



Artificial Intelligence in Financial Decision-Making: An Integrative Review of Applications, Governance Challenges and Future Research

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ABSTRACT

Artificial intelligence is increasingly shaping financial decision-making, particularly in predictive analytics, risk assessment, fraud detection and portfolio management. However, research on these applications remains fragmented and often gives limited attention to the governance arrangements needed for their responsible and reliable use. This study presents an integrative review of the applications, benefits and governance challenges of AI in financial decision-making. English-language scholarly publications issued between January 2018 and June 2026 were identified through Google Scholar and backward reference searching. Following title, abstract and full-text screening, 59 publications were selected and analysed using thematic synthesis. The findings show that AI can improve analytical efficiency, forecasting, risk monitoring, fraud detection and investment analysis. Nevertheless, these benefits depend on data quality, model reliability and explainability, cybersecurity, appropriate human oversight and clear regulatory accountability. The review also identifies important research gaps relating to algorithmic bias, systemic financial risk, cross-border data governance, human-AI collaboration and workforce adaptation. By examining technological applications alongside their organisational, ethical and regulatory conditions, this review offers an integrated understanding of how and under what conditions AI can support reliable financial decision-making. It concludes that AI should complement rather than replace professional judgement, particularly in high-stakes financial settings.

Keywords: Artificial intelligence; financial decision-making; predictive analytics; financial risk management; AI governance; explainable AI

INTRODUCTION

Artificial intelligence (AI) has emerged as an influential technology in modern financial analysis and organizational decision-making. Advances in machine learning, deep learning, predictive analytics, and natural language processing have changed how financial information is collected, processed, interpreted, and used within organizations (Abdelghafar, 2025; Walawalkar et al., 2026). Financial institutions, accounting professionals, investment firms, and corporate organizations increasingly use AI-enabled technologies to improve forecasting, automate financial processes, strengthen fraud detection, support risk management, and inform investment strategies (Xu et al., 2024).

Traditional financial analysis has relied heavily on manual procedures, statistical techniques, and professional judgement. Although these approaches remain important, they can face difficulties when large volumes of real-time and unstructured data must be processed rapidly. AI provides opportunities to address these limitations through automated data processing, adaptive learning, predictive modelling, and continuous monitoring (Jinka, 2025; Ranković et al., 2023). In this review, financial decision-making covers organizational and institutional activities related to financial forecasting and planning, risk assessment, fraud detection, and portfolio or investment decisions. The review considers AI applications that directly support these activities, together with the governance, ethical and regulatory conditions influencing their use. Personal financial decisions and



technical AI studies without a clear connection to financial analysis or decision-making are outside the scope of the review.

At the same time, the growing use of AI introduces important governance and ethical concerns. The literature identifies challenges relating to algorithmic bias, transparency, explainability, cybersecurity, data privacy, accountability, and the appropriate role of human judgement. Some advanced models operate as black boxes, making it difficult for users, auditors, and regulators to understand how particular financial outputs are generated (Kou et al., 2026; Shoetan & FAMILONI, 2024). Excessive reliance on automated systems may also weaken professional oversight if decision-makers treat model outputs as substitutes for informed judgement (Thakur & Sharma, 2024).

The use of artificial intelligence (AI) in finance and accounting has grown rapidly, with organizations increasingly adopting AI to support forecasting, financial analysis, risk assessment, fraud detection, portfolio management and investment decisions. Research suggests that these applications can improve the speed and efficiency of financial analysis while helping organizations identify meaningful patterns within large volumes of financial data (Xu et al., 2024; Ranković et al., 2023).

Despite these developments, the literature remains fragmented across different financial functions and technological perspectives. Applications such as predictive analytics, fraud detection, risk assessment and portfolio management are often examined separately, making it difficult to understand their combined influence on financial decision-making. An integrated review is therefore needed to bring together the reported benefits of these applications and the governance conditions required for their reliable and responsible adoption (Choowan & Daovisan, 2025; Oyeniyi et al., 2024; Belhaoua & Hanif, 2026).

A further gap concerns the governance and ethical implications of AI adoption. While existing research has demonstrated the technical and operational benefits of AI, comparatively less attention has been given to questions of accountability, transparency, fairness, explainability, data privacy, and cybersecurity. These issues are particularly important in financial environments because AI-generated decisions may influence significant financial outcomes. The difficulty of understanding decisions produced by complex or “black-box” AI systems can also create challenges for managers, auditors, and regulators who need to review and justify those decisions (Kou et al., 2026; Shoetan & FAMILONI, 2024).

The literature also raises concerns about the appropriate balance between AI-based automation and human professional judgement. Although AI can process large volumes of information and identify patterns more quickly than traditional approaches, financial decision-making still requires professional experience, judgement, and accountability. Excessive reliance on automated systems may reduce human oversight and create additional ethical and financial risks (Thakur & Sharma, 2024). However, the existing literature provides limited integrated discussion of how human judgement and AI-supported decision-making should work together in practical financial environments.

Another important gap relates to data quality, privacy, and cybersecurity. The effectiveness of AI depends heavily on the quality and reliability of the data used to train and operate AI systems. At the same time, the increasing use of financial and personal data creates concerns about privacy and security. These issues cannot be considered separately from AI governance because weaknesses in data management can affect the reliability, fairness, and security of AI-generated financial outcomes (Kou et al., 2026; Shoetan & FAMILONI, 2024). A more comprehensive understanding is therefore needed of how data governance and AI governance can be addressed together.

There is also a need for greater attention to regulatory preparedness and institutional accountability. The rapid development of AI technologies has created challenges for organizations and regulators in determining appropriate standards for transparency, accountability, risk management, and oversight. Existing research has highlighted the importance of connecting technological development with appropriate ethical oversight and regulatory compliance (Lakshminarayanan et al., 2024; Ridzuan et al., 2024). However, the literature remains insufficiently integrated in explaining how organizations can translate these principles into practical governance arrangements.



In addition, relatively limited attention has been given to the future direction of responsible AI adoption in financial management. As AI becomes more deeply integrated into financial processes, organizations will need to consider not only technological capability but also professional skills, human oversight, governance mechanisms, ethical standards, and regulatory requirements. The literature therefore needs to move beyond asking whether AI can improve financial performance and consider how it can be adopted in a responsible, transparent, and sustainable manner (Choowan & Daovisan, 2025; Oyeniyi et al., 2024).

Overall, the research gap is not simply a lack of studies on AI in finance. Rather, existing knowledge is spread across different applications, technical perspectives, and governance concerns, with limited integration between these areas. This fragmentation creates a need for a comprehensive review that considers AI applications together with their governance, ethical, regulatory, and future implications. Such an integrated perspective can provide a clearer understanding of both the opportunities and the challenges associated with AI in financial analysis and decision-making (Oyewole et al., 2024; Belhaoua & Hanif, 2026).

Therefore, this study aims to critically review the existing literature on AI in financial analysis and decision-making by bringing together three closely related areas: the major applications of AI, the governance and ethical challenges associated with its use, and the future directions required for responsible and effective adoption. This approach is consistent with the study's purpose of providing an integrated review of fragmented research while extending the discussion beyond technical performance to include governance, accountability, transparency, and ethical considerations.

This study contributes to the literature by integrating research on AI applications with the governance conditions required for their responsible use in financial decision-making. It brings together evidence on predictive analytics, risk management, fraud detection and investment analysis while considering related concerns such as data quality, explainability, accountability, cybersecurity and human oversight. By examining these areas together, the review offers a more comprehensive understanding of the opportunities and limitations of AI-supported financial decision-making. To address these questions, the study has the following objectives:

1. To identify and examine the major applications of AI in financial analysis and decision-making.
2. To analyze the governance and ethical challenges associated with AI-driven financial management practices.
3. To identify future directions for the responsible and effective adoption of AI in finance and accounting.

By addressing these areas together, the study aims to provide a clearer and more balanced understanding of AI in finance. It recognizes the opportunities AI offers while also considering the challenges that organizations need to manage. In this way, the study contributes to the growing discussion on how AI can be adopted in a way that supports financial performance while maintaining transparency, accountability, professional judgement, and responsible governance.

Accordingly, the study is guided by the following research questions:

1. What are the major applications of AI in financial analysis and decision-making?
2. What governance and ethical challenges emerge from the increasing use of AI in finance and accounting?
3. What future directions should be considered to support the responsible and effective integration of AI into financial management practices?

LITERATURE REVIEW

AI-Driven Predictive Analytics

AI significantly enhances predictive analytics in finance by using historical data, market information, economic indicators, and other relevant variables to forecast financial outcomes. Machine learning techniques can support predictions of revenue, expenses, cash flows, credit risk, and market movements, thereby assisting managers in strategic planning and resource allocation (Okwaraocha, 2023; Jain & Kulkarni, 2023). Natural



language processing can also analyse unstructured sources such as financial news, earnings-call transcripts, and market sentiment, extending the information base available for financial forecasting (Zakaria et al., 2023).

The literature nevertheless shows that predictive performance depends strongly on the quality, completeness, and representativeness of the underlying data. Poor-quality or biased training data can produce unreliable forecasts, while opaque algorithms can make it difficult to understand why a prediction was generated (Santos et al., 2025; Ding, 2024; Akinrinola et al., 2024). Combining algorithmic predictions with established financial techniques and professional judgement can therefore provide an additional safeguard against model volatility and inappropriate interpretation (Ajiga et al., 2024).

AI-Enhanced Risk Management

AI has an important role in financial risk management because it can process large datasets, identify emerging risk indicators, and support continuous monitoring. Applications include credit-risk assessment, default prediction, market-risk analysis, operational-risk monitoring, and the identification of suspicious transaction patterns (Nnaomah et al., 2024; Jagtap & Epilli, 2024). Advanced machine learning models can detect relationships and vulnerabilities that may be difficult to identify using conventional statistical methods (Nahar et al., 2024).

AI-enabled risk management can improve the timeliness of intervention by allowing institutions to identify potential problems before they develop into significant losses. However, the complexity of AI models can create interpretation and accountability problems, while excessive confidence in automated outputs may conceal underlying risks (Mubarroq et al., 2025; Abikoye et al., 2024). Cybersecurity threats and the possibility that institutions use similar models that react simultaneously to common market signals also create potential systemic vulnerabilities (Narayanan et al., 2024; Olanrewaju, 2025).

AI in Fraud Detection

Fraud detection is one of the most established applications of AI in financial services. AI systems can analyse large transaction datasets to identify unusual patterns, anomalies, inconsistencies, and behavioural signals associated with fraudulent activity (Bello & Olufemi, 2024; Odeyemi et al., 2024). Machine learning can also examine unstructured information, including documents and communications, to identify additional indicators that conventional rule-based approaches may overlook (Odonkor et al., 2021).

AI-based fraud detection is not without limitations. High false-positive rates may inconvenience legitimate customers and increase investigation costs, while changes in fraud techniques can reduce model effectiveness over time (Weng et al., 2024). The quality and representativeness of training data remain important, and sophisticated offenders may adapt their behaviour to circumvent detection systems (Farzaan et al., 2024; Roshan, 2024). Adaptive models, continuous monitoring, and strong governance are therefore necessary to maintain effectiveness and institutional trust (Tillu et al., 2023; Adeyelu et al., 2024).

AI in Portfolio Management and Investment Decision-Making

AI is increasingly used in portfolio management and investment decision-making to analyse large volumes of market data, identify investment opportunities, optimize asset allocation, and support risk management (Rathour, 2025; Moosa et al., 2024). Algorithmic trading systems can automate trade execution using predefined rules or model-generated signals, while AI-based analytical tools can support more dynamic investment strategies.

Despite these capabilities, AI does not eliminate investment uncertainty. Market conditions change, models may perform differently across market cycles, and opaque systems can make investment decisions difficult to explain. The literature therefore emphasizes the need to balance automated analysis with human oversight, especially where model outputs can materially affect investment outcomes (Argento et al., 2025; Sangisetti et al., 2026). Long-term empirical evidence across different market environments remains an important research need.



GOVERNANCE, ETHICAL AND REGULATORY CHALLENGES

Data Quality, Algorithmic Bias and Fairness

The effectiveness of AI in finance is closely linked to data quality and availability. Inaccurate, incomplete, fragmented, or historically unrepresentative datasets can produce unreliable or discriminatory outcomes (Ding, 2024; Enholm et al., 2021). Algorithmic bias may affect credit scoring, risk assessment, investment recommendations, and other financial decisions. Bias mitigation therefore requires careful data curation, model validation, continuous monitoring, and appropriate fairness controls (Venkatasubbu & Krishnamoorthy, 2023; Elhady & Shohieb, 2025).

Transparency, Explainability and Accountability

Many complex AI systems are difficult to interpret, creating a tension between predictive performance and explainability. In financial environments, this issue is particularly important because decisions may need to be reviewed by managers, auditors, customers, regulators, or courts (Boretti, 2024; Frasca et al., 2024). Explainable AI can help stakeholders understand model behaviour and improve confidence, auditability, and accountability (Weber et al., 2023; Radanliev, 2025).

Accountability also requires clear allocation of responsibility when an AI-supported decision produces an adverse outcome. Human decision-makers should remain responsible for the appropriate use and review of AI outputs rather than treating algorithmic recommendations as inherently correct (Thiebes et al., 2020; Radanliev et al., 2024).

Data Privacy and Cybersecurity

AI applications in finance often depend on large quantities of sensitive financial and personal information. This creates risks relating to unauthorized access, data leakage, cyberattacks, inappropriate secondary use, and inadequate data governance (Cao et al., 2024). Strong access controls, secure architectures, encryption, monitoring, and compliance with applicable privacy requirements are therefore essential (Gowtham et al., 2025; Uzougbo et al., 2024).

The security challenge is ongoing because both financial technologies and cyber threats continue to evolve. Governance frameworks should therefore treat data protection and cybersecurity as continuing control responsibilities rather than one-time implementation requirements.

Infrastructure, Skills and Workforce Adaptation

AI adoption can require significant investment in computing infrastructure, software, data management, and specialist skills. These costs can create barriers for smaller or resource-constrained organizations (Attah et al., 2024). The shortage of professionals who can understand both finance and AI further complicates implementation (Ghandour, 2021).

Workforce adaptation should therefore focus on reskilling and multidisciplinary capability. Financial professionals increasingly need sufficient knowledge of data, AI models, cybersecurity, ethics, and model limitations to evaluate AI-generated information effectively (Kaakandikar et al., 2025; Ranković et al., 2023).

Regulatory and Compliance Challenges

The regulatory environment for AI in finance continues to develop. Effective frameworks need to address algorithmic bias, data protection, transparency, accountability, cybersecurity, and model risk while allowing responsible innovation (Nwachukwu et al., 2025; Meena, 2025). Because financial markets and digital services increasingly operate across jurisdictions, differences in regulatory requirements can also create compliance complexity and opportunities for regulatory arbitrage (Vuković et al., 2025).



Regulation should therefore be sufficiently adaptable to technological change while maintaining clear minimum requirements for governance, documentation, human oversight, risk management, and auditability. Continued collaboration among regulators, financial institutions, researchers, and technology providers is important for developing workable and proportionate standards (Ridzuan et al., 2024; Uzougbo et al., 2024).

METHODOLOGY

Review Approach

This study adopted an integrative literature review approach to examine the applications and governance of artificial intelligence in financial analysis and decision-making. This approach was appropriate because the relevant literature extends across finance, accounting, banking, investment management, information systems and artificial intelligence. It allowed evidence from these related fields to be brought together to provide a broader understanding of AI applications, their reported benefits and risks, and the governance conditions surrounding their use. The study therefore provides an interpretive synthesis of the relevant literature rather than claiming to be an exhaustive systematic review of all available publications.

Literature search

Google Scholar was used as the primary search source to identify relevant studies published between January 2018 and June 2026. This period was selected to capture recent developments associated with the rapid growth and adoption of AI across financial functions. The principal search string was: (“artificial intelligence” OR “machine learning”) AND (“financial analysis” OR “financial decision-making” OR “risk management” OR “fraud detection” OR “portfolio management” OR “accounting”) AND (“governance” OR “ethics” OR “regulation”). Variations of these terms were also used to identify studies addressing both the applications of AI and its governance implications in financial contexts. The final search was conducted on 30 June 2026, and publications from 2026 were included only if they were available online by that date. Full texts were obtained from the relevant journal or publisher platforms.

Supplementary search and selection

Backward reference searching was conducted by examining the reference lists of relevant articles and review papers to identify additional studies that were not captured through the initial search. Publications were eligible for inclusion when they were written in English, published between January 2018 and 30 June 2026, and directly examined the applications, benefits, limitations, risks or governance implications of AI in finance, accounting, banking or investment-related contexts. The selection process involved reviewing titles and abstracts for relevance, followed by a full-text assessment of potentially eligible publications. Duplicate records, non-scholarly materials, publications outside the specified period and studies without a clear connection to financial decision-making were excluded.

Analysis of the literature

The selected literature was analysed using thematic synthesis. Each publication was examined according to its study context, AI application, reported benefits, limitations, risks and governance implications. Attention was also given to the organizational and regulatory conditions associated with the implementation of AI. Related findings were compared and grouped into three broad themes: applications of AI in financial decision-making, governance and ethical challenges, and future research priorities. This process enabled the review to connect specific AI applications with their potential benefits, associated risks and relevant governance requirements. Given that the literature was identified primarily through Google Scholar and backward reference searching, the study provides an interpretive and integrative synthesis rather than an exhaustive systematic review.

Literature Identification and Selection Process

The Google Scholar search initially identified 85 records, with a further 30 publications located through backward reference searching. This produced a total of 115 records. After 12 duplicates had been removed, the

titles and abstracts of the remaining 103 records were screened for relevance. At this stage, 33 records were excluded because they fell outside the review period, were non-scholarly, or were not directly related to the application or governance of AI in financial decision-making. The full texts of the remaining 70 publications were then assessed against the eligibility criteria.

A further 11 publications were excluded because they did not provide sufficient evidence on the applications, benefits, risks or governance of AI in financial contexts. The final review therefore included 59 publications in the integrative thematic synthesis. The literature identification and selection process is presented in Figure 1.

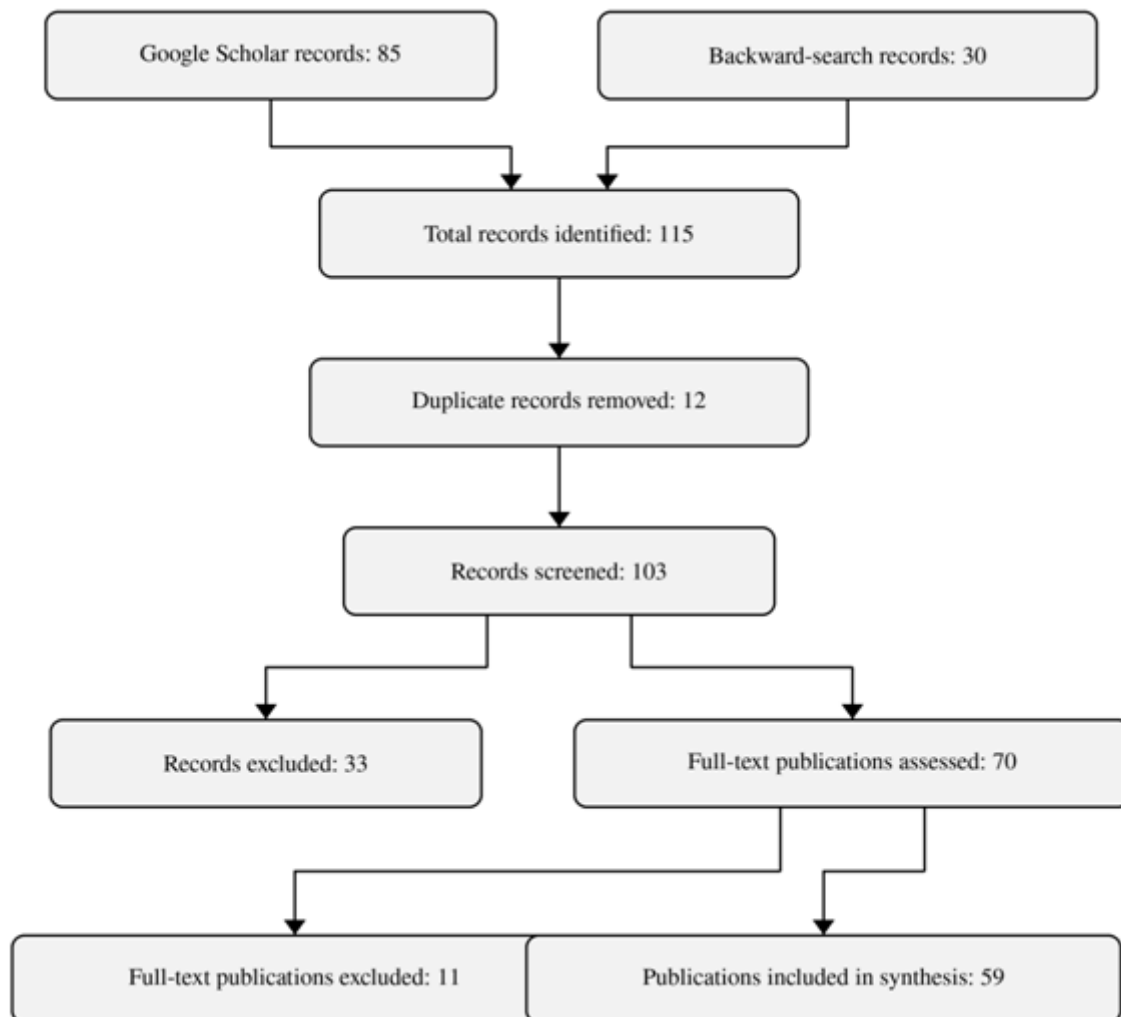


Figure 1. Literature identification and selection process

RESULTS AND DISCUSSION

The reviewed literature consistently identifies predictive analytics, risk management, fraud detection, and investment or portfolio applications as important areas in which AI is influencing financial analysis and decision-making. AI can increase processing capacity and provide timely analytical insights, particularly where large, complex, or unstructured datasets are involved (Zakaria et al., 2023). These applications suggest that the principal value of AI lies not simply in automation, but in its ability to support continuous analysis and decision-making at a scale that is difficult to achieve through manual procedures alone. Table 1 summarises the reported benefits, risks, governance mechanisms, and organizational or regulatory conditions associated with the four main AI application areas.

Table 1. Thematic synthesis of AI applications, benefits, risks and governance conditions

AI application	Reported benefits	Main risks or limitations	Governance mechanisms	Organizational or Regulatory conditions
Predictive analytics and forecasting	Faster analysis; improved forecasting; processing of large and unstructured datasets	Poor data quality; biased predictions; model opacity; instability across changing conditions	Data-quality controls; model validation; explainability; human review	Reliable data infrastructure; analytical capability; documentation requirements
Financial risk assessment	Continuous monitoring; earlier identification of credit, market and operational risks	Model risk; hidden vulnerabilities; overreliance on automated outputs; systemic reactions	Independent validation; stress testing; audit trails; human oversight	Risk-management capability; regulatory supervision; model-governance standards
Fraud detection	Detection of anomalies and suspicious patterns; faster transaction monitoring	False positives; changing fraud techniques; privacy and cybersecurity concerns	Continuous monitoring; access controls; periodic retraining; investigation protocols	Secure data systems; skilled investigators; data-protection and compliance requirements
Portfolio and investment management	Improved market analysis; dynamic allocation; faster investment support	Market uncertainty; algorithmic bias; automated trading risks	Explainability; performance monitoring; human authorization; accountability controls	Professional investment judgement; market-conduct rules; disclosure and auditability requirements

The literature also indicates that benefits are conditional rather than automatic. Forecasting and risk models depend on reliable data; fraud systems must adapt to changing patterns; investment models are exposed to market uncertainty; and complex algorithms can be difficult to explain. These findings reinforce the importance of combining technological capabilities with established financial controls and professional judgement (Kureljusic & Karger, 2023; Weber et al., 2023).

A second major finding is the central role of governance. Across the reviewed studies, algorithmic bias, opacity, privacy, cybersecurity, accountability, and regulatory uncertainty recur as significant concerns. This indicates that AI governance should be treated as an integral component of financial management rather than as a separate technology issue (Lakshminarayanachar et al., 2024; Ridzuan et al., 2024).

The literature further highlights a gap between the rapid development of AI applications and the availability of robust evidence on their long-term consequences. Research remains limited on systemic market effects, cross-border governance, the long-term impact of autonomous decision-making, and the interaction between AI systems and professional judgement. Reviews of emerging AI research in accounting and finance similarly indicate the need for more structured investigation of governance and implementation issues (Dong et al., 2024; Oyeniyi et al., 2024).

Overall, the findings suggest that the value of AI in financial decision-making depends not only on its technological capabilities but also on how it is implemented and governed. AI can improve the speed, scope and consistency of financial analysis. However, poor-quality data, opaque models and inadequate oversight may weaken the reliability of the resulting decisions. The literature therefore supports a complementary approach in which AI enhances analytical processes while financial professionals remain responsible for interpretation, contextual judgement and accountability.



This review has several limitations. The literature was identified primarily through Google Scholar and backward reference searching rather than through a comprehensive search of multiple bibliographic databases. Therefore, some relevant studies may have been overlooked. The review was also limited to English-language publications. In addition, differences in research methods, financial settings and AI applications limited direct comparisons among the selected studies.

FUTURE RESEARCH DIRECTIONS

Future research should prioritize explainable AI and develop models that provide decision-makers with meaningful explanations of financial predictions and recommendations. Greater interpretability can strengthen trust, accountability, auditability, and regulatory compliance, but research should also examine the trade-off between model complexity, predictive performance, and explainability (Khan et al., 2025; Weber et al., 2023).

Further work is needed on algorithmic bias mitigation. Research should evaluate practical methods for identifying and reducing bias in credit scoring, lending, investment recommendations, and other automated financial decisions. Longitudinal and real-world validation would help determine whether fairness controls remain effective as datasets, markets, and customer behaviour change (Ranković et al., 2023).

Data privacy and cybersecurity also require continued attention. Future studies should investigate privacy-preserving analytics, secure data-sharing architectures, and approaches that allow institutions to collaborate without unnecessarily exposing sensitive information. The interaction between AI, blockchain, and other distributed technologies may provide additional opportunities for improving traceability and security, but these arrangements also require careful assessment of systemic and governance risks (Addula et al., 2024; Martínez et al., 2024).

Human–AI collaboration is another important research area. Future studies should examine how AI can augment rather than replace professional expertise, including the effects of automation on cognitive workload, judgement, accountability, and decision quality. Research on workforce adaptation should also identify the skills and training required by finance professionals working in increasingly data-driven environments (Odonkor et al., 2024; Kaakandikar et al., 2025).

Regulatory research should examine how existing financial regulation can be adapted to AI-enabled decision systems. Important topics include model governance, auditability, accountability, cross-border data flows, and the regulation of autonomous or generative AI applications. Harmonized principles may help reduce regulatory fragmentation while allowing jurisdictions to address sector-specific risks (Vuković et al., 2025; Nwachukwu et al., 2025).

Finally, further research should investigate AI's contribution to sustainable finance and the integration of AI with blockchain and other emerging technologies. These areas may influence ESG reporting, investment allocation, fraud monitoring, and financial inclusion, but empirical research is needed to establish their practical benefits and unintended consequences (Lim, 2024; Vinothkumar & Lawrance, 2024; Sarjas & Velmurugan, 2025).

CONCLUSION

This review indicates that artificial intelligence is increasingly influencing financial analysis and decision-making through predictive analytics, risk management, fraud detection, and portfolio management. The literature suggests that AI can improve analytical efficiency, support timely risk identification, detect complex fraud patterns, and enhance investment analysis when appropriate data and models are available.

However, the benefits of AI are closely connected to governance quality. Data quality, algorithmic bias, transparency, explainability, cybersecurity, privacy, accountability, workforce capability, and regulatory uncertainty can materially affect the reliability and acceptability of AI-enabled financial decisions. AI should therefore complement rather than replace professional judgement, particularly in high-stakes financial environments.



The overall evidence supports a balanced approach to AI adoption. Financial organizations should combine technological innovation with robust data governance, model validation, explainability, human oversight, cybersecurity, ethical safeguards, and adaptable regulatory controls. Future research should provide stronger empirical evidence on long-term systemic effects, human–AI collaboration, cross-border governance, and responsible deployment. Such an approach can help financial institutions realize the potential of AI while maintaining transparency, accountability, fairness, and institutional trust.

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