

From statistics to generative models

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The term artificial intelligence covers a family of techniques whose common feature is that a computer system produces outputs, such as predictions, classifications, recommendations or text, that would otherwise require human judgement. The definition adopted by the Organisation for Economic Co-operation and Development in 2019 and revised in 2023 describes an AI system as a machine-based system that infers from the input it receives how to generate outputs which can influence physical or virtual environments. Both the Council of Europe convention and the European Union's AI Act have taken up this wording in substance, which gives the concept a common core across the legal systems that matter for Basel.¹

Financial institutions have used the older members of this family for a long time. Credit scoring based on logistic regression became standard in consumer lending in the 1980s and 1990s. Actuaries have applied generalised linear models to insurance pricing for decades. Fraud detection in card payments has relied on neural networks since the 1990s. Machine learning methods such as gradient boosting and random forests entered risk management and transaction monitoring in the 2010s, because they detect patterns in large data sets more precisely than fixed rules.²

Generative models differ from these predecessors in two respects that matter for financial services. They work with unstructured information such as contracts, emails, research reports and recorded conversations, which make up most of the knowledge of a bank or a law firm. They are also general-purpose systems, trained by a small number of providers at great cost and then adapted by thousands of users for their own tasks. The first feature explains their rapid adoption in the back and middle offices. The second explains why supervisors worry about concentration, dependence and the limited ability of users to understand how the systems reach their outputs.³

1 Notes

1. OECD, Recommendation of the Council on Artificial Intelligence, OECD/LEGAL/0449, adopted 22 May 2019, definition revised 8 November 2023; Art. 3(1) Regulation (EU) 2024/1689 (AI Act); Art. 2 Council of Europe Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law (CETS No. 225). To be verified. ↩
2. On the history of statistical and machine learning methods in credit scoring, insurance and fraud detection, see the overview in Financial Stability Board, Artificial Intelligence and Machine Learning in Financial Services, 1 November 2017. To be verified. ↩
3. On the characteristics of foundation models and their implications for financial institutions, see BIS, Annual Economic Report 2024, Chapter III, "Artificial intelligence and the economy: implications for central banks", June 2024. To be verified. ↩

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