during those months.

Thus, it can be said that the rectitude and independence of central banks has been severely compromised. However, it should be mentioned that central banks are taking these actions for good reasons: in their absence a deep depression might take hold and specifically the Eurozone might fall apart in a chaotic fashion. With the benefit of hindsight, the root cause of the problem is that at previous phases the pain of recessions has not been taken (Greenspan and the 'goldilocks' economy; solving the 2008 debt crisis with more debt) and specifically in Europe that knowingly a single currency for rather diverse and diverging economies has been set up, hoping that the resulting crisis will lead to forced political unification.

'This is of course pure fantasy and media spin.'

For asset managers such as pension funds and insurers, this is highly relevant. So let's look forward. How could this situation unravel? The following scenarios can be distinguished:

- The official narrative: after more than a decade of low and negative interest rates and QE, the pretence is still that these are temporary measures, that all debt will be paid back in good faith, that Eurozone economies will ultimately converge and that economic growth will allow economies to outgrow these debts. This is of course pure fantasy and media spin.

- A Japan-type scenario. The world would be stuck forever in low growth and a zero interest rate environment, with the central banks almost exactly offsetting the deflationary tendencies. This scenario is sometimes mentioned in defense of QE and high budget deficits: in a zero interest rate environment, high government debt and budget deficits should be completely sustainable. Of course this scenario can only be temporary and never be an endgame, as the economy will suffer from misallocation of capital, lack of creative destruction and the rise of ‘zombie' enterprises. It should also be noted that one country (Japan) having been in this scenario for decades, does not mean the entire world can function this way for decades to come.

- An elevated, but controlled, inflation for a substantial number of years, in combination with ‘financial repression'. This is the way the USA and the UK managed to decrease their indebtedness during the post-war years. This will mean a value transfer from mostly the middle classes (bank account holders and participants in pension funds holding bonds) to the population in general. It will mean that pensions will not be indexed, while prices rise. Billionaires and other high net-worth individuals will not be much affected, as they do not tend to hold cash or government bonds, but equities, gold, bitcoin, real estate. However unpalatable, this might still be a relatively benign outcome.

- Hyperinflation. Currently the population responds to the epidemic and other sources of uncertainty by saving in bank accounts. For now only some of the well-off and some of the young (bitcoin!) are feeling something is wrong. If the population at large starts to distrust fiat currencies and the way the financial system is managed, a hyperinflationary scenario cannot be excluded.

‘Should I jump left or jump right?'

Of course a fifth scenario is possible: if central banks would backtrack (‘taper'), gradually phase out QE and increase interest rates, a deflationary scenario might emerge. It would most likely involve default on many fixed income instruments, including sovereign ones. However, the FED says tapering and rate increases can be contemplated only after substantial inflation will have taken hold and the 2% target will have been overshot, compensating for earlier shortfalls. By that time backtracking might be difficult, as the stakes would have become even higher.

Until recently, each (institutional) investor was in the position of a goalkeeper having to stop a penalty kick: should I jump left (anticipate currency debasement and resulting inflation) or jump right (anticipate the depression that would occur naturally without central bank intervention and the resulting deflation). The narrative in the USA has always taken the Great Depression of the 1930s as something to be avoided at all cost (therefore: jump left, buy everything the government can't print), while in Europe until recently (2014) the experience of the German hyperinflation of 1922-1923 loomed large (therefore: anticipate hard money, jump right, buy government bonds, hold cash). However, at least since 2014 the ECB seems to have abandoned its German roots and Germany does not seem to insist on a return to these roots, as for Germany unity in Europe seems highest priority.

Many say: ‘so far no inflation has appeared'. This is because at the same time the velocity of money has decreased. After a short journey through the economy, the money has returned to the central banks, and sits at the liability side of their balance sheets. It is like the pistol that hangs on the wall during the first part of a play: first some events will have to happen in order for it to be used. But it is there, waiting.

> *'Either we have a depression first and then substantial inflation, or we move to substantial inflation directly.'*

Independent pundits nowadays tend to have two views: 1) either we have a depression first (because central banks are initially hesitant to react) and then substantial inflation, or 2) we move to substantial inflation directly. Although the judgment is still out, it seems that the 'bubble' in stock markets, housing, bitcoin etc. is rather persistent and actually might not be a bubble but instead the first wave of an inflationary scenario (a 'melt-up'). Furthermore, the actual implementation of Ben Bernanke's previously theoretical concept of 'helicopter money' (started by Trump and accelerated by the Biden administration) may provide a trigger for the velocity of money to increase.

The above is a very brief introduction to this matter. The main message I offer is that at this point there is no good way out. There will be pain. For investors the task is to anticipate where and how the pain will manifest itself. For those who would like to learn more, some interesting pundits are Willem Middelkoop, Edin Mujagić, Arno Wellens (the Netherlands), Marcus Krall, Max Otte (Germany) and Ray Dalio, Harry Dent, James Rickards and Peter Schiff (USA).

> ***Many say: 'so far no inflation has appeared'***

COLUMN

THE ACTUARIAL PROFESSION IN EVOLUTIONARY MOVEMENT

The only certainty is the change. Evolution teaches us, those who want to survive in the changing world, the need to adapt to new external conditions. The survivors are then ones with the properties that help them to adapt and to face future threats in a better way. Humans learned to cooperate in communities as efficient survivor strategy. The profession of the European actuary is no exception.

In past 10 years European actuaries, next to classical premium quoting, product pricing and statutory reserve valuation, had to adapt to new regulation requirements: Solvency II for insurance companies and IORP for pension funds. Many actuaries became risk managers and learned how to use risk modelling and forecasting in the insurer's own risk solvency assessment, understanding the asset/liability management and its impact on capital optimization by the investment strategy adjustment.

But the changes continue and the actuarial profession is facing evolutionary movement from challenges arising from new accounting rules in IFRS 17; or Environmental, Social, and Governance (ESG), the new set of standards including a company's approach to climate change that will impact underlying risks of the insurance industry we know today. ESG is bringing the challenge of how to address and adequately respond to climate change - either to the physical risks or more distant transition risks. At the same time there are materializing challenges to the actuarial profession from Data Science, Artificial Intelligence, and Insurance Blockchain. However, the change usually brings both threats and opportunities.

The change of AAE Core Syllabus of actuarial training in Europe was necessary and new learning areas were added in 2019. They cover Data Science, Machine Learning and Ethics, broaden the scope of the risk management techniques, and add the requirement to understand the Standards of Actuarial Practice. This Core Syllabus will become mandatory as of January 2022 for all 36 member associations. It is the responsibility of national actuarial associations to have procedures ensuring the fulfilment of the requirements of the AAE Core Syllabus.

But nowadays the AAE has higher aspiration and is preparing a proposal for European Continuous Professional Development (CPD) Guidelines. The AAE CPD Guidelines will provide the assurance that actuaries that qualified in the past continue to subsequent further development to maintain and develop skills and knowledge at an appropriate level. The current proposal is in the process of consultation with the aim to approve it by the end of this year.

It is clear that the current version of actuarial professional requirements is not the last one as the need to raise the bar seems inevitable in future. The AAE believes that as long as actuaries keep learning new skills and competencies, performing professional services competently and with care, the community of European actuaries will be able to adapt new challenges quicker and to become stronger together.

Maria Kamenarova, PhD, FRM
Vice-Chairperson 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.

aae actuarial association of europe

Actuarial Association of Europe
Maison des Actuaires
1 Place du Samedi
B-1000 Brussels, Belgium
https://actuary.eu/publications/the-european-actuary/

For futher informations contact
Monique Schuilenburg
(moniques@actuary.eu)

Lay-out Manager: Linda van den Akker
Magazine Manager: Frank Thooft

NEXT ISSUE:
The next issue will appear 1 Sept 2021.
Suggestions can be e-mailed to info@theeuropeanactuary.org
The deadline is 1 August 2021.

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