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THE BANKING RISK OF AI EXPLANATION

Front Cover: *AI Bank*
(*Author's AI Agents*)

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Table of Contents

Title: The Banking Risk of AI Explanation

Abstract: Artificial Intelligence brings significant benefits to banking, but also introduces novel risks, such as the requirement that decisions made by complex machine learning systems and deep neural networks be adequately explained to humans. This work offers a multifaceted view of the topic, harmonizing the legal frameworks of Data Protection and Artificial Intelligence, the background of systems engineers, academic contributions from the computing community, and banking risk management under Basel III and the DORA Regulation, suggesting the idea of the Five Beacons *as a structural model for explanation to strengthen the protection of financial customers (and citizens at large) against the machine.*

Keywords: Artificial Intelligence; Explainability; Banking; Risk.

I

BANKING AND ARTIFICIAL INTELLIGENCE

Aligned with its essential mission of gathering the most reliable information to make optimal decisions, the banking industry has consistently embraced breakthrough technologies, provided that they have not induced new risks or undermined well-established methodologies and processes.

The history of financial institutions is, in many aspects, the story of how technological innovation has enhanced an economic activity of paramount importance to the progress of nations[1]. Among the milestones are the Italian invention of the bill of exchange in the 12th century, with its remarkable abstraction of a complex legal transaction; the advent of double-entry bookkeeping during the Renaissance; and the establishment of branch and correspondent networks in the 17th century, recognized today as early seeds of globalization.

Mechanization in the 18th and 19th centuries brought ingenious counting and adding machines, such as the arithmometer based on Leibniz's wheel. Later, the widespread adoption of the telephone and telegraph introduced a development that radically transformed communication: the immediacy of the message. Before the emergence of fax, email, and instant messaging, information on a global scale—including financial market news—was transmitted through a network of teletype machines.

[1] Ferguson, Niall (2009). "*The Ascent of Money: A Financial History of the World*". Penguin Books.

With the dawn of the Information Age came the installation of the first computers (*mainframes*), admittedly of ungainly appearance; the automated teller machines; internal and operational digitization through online systems; the mass adoption of credit cards; and the installation of point-of-sale terminals in shops[2].

Over the past decade, the banking sector has undergone a profound digital transformation that has improved operational efficiency and customer experience. Alongside this modernization, complete with its advantages and drawbacks, other technologies have emerged to facilitate integrated information management and more sophisticated risk control.

Disruptive ideas such as Big Data, Biometrics, Cloud Computing, Smart Contracts, digital wallets; as well as Distributed Ledger Technology—primarily associated with blockchain and its derivatives, such as cryptoassets and tokens—together with emerging fields such as Quantum Computing and the universal Interconnection of Objects, are becoming decisive in reshaping the financial system and redefining banking activity.

The AI Bank

As we move through the first quarter of the 21st century, it can be asserted that, among these, none will have as far-reaching or enduring an impact on banking as the breakthrough now underway: the combination of Artificial Intelligence, Data Science, and Robotics into a single transformative framework (ADR)[3].

Artificial Intelligence (AI; *Artifiligence*[4]) means *a machine-based system that is designed to operate with varying levels of*

[2] Walker, Tim; Lucian Morris (2021). *"The Handbook of Banking Technology".* Wiley.

[3] ADRA-The AI, Data, Robotics Association (2023). "*Strategic Orientation towards an AI, Data, Robotics roadmap 2025-2027*" (May 2023). https://adra-e.eu/publications#

[4] For the sake of broadening the rather scanty linguistic stock on the topic, let's introduce a portmanteau.

autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments[5].

The reasons why AI has captured the attention of financial institutions are numerous and diverse, driven by the pursuit of higher productivity, lower costs, and greater quality and security in banking operations[6].

Properly applied, AI can optimize internal business processes, reduce costs, automate routine tasks, repurpose human resources toward higher-value activities, and increase productivity. It can enhance ICT applications by generating code from natural language, detecting and correcting programming errors, converting code between languages, and facilitating legacy system migration.

AI strengthens fraud detection by identifying anomalies in transaction patterns—amounts, frequencies, counterparties—and issuing alerts for further investigation. It refines risk modeling and management, improves anomaly detection, and supports better anticipation of market movements and customer behavior shifts.

AI's predictive capabilities enhance investment analysis, enabling more accurate and consistent forecasts in volatile markets, leveraging data aggregation from previously inaccessible sources and real-time updates.

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[5] *Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending certain Union legislative acts*. *Official Journal of the European Union*, L 2024/1689, 14 June 2024. / Also: *European Commission (2025). "Guidelines on the definition of an artificial intelligent system established by Regulation (EU) 2024/1689 (AI Act)".*

[6] Aldasoro, Iñaki; Et al. (2024). "*Intelligent financial system: how AI is transforming finance"* BIS Working Papers, 1194, Bank for International Settlements. https://www.bis.org/publ/work1194.pdf