

Regulation and supervision of artificial intelligence and machine learning (AI/ML) in insurance: a thematic review

Introduction

Around the globe, the adoption of AI/ML is growing across the insurance value chain (eg in marketing, underwriting, pricing, claims management, etc) at varying levels of pace, sophistication, and complexity. It has significant potential to bring value to both insurers and their customers, in terms of improving operational efficiency, promoting financial inclusion and facilitating development of innovative products and services.

While AI/ML presents significant benefits, it also has the potential to create new, or enhance existing risks. The recent public IAIS Report on FinTech developments in the insurance sector¹ highlighted some of the possible supervisory concerns in relation to the use of AI/ML and Big Data by insurers. For example, operational risk in terms of data security, third-party dependency and cyber risk; conduct risk such as discrimination or unfair or biased treatment of customers; and model risks arising from flaws in design, or lack of explainability and transparency of AI/ML models.

Thematic review on AI/ML

In view of these opportunities and risks, many supervisors have increased their attention on the use of AI/ML by insurers, including identifying what, if any, changes are needed to existing regulatory frameworks and supervisory processes (eg policy, guidance, internal skills, data, toolkits) to maintain effective market oversight. A number of IAIS members have issued high-level principles or more detailed standards or guidance to complement existing legislation and address the aforementioned supervisory concerns. This is particularly the case in the area of model governance and model risk management (MRM) principles for AI/ML models, data usage and management (including fair use of alternative data), and management of third-party service providers.

Against this background, the IAIS FinTech Forum AI/ML subgroup conducted a thematic review and developed a stocktake of existing guidance on AI/ML and MRM across jurisdictions to facilitate the exchange of supervisory practices and experiences, as well as to explore whether there is a need for the IAIS to develop further guidance in this area. As part of the thematic review, the AI/ML subgroup conducted interviews in May to July 2023 with 12² supervisory authorities and international organisations which have already developed principles, standards or guidance on AI/ML or MRM. These interviews were intentionally focused on MRM, because ensuring sound end-to-end oversight of models is paramount, given the important role that models play in an insurer's operations and overall risk management framework – including marketing, underwriting, pricing, claims

¹ <https://www.iaisweb.org/uploads/2022/12/IAIS-Report-on-FinTech-developments-in-the-insurance-sector.pdf>

² We would like to thank the following supervisory authorities and international organisations for participating in our interviews: Canada Office of the Superintendent of Financial Institutions (OSFI), Chinese Taipei Financial Supervisory Commission (FSC), France Autorité de Contrôle Prudentiel et de Résolution (ACPR), Germany Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin), Netherlands De Nederlandsche Bank (DNB), Republic of Korea Financial Supervisory Service (FSS) and Financial Services Commission (FSC), Singapore Monetary Authority of Singapore (MAS), United Kingdom Bank of England Prudential Regulation Authority (BoE PRA) and Financial Conduct Authority (FCA), United States National Association of Insurance Commissioners (NAIC), European Insurance and Occupational Pensions Authority (EIOPA), Financial Stability Institute (FSI), and Organisation for Economic Cooperation and Development (OECD).

management, fraud detection and capital setting. Annex 1 contains a list of some relevant reference material in this regard.

Key findings

At the international level, the existing IAIS Insurance Core Principles (ICPs) which, by design, address the management of risk-related outcomes (rather than specific causes), continue to be applicable and appropriate for supervisors overseeing the use of AI/ML models. Further, jurisdictional laws and requirements such as on governance, risk management and consumer protection also continue to apply to AI/ML models (including those relating to model risk management, data privacy, third-party dependency and operational resilience). Therefore, AI/ML-specific policy responses across the interviewed jurisdictions tend to complement these existing requirements and place stronger emphasis on several common aspects such as on the soundness, reliability, accountability, explainability, transparency, and fairness of AI/ML models. This emphasis reflects the heightened concerns for financial regulators on undesirable results arising from the use of AI/ML if these aspects are not managed properly (eg bias, discrimination, financial exclusion, etc).

The thematic review highlighted that AI/ML-specific policy responses take a combination of different forms around the globe, including binding legislation or standards, high-level AI principles, non-binding supervisory guidance and publication of discussion papers, to enrich discourse on this topic. The policy responses across the interviewed jurisdictions are at different stages of maturity – both in terms of scope and applicability. Some are applied at a cross-sectoral level, while others are exclusive to the financial sector. Only a few interviewed jurisdictions have insurance sector-specific AI principles or guidance. Further, some measures take a technology-agnostic approach (eg setting MRM expectations on all types of models, including AI/ML-based models), while others introduce AI/ML-specific expectations. But what is clear is that all interviewed jurisdictions expect the need for continued enhancements in this area to keep pace with the rapidly evolving risks, including those arising from generative AI and large language models.

Work to develop AI/ML specific policy responses across the interviewed jurisdictions typically involves significant collaborative efforts between prudential and conduct supervisors with insurers, AI/ML-related firms and other domestic stakeholders (such as government agencies and members of academia). Multi-disciplinary or cross-industry platforms have been established in some jurisdictions to facilitate more in-depth discussions of AI/ML use cases and emerging good practices to better understand, monitor and respond to AI/ML developments in the financial sector. This would then help inform the development of AI principles or more detailed guidance that are fit-for-purpose and allow supervisors to leverage on the technical expertise of different stakeholders. Further, some jurisdictions have also established dedicated training programmes on digitalisation to address the supervisory skills and knowledge gaps.

Looking ahead

The IAIS envisions that AI/ML will remain a key focus of its work in the coming years, given its extensive impact on the insurance sector and insurance supervision. This thematic review has focused on sharing knowledge on how different jurisdictions are seeking to address potentially new or heightened risks that could arise from AI/ML through changes in policy and/or guidance. The IAIS FinTech Forum will continue to monitor developments in this area and facilitate the ongoing sharing of insights and supervisory practices that support the needs of IAIS members in developing their approach in this space. In 2024, the IAIS will also start the development of an application paper on the topic, to promote convergence and support supervisors in responding and keeping pace with these trends. In developing the application paper, the IAIS will engage with stakeholders for input and expertise on AI/ML use cases.

Annex 1: Reference material on AI/ML and MRM

1. OSFI (2017), [*Guideline E-23 Enterprise-Wide Model Risk Management for Deposit-Taking Institutions*](#)
2. OSFI (2020), [*Discussion Paper on Developing Finance Sector Resilience in a Digital World*](#)
3. OSFI (2022), [*Proposed Revisions to Guideline E-23 on Model Risk Management*](#)
4. EIOPA (2019), [*Big Data Analytics in motor and health insurance: a thematic review*](#)
5. EIOPA (2021), [*AI Governance Principles: towards an ethical and trustworthy AI in the European insurance sector*](#)
6. European Commission (2015), [*Commission Delegated Regulation \(EU\) 2015/35*](#)
7. European Commission (2019), [*Ethics guidelines for trustworthy AI*](#)
8. European Commission (2022), [*AI Liability Directive*](#)
9. European Commission (2021), [*AI Act legislative proposal*](#)
10. European Commission (2022), [*EU Supervisory Digital Finance Academy*](#)
11. ACPR (2018), [*Discussion Paper on AI: Challenges for the Financial Sector*](#)
12. ACPR (2020), [*Discussion Document on Governance of AI in Finance*](#)
13. BaFin (2018), [*Study: Big Data Meets AI*](#)
14. BaFin (2021), [*Big data and artificial intelligence: Principles for the use of algorithms in decision-making processes*](#)
15. DNB (2019), [*General principles for the use of Artificial Intelligence in the financial sector*](#)
16. Korea FSC (2021), [*Guideline on the Use of Artificial Intelligence in Financial Services*](#)
17. Korea FSC (2022), [*Plans to Promote the Use of Artificial Intelligence in Financial Services*](#)
18. MAS (2018), [*Principles to Promote Fairness, Ethics, Accountability and Transparency \(FEAT\) in the Use of Artificial Intelligence and Data Analytics in Singapore's Financial Sector*](#)
19. MAS (2021), [*Veritas Initiative Addresses Implementation Challenges in the Responsible Use of Artificial Intelligence and Data Analytics*](#)
20. MAS (2021), [*Technology Risk Management Guidelines*](#)
21. MAS (2022), [*MAS-led Industry Consortium Publishes Assessment Methodologies for Responsible Use of AI by Financial Institutions*](#)
22. MAS (2023), [*MAS-led Industry Consortium Releases Toolkit for Responsible Use of AI in the Financial Sector*](#)
23. MAS (2022), [*Information Paper on Implementation of Fairness Principles in FIs' Use of AI/ML*](#)
24. BoE PRA and FCA (2019), [*Machine learning in UK financial services*](#)
25. BoE PRA and FCA (2022), [*Machine learning in UK financial services*](#)
26. AI Public-Private Forum (2022), [*Final Report*](#)
27. BoE PRA (2022), [*Consultation Paper on Model Risk Management Principles for Banks*](#)
28. BoE PRA (2023), [*Supervisory Statement on Model Risk Management Principles for Banks*](#)
29. NAIC (2020), [*Principles on AI*](#)
30. NAIC (2023), [*Model Bulletin on the Use of Artificial Intelligence Systems by Insurers*](#)
31. FSI (2021), [*Humans keeping AI in check – emerging regulatory expectations in the financial sector*](#)
32. OECD (2019), [*AI Principles*](#)