KPMG

Model Risk Management

Current challenges and sound practice for insurance companies

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In models we trust

Models are increasingly being used in every aspect of our day to day lives. In the current COVID-19 environment statistical and mathematical models are literally everyday news, given the key role of the Irish Epidemiological Modelling Advisory Group in supporting and advising the Chief Medical Officer and the National Public Health Emergency Team, which in turn advise the Government in its response to the COVID-19 pandemic.

Financial institutions use models across a number of disciplines including business planning, calculation of regulatory capital requirements, calculations of provisions, pricing, liquidity modelling, risk management etc. Such models are currently subject to increased scrutiny given the need for real time analysis in the COVID-19 environment, in order to support key business decisions and enquiries from and reporting to regulators. Furthermore, any models utilising a proxy based approach may face additional reliability challenges of proxy based approaches as traditional rules of thumb breakdown under stressed conditions. The increasing reliance on models requires a sound model governance and model risk management framework, not only for financial reporting and key business decisions but also to ensure compliance with supervisory requirements.

"All models are wrong, but some are useful"

The above quote attributed to statistician George Box is useful to contextualise that models, however complex they may be, are by definition a simplification of real world mechanics and therefore are subject to error. As we can see in the current COVID-19 environment, we don't have the luxury of waiting for perfection before taking actions. Therefore, understanding the model risks and limitations will enable the models to be used in a way commensurate with their usefulness and to support their intended purpose.

Model risk in insurance

Under Solvency II requirements, capital and reserving models and their key assumptions are subject to rigorous validation requirements. Until recently the risks associated with the broader use of models within insurance companies outside of Solvency II valuation and capital requirements, have not received significant regulatory attention. However, the Central Bank of Ireland ("CBI") requirements arising from the first phase of their review of differential pricing places the use of pricing models in the context of fair treatment of customers in sharp focus. The CBI's recent findings on differential pricing found that many firms utilise differential pricing through advanced modelling techniques such as price elasticity modelling, retention / lapse modelling etc. However, many firms had failed to recognise and/or acknowledge the practice of price differentiation. As a result, the CBI requires firms to take responsibility at Board level for the impact of differential pricing on customers, including deployment and monitoring of models, and to be fully informed on the impact of those practices on their customers. Furthermore, the proposed Financial Conduct Authority ("FCA") remedies on UK pricing practices require regular confirmation from a senior manager that the firm's pricing models comply with the pricing remedies.

"Given the significant potential impact that model risk can have on financial results, regulatory capital requirements and customer outcomes, it is crucial for senior management to instil a robust and holistic model risk culture across the model inventory within the company, supported by a sound model risk management framework"

Jean Rea
Director, Actuarial Services & Applied Intelligence

Model risk management

The global financial crisis showed that model risk is real and can have far reaching consequences. It also highlighted that controls and governance frameworks associated with valuation, risk and other model types can be fragmented, incomplete or unreliable. Focus has now shifted to the ways in which financial institutions can prevent or mitigate such instances, for example through an effective model risk management program.

Demonstrating not only the validity of individual models but also the effectiveness of the controls covering the design, development, revision, and use of models is of paramount importance. Many organisations are struggling to meet this mandate given the size and complexity of the typical model portfolio, the increasing use of algorithms and the sophistication of underlying technologies, and the diversity of the environments in which they are used.

Model risk management framework

Establishing a Model Risk Management framework allows an entity to set out a comprehensive approach to managing and controlling model risk. Key components of a model risk framework would include:

- Principles of model risk management including objectives of the framework, model definition, model scope, definition of model risk including risk appetite, KRI's etc.
- Governance including three lines of defence in the context of model risk management, senior management oversight, clear definition of roles and responsibilities, escalation procedures, independent model validation and internal audit review.
- Model tiering and quantification including an entity bespoke classification methodology and model risk assessment across qualitative and quantitative aspects e.g. complexity and materiality.
- Model management and control including model documentation, model inventory, other model risk tools including model development and independent validation.
- Processes including model lifecycle from model development through to deployment, ongoing monitoring and stakeholders involved and their duties.
- Internal and external communication of model risk and consideration of the fast paced technological environment are also key considerations.

Benefits of having a model risk framework include:

Robust governance framework and a standardised process to be able to manage model risk.

Creation of an inventory which includes all the entity's models, taking into account their materiality / importance.

Identification of all risks associated with data, methodology, implementation and use of models.

Model risk assessment and quantification of its impact on key metrics such as profitability, operational risk etc.

Standardised reporting, risk register and controls which mitigate the risks.

Conclusion

In recent times some financial institutions have suffered significant financial losses due to inadequate models or erroneous model use. Additionally, the importance of models for business decisions is growing. As a result regulators are issuing guidelines and recommendations to control model risk management. In the insurance industry, focus on pricing model fairness extends the scope of model risk from the traditional focus of valuation and capital requirements, to assessing models through a fairness and conduct lens. As the scope of modelling and linked processes such as complex algorithms, machine learning and Artificial Intelligence is fast expanding this is a topic that will be relevant for some time across a broad range of domains.

How can KPMG help

KPMG has a successful track record of providing a broad range of financial and strategic advisory services to clients across a wide array of industries related to model risk management. KPMG's Model Risk Management approach offers a practical framework for identifying, quantifying, and mitigating model risk by addressing the sources of risk head on through:

- Model risk management framework including development of a Target Operating Model for a model risk framework.
- Model governance enhancements including model risk framework, policies and procedures, accountability of key stakeholders, senior management oversight.
- Model lifecycle management support including development, testing, deployment, independent validation etc.
- Model risk assessment including gap analysis, model risk quantification, identifying potential remediation actions.
- Technical support.

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