Risk and capital modelling 2025 hot topics

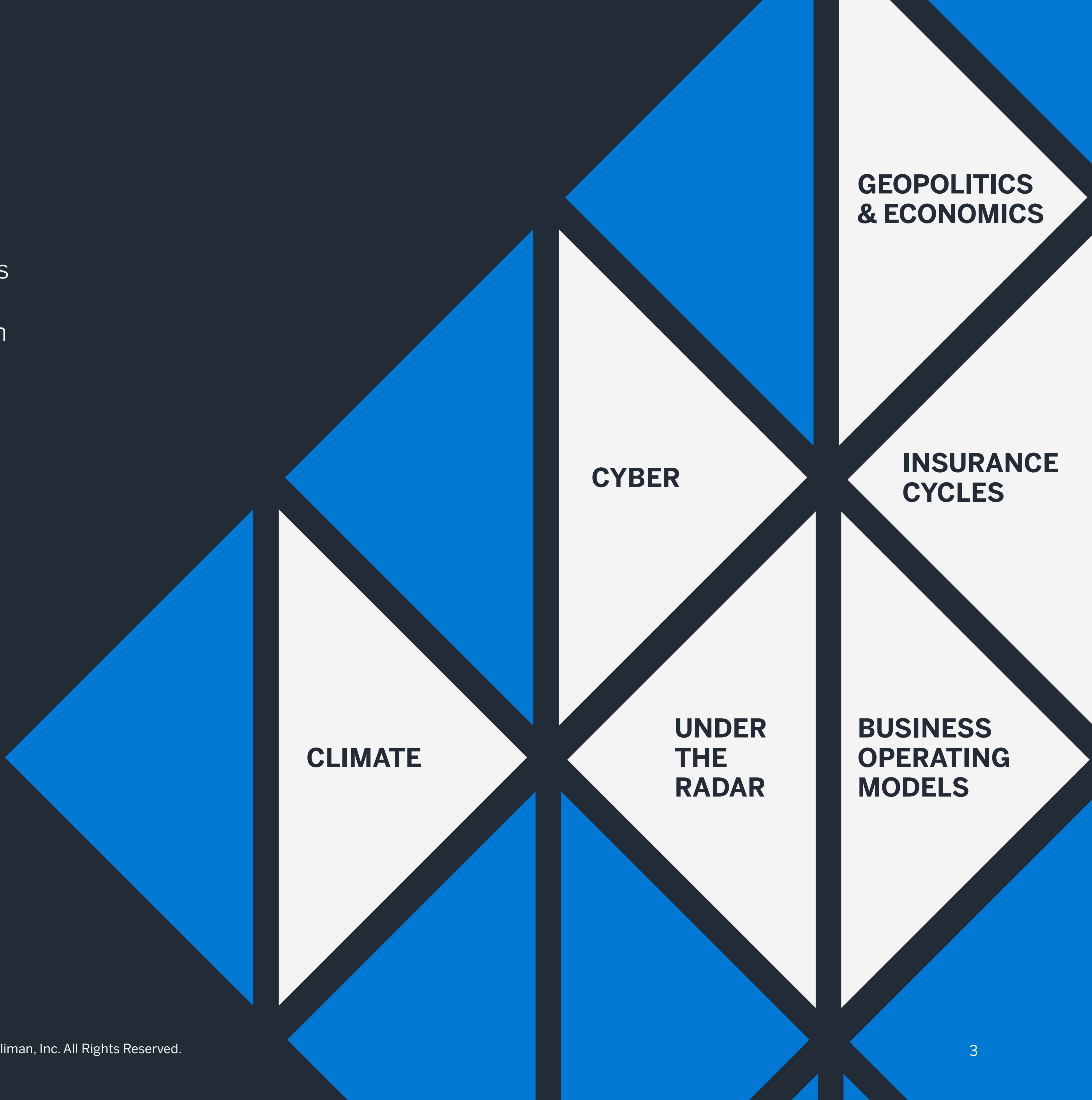
Milliman

Adapting to a world at risk

Climate change. New technologies. Political and economic uncertainty. As the world faces emerging and worsening risks, general insurers must respond.

Milliman specialises in providing our clients with a variety of risk and capital solutions. These include risk management, capital modelling, internal model validation, evaluation of strategic transactions and business planning support.

In the following pages, we present our main observations on key emerging risks and questions to facilitate decision making in the context of risk and capital management.



Climate

INCREASING FREQUENCY OF NATURAL CATASTROPHES

In 2024, global losses from natural catastrophes reached $320 billion, $140 billion of which were insured. A record 21 events resulted in losses exceeding $1 billion. In contrast, losses reached $268 billion in 2023 and $250 billion in 2022.[1] In 2020 and 2023, 17 catastrophes caused losses of more than $1 billion.

The effects of climate change are becoming more frequent and more severe. This trend was already evident at the start of 2025, when Lloyd's estimated it would lose $2.3 billion from the Los Angeles wildfires alone.[2]

Are models based on historical data still adequate for predicting future risks?

Do models account for the increased risk associated with more frequent and severe natural catastrophes?

SHIFTS IN CLIMATE REGULATION

Since President Trump took office in January 2025, there has been a shift in the US climate regulatory landscape. Climate policies are set to relax, with less regulation on the investments that the insurance companies should invest in.

In the UK, climate scenario analysis and risk management were highlighted as focus areas in the Prudential Regulation Authority (PRA)'s 2025 priorities. In particular, firms were encouraged to consider a selection of scenarios for internal planning and risk management purposes, and to articulate the limitations of their approach. From a Lloyd's perspective, feedback is awaited from the Corporation's 2024 survey of managing agents' climate risk management practices.[3]

What is your company's strategy on climate and environmental, social, and governance issues?

How might it evolve in the face of future regulatory changes?

How effectively do your models test various scenarios, and do they fully incorporate new and emerging risks?

LITIGATION

Climate-related litigation is on the rise, especially in the rapidly growing area of 'climate-washing' cases. The new US administration's reduction of environmental policies poses risks for companies that might misrepresent their new climate strategies. The Lloyd's market oversight plan for 2025 indicates collaboration with the London Market Association and the market to enhance understanding of climate litigation.

How do you monitor exposures and volatility arising from climate litigation?

Cyber

CYBER COVERAGE AND CAPACITY

The cyber insurance market continues to grow, with additional cyber catastrophe bonds issued in 2024 after their introduction in 2023.[4]. A report from Lockton Re highlights the urgent need for a government-supported cyber risk pool to address the potential for catastrophic cyber incidents.[5]

Similarly, the PRA has indicated it will continue to focus on cyber underwriting risk[6] and will set out its supervisory expectations in this area in light of market developments.[7]

How do you see cyber cat bonds or other forms of alternative risk transfer coming into play in the cyber insurance space?

QUANTIFYING CYBER RISK EXPOSURE

The challenge of quantifying cyber risks relating to small and medium enterprises (SMEs) highlights a gap in current catastrophe models, with SMEs now accounting for approximately 45% of the exposure in the cyber market.[8] SMEs are likely to be an area for growth in the market going forward due to a protection gap.[9]

Lloyd's of London and the Association of British Insurers have released a guide to provide a robust framework for (re) insurers to better define, assess and evaluate the impact of major cyber events.[10]

What challenges have you faced in parameterising the characteristics of exposure to cyber risk?

What reliance do you place on cyber vendor models?

AI AND LONG-TAIL RISKS

Artificial intelligence (AI) presents opportunities and risks that can drive demand for cyber insurance and fuel economic growth. As AI continues to evolve, bad actors may harness deepfake technology and automation tools within readily available AI software to increase fraud scalability. Longer-tail claims may arise due to additional AI litigation, on top of lengthier business interruption periods from cyber events.

On the positive side, AI has the power to protect insurers from fraudulent claims and to implement additional security and verification features. The market may demand additional security in cyber risk policies, such as coverage for AI system errors.

How do you foresee AI and technology affecting the capital intensity of different classes of business?

Geopolitics & Economics

CURRENT GEOPOLITICAL EVENTS

The insurance industry continues to feel the effects of ongoing conflicts in the Middle East and Ukraine. In particular, the Russian invasion of Ukraine has had a significant impact on aviation and marine liabilities, most notably causing uncertainty regarding the settlement of liabilities between insurers and aircraft lessors. Approximately €2.5 billion worth of aircraft remain stranded in Russia.[11]

What are the expected knock-on effects on war and terrorism coverage in the aviation and marine industries?

What are the wider impacts on other classes of business?

OUTLOOK: UK REGULATION AND GLOBAL PERSPECTIVES

The Bank of England has urged financial services firms to prioritise resilience, diagnosis and preparedness amidst growing geopolitical instability. In a recent survey, geopolitical risk was seen as the most prevalent risk to the UK financial system—the highest level it has reached compared to previous surveys.[12] One of the key messages from the regulator is that economic, financial and operational interdependencies need to be considered to maintain resilience.

Do you feel that dependencies relating to geopolitical events are adequately reflected in the capital-setting process?

What alternative modelling methods, such as ‘war-gaming,’ have you considered to support understanding of the impact of major geopolitical conflicts?

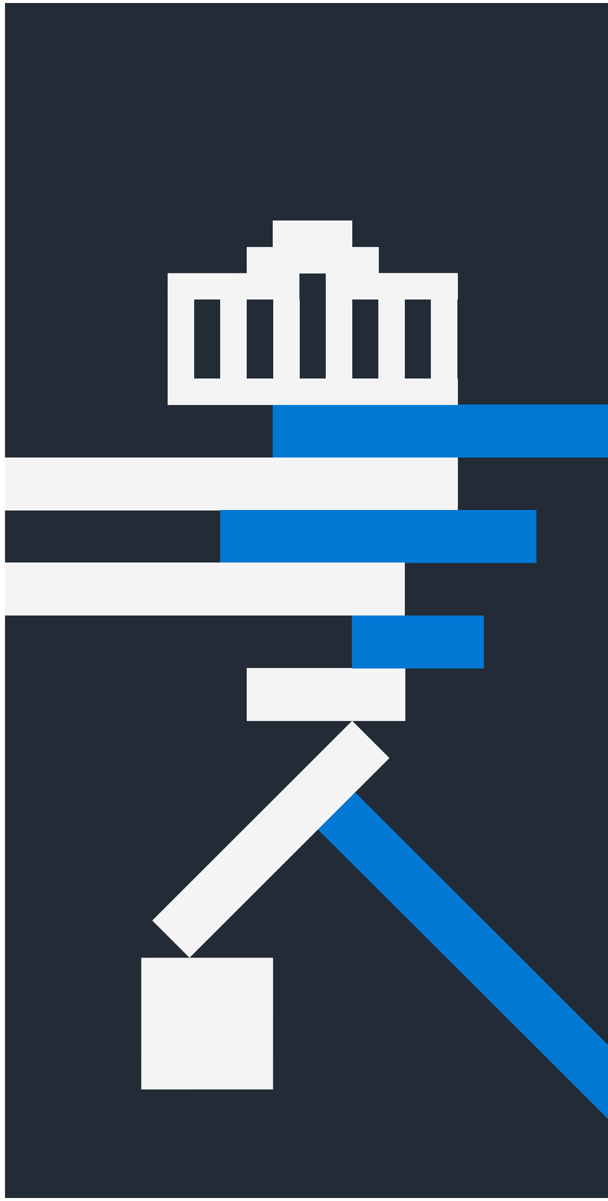
FUTURE EVENTS: US TARIFFS, MARKET RISK AND ECONOMIC SCENARIO GENERATORS

The US government’s shifting policies on international trade have roiled the global economy. While the long-term use of tariffs, and their impact, is uncertain, the short-term volatility already experienced may affect the level of market risk for insurers.

From an insurance risk perspective, research from the American Property Casualty Insurance Association suggests trade credit and marine lines could be significantly affected if tariffs are imposed at their most restrictive levels.[13] Similarly, Lloyd’s syndicates believe an increase to wage inflation could have a notable impact on rates for casualty lines.[14]

Do you feel these scenarios are being adequately represented in economic scenario generators?

How do you maintain the link between market risk and insurance risk, specifically for the lines exposed to these events?



Under the radar

Emerging exposures present a number of current issues within risk and capital management for insurance companies. Risks such as PFAS (otherwise known as 'forever chemicals'), cryptocurrency and fraudulent claims are on the rise.

PFAS

Insurers face growing challenges managing PFAS exposures, which are similar in many ways to asbestos, pollution and health (APH) liabilities: They are long-tailed and depend on ambiguous policy wording and exclusions, which direct insurers and reinsurers must address. The lack of robust historical data and volatile settlement trends present a further issue to adequately understand the exposure. Litigation is growing, especially in the United States, and affects multiple coverage lines (including general liability and D&O) and involves both large manufacturers and smaller entities.

CRYPTO

The rise of cryptocurrencies presents unique risks and opportunities for the insurance industry.[15] Traditional property and specie policies often exclude or insufficiently address digital assets, creating coverage gaps when wallets or tokens are compromised. Cyber insurance faces heightened exposure to hacking and ransomware events, while financial crime and fidelity lines contend with fraud and theft that are difficult to trace due to the pseudonymous nature of blockchain. From a regulatory perspective, there are evolving global regulatory frameworks (such as 'know your customer') which demand close monitoring to keep policies compliant and agile.[16,17]

FRAUD

There has been a noticeable uptick in fraudulent claims in recent years. For example, in personal lines such as pet or motor insurance, some claimants may fabricate higher veterinary bills or exaggerate costs of repairing vehicles. As insurers rely on accurate data and information, there have been concerns that misinformation and disinformation present an emerging risk, particularly in the context of digital transformation and the rise of AI.[18] There is some evidence to suggest that the significant rise in fraudulent claims has been worsened by misinformation.[19]

What is your process for understanding and incorporating emerging risks into your capital model?

Are these simply captured within ENIDs, or are additional frameworks employed?

Insurance cycles

REGULATION

Insurance carriers face various risks in a softening market, notably the risk of missing plan and of seeing an unexpected weakening in solvency position. The PRA and Lloyd's have stated their intentions to monitor how firms navigate the cycle.

How do you think this affects the PRA's 2024 supervisory priority on the optimism of business plan profit in the context of capital setting?[20]

FEATURES

Given that the typical features of a softening market can be hard to measure in time to take effective mitigating steps, it is important to reflect on lessons learned and the differences from previous soft cycles. For example, in the 2010s there was a sustained period of low inflation and low interest rates, in contrast to today's inflation and interest rate volatility.

How do you think the cycle will vary by line of business?

PREPAREDNESS

New capital continues to be attracted to insurance markets, with much of it deployed through managing general agents (MGAs). The underwriting discipline and risk appetites of these new participants will be tested in the coming years. It is uncertain how pipeline capacity will be affected as this unfolds.

Reserving effects also may emerge. Carriers with robust case reserves and good governance around their claims handling may fare better through the cycle.

How do you use underwriting strategies and pricing actions to navigate the cycle?

How do feedback loops between reserving, underwriting and pricing support the parameterisation of your internal model?

Business operating models

INCREASING REGULATION

In recent years, the growing number of MGAs in Europe has attracted the attention of regulatory bodies such as Lloyd's, the Financial Conduct Authority (FCA), and Switzerland's Financial Market Supervisory Authority. There has been a push for more specific regulations targeting MGAs. In Discussion Paper 24/1, the FCA highlights possible risks of multiple firms co-manufacturing products and suggests more regulation on who holds the 'sole responsibility' for compliance with products, outlining ways the supervision could work.[21]

Are MGAs equipped to handle upcoming regulatory changes and increased scrutiny over their business operations?

How can carriers prepare for possible changes?

TECHNOLOGY

About 80% of MGAs have invested in technology or insurtech, compared to 55% of traditional carriers. The rapid technological evolution in the industry necessitates that MGAs and carriers alike remain adaptable by leveraging disruptive technologies.[22]

How are MGAs and insurers adapting to technological changes within the industry?

RISK MANAGEMENT

Opportunities for partnerships between traditional insurers and MGAs are expected to continue to grow as MGAs become more specialised in difficult-to-insure sectors. Consequently, the number of associated risks—such as subcontracting certain processes to 'fourth parties' and the increasing use of AI—also will rise.

What due diligence is carried out when partnering with an MGA as part of your risk management strategy?

ATTRACTING AND RETAINING TALENT

The Chartered Insurance Institute estimated that 25% of insurance industry practitioners are due to retire in the next 10 years, and that only 4% of young people consider a career in insurance a viable option. Shifting career preferences among younger generations, coupled with limited opportunities to upskill the current workforce in areas such as AI, threaten the industry's ability to maintain sufficient resources.[23]

Does the acquisition and retainment of talent feature in your firm's risk management framework?

How is your firm tracking this?

Understanding the relationship between risk and reward

In a constantly changing world, insurers' capital modelling and risk management strategies must consider the interrelated drivers of cyber and technology and geopolitical and climate risks. In the short to medium term, many companies will need to view these through the lens of softening market conditions and proactively navigate the cycle whilst pursuing their longer-term strategy. The emergence of new claims and the adoption of new operating models will test and challenge insurance leaders and create opportunities for those best prepared.

Milliman's experts can advise risk committees, board members and other senior leaders on the risk landscape and the right path forward.

Should you have any questions or require further information, please contact our team.

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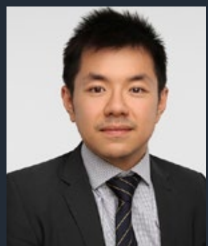

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Endnotes

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