Grant Thornton

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Capital modelling
General insurance

Annual survey results 2024

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Introduction

We are delighted to present the results from Grant Thornton's 2024 Capital Modelling Survey of the general insurance market.

We see from our survey results that insurers continue to develop their capital modelling processes and platforms to adapt to the dynamic nature of risks and regulation. It appears that the development in the sophistication of capital models may have resulted in an increase in the level of investment in model development and validation across the industry.

As we gear up for the second half of 2024, it is evident that the landscape of the insurance industry is undergoing significant transformation and evolution, prompting insurers to respond by reevaluating their capital modelling capabilities. As we navigate through the ever-changing dynamics of the global insurance market, it becomes increasingly important to gain insights into the perspectives and readiness of insurance firms in addressing critical market challenges.

The sector stands at the intersection of various forces that are reshaping the way insurers approach risk management and capital modelling. With the arrival of disruptive technological advancements, such as Artificial Intelligence (AI) and Machine Learning (ML), insurers are presented with both unprecedented opportunities and challenges in understanding and managing risks. Moreover, the evolving regulatory landscape and heightened geopolitical uncertainties are adding layers of complexity to insurers' risk management strategies. Against this backdrop, understanding insurers' perceptions and their strategies for navigating these challenges is essential for building a resilient and adaptive insurance industry.

In this survey report, we delve into the unique perspectives of insurance firms, aiming to provide a comprehensive understanding of their capital modelling capabilities and readiness in responding to market challenges. By exploring the responses of industry participants, we seek to offer valuable insights into the current state of the insurance market and the strategies being employed to navigate the complexities within the general insurance sector. We also examine how approaches have changed by comparing the responses from our latest survey to those obtained from a similar survey that we conducted in 2022, providing a deeper understanding of the evolving trends in the industry.

We extend our deepest appreciation to all survey participants who invested their time and effort to share their invaluable insights with us. In addition, a special thanks to Vaibhav Agarwal, Oscar Marshak and Raluca Stefan for all their efforts in helping to put this report together.

Thank you for your interest and support.

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Key findings

Here, we provide highlights of our finding and key takeaways from the survey.

64%

of the respondents use a Full Internal Model to calculate their Solvency II regulatory capital requirements while **19%** of the respondents use a Partial Internal Model.

54%

of the survey respondents are general insurance companies, **41%** are Lloyd's market companies, and composites and reinsurers each represented **2%**.

33%

of the respondents utilise Igloo as their capital modelling platform, with Tyche and ReMetrica are used by **26%** and **24%** of the respondents, respectively.

The majority of individuals who responded to our survey were Heads of Capital, with **59%** of respondents filling this role. This was followed by the Chief Actuary at **20%**.

41% of our respondents use RMS for their catastrophe modelling processes, whereas **30%** of the respondents use solutions provided by Verisk for the same.

We have observed a sharp decrease in the number of teams reporting into the Risk Management function, falling from **33%** in 2022 to **14%**.

50% of the respondents believe that the Solvency UK reforms will impact their capital modelling processes to some extent, with model governance cited to one of the areas most impacted by this change.

31% of the respondents use their capital model outputs for IFRS 17, an increase from **20%** in 2022. This survey also measured an additional area of utilisation, developing an own view of economic capital. **71%** of the respondents used their capital model for this.

We outline some key trends we are seeing in 2024 and what participants are watching out for.

88%

of the respondents said that they maintain a formal model validation process. Most of the respondents that do not have a formal validation process, use the Solvency II Standard Formula for calculating their capital requirements.

46%

of the participants are either very, significantly or moderately concerned about the impact of geopolitical issues on their regulatory capital requirements.

93%

of participants do not have plans to incorporate Artificial Intelligence (AI) such as ChatGPT and DALL-E into their capital modelling process.

41% of our respondents' capital modelling teams spend over 1 employee year on model validation annually.

For geopolitical risks, the escalation of the Russia-Ukraine conflict and other global conflicts trail this, with **47%** and **44%** respectively.

Adjusting parameters in insurance risk is the most popular means of capturing geopolitical risks, with **58%** of the respondents opting for this. Only **3%** of respondents license an external vendor model for capturing geopolitical risk.

Although the majority of our respondents are not using AI in their current models, **92%** of them believe efficiency to be the most significant advantage of AI.

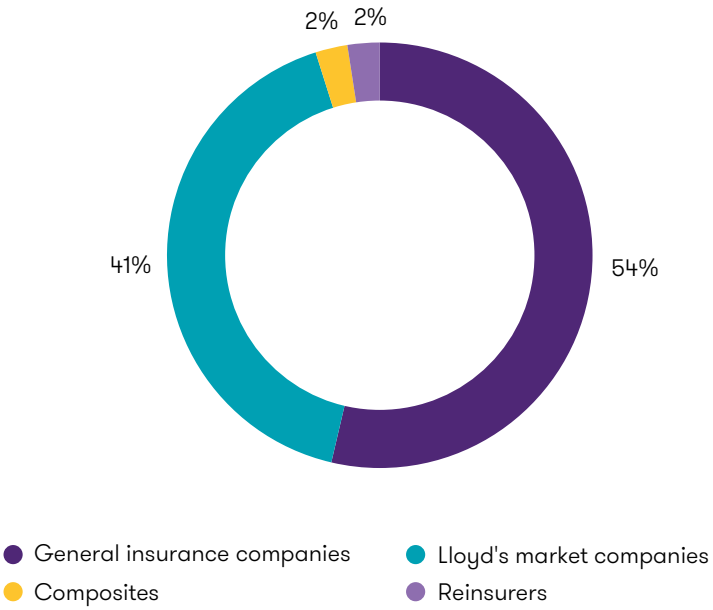
70% of our respondents state that a lack of expertise and understanding is an obstacle preventing the incorporation of AI into capital modelling. This is followed by regulatory and compliance challenges alongside data quality and infrastructure, which both stand at **60%**.

Detailed results

Here, we provide a more detailed outline of our results and the respondents of our survey.

Composition of the respondents

Fig 1: Type of company

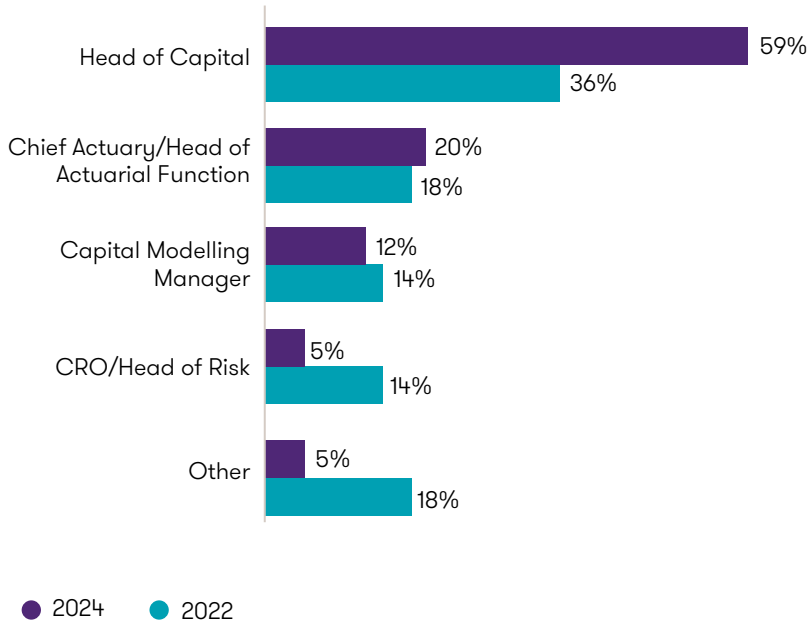


Type of company

A wide range of insurance entities were invited to participate in this survey. As shown in Figure 1, 41% of our respondents were from Lloyd's market agencies while 54% were from general insurance companies. Further, composites and reinsurers each comprised 2% of our respondents.

Please note that the composition of the respondents has changed from our previous survey, conducted in 2022. The largest share of the respondents in our 2022 survey were Lloyd's managing agencies (48%), followed by general insurance companies (44%).

Fig 2: Role within organisation

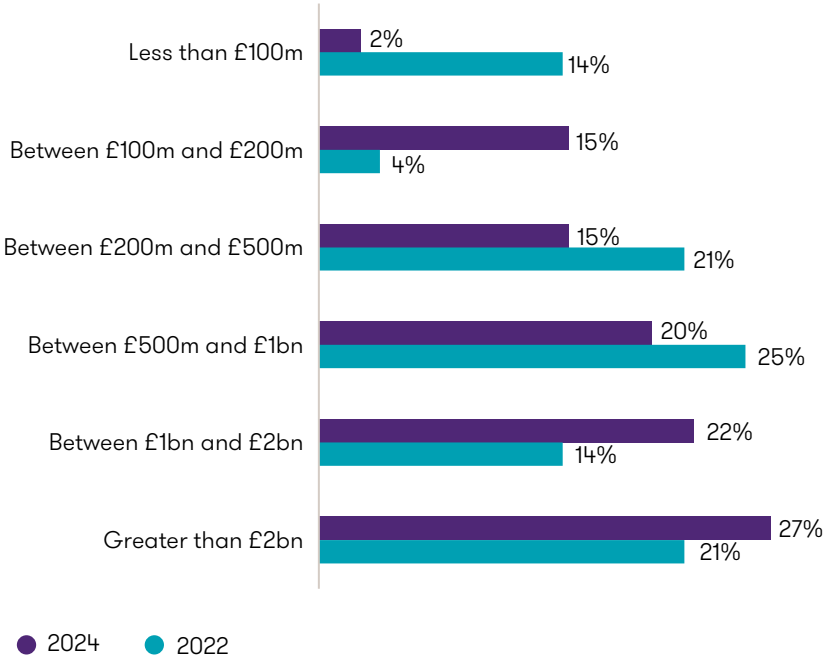


Role within organisation

Responses were received from individuals working in a range of roles including the Head of Capital, Chief Actuary and Chief Risk Officer.

This year 59% of our respondents were Heads of Capital. Approximately a fifth (20%) of all respondents were Chief Actuaries or Heads of Actuarial Functions, whilst another 5% held other actuarial roles. The remaining responses came from capital modelling managers, CROs or Heads of Risk.

Fig 3a: Net Premium Income



Size of company

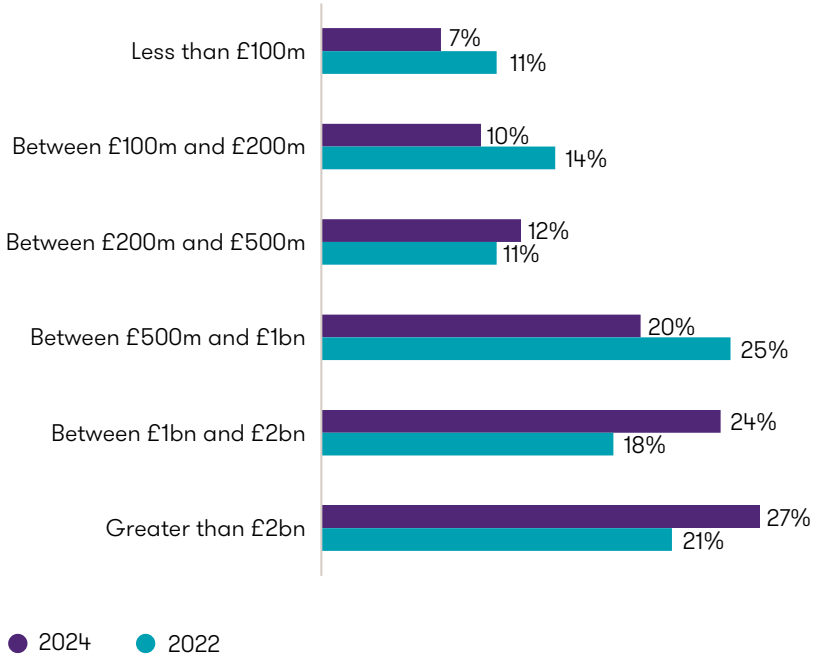
Net Premium Income

We have grouped respondents into categories based on their size.

We have done this on two bases, the first of which is annual net premium income. 17% of the respondents had net premium income of less than £200 million, approximately 34% of them had a net premium income between £200 million and £1 billion, and 49% of them had a net premium income greater than £1 billion.

When compared to our previous survey, we have seen an overall increase in the average size of our respondents in terms of net premium income.

Fig 3b: Net Technical Provisions



Size of company

Net Technical Provisions

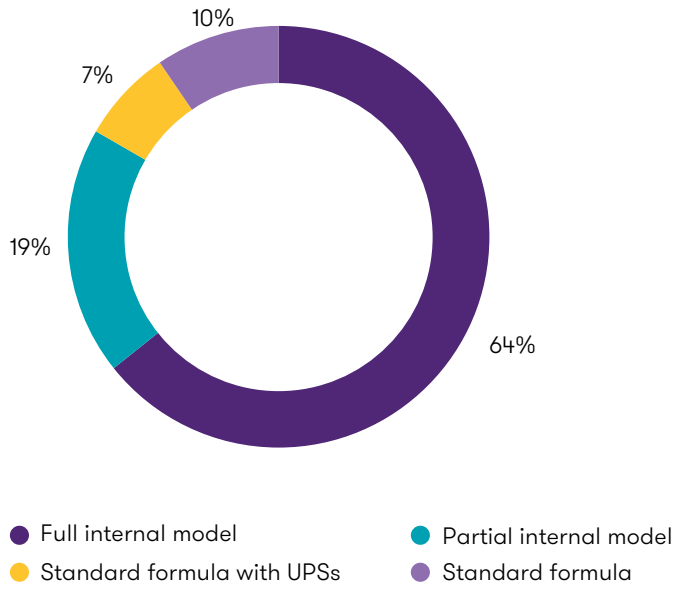
We have also grouped respondents by the level of their Solvency II net technical provisions.

17% of the respondents had net technical provisions of less than £200 million, 32% between £200 million and £1 billion and 51% greater than £1 billion.

When compared to our previous survey, we have seen an overall increase in the average size of our respondents in terms of net technical provisions.

Calculation of Solvency Capital Requirements

Fig 4: Method of calculation of Solvency Capital Requirements

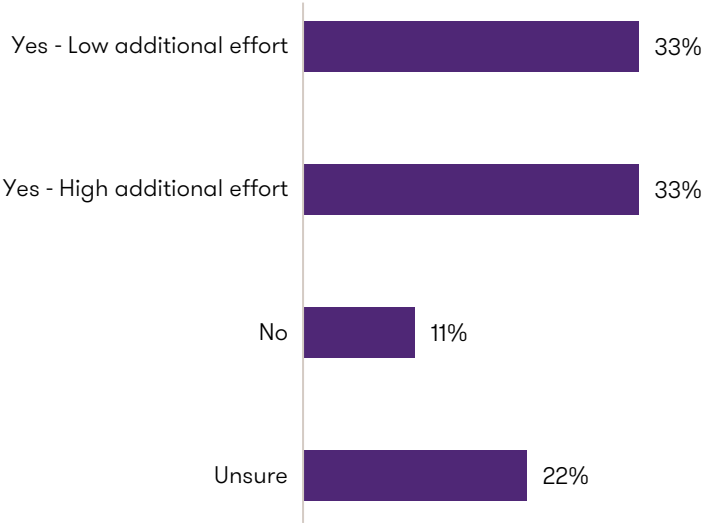


Method for calculation of Solvency Capital Requirements

64% of the respondents use a Full Internal Model to calculate their Solvency Capital Requirements, while 19% of the respondents use a Partial Internal Model. The remaining 17% of the respondents use the Standard Formula, (of which, 7% of the total respondents were using the Standard Formula with USPs).

In comparison, our previous survey found that 63% of the respondents were using a Full Internal Model, 22% were using a Partial Internal Model and 15% were opting for the Standard Formula. No respondents from our previous survey used the Standard Formula with USPs.

Fig 5: More likely to develop an Internal Model after reforms?

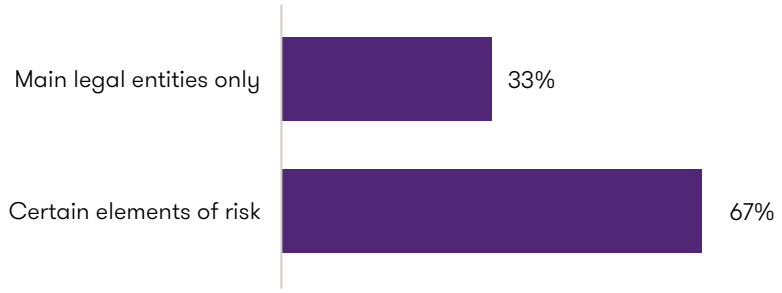


Changes in method of calculation of Solvency Capital Requirements

The Prudential Regulation Authority (PRA) has begun the process of reforming the Solvency II regime, and it intends to make it easier for companies to obtain Internal Model approval. We asked the participants currently using the standard formula if this reform will make it more likely for them to develop an Internal Model.

Figure 5 shows the responses to this question, which demonstrates that a majority of respondents currently using the standard formula are more likely to develop their own Internal Model following the reforms. However, we observed some variation within the additional effort that our respondents intend to invest in their Internal Model development process – there is an even split between respondents who expect to invest significant additional effort in model development, versus those who expect to invest relatively lower efforts. This could potentially, at least in part, be driven by the readiness of the respondents' existing capital models which have not yet been approved.

Fig 6: Areas where Partial Internal Models are used

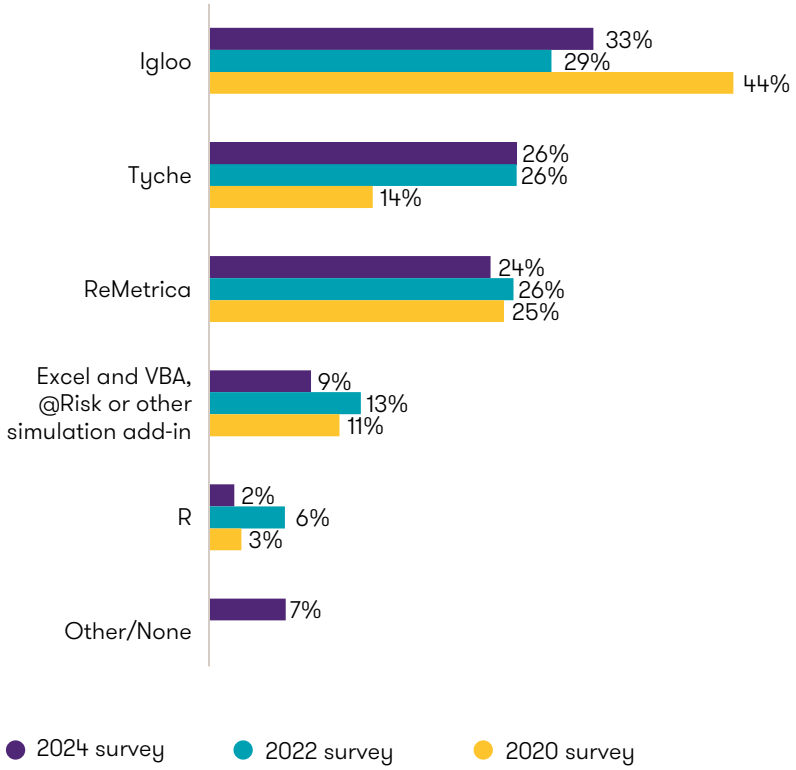


Scope of usage of Partial Internal Models (PIM)

19% of the respondents use a Partial Internal Model to calculate their Solvency Capital Requirements, while 67% of the respondents use a Full Internal Model .

Of the 19% of insurers using Partial Internal Models, 33% of insurers use it for main legal entities only, split by geography, market or nature of business. The remaining 67% used their PIM to model certain elements of a risk, such as Insurance, Market or Operational.

Fig 7: Modelling platforms used



Modelling platforms used

We asked insurers which modelling platforms they use for running their capital model. The most popular platform amongst our respondents is Igloo, with 33% of the respondents using it. The top three platforms are Igloo (33%), Tyche (26%) and ReMetrica (24%).

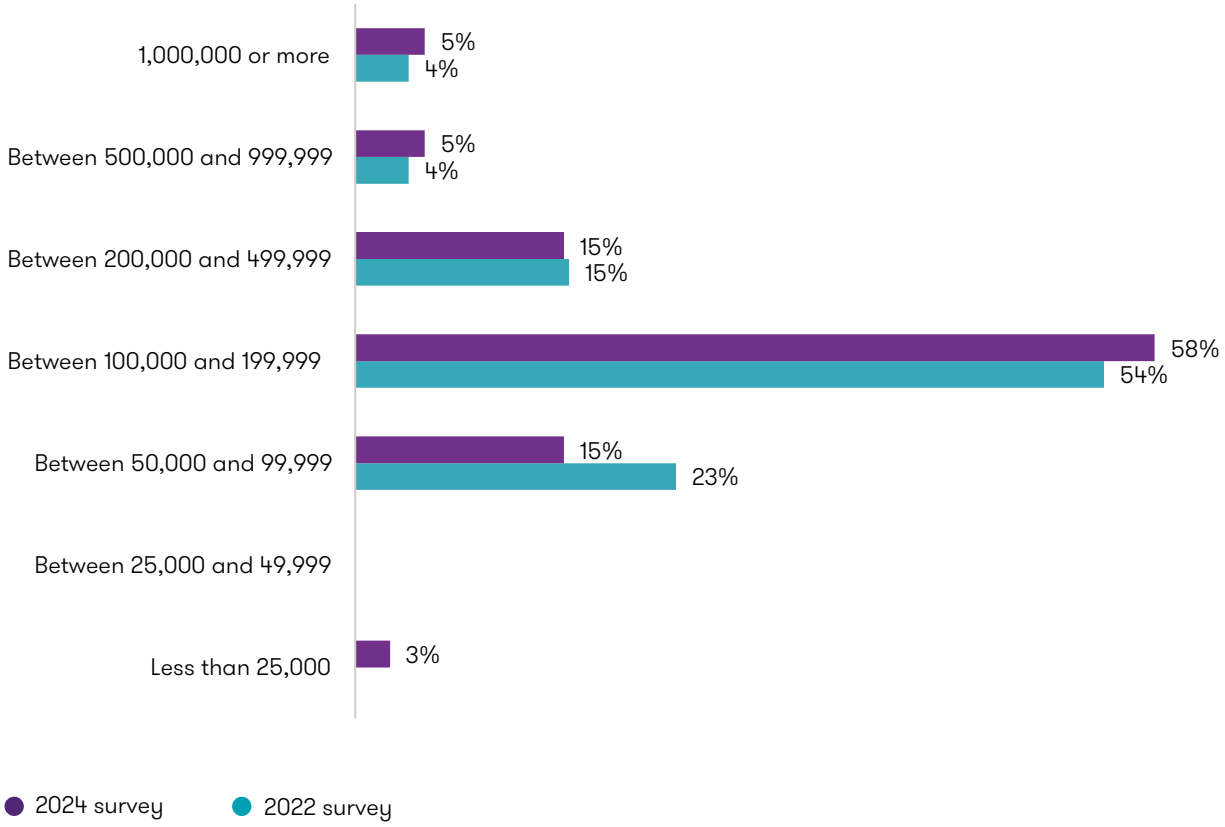
Figure 7 shows a comparison to the responses to our previous surveys, which demonstrates that the split of participants using the different capital platforms has been relatively stable between 2022 and 2024. It's clear that our respondents are favouring packaged solutions, as opposed to the use of Excel/VBA, which has further reduced. We have observed a substantial change in the type of modelling platform used since 2020. Igloo has seen a decline in popularity over the last four years, with 44% of the respondents using this in 2020, compared to 33% in 2024. The opposite is true for Tyche, which was used by 14% of our respondents in 2020 and has nearly doubled to 26% in 2024.

Number of simulations

The number of simulations that insurers run for calculating the final capital requirement varied between our respondents. This year, 73% of the respondents stated that they perform between 50,000 and 200,000 simulations while 25% of our respondents use 200,000 or more simulations.

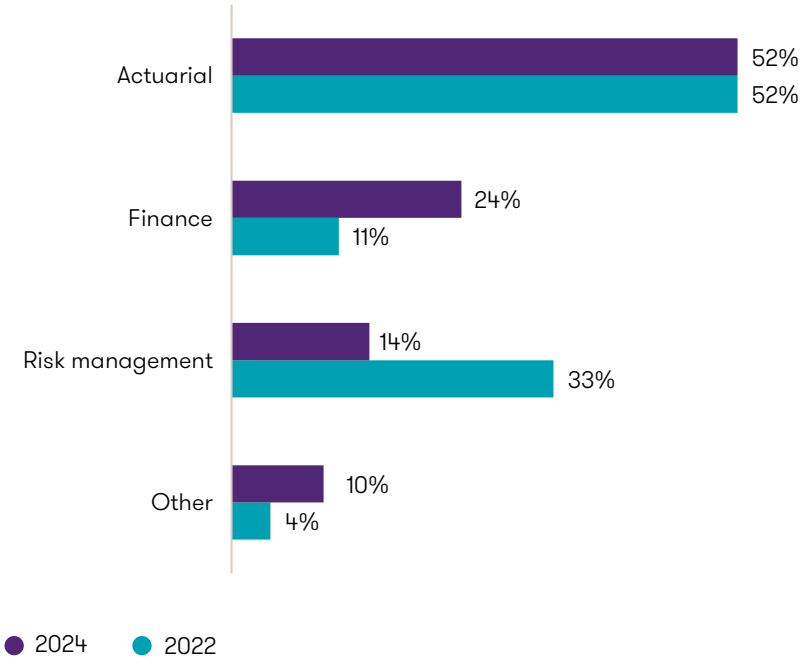
When compared with the results of our 2022 survey, we have seen an increase in the average number of simulations performed by the respondents. Most notably, the proportion of the respondents using more than 500,000 runs increased from 8% to 10%. Also, the proportion of the respondents performing 100,000-200,000 simulations has increased from 54% in 2022 to 58% in 2024. These increases can be potentially attributed to enhanced computing power, more efficient models and faster modelling platforms.

Fig 8: Number of simulations per model run



Scope and resources

Fig 9a: Business function the capital modelling team reports into



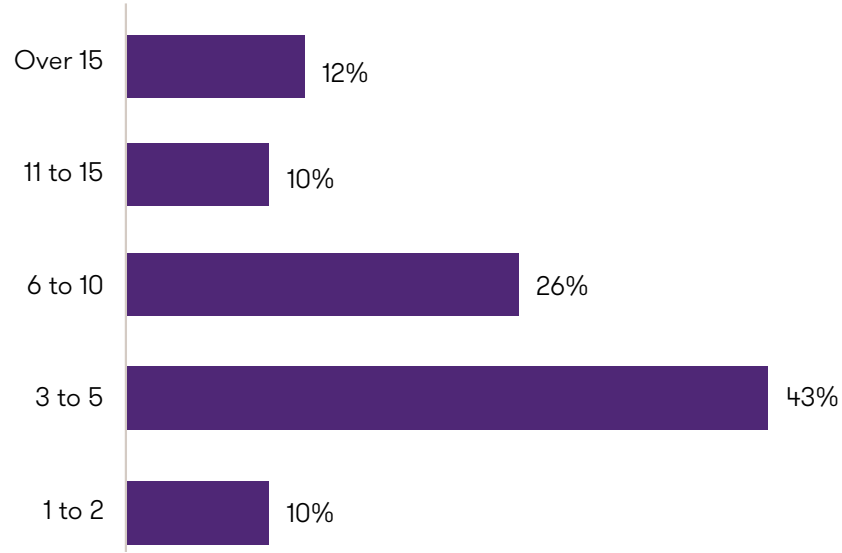
Reporting line of the capital modelling team

We asked insurers about the business function that their capital modelling team reports into. Amongst our respondents, the main business functions that the capital modelling teams report into are the actuarial function (52%) and the finance function (24%). For 14% of our respondents, the capital modelling teams report into the risk management function.

These results differ materially from our previous survey. We note that only 14% of our respondents have capital modelling teams reporting into the risk management function, as compared to 33% of the respondents in 2022. It is worth noting that, according to Solvency II, the risk management function is responsible for the Internal Model.

As compared to the previous survey, the proportion of insurers with their capital modelling teams reporting into the finance function has increased from 11% to 24%. Considering the finance function's strong understanding of, and easy access to, a company's financial data, a possible reason for this increase is the potential efficiencies that can be built into the capital modelling process. Furthermore, this allows for better alignment with the financial objectives of the company and better collaboration with the finance team (given the quantity of data from the finance team feeding into the capital model).

Fig 9b: Size of the capital modelling team



Size of the capital modelling team

53% of the respondents' have between one and five people in their capital modelling team. 26% of our respondents have between six and ten people, whilst 22% of our respondents have more than ten people in their capital modelling team. In our 2022 survey, 56% of the respondents had between one and five people in their capital modelling team and only 44% had more than six people, as compared to 48% this year. This implies that the size of capital modelling teams has, on average, increased, as shown by the shift to larger teams.

However, it is worth noting that this, at least in part, is potentially driven by the fact that there has been an increase in the average size of our respondents in terms of net premium income, as can be observed in Figure 3a of this report

Allocation of work within the Capital Modelling team

We asked our respondents about the number of employee years spent on certain aspects of capital modelling, and how these resources were allocated. We observed that most companies spend no more than 2 employee years, on average, on each of the aspects of capital modelling included in our survey. Reporting and communication is the component that insurers spend the most time on, with a little less than 75% of the respondents spending over 1 year on this area. Model parameterisation as well as the development and change of models are also significantly time consuming. The opposite is true for documentation where approximately 75% of the respondents spent less than 1 year on this area.

We also compared the average number of employee years spent by the capital modelling team members across our respondents, to our survey results in 2022. On average, capital modelling teams are now spending much more time across all aspects of capital modelling. The areas with the most notable increases are model parameterisation, and reporting and communication with growth standing at 0.62 and 0.59 years, respectively. In general, we can see a broad increase in time spent across all areas of capital modelling, which is driven by multiple factors including but not limited to an increase in risk coverage, increase in model use as well as an increased focus on model transformation such as a switch of platforms or a change from a bespoke solution to an "out-of-the-box" solution.

Fig 9c: Allocation of employee years spent by the Capital Modelling team

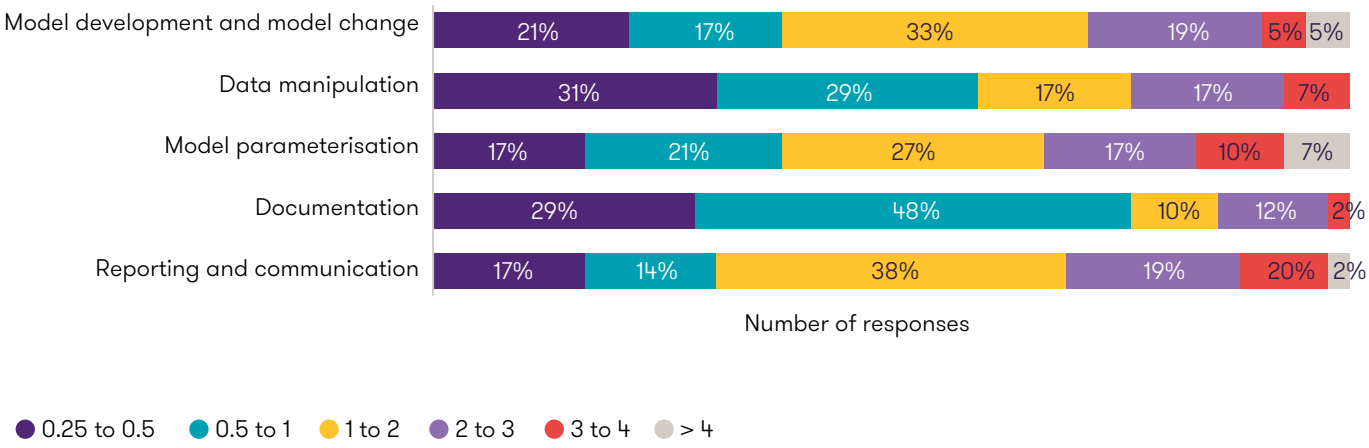
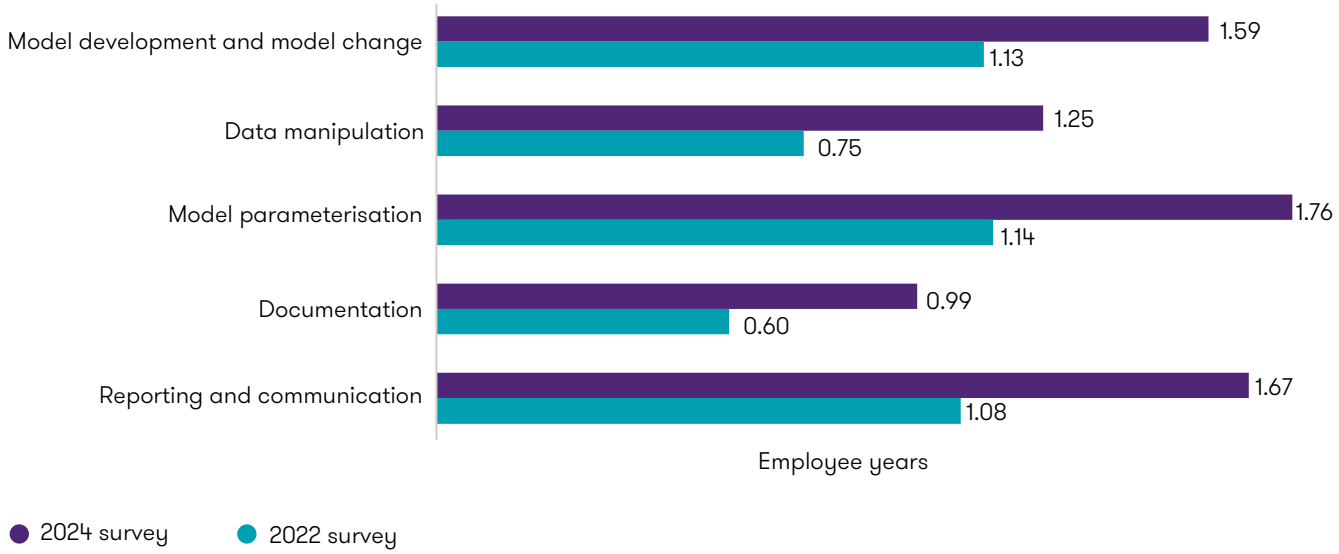


Fig :9d Average number of employee years spent on certain activities



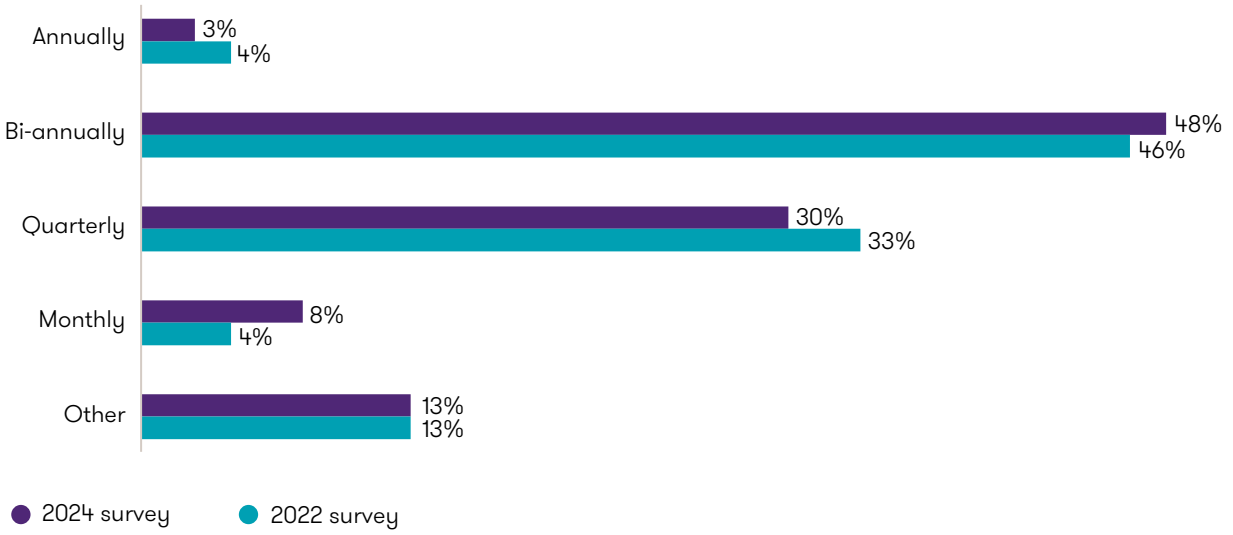
The capital modelling process

Frequency of model runs (regulatory capital requirements)

We asked insurers how often they run their model to calculate their regulatory capital requirements. Of the companies who use Internal Models to calculate regulatory capital requirements, 30% run their model quarterly, 48% run it bi-annually (every 6 months) and 3% run it annually.

When compared to our previous survey, the overall frequency of regulatory capital runs amongst respondents has increased slightly. In particular, the proportion of the respondents running the capital model monthly has increased, and whereas the proportion running the model annually has remained relatively stable.

Fig 10a: Frequency of regulatory model runs

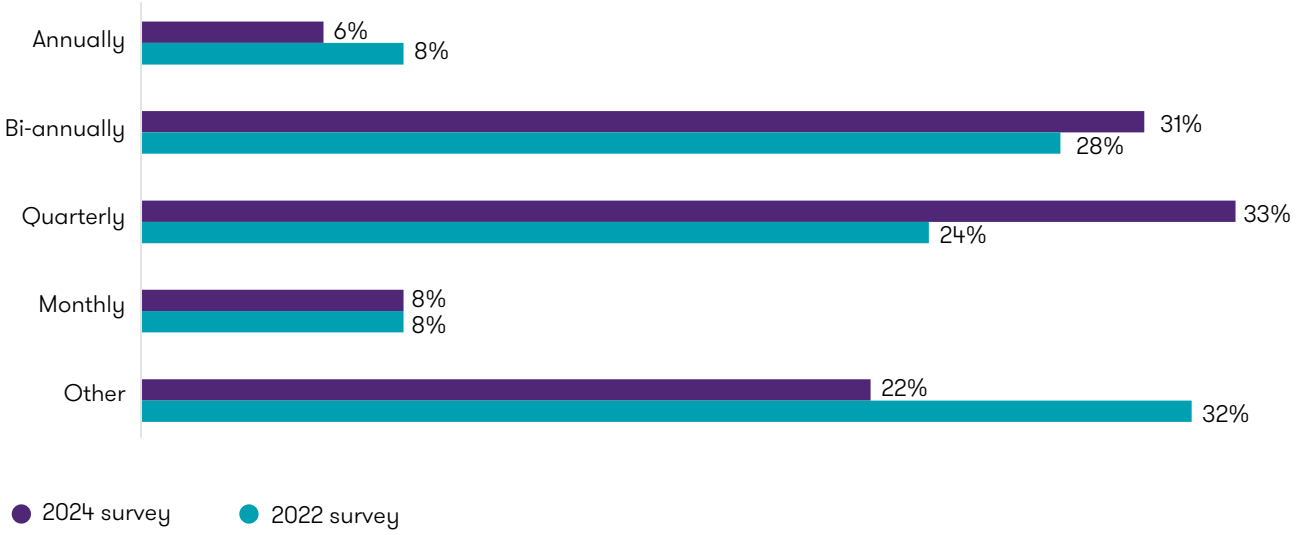


Frequency of model runs (economic capital requirement)

Of the respondents who run their model to calculate economic capital, 6% run the model annually, 31% run it bi-annually, 33% run it quarterly, and 8% run it every month.

When compared to our previous survey, the frequency of economic capital runs amongst respondents appears to have increased slightly. In particular, the proportion of the respondents running the capital model quarterly has increased to 33%. The proportion of insurers running their model monthly remained broadly stable at approximately 8%, however, the proportion of insurers running their model annually has decreased from 8% to 6%.

Fig 10b: Frequency of economic model runs

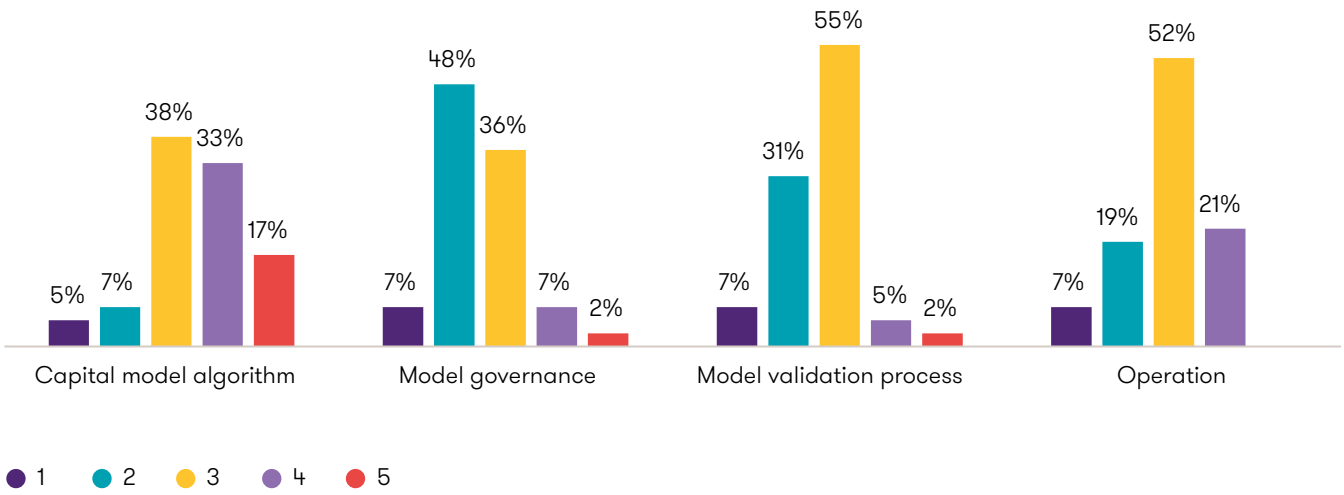


The increase in frequency in the charts above is potentially driven by an increase in uncertainty within the external environment, considering the dynamic geopolitical scenario as well as fluctuating macroeconomic factors such as inflation and interest rates.

The complexity of capital models

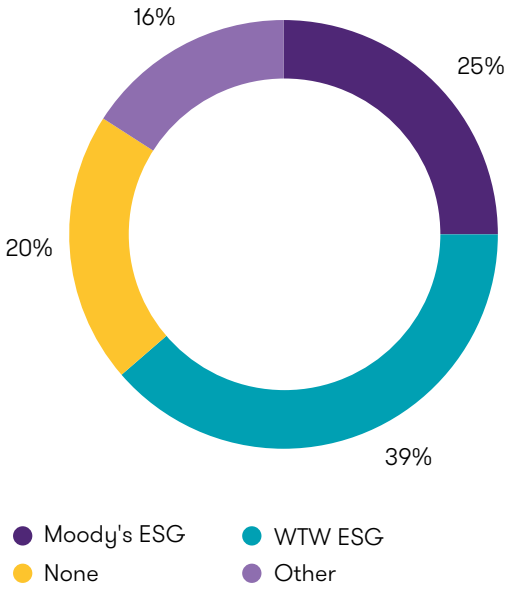
We asked insurers to rate the complexity of some aspects of their capital model on a scale of 1-5, where 1 is the simplest and 5 is the most complex. In general, the capital model algorithm is the most complex aspect of an insurers model, with a large majority of the respondents ranking their algorithm between 3-5 on the complexity scale. Most respondents ranked the operation of their model at 3, with a relatively even split of the respondents either side at 1-2 and 4. A large majority of the respondents ranked the model validation processes between 1-3, although 3 was the most popular choice. According to our respondents, model governance is the most simplistic aspect with the majority of respondents selecting a complexity rating between 1 and 2.

Fig 11: Complexity of capital models



External Models

Fig 12a: External Models used for the ESG

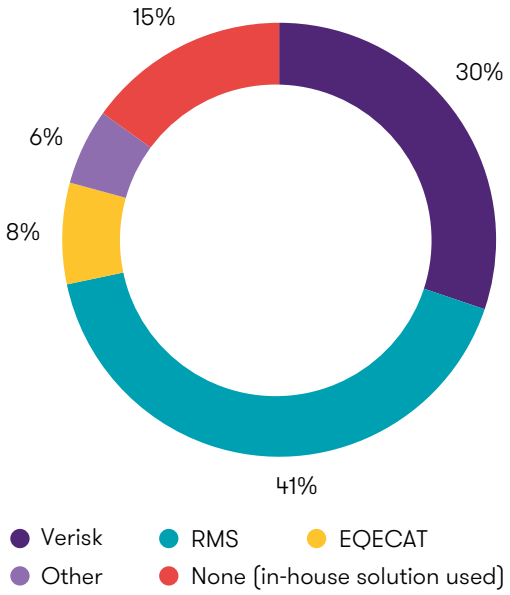


External models used for the Economic Scenario Generator (ESG)

We asked our respondents about the external model(s) they use for their ESG. 80% of our respondents used external models for their ESG. WTW appears to have the most popular ESG model, with 39% of the respondents using this, while Moody's were in second place with 25%.

It appears that insurers prefer to use an external model, either with the intent of optimising internal resources, or due to lack of in-house expertise in this area. Furthermore, a model from an external provider such as WTW or Moody's provides the insurer with robust insights into economic scenarios they need to consider as well as greater confidence in their risk management processes. It is also worth noting that the majority of firms that do not use an external model for the ESG are using the Standard Formula or a Partial Internal Models.

Fig 12b: External models used for catastrophe modelling



Catastrophe Models

We also asked insurers about the external model(s) they use for catastrophe modelling. Similar to the ESG, the majority (85%) of our respondents use external vendors for this process. RMS is the most popular choice, with 41% of the respondents using catastrophe modelling tools provided by it. It is followed by Verisk, which holds a 30% share across our respondents. EQECAT holds a smaller proportion of responses, with 8% of insurers choosing to use its catastrophe model.

Similar to ESG models, external catastrophe models will increase time and resource efficiency for insurers as well as increasing the confidence they have in their risk management process.

Capital model uses

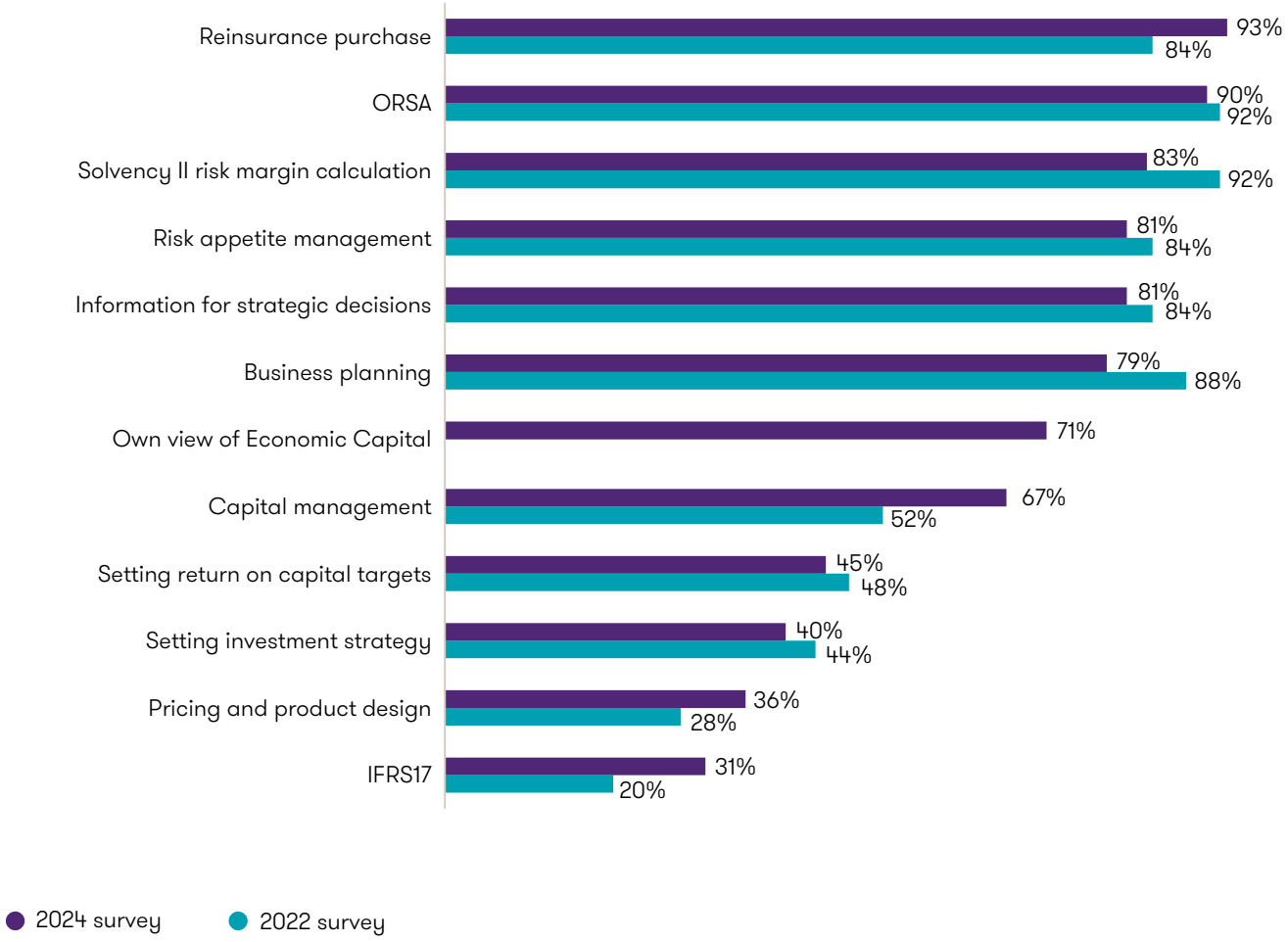
We asked insurers what they use their capital model outputs for in addition to calculating regulatory capital requirements. The most common use was the optimisation or purchase of reinsurance, with 93% of the respondents using the capital model outputs for this purpose. This was followed closely by the ORSA (90%). 83% of the respondents use their capital model for the Solvency II risk margin calculation.

Comparing the responses to the previous survey we can see that there has generally been some change in what insurers are using their capital model outputs for. Reinsurance purchase or optimisation has eclipsed ORSA and Solvency II risk margin calculation to become the most popular use of capital modelling. The proportion of insurers using the model for capital management has also substantially increased from 52% to 67%.

This year, a slightly lower proportion of the respondents said that they use their capital model outputs for determining the risk management appetite, information and strategic decisions as well as for business planning. By contrast, there were increases in the proportion of the respondents using capital model outputs for pricing and product design, alongside IFRS 17. the latter is unsurprising now that IFRS 17 has come into force.

By comparison to the previous survey, the proportion of the respondents who said that they will use capital model outputs for setting investment strategy has slightly decreased from 44% to 40%.

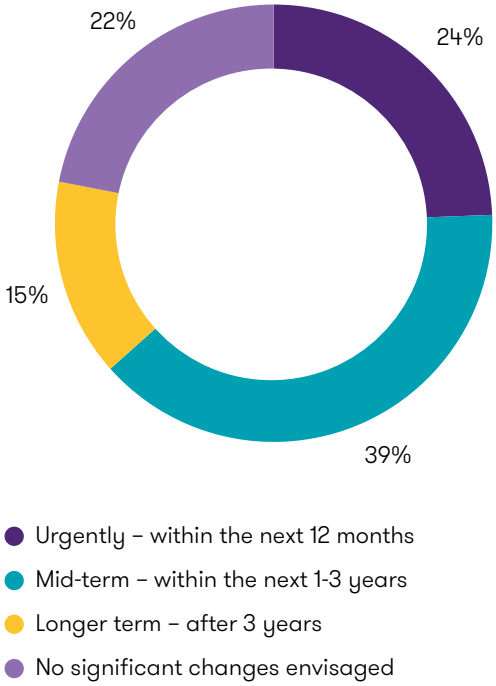
Fig 13: Capital model output uses



*Note that that the own view of Economic Capital is a new option in the 2024 survey so there are no previous figures to compare against.

Major Model Changes

Fig 14a: Re-engineering model processes

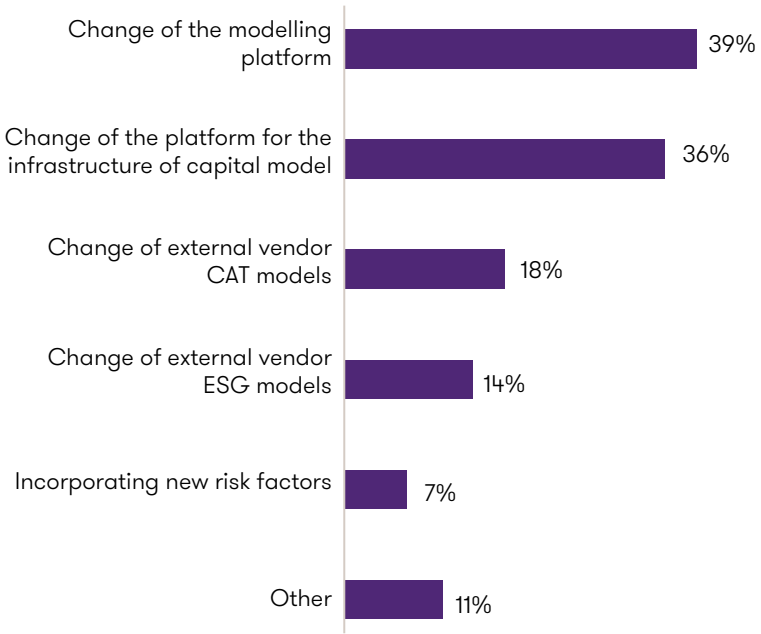


Re-engineering of modelling processes

We asked insurers how urgently they envisaged their models or modelling processes requiring re-engineering. 24% of the respondents consider their model or modelling processes to require re-engineering urgently, whilst 39% of the respondents expect to re-engineer within the next one to three years and 15% expect to re-engineer their modelling process in the longer term. 22% of the respondents do not envisage that any re-engineering is required in the foreseeable future.

These results slightly differ from those observed in our survey in 2022, in which 12% of the respondents expected to re-engineer their modelling process within the subsequent year and 40% stated that no re-engineering was envisaged. It appears that more of this years' respondents recognise that their capital modelling tools could benefit from changes to their modelling processes within the next 3 years.

Fig 14b: Aspects of significant change



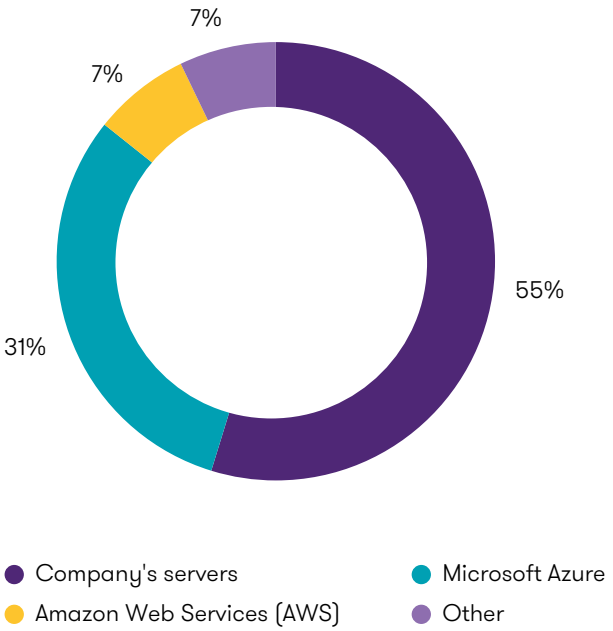
Aspects of significant change

We asked insurers envisaging a significant change to their model about the aspect(s) of the model that they think need to be altered. The area which appeared to require the most change was the modelling platform, with 39% of the respondents recognising this as a priority. This was closely followed by the platforms used for maintaining the model infrastructure (36%). Changes of external vendors for CAT and ESG models stand at 18% and 14%, respectively. The incorporation of new risk factors was less of a priority, with only 7% of the respondents recording this as an area for change.

The modelling and infrastructure platforms may require change due to the emergence of new risk factors, alongside changes in the technological landscape such as advancements in AI.

Modelling Infrastructure and Data

Fig 15a: Infrastructure used



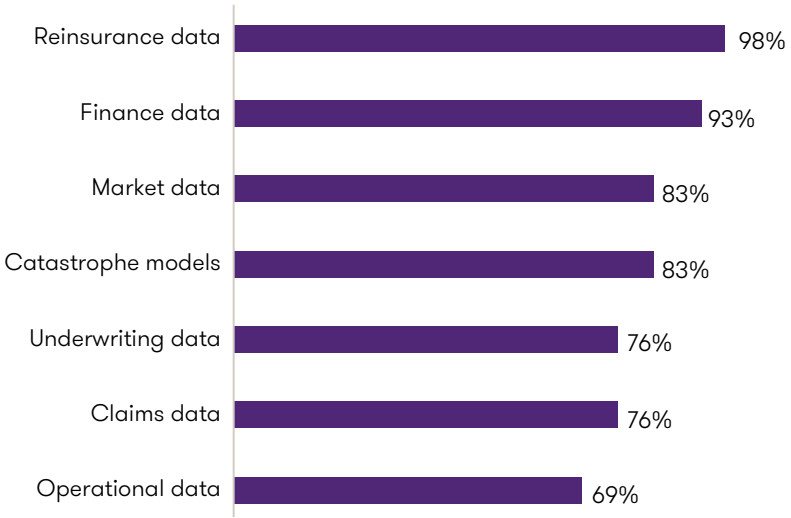
Infrastructure of capital modelling

Despite there being a range of infrastructure platforms available in the market offering cloud computing services for capital modelling, 55% of the respondents use internal company servers. The most popular external provider was Microsoft Azure, with 31% of the insurers opting for this platform. Amazon Web Services (AWS) was the next most popular, although lagging far behind Microsoft Azure with 7% of our respondents' share.

A large proportion of the insurers are using internal servers for capital modelling potentially because it aligns with legacy systems and capital modelling platforms that did not necessarily require cloud functionality. Further, it provides greater control over their data and systems, contributing to risk and security factors.

However, Microsoft Azure maintains a strong presence owing to its large data capacity, robust security features and relatively low cost.

Fig 15b: Data sources feeding into capital models



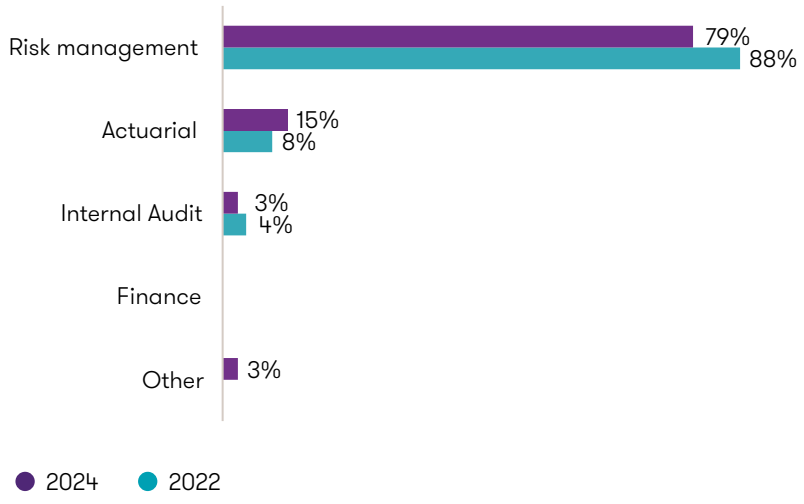
Data sources which feed into the capital model

We asked insurers about the sources of data they use as inputs, or to determine inputs, into their capital models. Almost every respondent (98%) stated that they utilise reinsurance data for their capital models. This was closely followed by finance data (93%). Both market data and outputs from catastrophe models are fed into 83% of the capital models. Underwriting data and claims data were fed into 76% of the models, and Operational data into 69% of the models.

Model Validation

88% of our respondents have a formal model validation process in place.

Fig 16a: Model validation process resourcing



Owner of the model validation process

We asked our respondents about the business function which is responsible for their model validation process.

The majority of the respondents (79%), said that the model validation process is owned by the Risk Management function, although this has decreased from the 88% recorded in our previous survey in 2022.

15% of the respondents said that the Actuarial team is responsible for model validation, almost double the corresponding proportion recorded in 2022. This could be a result of the establishment of independent validation teams within actuarial functions, who can independently validate actuarial models.

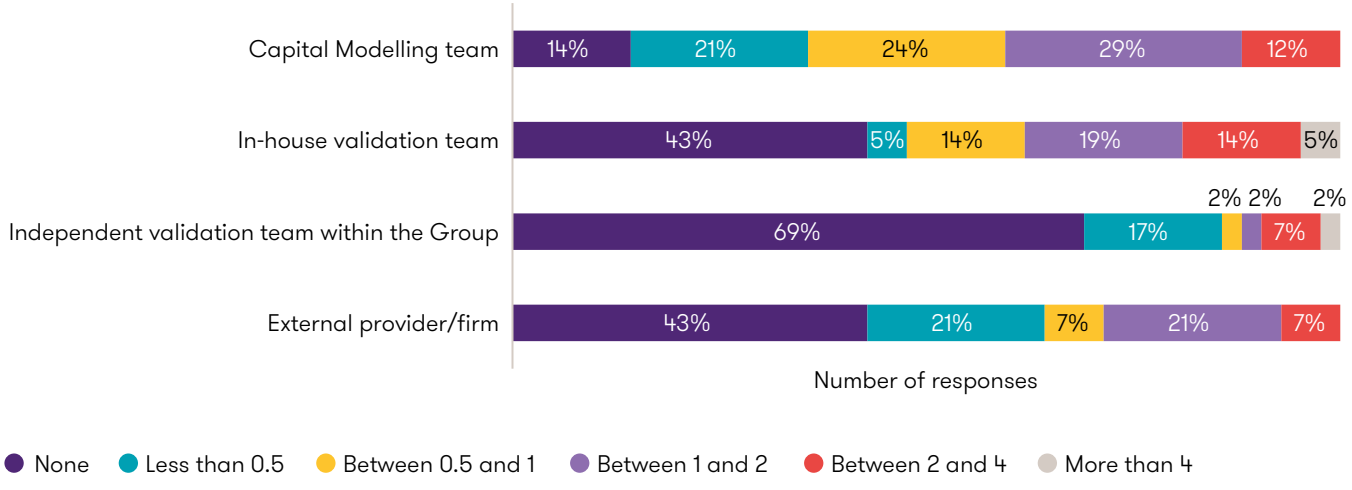
3% of the respondents said that the model validation process is owned by Internal Audit.

Number of employee years required per model validation cycle

We asked our respondents about the number of employee years required, across various functions of their business, for each model validation cycle.

The capital modelling team spends the most time on model validation with 86% of the respondents saying that their Capital Modelling team were involved in some form of validation activity. 65% of the respondents said that their Capital Modelling team spend more than 6 employee months. This was followed by in-house validation teams where 52% of respondents said that their in-house validation team spent more than 6 employee months. 69% of respondents said that they did not have an independent validation team within the firm and 13% of respondents spend more than 1 employee year. Finally, 35% of respondents said that external providers spend more than 6 months and 43% of respondents said that they did not utilise external providers.

Fig 16b: The approximate number of employee years required annually for model validation

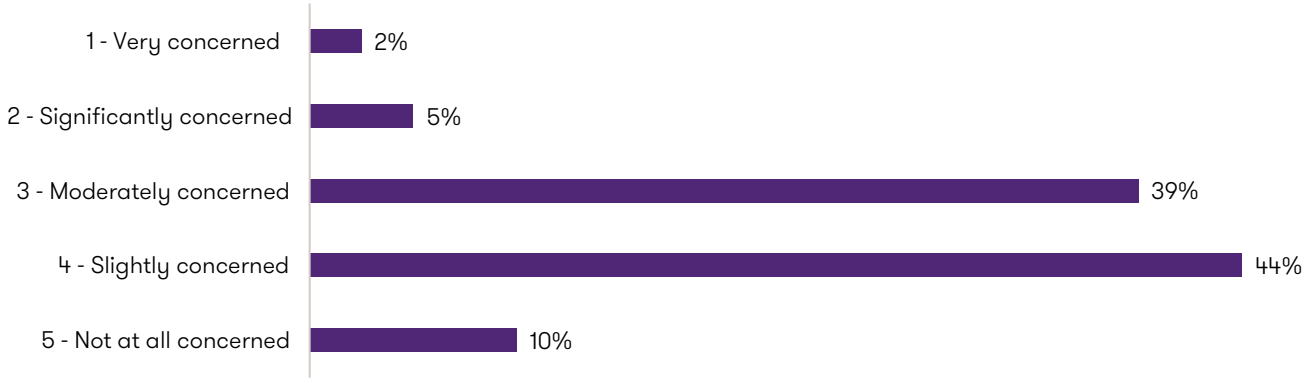


Emerging Risks and Geopolitical Issues

Level of concern over emerging risks and geopolitical issues' impact on Solvency Capital Requirement (SCR)

We asked our respondents to rank their level of concern over emerging risks and geopolitical issues and their impact on the SCR. Overall, the impact that such issues have on an insurer's SCR is not a major concern. The majority (54%) of insurers stated that they are either slightly or not at all concerned about the impact of these issues on their SCR, while 39% stated they were moderately concerned. Most notably, only 7% of the respondents informed us that they are either significantly or very concerned about such issues.

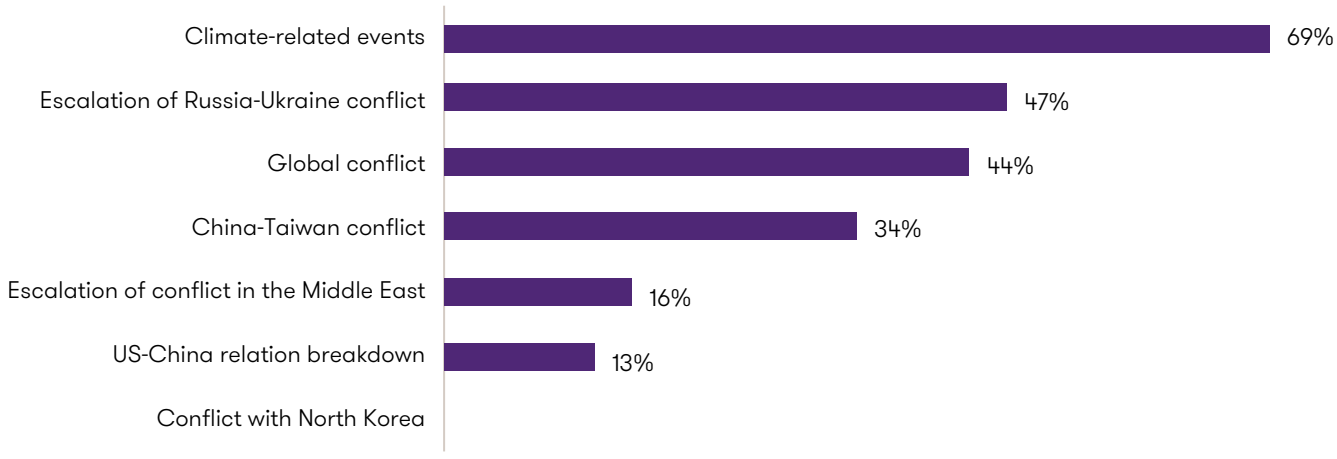
Fig 17a: Model validation process resourcing



Emerging risks and Geopolitical scenarios considered in current capital models

To gauge where respondent's concerns stemmed from, we asked them about the emerging risks and geopolitical events they have explicitly modelled for or considered in their capital models. Climate related events was the most common response, with 69% of the respondents taking this into consideration. The Russia-Ukraine conflict is also a concern for insurers, with 47% modelling for the impact of this scenario. This is closely followed by global conflict, which was stated by 44% of the respondents. Other regionalised conflicts like the ongoing situation in the Middle East and those between China and Taiwan have been modelled by 16% and 34% of the insurers, respectively. Further, a breakdown of the relationship between the US and China has been considered by 13% of the respondents, but none of the respondents have modelled for a scenario involving a conflict with North Korea.

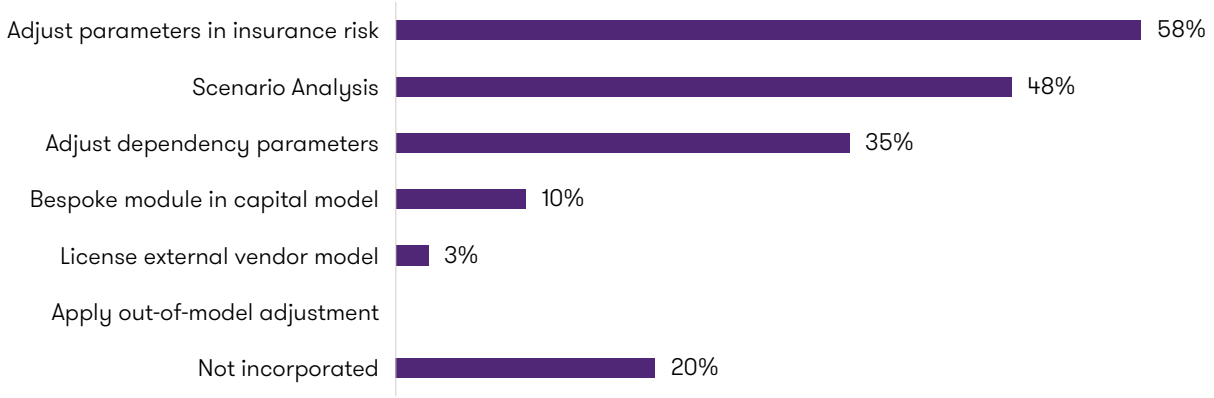
Fig 17b: Geopolitical issues included in current model



Capturing geopolitical risks

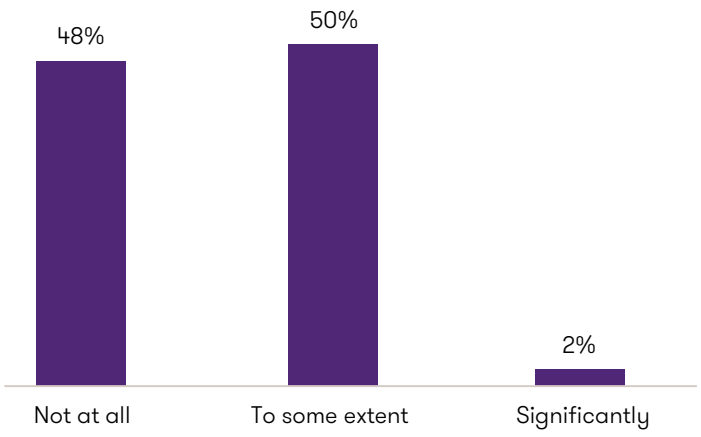
We asked our respondents to provide some detail about the methods they use to capture geopolitical risk. The most popular method used is to adjust the parameters within insurance risk, with 58% of the respondents opting for this. This method is popular, potentially, because it allows insurers to assess the likelihood of a certain crisis, while providing the flexibility to regularly update their risk models to reflect new developments. Scenario analysis trails this, with 48% of the respondents adopting this approach, which was in line with our expectations since scenario analysis is a common approach to assessing the impact of extreme scenarios. 35% and 10% of the respondents adjust dependency parameters or use a bespoke module in capital modelling, respectively. A further 3% licence an external vendor model. It's also worth noting that no respondents apply an out-of-model adjustment.

Fig 17c: Methods used by respondents to capture geopolitical risks



Reforms to Solvency UK

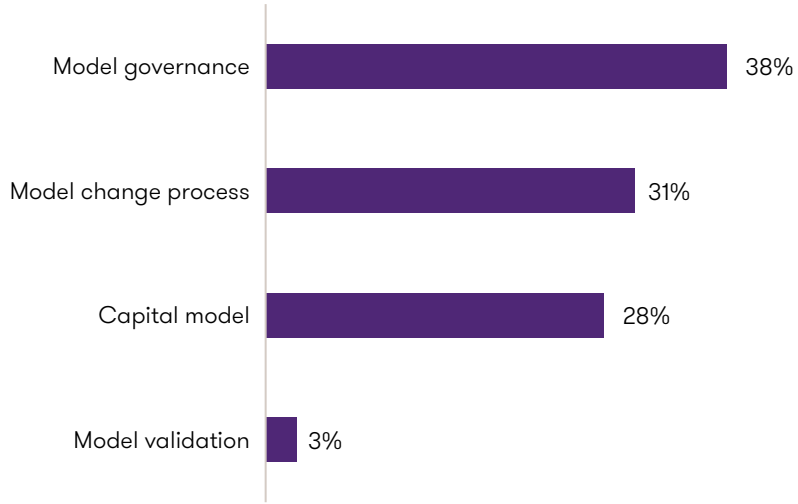
Fig 18a: Predicted impact of Solvency UK reforms



Impact of Solvency UK reforms on the capital modelling process

The PRA is working on reforms to Solvency II, to make it specific to the UK market. This new regime, Solvency UK, is now taking shape, with changes expected to come into force by December 2024. We asked our respondents about their views on the impact of Solvency UK reforms on their capital modelling process. Insurers believe that the reforms won't substantially impact their capital modelling process, with only 2% of the respondents envisaging a significant impact. 50% of the respondents envisage some impact, while 48% don't foresee any impact at all. It seems that, for the most part, reforms may not change the way that SCR is calculated, and that there won't be a substantial impact on the capital modelling process. It is worth noting that this result may be, at least in part, influenced by the fact that a majority of our respondents are using internal models to calculate their SCR. The impact of Solvency UK reforms is likely to be more material for insurers currently using the standard formula.

Fig 18b: Areas most impacted by Solvency UK reforms

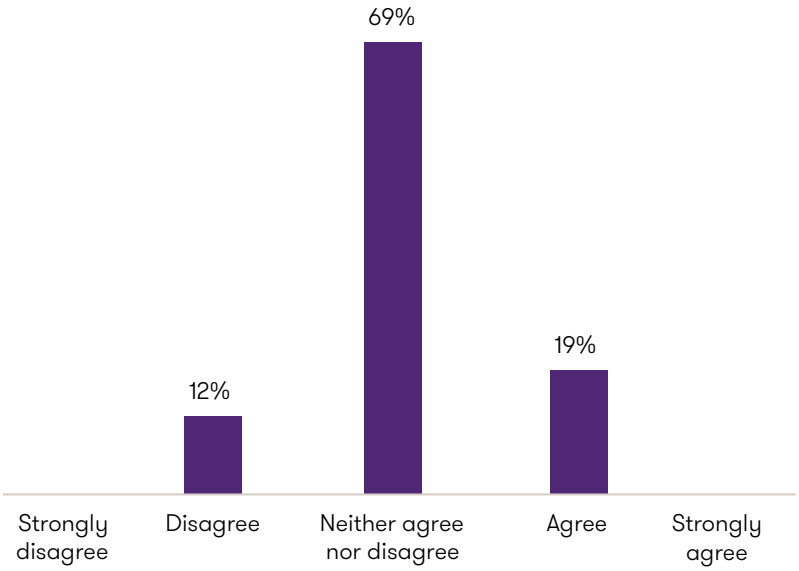


Areas affected by Solvency UK reforms

Alongside foreseeing the extent of the reforms' impact, we also asked insurers which areas they think will be most affected by Solvency UK reforms. It's worth nothing that only 3% of the respondents believed that model validation will be most impacted by this change. Potentially, the scope of change to model validation requirements within the Solvency UK reforms isn't as significant as the changes within other areas.

There is a relatively even split across the other areas. 38% of the respondents see model governance as the area which will be most impacted by the reforms. This is trailed by the model change process, with 31% of insurers predicting this as the most impacted area. Meanwhile, 28% of the respondents envisage their capital model to be most impacted by the reforms. It is worth noting that this result may be, at least in part, influenced by the fact that a majority of our respondents are using internal models to calculate their SCR. By comparison, insurers currently using the Standard Formula may have different views on the areas most impacted by the Solvency UK reforms.

Fig 18c: Opinion on whether reforms will simplify the model change/ model approval process



Simplification of the model change and/or model approval process

Generally, it appears that insurers are yet to gain clarity over whether the reforms to Solvency UK will simplify their model change/model approval process. When asked this question, 69% of the respondents stated that they neither agreed, nor disagreed with the statement. 19% of the respondents agreed that the reforms will simplify the process, while 12% disagreed. It's also worth noting that none of the respondents strongly agreed or disagreed with the statement.

We observed how AI is currently being used in Capital Management and how it is likely to evolve moving forward.

Incorporation of AI

Artificial Intelligence ("AI") has developed rapidly over the last three years, with advancements in generative AI and a significant increase in accessibility. As a result, we asked insurers whether they envisage to use AI within their capital modelling processes. 93% of the respondents informed us that they have no current plans to incorporate AI such as ChatGPT and DALL-E into their capital modelling process.

Fig 19a: Intentions to incorporate AI into the capital modelling process

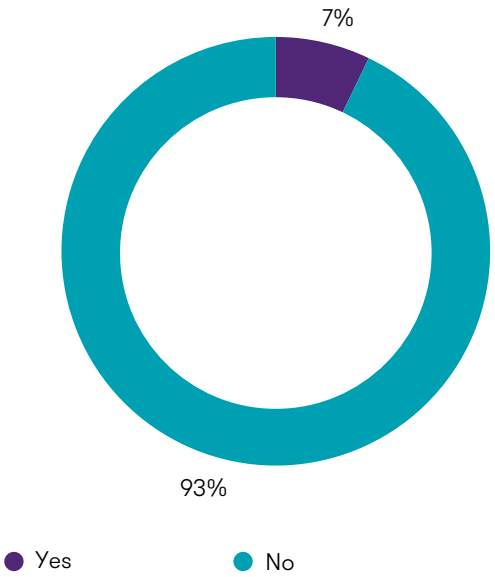
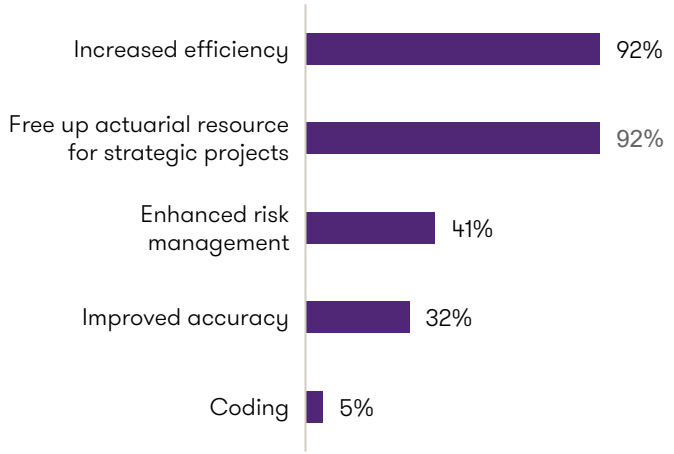


Fig 19b: Advantages of using AI in capital modelling



Top three advantages of using AI within capital modelling

It is clear that the two key advantages of using AI within capital modelling are increased efficiency and the freeing-up of actuarial resources for strategic projects, with 92% of the respondents placing these in their top three choices. Both facilitate a reduction in costs and provide insurers with more time to focus on strategic projects.

Many insurers also believe that utilising AI will enhance their risk management processes, with 41% of the respondents selecting this option. This could be attributed to AI's ability to identify patterns in data that are not easily discernible to humans. 32% of the respondents think that AI will improve the accuracy of their capital model, most likely through its ability to analyse large volumes of data and make accurate forecasts. Interestingly, only 5% of the respondents placed emphasis on the value that AI can add by assisting with coding.

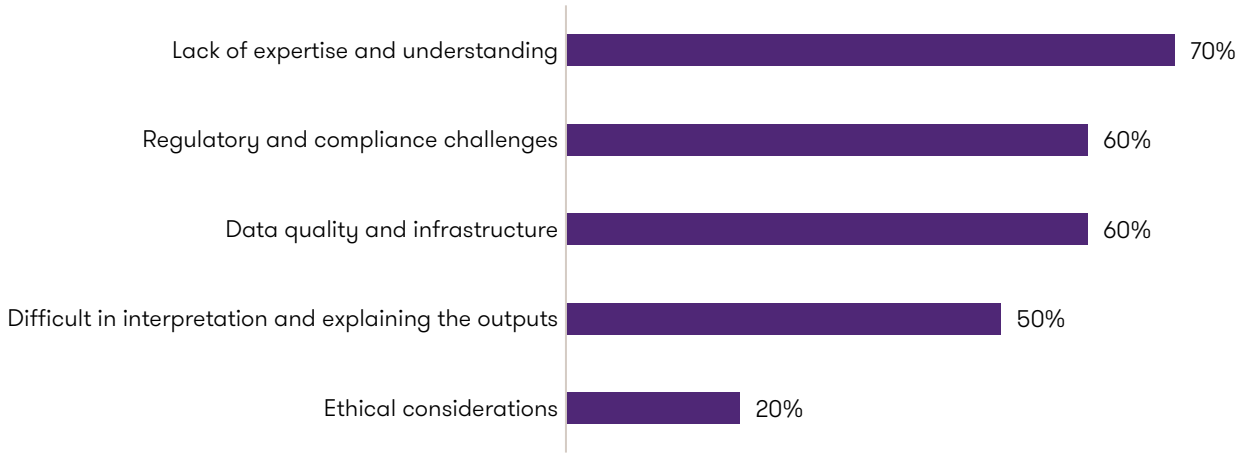
Obstacles to using AI in capital management

We asked our respondents about the main obstacles which are preventing them from using AI in their capital modelling processes. The majority (70%) of the respondents flagged a lack of expertise as the largest blocker in the implementation of AI into their capital model. Capital modelling teams will need to increase their familiarisation with using AI before it can be optimally utilised.

The next largest obstacles manifest through regulatory and compliance challenges, alongside data quality and infrastructure (60% each). Regulators have not explicitly stated how they will leverage AI in the future; therefore, insurers may be reluctant to implement such aspects into their capital modelling process due to this uncertainty. Furthermore, many infrastructure platforms used for capital modelling do not have AI-related functionality yet, rendering it difficult to include AI in capital models.

50% of the respondents expect to face difficulty in interpreting and explaining the outputs, which perhaps relates to the lack of familiarisation explored earlier. 20% of the respondents also flagged concerns related to ethical considerations, which should become clearer once regulators explicitly outline their expectations and guidelines.

Fig 19c: Obstacles limiting the use of AI in capital modelling



Concluding remarks

It is of no surprise that the nature of risks, both within the business and externally, has been evolving. Developments within regulation, policyholder behaviour and the technological environment have prompted insurers to continue to invest in the robustness of their capital modelling and model validation processes. Global risks such as climate change, the evolution of AI and geopolitical events have further strengthened this argument.

Access to higher volumes of data and better technology has enabled insurers to further develop their capital models and navigate through these risks with informed decisions. This is evidenced by the average number of employee years spent on capital model development and model parameterisation increasing by 47% across our respondents.

50% of our respondents believe that the level of complexity within their capital model algorithm is above average (>3 on a scale of 1 to 5). This could be potentially be driven by the current systems in place or just a natural evolution of capital models over time. Another indicator of increasing sophistication is the higher average number of simulations being run.

As observed in previous surveys, the level of competition in the market for capital modelling platforms continues to grow, which has driven further technological advancements. Nearly 40% of our respondents who envisage a change to their capital modelling processes, believe that this change will be driven by a transition in the modelling platform. The market continues to be led by Igloo, ReMetrica and Tyche, with over 80% of participants using these platforms to assess their capital needs.

The capital modelling teams continue to be positioned amidst multiple stakeholders, with inputs being sourced from key functions within the business such as Finance, Claims, Reinsurance and Underwriting. The results of the capital modelling process benefit a wide range of strategic and critical processes including but not limited to reinsurance purchase, investment strategy, pricing, and risk appetite management.

Regulation remains a topic driving discussions with the key stakeholders of insurers. The Prudential Regulation Authority's (PRA) Solvency UK reforms are anticipated to come into effect by the end of this year. At the time of this report, the PRA proposes to introduce further flexibility in the process for testing and/or approving internal models. Around two thirds of the respondents to our survey that do not already have an approved Internal Model believe that they will be more likely to get one approved, once the process is modified. Nearly all insurers believed that the Solvency UK reforms will have moderate to no impact on their capital modelling processes. It is worth noting that this result may be, at least in part, influenced by the fact that a majority of our respondents are already using internal models to calculate their SCR. The impact of Solvency UK reforms is likely to be more material for insurers currently using the standard formula who will find it easier to get an internal model approved.

Emerging and geopolitical risks pose a cause of concern and uncertainty, especially for insurers conducting business in multiple geographies. Nevertheless, over 80% of participants are only slightly to moderately concerned about the impact of such risks on the SCR. Key emerging risks and geopolitical risks that concerns insurers include climate change, escalation of the Russia-Ukraine conflict, or a global conflict, among others. Some popular approaches that insurers are taking towards allowing for such risks include adjusting the insurance risk parameters or dependency parameters as well as scenario analysis.

Despite Artificial Intelligence having developed rapidly over the last three years with advancements in generative AI and a significant increase in accessibility, 93% of our respondents do not have immediate plans to incorporate such technology into their capital modelling processes. Key reasons for this were the lack of existing expertise, uncertainty in regulation, and data quality issues. However, the vast majority of respondents (>90%) do recognise that such technology can help them increase efficiency and free up actuarial resources.

Our 2024 survey represents a major shift in how insurers are developing their capital modelling processes. The landscape of the insurance industry is changing massively, and insurers must evaluate their capital modelling requirements in response. To navigate the evolving dynamics of the global insurance market, it is crucial to use these insights to address critical market challenges and prepare long-term. By embracing these insights, insurers can achieve more reliable capital assessments, better risk management and increased resilience in an ever-evolving landscape. Continuous improvement and innovation in capital modelling processes will position insurers to address their future challenges in a proactive manner and seize opportunities with an expansive insight as a guide to helping you stay prepared.

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