

LOUIS BACHELIER

Economic and financial news seen through research



How is insurance risk management evolving?

With Sylvestre Frezal,
Pierre François, Carine Ollivier,
Virak Nou and Emmanuel Sales



Why does insurance mistakenly rely on statistics to manage its risks?



Based on an interview with Sylvestre Frezal

4

Solvency II is counterproductive

6

Based on an interview with Sylvestre Frezal

Risk management in insurance has experienced meteoric growth

10



Based on an interview with Pierre François

Solvency II has put actuaries in the limelight



12

Based on an interview with Carine Ollivier

“Solvency II is overly procyclical”



14

Based on an interview with Virak Nou

“The effects of Solvency II are disastrous”



15

Based on an interview with Emmanuel Sales

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Financial risk management is at the heart of the research activities of the Institut Louis Bachelier through its two foundations, the Europlace Institute of Finance (EIF) and the Risk Foundation (FdR).

It has to be said that at the time of the onset of the worst economic and financial crisis of the post-war period, there was a paramount need for the public authorities, regulators and professionals to understand and identify the mechanisms that threatened international finance with meltdown. If, since then, safeguards have been put in place to regulate the financial system, it is clear that many questions about the threats and risks have yet to be answered.

Without going into too much detail, it is clear that the current situation, which is both uncertain and fluid, calls for academic research of excellence, of which there is certainly no shortage in France, but which is often insufficiently exploited and shared with the general public and with specialists. As well as carrying out research, our principal mission is to disseminate the latest scientific work in economics and finance. You can find examples of this work in our various publications, such as the *Cahiers Louis Bachelier*.

This latest issue addresses developments in risk management in insurance. The insurance sector has undergone many changes, most of them regulatory, which have reshuffled the cards of the profession. It can even be said that the insurance industry has probably experienced the greatest upheavals within the financial sector, in particular with the introduction of the European Solvency II Directive and the recent emergence of Big Data.

Within this perspective of deepening the theoretical knowledge and practical applications of the insurance sector, the PARI research programme on the apprehension of risks and uncertainties has the experience and expertise needed to analyse the most recent changes taking place in the insurance industry. This programme brings together a variety of researchers from different disciplines, such as sociology and statistics. This cross-disciplinary approach brings different viewpoints to the research, which are relevant for historically analysing developments in the insurance industry, while at the same giving rise to concrete recommendations for improving risk management in the future.

In the first article, the researchers trace how inconsistent mathematical models have slowly and surely spread across the industry. The second article offers an analysis of the advantages and disadvantages of the Solvency II Directive, covering insurance in Europe. In the third, the emergence and rise of the risk function in insurance companies are explained from a sociological standpoint. The fourth of these scientific articles discusses the evolution of the actuarial profession, which has become indispensable with the passage of time. As well as these four studies, this issue of *Cahiers* features two interviews with professionals – financial partners of PARI –, which give practitioners new insight into developments in the sector.

Enjoy your reading!



Jean-Michel Beacco
CEO of the Institut Louis Bachelier

Partners



WHY DOES INSURANCE MISTAKENLY RELY ON STATISTICS TO MANAGE ITS RISKS?

The mathematical tools used in the insurance sector for the management of rare risks – which were adopted in the 1990s, before spreading to the entire sector in the following decades – are based on a crippling amalgam of notions of randomness and of heterogeneity. The papers presented below recount the slow percolation of this incompatible pairing into the very heart of insurance company management.

The 2008 financial crisis revealed the weaknesses of statistical models when mobilized for the management of rare risks. Statistical indicators and measures of risk in fact suffer from conceptual and empirical limitations, such that they should be used sparingly. But after being adopted by certain insurers, they were not called into question and since then their use has become standard throughout the sector.

RANDOMNESS AND HETEROGENEITY HAVE BEEN CONFUSED

To illustrate the above, consider the example of an insurance company managing several thousand motor insurance policies. To estimate the premium, the insurer can use statistics, relying on the law of large numbers. In other words, it can manage the heterogeneity of the events stemming from its various contracts on the basis of statistics. But this is not the case when it tries to describe and deal with a rare event, such as a large-scale natural disaster: the statistics then no longer make sense. To base its reasoning on statistics in such an instance is absurd, just as someone with one hand in a hot oven and the other in the freezer would not find the temperature “on average” to be pleasant... *“The statistics are relevant for describing a mass of data, where there are numerous contracts with heterogeneous outcomes. But for dealing with a rare event, such as a financial crisis, the law of large numbers cannot apply. Yet in practice insurers use the same tools to measure the risks pertaining to their policyholders, which they aggregate and which are deterministic*



Historically, debates about the appropriateness of using probability laws to make decisions in a situation of randomness began in the 17th and 18th centuries



overall, and the risks to which they themselves are exposed, which are random,” Sylvestre Frezal explains.

These tools have become an institution – in the sociological sense of the term – of risk management. All actors in the field recognize them; such statistics frame their behaviour; and the credibility of these tools is unaffected by any failures they are subject to.

Starting from this simple, not to say trivial, observation, the researchers set out to find out how and why the amalgam of randomness and heterogeneity has slowly and gradually been introduced, spread and become institutionalized in the mathematical models used in finance and more particularly in insurance – a sector that, unlike market activities and banking, has been little studied.

AN AMALGAM MASKED BY MATHEMATICAL THEORY...

Historically, debates about the appropriateness of using probability laws to make decisions in a situation of randomness, i.e. of unique event, began in the 17th and 18th centuries, notably with the Swiss mathematician

Based on the papers *Pourquoi utilisons-nous des modèles « faux »?* and *Instituer l'incohérence. Aléa et hétérogénéité au sein du secteur assurantiel* by Pierre François and Sylvestre Frezal and on an interview with Sylvestre Frezal.



Sylvestre Frezal is a mining engineer and researcher at Datastorm. He is affiliated with the CREST Finance and Insurance Laboratory. He is a former student of the Ecole Polytechnique, an economist of the ENSAE and a qualified actuary. He has, in particular, been auditor of insurance at ACPR and director of insurance and financial risks at Generali France.

Methodology

The researchers carried out a sociological study of organizations, science, and techniques in order to identify and understand the origin of the statistical tools used in the insurance sector. To this end, they proceeded in four distinct stages: analysis of the existing literature on the history of statistics and probabilities through the perspective of the amalgam between randomness and heterogeneity; dissection of the prudential and financial statistical tools; conducting interviews with players from the sector; and participatory observation with note-taking to obtain empirical data.

Jacques Bernoulli. There were subsequently many attempts to find a rational basis for decision-making in a random environment. But by the early 1800s the idea had been abandoned by scientists, mathematicians, philosophers, lawyers and economists who might wish to resort to it, because they considered it to be meaningless. It was only in the 20th century that this idea re-emerged. Until the 1930s, mathematicians constructed and articulated probabilistic, mathematically sound, concepts while being alert to issues of interpretation with regard to operationally applying these purely theoretical models. However, afterwards, *“These theoretical mathematical models then led to the abandonment of epistemological questions regarding the amalgam between randomness and heterogeneity, with the adoption of a consistent ‘off-the-shelf’ approach, the abstraction of which was remote from the questions of interpretation needed for operational use,”* Sylvestre Frezal says.

... AND INSTITUTIONALIZED OVER TIME

These mathematical models entered the field of economics in the 1940s and 1950s and were taught in business schools in the United States from the late 1960s, thus marking the beginning of portfolio theory. *“The economic and financial community appropriated these theoretical models without questioning their conditions for practical use, as the thinkers of the 18th century had done, and the importance of which was emphasized by the mathematicians of the early 20th century,”* Sylvestre Frezal says. Over the past three decades, these tools have been widely used in the financial industry (by banks

and asset management companies) to address investment-related issues, and then in the last 25 years they have spread to insurance companies. There were two main reasons for this. Without going into too much detail – which also concerns the development of the risk function in insurance companies (see pages 10 and 11) – the spread was favoured, first of all, by the consolidation of the sector with the creation of a few large financial conglomerates, in which the major insurers imported the financial communication tools of the companies they had acquired. Then, in a second step, the spread was amplified by the requirements of the Solvency II Directive, which generalized these practices to all actors. *“Regulation led to the extension of the amalgam to the entire insurance sector, even among small companies,”* Sylvestre Frezal says.

STATISTICS CONFER FUNCTIONAL BENEFITS

The use of statistical tools to manage insurers' own risks is certainly ill-advised and its dissemination seems absurd. The reason this has happened is because some actors in the industry actually believe in these tools, but also because statistics bring many functional advantages for practitioners: *“From a rhetorical standpoint, calling on figures is very powerful. Even if analysis suffers, it carries greater conviction. Moreover, statistics provide justification and, in event of an unfavourable outcome, allow one to blame it officially on bad luck. Finally, they provide a point of anchorage: whether or not they are well founded, statistics are psychologically reassuring,”* Sylvestre Frezal says.

With supervision of the insurance sector currently under debate on the part of the European authorities, the question of the relevance of the quantitative indicators used should also be put on the table, in the light of the observations and analyses offered by research. ●

Key points

➤ Statistics are relevant for managing numerous aggregated risks through the law of large numbers. On the other hand, they are not suited to dealing with rare risks.

➤ Despite their lack of relevance, statistics are used to manage randomness, and this concept has become an institution. It is a framework shared by the sector as a whole, it is not called into question, and it is normative in nature.

➤ The use of statistics to manage randomness can be an act of faith, but it also has functional advantages, because figures help convince and reassure people and provide a defence against criticism.

SOLVENCY II IS COUNTERPRODUCTIVE

Less than two years after its entry into force in Europe, the Solvency II Directive, which regulates insurers, is already under review. The following article provides a critical scientific evaluation of this prudential framework, which is designed to protect insurees by improving the sector's risk management.

After years of elaboration and negotiation, beginning in the 2000s, the Solvency II reform, which regulates the insurance sector, came into force on 1 January 2016 in the European Union (EU). The aim of this prudential framework is to protect those insured against the bankruptcy of their insurer, through the introduction of new measures to control risks in their balance sheets.

Solvency II is based on three distinct and complementary pillars. The first concerns the quantitative requirements that insurers should apply in order to measure their risks. This component requires in particular that insurers' balance sheets be valued at market value (as opposed to book value in Solvency I), and imposes new capital requirements so as to absorb shocks. The second pillar focuses on qualitative requirements, which are illustrated, inter alia, by a framework for risk governance among insurers. The third pillar entails greater transparency, by requiring industry actors to share information about their risks with the regulator and the public.

A number of questions arise, however. Is this new system effective? Does it have perverse effects? Does it ultimately improve the situation? In what ways might it be improved?

AN ERRONEOUS POSITIVIST APPROACH

Whereas Solvency I adopted a flat-rate approach, basing capital requirements on the size of insurers – the larger the insurer, the greater the capital it was required to have –, Solvency II is based on a positivist perspective. *“This approach is based on the argument that risks can be finely estimated through mathematical and computer tools. In this context,*

insurers' capital requirements are deemed to correspond to their risks. But this logic does not work, because the risk measures adopted embody too high a margin of error for operational use,” says Sylvestre Frezal. This dangerous situation can be illustrated by the following metaphor: managing a company with Solvency II risk measures would be equivalent to piloting an airliner with an altimeter that has a 50-kilometre margin of error. Requiring that such an instrument be used is therefore counterproductive.

By way of a concrete example, the European Insurance and Occupational Pensions Authority (EIOPA), which coordinates national regulators applying Solvency II, has tried to calibrate the risks of the various branches of the insurance sector in the EU (car insurance, house insurance, civil liability, etc.). The findings revealed a discrepancy by a factor of two or three between the different branches. In other words, some categories of insurance are viewed as two to three times more risky than others. *“But when we analyse each estimate, we find, depending on the methods used, that the quantification of the risk for a given branch varies by a factor of 10 or sometimes 50,”* says Sylvestre Frezal.

Based on the paper *Une réforme pavée de bonnes intentions: Retour d'expérience sur Solvabilité 2 et propositions pour Solvabilité 3*, by Sylvestre Frezal, and on an interview with the author.

The harmonization of quantitative tools for measuring risks prompts insurers to adopt similar representations

Methodology

Sylvestre Frezal has produced a work of synthesis with a view to assessing the various dimensions of and recommendations for Solvency II. To this end, he drew on a number of papers, including *Solvabilité 2 est-il risk based?*, which quantitatively evaluates the error margins of risk measures, and *Procyclité et contrats avec PB: inéluctabilité, avantage et inconvénient*, which uses a synthetic model and numerical simulations. He has complemented his study with sociological analyses on the use of models in insurance companies.

He continues, “We must take on board the fact that it is not possible to quantify those very rare risks that could destroy a company. We therefore need to turn to other tools, admittedly less sophisticated, that will promote vigilance rather than create an illusion.” Put plainly, insurance risk measures are not reliable with Solvency II – a bitter disappointment with regard to one of the expected goals of this reform. “Recognizing this would also allow us to adopt a political view of a regulation that impacts not only policyholders’ degree of protection, but also the financing of the economy and the provision of insurance services. And with regard to the governance of Solvency II, trade-offs need to be discussed and implemented at the right level.”

INCREASING SYSTEMIC RISK

What is more, the positivist approach taken by Solvency II also increases the sector’s systemic risk. Indeed, the harmonization of quantitative tools for measuring risks prompts insurers to adopt similar representations and the same ways of thinking, in terms of assessing their respective risks. “Replacing internal tools by standardized measures increases systemic risk, by creating a crowding-out effect. When managers are provided with a yardstick for measuring their risks, they will refer directly to it, without necessarily developing their own analytic framework. Thus standardized measures generate similar behaviour and reduce the diversity of insurers and the overall resilience of the system,” Sylvestre Frezal explains.

To avoid this dangerous situation, the European regulator should encourage heterogeneity and not impose a standardized industrial tool on insurers. The aim here is to avoid shaping insurers’ perceptions of their respective risks:

“In order to allow each insurer to produce its own analysis, it is important to avoid dictating to them a common and shared hierarchy of risks – for example, the same calibration should be applied to all assets (stocks, bonds, real estate, etc.) without distinction. Then if some actors are convinced, say, that real estate is currently more risky than equities, so much the better: they will behave differently from others. As such, when an asset class is in crisis, it will only affect certain actors, who can then be rescued by other actors. In this way, systemic risk is diluted.”

A COMPLEX SYSTEM IN NEED OF SIMPLIFICATION

Although Solvency II has some positive aspects, such as improving the quality of data, it is too complex. The simplifications recommended by Sylvestre Frezal include in particular: “Putting an end to stochastic calculations in the balance sheets of life insurers, because they are cumbersome and ultimately lead to results derived from conventions. Might as well take a convention, working on a pro rata basis would be simpler than simulating multiple scenarios”.

At a time when ideas are being developed for the review of Solvency II scheduled for 2018, the contribution of research in this field can shed light for stakeholders with regard to this thorny issue. ●

Key points

- The quantitative component of Solvency II is counterproductive. It would be preferable to apply flat-rate requirements and to simplify the balance sheet conventions.
- The standardization of risk measures, by forcing insurers to adopt the same perspective, constrains their thinking and increases systemic risk. If the regulator were to abandon an imposed hierarchy of asset risks (equities, real estate, credit), this would allow each insurer to have its own view of risks.
- Capital requirements do not adequately reflect the risks for operational use. Their management should, as for any other financial metric, be devolved to the chief financial officer and not to the risk manager. The latter needs to be free of any standardized framework, so as to be vigilant toward and respond to risks that are constantly liable to change and take new forms.

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RISK MANAGEMENT IN INSURANCE HAS EXPERIENCED METEORIC GROWTH

Non-existent within insurance companies in the early 1980s, in common with most sectors, risk management since then has progressively become indispensable.

While risk management, embodied by the Risk Department and its Chief Risk Officer (CRO), is now an integral part of insurance companies' strategic management, this has not always been the case. In fact, the development of risk management is relatively new, dating back only to the second half of the 1990s. How did this new métier come about? How did it spread in the insurance sector? Does it threaten the established managerial order in insurers and mutual benefit societies? It is questions such as these that the researchers wanted to answer in their work. *"The dramatic growth of risk management over the last 25 years is an interesting case study for understanding the development trajectory of certain professions and the reshaping of the power relationships they can lead to within insurance companies,"* Pierre François says.

At the outset, risk management was embryonic and took very varied forms, regardless of the sector in which it arose. It developed from already existing operations such as internal audit or the management of insurance policies in large industrial groups. It was only gradually that risk management became organized around a distinct department, favoured in particular by occasional crises and the emergence of new risks.

LARGE GROUPS AS FORERUNNERS

In the insurance sector as in most other sectors, risk management initially concerned only a few major groups that began adopting new techniques and methods for assessing their commitments and assets. There were two reasons for this early adoption. First, some large companies appropriated quantitative tools used by smaller asset management companies

that they controlled in the context of financial conglomerates. In fact they found that these tools enabled them to define the management of capital requirements more accurately and often less expensively. Second, at the time, the sector was consolidating through numerous mergers and acquisitions, which required precise assessments by analysts and rating agencies. Large groups thus gradually adopted the same evaluation mechanisms, so as to enter into dialogue with the institutions assessing their financial health. This gradual steady rise of the risk management profession is reflected in the annual reports of the groups concerned, where the sections on risk management became lengthier year after year.

SOLVENCY II DEMOCRATIZES RISK MANAGEMENT ACROSS THE SECTOR

Initially confined to the limited segment of very large insurance groups, risk management subsequently extended to the whole sector, which was very heterogeneous with regard to the size of the companies comprising it. Solvency II played a decisive role in this expansion: by the end of the 2000s, the principles underlying the European directive had stabilized and spread. *"Solvency II played a catalytic role in*

Based on the paper *L'invention de la fonction risque: pouvoir, contre-pouvoir?* by Alban Bizieux et Pierre François, and on an interview with Pierre François.

This gradual steady rise in the risk management role is reflected in the annual reports of the groups concerned.



Pierre François is a former student of ENS de Cachan and of Sciences Po. He is director of research at the CNRS (Centre for the Sociology of Organizations). Previously director of the sociology department at Sciences Po and a professor at the Ecole Polytechnique, he now teaches at Sciences Po, where he directs the doctoral school.

Methodology

The researchers carried out a sociological survey of organizations on the development of risk management in insurance. They conducted a series of interviews with members of the risk department (CRO, actuaries, etc.) and managers of insurance companies. They complemented their work with a detailed analysis of the annual reports of actors in the sector over a 20-year period. In this way they were able to establish a detailed chronology of the evolution of risk management in insurance companies.

disseminating risk management throughout the sector, as it made mandatory the implementation of a function and processes specifically dedicated to this purpose," Pierre François says. At that time, however, small and medium-sized companies were lagging far behind the largest groups in developing internal risk management skills. In order to catch up and comply with future prudential requirements – initially planned for 2012, the entry into force of Solvency II was now set for early 2016 –, these companies were obliged to rapidly recruit modelling specialists. "The spread of risk management was facilitated by the circulation of personnel from company to company, variously by very costly head-hunting on the part of the major groups, recruitment at ACPR (Autorité de contrôle prudentiel et de résolution) colleges of supervisors, or the use of external consultants," Pierre François explains, and adds, "Risk management in insurance followed a quite similar chronology to other sectors, but it took place in two very distinct stages".

A TWO-SIDED ORGANIZATION SPECIFIC TO INSURERS

Solvency II does not impose a precise model as to what forms risk management should take. There is however, a specific form that applies throughout the sector. "In other sectors, risk management is handled by very heterogeneous organizations – sometimes there are engineers, sometimes lawyers, sometimes salespeople. This heterogeneity is not found among insurance companies, which above all have had to meet technical modelling requirements. This is why risk management for insurers is two-sided, with on the one hand mathematical experts who specialize in modelling, and on the other people who interface with other job profiles in

the company to collect information and provide explanations to different departments when necessary," Pierre François explains.

THESE NEW RISK MANAGEMENT DEPARTMENTS HAVE LITTLE DISRUPTIVE IMPACT ON FINANCE DEPARTMENTS

With the rapid and growing development of risk management departments and their CROs, the balance of power in companies could have been redistributed, and in particular it could have led to competition with the finance department. "Risk management has quickly gained considerable power, but not to the point of challenging the power of the finance department, which is still the antechamber of many CEOs and which makes decisions of crucial importance to the company," Pierre François says. It should also be noted that these two departments are not in conflict with each other, because they have common objectives and speak the same language: the risk management department offers a general frame of reference for the company, as does the financial management. "Risk management is young, and can sometimes be censorious. But it remains primarily a technical department, representing a cost centre for the company. It is therefore still far from taking the place of the finance department. Nor should we forget that the management of risks under Solvency II is compatible with the viewpoint of the finance department," Pierre François points out. Struggles for influence between these two departments, if they arise, will doubtless be slow to go beyond the stage of occasional confrontations – particularly since the risk management department is often dependent on the finance department. ●

Key points

- The chronological development of risk management in insurance is fairly similar to that of other sectors, but here it occurred in two distinct stages: in the 1990s, it was confined to a few large groups, and subsequently spread to smaller companies following the Solvency II Directive.
- Unlike other sectors, risk management in insurance has followed a specific two-sided organizational model mainly composed of technical profiles.
- Risk management has gained significant power in insurance companies in a very short period of time, but it is still far from being in competition with the finance department.

SOLVENCY II HAS PUT ACTUARIES IN THE LIMELIGHT

The actuarial profession – which specializes in the calculation of insurance risks – has undergone major changes in recent years. The sociology of professions is consequently able to shed light on these upheavals within a sector that escaped the crisis.

With its 3,000 or so members in France, the actuarial profession remains largely hidden to the general public. It must be said that this occupation – which calls for mathematical and technical skills – is traditionally and historically concerned with the calculation and risk management of products marketed by insurance companies. And this specialist domain generally lies outside the purview of the ordinary citizen.

However, regulatory changes in the insurance sector with the EU Solvency II Directive – the development of which was speeded up following the financial crisis of 2008 and which came into force in 2016 – placed a new emphasis on actuaries. *“Actuaries have played a major role in the Solvency II directive at a technical level, linked to the complex modelling of risks involved in the balance sheets of insurance companies,”* Carine Ollivier says. Thus, Article 48 of Solvency II specifically defines the actuarial function by assigning it, inter alia and not exclusively, major responsibilities for the assessment of commitments and risk modelling.

Moreover, with its emergence in recent years, Big Data also plays an important role in the evolution of the actuarial profession, which is facing massive inflows of heterogeneous data needing to be processed as well the advent of the new profession of data scientist, dedicated to this digital transformation.

In view of these two major changes, Carine Ollivier, a sociologist of professions, became interested in the composition of this particular profession, the evolution of its prerogatives, and its representation in the public sphere. *“Actuaries represent a very interesting laboratory case in my field of research because, unlike notaries, lawyers and doctors, it is not a regulated profession. Yet they enjoy*

full employment and their labour market is pretty much closed,” Carine Ollivier says. In her research on the profession, she conducted a qualitative sociological survey through a review of the existing literature and by carrying out numerous interviews with actuaries and people who revolve around the profession (recruiters, members of the Institute of Actuaries, and so on).

ACTUARIES AND CORPORATE RISK MANAGEMENT

If actuaries specialize in the calculation of the various individual risks of insurance products using modelling and pricing, on the basis of statistics and probabilities, Solvency II has allowed the reach of the profession to be extended to the management of overall business risks. *“Even though the management of large-scale risks at the level of a company is very different compared to the smaller scale in relation to individual products, the new position of Chief Risk Officer (CRO) is mainly occupied by actuaries. The evolution of risk management, generated by Solvency II, provides a natural outlet for them,”* Carine Ollivier explains. The recent prevalence of actuaries in the management of business risks does

Despite the prospects for migrating to a CRO position, there arises the issue of the independence of actuaries, as they remain hierarchically subject to their general management.

Based on the paper *L'actuaire à la croisée des chemins* by Carine Ollivier, and on an interview with the author.



Carine Ollivier is a qualified social science teacher and a diploma holder from the Cachan ENS Modern Humanities programme. She is a lecturer at the University of Rennes 2, a member of CIAPHS and an associate of the PRINTEMPS Laboratory (CNRS / Versailles Saint-Quentin University) and of GIRSEF (Catholic University of Louvain). A specialist in the sociology of professions and of economic sociology, she has been published, among other journals, in *Sociologie du travail* and in *Revue française de sociologie*.

Methodology

Carine Ollivier conducted a sociology of professions survey on actuaries. Following an exploratory stage, with a review of the existing literature, she carried out the first stage of her qualitative survey by means of biographical interviews with actuaries. She then complemented this stage with non-directive interviews with members of the Institute of Actuaries, human resources managers and head-hunters. She was thus able to identify issues and hypotheses that will allow her to continue her work through a future survey of statistical trajectories.

not, however, constitute an exclusive preserve. *“Actuaries were on their toes and seized their opportunity at the right time. They are very well positioned to get CRO positions, but they are in competition with other profiles such as people with business school backgrounds and engineers,”* Carine Ollivier says.

However, despite the prospects for migrating to a CRO position, there arises the issue of the independence of actuaries, as they remain hierarchically subject to their general management. *“In the Anglosphere, actuaries have a responsibility similar to that of auditors and their independence is protected. In France, it is not very clear and there is an ambiguity between independence and the hierarchy,”* Carine Ollivier points out.

ACTUARIES FACED WITH COMPETITION FROM BIG DATA

In addition to risk management, actuaries are also confronted with the changes resulting from the rise of Big Data. Although this field is still relatively new and is far from being monetisable within insurance companies, actuaries have nevertheless rushed towards this new open door. *“Even though actuaries analyse data, they do not have any particular expertise in Big Data. However, the Institute of Actuaries (IA) – the association that organizes and represents the profession – believes that its members are best placed to take charge of this work. In point of fact, the IA expects”* – albeit somewhat late compared to other actors – *“that the upheaval resulting from Big Data will be alarming, because no one knows how it will evolve,”* Carine Ollivier says.

Unlike risk management, however, analysis of Big Data extends to a much wider range of profiles, including mathematicians, computer scientists and physicists. *“The insurance market operates on the law of large numbers, whereas Big Data contradicts the mutualisation principle of insurance. It may seem strange that actuaries are interested in Big Data. There’s a split here between profiles and generations: the older generation are oriented toward the design and pricing of products and are not very interested in Big Data, while the younger generation of actuaries, with a profile attracted to modelling, view it as an opportunity to break new ground,”* Carine Ollivier says.

THE INSTITUTE OF ACTUARIES (IA), THE GUARANTOR OF THE PROFESSION

Despite the recent developments observed by actuaries, the profession remains privileged and does not suffer from unemployment. On the contrary, there is even a shortage of these “risk technicians”, and specialist recruitment firms are desperate to get hold of them. *“The IA manages to regulate the labour market very successfully. Its assessment and salary grids are commonly applied by actors in the sector. The market and corporatist effectiveness of the IA does not require legislative intervention, despite its demand for the ‘fit and proper’ character of actuaries to be recognized in order to guarantee their Independence and responsibility,”* Carine Ollivier says. Given this situation, although many professions are deregulated, actuaries enjoy a positioning and status that is envied by other professional groups. ●

Key points

➤ Paradoxically, although the actuarial profession is not regulated in France, it is very well positioned in the labour market. The profession thus constitutes an interesting laboratory case for understanding the functioning of professional groups.

➤ Thanks to Solvency II, actuaries enjoy a strong position that allows them to take on the risk management of insurance companies. On the other hand, in the emerging field of Big Data, their position is more precarious, with competition from various profiles (computer scientists, mathematicians, physicists, etc.).

➤ The Institute of Actuaries plays an important and effective role in participating in the regulation of the labour market of the actuary profession.

“SOLVENCY II IS OVERLY PROCYCLICAL”



Virak Nou is a partner and head of the life business of Actuaris, which specializes in actuarial advice to insurance companies. As an actuary and a specialist in modelling and valuation, Virak Nou is an informed observer of the regulatory changes that have taken place in the sector in recent years. In addition to his professional duties, he has also participated in the work of the PARI Research initiative, which led to the drafting of the paper *Contrats avec PB et régulation procyclique: inéluctabilité, avantage, inconvénient*. For the ILB, he returns to the main conclusions and recommendations of the paper, which was co-authored by Sylvestre Frezal and Eléonore Haguet.

ILB: Why does Solvency II increase pro-cyclicality for life insurers?

Virak Nou: First of all, let's not forget that Solvency I was also a pro-cyclical regulation, even if it was less pronounced. Solvency II is more procyclical for two reasons. First, the required capital is supposed to be risk based, which implies fluctuations. Conversely, under the old regulation, the required capital amounted to 4% of the technical provisions. As a result, Solvency II capital requirement is higher today than it would have been in the early 2000s, as the current economic situation is less favourable. Secondly, Solvency II introduced the idea of the expected value (future margins) of life insurance contracts. Life insurers now include these margins in their balance sheets, which in particular allow them to cover capital requirements. However, in the present gloomy economic situation, the expected profits of life insurance policies are zero, or even negative, which increases companies' capital need, whereas in the early 2000, this same activity would have generated positive margins which would have reduced the required capital.

That's why you concluded that Solvency II excessively rewarded favourable situations...

VN: Exactly. When the economy is doing well, as in the early 2000s, companies are prompted to offer a large number of life insurance contracts. However, if the situation is reversed and the economy deteriorates, these same

subscriptions penalize the actors in the sector due to the very high capital requirement. But the economic environment changes much faster than the duration of contracts. Solvency II is overly procyclical.

So can we say that Solvency II negatively impacts life insurers' capital?

VN: It's a bit more complicated than that. Today, new life insurance policies do not come with a guaranteed minimum rate (GMR), and so are not penalising for the companies' capital requirements. On the other hand, the old policies still in force – such as those issued in the early 2000s, with a high GMR of 2-4% – involve very high capital requirements. It is these contracts which have a very negative impact on insurance companies' capital. Note also that policies from this period were already costly under Solvency I, because the French Prudential Supervision and Resolution Authority (ACPR) had decreed that insurers make provision for interest rate risk.

Is not the one-year horizon of capital requirement associated with Solvency II inconsistent with life insurance contracts?

VN: Indeed, one-year capital requirements are not suitable for life insurers with long-term commitments. That being said, this one-year principle is illusory, because in practice life insurance products are valued in the companies' prudential balance sheets until their expiry date, which in fact amounts to having a longer-term view of risks than one year.

In the event of falling interest rates, Solvency II provides an early warning. Is that the only benefit of the directive?

VN: Solvency 2 can anticipate losses more quickly on life insurance contracts, before they become effective, but this is not the only advantage over the old system. While Pillar 1 of the Directive – and its quantitative requirements – is of little relevance to life insurance policies, the two other pillars, which in particular include regular reporting to regulators and improved governance of insurers, offset the negative effects of the former. But it is mainly ORSA-type (Own Risk and Solvency Assessment) prospective exercises that will be of value for providing good visibility for the financial management of life insurers.

What measures could mitigate the procyclical nature of Solvency II?

VN: It should be remembered that Solvency I had a number of virtues, such as the valuation of assets in historical accounting and the persistence over time of capital requirements. The reintroduction of these principles (as is the case for occupational pension funds) would probably be more appropriate for the life insurance industry. ●

“THE EFFECTS OF SOLVENCY II ARE DISASTROUS”

Emmanuel Sales is the President of Financière de la Cité, a management company for third parties to institutional clients, mainly mutual funds and medium-sized insurers. With more than 30 years of experience in asset management, he has witnessed the upheavals caused by Solvency II at first hand. In this interview he describes the disruption in detail.



ILB: How do you view the overall impact of Solvency II on insurers?

Emmanuel Sales: Solvency II stems from a positivist view of the economy, which leads to the destruction of all practices and institutions within the world of insurance that constitute an obstacle to the logic of the market. Political choices are obscured by a purely technocratic approach, the economic and moral effects of which are disastrous.

Could you elaborate on these risks?

ES: The assimilation of risk to volatility obviously creates a short-term bias. As a result, many insurers switched a significant share of their equity investments to government bonds, when interest rates were at their lowest ever level. Combined with the ECB's policies to tackle attrition in the banking sector, Solvency II had a deflationary effect on the economy. At the industrial level, its provisions favour the cartelisation of the sector to the detriment of medium-sized players. Within companies, political responsibility gives way to the requirement for external conformity, in a quasi-medieval logic of compliance with standards. Europe has imposed these fetters on itself. Neither the United Kingdom (for its pension funds) nor the United States have such rules.

This directive has nevertheless been presented as a response to the financial crisis ...

ES: Solvency II was launched well before the crisis and unfortunately the regulations have not drawn any lessons from it. The crisis taught us to be more suspicious of credit rating agencies, that “value at risk” was not an absolute measure of financial risks, and so on. Curiously, Solvency

II magnifies the role of rating agencies and adopts a risk approach largely controverted by reality. In private, many actors recognize these limitations, but they are afraid of going back on their decisions and the interests at stake have become too large to change direction.

What is the biggest risk for insurers with Solvency II?

ES: The role of insurance is to mutualise and transfer intergenerational risks. Assessing the situation of a company based on the probability of bankruptcy within a one-year time frame destroys the notion of transfer of risks that is normally taken on by insurers. It would have been more logical to allow companies to cover their own risks, rather than introduce such complex regulations.

According to its originators, Solvency II was introduced to protect the insured parties. What is your opinion ?

ES: As the PARI Research initiative has shown, Solvency II is basically a reform of financial communication, which introduces a homogenization of standards on a European scale within a logic of concentration that is fully accepted by the promoters of the reform. The interest of policyholders is secondary.

The work of the PARI Research initiative suggests that Solvency II increases systemic risk.

What is your view on this?

ES: Yes, the standardized Solvency II framework for measuring insurers' risks significantly increases systemic risk, forcing all players to adopt similar investment strategies. For example, if there is a sharp rise in interest rates,

the entire sector will be subject to much more pressure than under Solvency I. It should be remembered that in Europe there have been very few bankruptcies of insurance companies. Indeed it is a business in which systemic risk used not to exist, unlike the banking sector.

What do you think of the recommendations put forward by the PARI Research initiative researchers for simplifying Solvency II?

ES: First of all, I would like to applaud the courage of the PARI researchers, in that they have raised genuine questions of epistemology and legitimacy in an area where the political and financial stakes are enormous. I think that the Solvency II will not be challenged, but that it would be possible to make some adjustments to make it more flexible. In this regard, as the Research initiative recommends, standardization of stress across all asset classes would help to promote heterogeneity in risk perception and thus reduce systemic risk. The same goes for the abolition of stochastic calculations in life insurers' balance sheets, which in their current state introduce volatility into insurers' equity capital and consequently their solvency ratios. ●

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