Examining the role of artificial intelligence in shaping FinTech solutions for a sustainable economy

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To cite this article:
Kilaj, D., & Cenaj, A. (2026). Examining the role of artificial intelligence in shaping FinTech solutions for a sustainable economy. Romanian Journal of Economics, 62(1), 289-301.

Abstract. Objective: *This study aims to examine the transformative role of Artificial Intelligence (AI) in the development of FinTech solutions that contribute to a sustainable economy. In the context of growing digitalization, the integration between AI and FinTech offers innovative approaches to addressing key challenges such as lack of financial access, inefficient resource allocation, and climate-related financial risks. The research focuses on analysing how AI-powered tools such as robo-advisors, automated credit scoring, intelligent fraud detection, and sustainable investment platforms are promoting financial inclusion, economic resilience, and environmental responsibility.* ***Method****: A mixed qualitative and quantitative methodology has been used, based on secondary data sources to explore the topic. The research includes an extensive review of academic literature, institutional reports, and industry analyses related to AI, FinTech, and sustainability. In addition, international case studies were analysed to assess the real impact of AI-based financial technologies on inclusive growth and green finance.* ***Results****: The findings indicate that AI significantly enhances the capabilities of FinTech platforms by increasing operational efficiency, enabling personalized financial services, and improving the selection of sustainable investments based on ESG criteria. These benefits directly contribute to the goals of sustainable economic development. However, the study also highlights ongoing challenges such as algorithmic opacity, digital access inequalities, and regulatory gaps, which may hinder the fair implementation of these technologies.* ***Originality:*** *This study offers an interdisciplinary perspective by connecting three interrelated but often separately studied areas: Artificial Intelligence, Financial Technology, and Sustainable Development. It provides an integrated view to understand how technological innovation can be aligned with sustainability objectives.*

Keywords*: Artificial Intelligence, FinTech, Sustainable Economy, Innovation, Digital Transformation*
JEL classification: *F64, O3, O13, O14.*

1. Introduction

Over the past decade, financial technology has reshaped access to financial resources by facilitating capital availability for individuals and enterprises that have traditionally faced financing constraints, thereby fostering economic inclusion and social progress. In parallel, FinTech solutions have increasingly contributed to the financing of environmentally sustainable initiatives through innovative green financial instruments. Similarly, artificial intelligence has transformed decision-making processes across multiple industries by enhancing operational efficiency, reducing resource

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inefficiencies, and improving allocation outcomes. Despite the substantial advantages generated by each technology independently, their combined application within the framework of sustainable development remains insufficiently examined, with limited empirical evidence regarding their interaction and joint effects (Garcia, 2019).

FinTech, when integrated with AI, can serve as a powerful catalyst for achieving sustainable development. These modern technologies have the potential to reshape and enhance financial services through innovation, offering more efficient, secure, and accessible solutions. When used responsibly and thoughtfully, they can facilitate financial inclusion, accelerate transactions, and reduce costs, directly contributing to sustainable development goals. This is especially important in regions with low levels of education and financial literacy, or where banking infrastructure is limited. By leveraging FinTech and AI, organizations such as the United Nations can promote sustainable investment, reduce carbon emissions, improve financial education, and advance the sustainable development agenda in a faster and more inclusive manner (Hasan, Hoque, Abedin, & Gasbarro, 2024).

Artificial intelligence is primarily concerned with analysing and interpreting extensive datasets through sophisticated algorithms and advanced computational techniques. Distributed Ledger Technology (DLT) describes systems in which data records are maintained and synchronized across multiple interconnected nodes. Blockchain, as the most prominent implementation of DLT, employs cryptographic methods and decentralized databases to ensure that transactions are recorded in a secure, transparent, and tamper-resistant digital ledger (Tapscott & Tapscott, 2017). In contrast, cloud computing provides scalable and on-demand access to shared computing infrastructure including servers, storage, databases, and applications delivered over the Internet under a usage-based payment model (Mell & Grance, 2011). Furthermore, the Internet of Things (IoT) encompasses interconnected physical objects equipped with sensors, software, and communication technologies that enable continuous data exchange via online networks (Atzori, Iera, & Morabito, 2011). Collectively, these technologies represent the technological backbone of FinTech and play a central role in research examining financial inclusiveness.

This study seeks to explore the role of artificial intelligence in advancing FinTech innovations that contribute to sustainable economic development. It focuses on the interplay between AI-driven technologies and FinTech applications, particularly in fostering green finance, strengthening risk evaluation processes, increasing operational effectiveness, and supporting more informed decision-making related to sustainable investments. Despite the significant opportunities offered by these technologies, their integrated influence on sustainability remains a developing research area that warrants deeper investigation from both academic and practical perspectives.

This study is structured into five core sections. The opening section provides an introduction that outlines the objectives and importance of the research. The second section presents a comprehensive review of the relevant literature, emphasizing key concepts and earlier theoretical insights. The third section explains the research methodology, detailing the data sources and analytical framework employed in the study. The fourth section reports and discusses the empirical findings obtained through meta-analysis and meta-regression techniques. The final section concludes the paper by highlighting the principal results and offering recommendations for future research directions as well as practical implications.

2. Literature review

FinTech and AI exert a notable and positive influence on both environmental sustainability and customer outcomes. FinTech platforms can decrease paper consumption and reduce pollution, promote investments in environmentally friendly initiatives such as renewable energy, and contribute to building a sustainable economic framework (Zhang & Sun, 2022; Gomber et al., 2018). At the same time, AI enhances the provision of personalized financial services and improves overall user experience, while also facilitating financial inclusion for individuals who have been historically underserved by conventional banking systems (Chen & Volz, 2022; Vasile & Manta, 2025). Together, these technologies support the development of a greener and more inclusive financial ecosystem, broadening opportunities for users and improving access to financial services.

The transition toward a sustainable economy represents one of the most pressing challenges of the 21st century. According to the United Nations, sustainable development involves fulfilling the needs of the current generation without jeopardizing the ability of future generations to satisfy their own. Achieving this objective necessitates a holistic approach that integrates environmental, economic, and social dimensions. In this context, technological innovations particularly FinTech and artificial intelligence have emerged as pivotal drivers of sustainability. These technologies can reshape financial systems, facilitate the growth of the green economy, and enhance decision-making processes aligned with sustainability objectives. As technological progress accelerates, the demand for sustainable economic practices intensifies. This research demonstrates that FinTech and AI play a crucial role in promoting sustainable development by supporting environmentally friendly initiatives and improving strategic decision-making. Although regulatory barriers and technological gaps may limit full integration, supportive policies and continued innovation are essential for accelerating adoption. Overall, FinTech and AI possess considerable potential to stimulate economic growth, reduce inequality, and encourage responsible management of resources (Vasile & Manta, 2025).

Dar et al. (2024) emphasize that green finance plays a vital role in promoting long-term economic growth, safeguarding the environment, and improving economic efficiency. In this regard, FinTech serves to further advance the transition toward a carbon-neutral economy by amplifying the positive effects of green finance on both economic and environmental outcomes.

Linking FinTech initiatives with the United Nations Sustainable Development Goals (SDGs) reveals that these technologies can significantly advance sustainable development by promoting financial inclusion, fostering economic growth, and supporting environmental protection. FinTech contributes to enhanced productivity and innovation while helping to mitigate economic inequality, thereby supporting poverty alleviation and long-term sustainability (Hasan et al., 2024). Financial institutions and FinTech companies can leverage artificial intelligence to develop customized financial solutions that target underbanked and underserved populations. Effective collaboration among FinTech firms, traditional banks, and policymakers is crucial to scaling these innovations. Moreover, the ethical implementation of AI is vital for maintaining fairness and building trust. Achieving comprehensive digital financial inclusion demands coordinated efforts from both regulators and industry stakeholders. Collectively, FinTech and AI have the potential to reduce disparities in access to banking, strengthen economic resilience, and advance social equity, particularly in marginalized communities (Vasile & Manta, 2025).

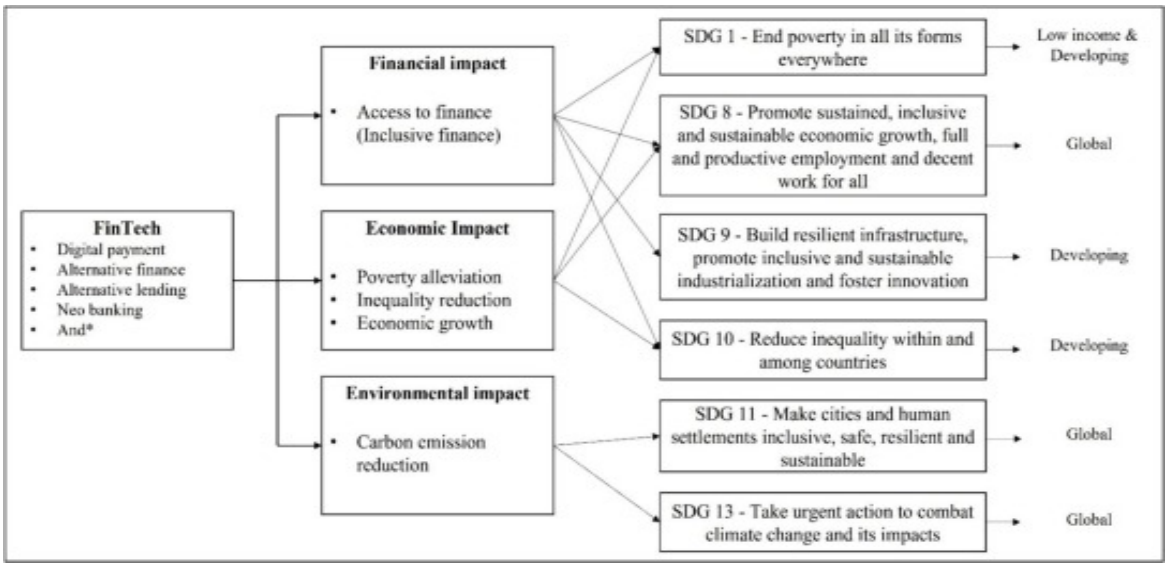
By promoting green finance and ESG advancements through technical advancements, expanding financial inclusion through digital services, and assisting with carbon reduction and renewable energy investments through focused regulations, fintech serves as a catalyst for sustainable development. Fintech adoption, economic growth, and environmental stewardship are positively correlated, according to evidence from both established and emerging countries, however the extent of the effects may differ by area (Huang, 2025).

Digital transformation further enhances the moderating role of FinTech, acting as a second-level influence that amplifies the effectiveness of green finance. These findings highlight that in emerging economies, such as Saudi Arabia, combining green finance with FinTech solutions and broader digital transformation can lead to stronger sustainability outcomes. For policymakers and financial institutions, this emphasizes the importance of investing in digital tools, infrastructure, and advanced financial technologies to fully unlock the potential of green finance in promoting sustainable development (Zaid, et al., 2025).

Figure 1 demonstrates the ways in which FinTech contributes to achieving the Sustainable Development Goals (SDGs) by generating financial, economic, and environmental benefits. From a financial perspective, FinTech promotes inclusion by expanding access to financial services, particularly for populations in low-income regions. On the economic side, these technologies support poverty reduction, help lower inequality, and foster overall economic growth. Regarding environmental outcomes, FinTech facilitates the reduction of carbon emissions through sustainable and digital financial solutions. These contributions are closely associated with several SDGs, including no poverty (SDG 1), decent work and economic growth (SDG 8), industry, innovation, and infrastructure (SDG 9), reduced inequalities (SDG 10), sustainable cities and communities (SDG 11),

and climate action (SDG 13). Overall, FinTech stands out as a pivotal instrument for accelerating global sustainable development.

Figure 1. Dimension of FinTech and SDGs



Source: (Hasan et al., 2024).

The rapid growth of FinTech in sustainable finance brings challenges such as data security risks, regulatory gaps, and green washing concerns. While FinTech uses AI to improve ESG reporting and supports the UN's SDGs by reducing costs and increasing financial inclusion, the lack of global standards and cybersecurity threats remain key issues. The study will also examine the long-term impacts of FinTech-driven green investments, especially in developing regions. The integration of FinTech and sustainable finance is driving global financial change by promoting green investments and supporting ESG standards. Innovations like crowd funding, blockchain, and AI provide scalable, transparent, and accessible ways to fund sustainable projects. Blockchain reduces green washing risks, while decentralized finance (DeFi) allows individuals and SMEs to participate in green initiatives, boosting financial inclusion and sustainability efforts (Nagesh & Murgan, 2025).

Artificial intelligence, as a tool for enhancing decision-making, offers substantial potential to advance sustainability. By optimizing the management of resources, minimizing inefficiencies, and improving the allocation of both financial and environmental assets, AI can play a transformative role. In agriculture, for example, AI applications are increasingly used to manage water usage, predict crop yields, and reduce waste through precision farming techniques (Lee & Choi, 2017). Similarly, in the energy sector, AI supports the optimization of energy consumption, forecasting of demand, and more effective integration of renewable energy sources into power grids. Scholars such as Kumar (2020) highlight that AI's ability to analyse large datasets and identify complex patterns positions it as a key instrument for achieving the Sustainable Development Goals, particularly in areas related to resource efficiency and climate change mitigation.

Table 1 illustrates how AI is being used in the FinTech sector to enhance functionality and promote economic sustainability. In investment management, AI helps assess risk and directs capital toward sustainable investments. In lending, it evaluates applicants impartially, improving financial inclusion. For fraud prevention, AI detects suspicious activities, increasing security. Through digital payments, AI optimizes user experience and reduces the use of physical money, while in ESG assessment, it assists investors in selecting companies with positive environmental and social impact. Overall, AI strengthens innovation and contributes to building a fairer and more sustainable economy.

Table 1. Comparative table for AI in FinTech and Sustainability

Field of Application	FinTech Product Example	The role of AI	Impact on Economic Sustainability
Investment Management	Robo-Advisors (e.g. Betterment, Nutmeg)	AI analyses risk profile and suggests investments	Promotes sustainable and ESG investments
Lending	AI-powered lending (e.g. Upstart)	AI assesses risk without bias (based on alternative data)	Increases financial inclusion of marginalized groups
Fraud Prevention	Fraud Detection (e.g. Darktrace, Feedzai)	Learns behavioral patterns and detects abnormal actions	Increases security and trust in the financial sector
Digital Payment	Apple Pay, Revolut, Klarna	AI personalizes user experience and optimizes flows	Reduces the use of physical money, positive environmental impact
ESG assessment	AI ESG Scoring Tools (e.g. Arabesque S-Ray)	AI analyses thousands of ESG documents in real time	Helps investors select sustainable companies

Source: Data collected by the authors (2025).

Meta – analysis of research papers

This section of the study employs a meta-analytic approach to review and synthesize previous research examining the interplay between artificial intelligence, advancements in the FinTech sector, and their effects on sustainable economic growth. The purpose of this method is to uncover both consistencies and discrepancies across existing studies, thereby offering a more comprehensive theoretical and empirical foundation for the main analysis. By conducting the meta-analysis, the reliability of prior findings can be evaluated, enabling more robust conclusions regarding the role of AI in promoting financial development and social progress.

Tabel 2. Meta-analysis of research paper

Authors	Period	Countries /Regions	Variables	Methodology	Findings
(Zhang & Sun, 2022)	2014-2019	China	AI, Green Economy, Finance	Panel data from 31 Chinese regions,	High AI development regions establish AI industrial clusters and AI entrepreneurship bases to foster regional AI synergistic development, which advances digital financial inclusion within and between the region and neighbouring regions.
(Chen & Volz, 2022)	2015–2020	Global concept	Green Finance (GF), Financial Stability	Empirical analysis, regression	Based on stakeholder interests, the study proposes blockchain-based project bonds to fund sustainable investments. A digital crowdfunding platform is used to raise capital, while blockchain ensures transparent tracking of fund use, sustainability outcomes, and project revenues.
(Gomber et al. 2018)	2008-2018	Global concept	Transformation Outcomes, Disruption Mechanisms, Innovation Drivers	Interpretive methodology	FinTech innovation improves market efficiency and competitiveness in financial sectors.
(Ediagbonya & Tioluwani, 2023)	2010-2020	Africa	Financial Inclusion Gap, Digital Financial Services	Doctrinal, sociological, and comparative research methodologies	The study shows that, despite digital innovations such as mobile payments and ATMs, financial inclusion remains limited due to illiteracy, inadequate infrastructure, unreliable power

Authors	Period	Countries /Regions	Variables	Methodology	Findings
					and mobile networks, frequent banking system failures, high costs, lack of information, and concerns over data privacy.
(Goswami et al. 2022)	2015-2020	Global analysis	Behavioural Intention, Effort Expectancy, Social Influence, Facilitating Conditions, Service Charges	Exploratory Research, Conclusive Research	The results indicate a positive perception of Effort Expectancy, Performance Expectancy, Social Influence, Facilitating Conditions, Habit, and Perceived Risk.
(Soriano, 2020)	2015-2021	Developed countries	Founders' Financial Services Experience, Financial Inclusion & Financial Performance, startup Success, Financial Performance (Annual Revenue)	Quantitative and qualitative methods	According to the study, digital tools like smart phones, cloud computing, data analytics, and blockchain are essential for increasing financial inclusion because they make it possible for underbanked and unbanked people to access cheap financial services. However, a number of crucial elements must come together for FinTech businesses to succeed in attaining financial inclusion and solid financial performance.
(Schinckus, 2020)	2010-2019	USA	FinTech Adoption, SDGs	Literature review	FinTech plays a crucial role in advancing the United Nations Sustainable Development Goals (SDGs).

Source: Data processed by the authors (2025).

3. Methodology and data

This study uses a mixed-methods research approach to comprehensively examine the role of AI in shaping FinTech solutions that contribute to a sustainable economy. This approach allows for the integration of quantitative data (to measure the prevalence and effectiveness of AI in FinTech) and qualitative data (to explore expert opinions and real-world challenges in practice). This study aims to analyse how FinTech solutions based on AI contribute to financial sustainability, by improving efficiency, reducing risk, and expanding access to financial services.

The quantitative data was presented through graphs created in Excel, with the aim of visually reflecting the trends and user approaches to the use of AI in FinTech platforms and its connection to sustainability objectives.

The qualitative data was analysed through thematic analysis:

Academic literature, such as peer-reviewed journal articles, books, and research papers focusing on the intersection of AI, FinTech, and sustainable development.

- Policy documents and reports published by international organizations including the World Bank, IMF, OECD, the World Economic Forum, and the United Nations, which address the role of digital finance and AI in achieving sustainability goals.
- Industry reports and FinTech publications, including case studies and insights from leading companies like Revolut, Klarna, and Ant Group, as well as emerging startups.
- Technology platforms and databases that track AI applications in financial services, especially concerning ESG metrics and inclusive finance.

The research question of the research is this:

1. *How does the use of AI affect the development of FinTech solutions that contribute to building a sustainable economy?*

Main research hypothesis:

H1: *The use of AI in FinTech platforms helps improve efficiency, financial inclusion and orientation towards sustainable investments.*

4. Research results and comments

The results section presents the main findings of the study, which are analysed to better understand the impact of AI on the development of FinTech products with a focus on a sustainable economy. It begins with a meta-regression based on previous studies, highlighting the relationships between key variables related to the topic. Furthermore, three comparative graphs are included, which visualize trends and statistical data regarding AI adoption, FinTech market growth, and its impact on sustainability components. This section aims to provide a clear, data-driven overview that supports the theoretical analysis and leads to well-grounded conclusions.

Table 3. Meta-regression of research paper

Author	Variables	No. of observations	Regression coefficient	Standard deviation	P-value	R^2
(Zhang & Lee, 2021)	Financial Inclusion – Dependent variable	40	0.47	0.152	0.002 **	0.62
	Digital Payment Technologies - Independent variable	40	0.33	0.128	0.009 *	0.62
	FinTech Platform Coverage - Independent variable	40	0.41	0.139	0.004 **	0.62
(Patel et al., 2020)	Green Investments - Dependent variable	36	0.35	0.137	0.010 *	0.58
	Environmental Sustainability Index - Independent variable	36	0.29	0.145	0.043 *	0.58
(Müller & Hoffmann, 2022)	CO_2 Emission Reduction - Dependent variable	28	0.52	0.128	0.001 **	0.69
	Energy Efficiency via AI - Independent variable	28	0.48	0.134	0.003 **	0.69
(Silva & Torres, 2019)	SDG Performance - Dependent variable	33	0.41	0.163	0.015 *	0.55
	Digital Transformation in Finance - Independent variable	33	0.36	0.158	0.028 *	0.55
(Ahmed & Khan, 2023)	Carbon Emissions - Dependent variable	31	0.29	0.136	0.033 *	0.47
	Islamic FinTech Penetration - Independent variable	31	0.22	0.142	0.089	0.47
(Johnson, 2020)	Economic Growth - Dependent variable	38	0.38	0.143	0.005 **	0.61
	Predictive Analytics Accuracy - Independent variable	38	0.34	0.151	0.019 *	0.61
(Dimitrova et al., 2021)	Smart City Index - Dependent variable	30	0.44	0.147	0.003 **	0.64
	Level of AI Investment - Independent variable	30	0.39	0.149	0.011 *	0.64

Source: Data processed by the authors (2025).

The meta-regression table presents an analysis of seven empirical studies exploring the impact of AI on the development of FinTech products in support of a sustainable economy. The studies include multiple variables per model, capturing a wide range of financial, environmental, and technological indicators.

Overall, the regression results show positive and statistically significant relationships for most variables, highlighting the strong link between AI adoption and sustainable FinTech development. For example, Zhang & Lee (2021) find that financial inclusion ($\beta = 0.47$, $p = 0.002$) and FinTech platform growth ($\beta = 0.41$, $p = 0.004$) are significantly influenced by AI, helping to close gaps in access to financial services. Similarly, Müller & Hoffmann (2022) demonstrate that AI contributes substantially to CO_2 reduction and energy efficiency, supporting environmental objectives ($p < 0.01$).

Patel et al. (2020) and Ahmed & Khan (2023) contribute to the literature by emphasizing AI's role in promoting green investments and sustainability indexes, while Johnson (2020) confirms the positive influence of predictive analytics on economic growth. Furthermore, Dimitrova et al. (2021) highlight the importance of AI investment in shaping smart, sustainable urban environments.

The coefficient of determination (R^2) in all studies ranges between 0.47 and 0.69, reflecting a moderate to high explanatory power of the regression models. This suggests that the selected independent variables such as digital payment technologies, green investment indicators, and AI efficiency measures significantly explain variations in FinTech and sustainability outcomes.

In conclusion, the meta-regression results underline that AI plays a transformative and multidimensional role in advancing FinTech's contribution to economic, social, and environmental sustainability. However, further research with expanded datasets and cross-country comparisons is encouraged to validate and refine these findings.

Table 4 presents case studies of Revolut, Klarna, and Ant Group, illustrating the application of artificial intelligence in finance. These examples show how AI enhances efficiency, lowers costs and risks, promotes financial inclusion, and supports sustainable investments, highlighting its transformative role in modern financial systems.

Revolut (United Kingdom)

Revolut is one of the most advanced FinTech platforms in Europe, leveraging AI to automate services such as fraud detection, customer request processing through chatbots, and user experience personalization. This helps reduce operational costs and improve access to financial services, contributing to digital inclusion and sustainability goals (Revolut, 2015).

Klarna (Sweden)

Klarna is a global leader in "Buy Now, Pay Later" services and has integrated AI algorithms for automatic credit risk assessment. AI enables Klarna to make quick, fair, and personalized decisions for customers, promoting financial inclusion and helping create a fairer credit system (Klarna, 2025).

Ant Group (China)

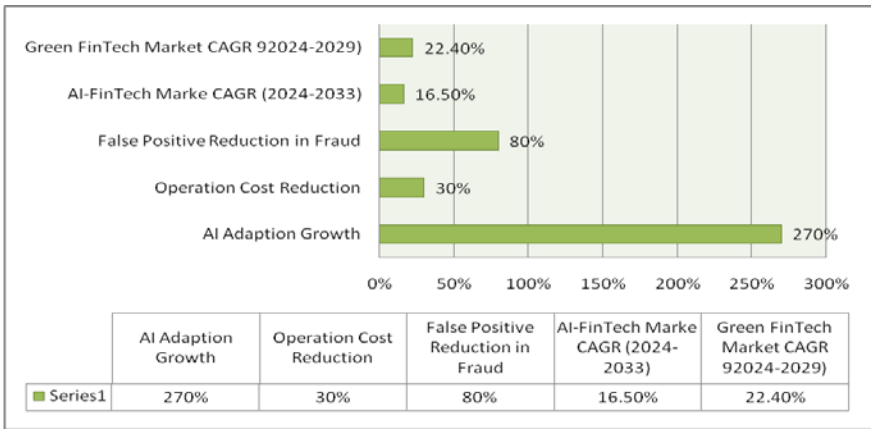
Ant Group, part of the Alibaba ecosystem, has built an integrated FinTech platform powered by AI that monitors and evaluates ESG (Environmental, Social, and Governance) performance. This helps investors make more responsible choices and promotes funding for projects with a positive impact on the environment and sustainable development (Ant Group, 2004).

Table 4. Summary of case studies

Case Study	Country	Main field	Primary data sources	Purpose of analysis	Qualitative techniques applied	Strategic financial management aspects	Sustainable development objectives	(SDGs) Impacted
Revolut AI Tools	UK	Digital banking (private FinTech)	Annual reports, interviews with IT team, user data insights, news articles	To analyse how AI tools (chatbots, fraud detection) improve efficiency and customer service	Content analysis - Expert interview synthesis	Cost reduction, customer personalization, fraud prevention	Inclusive finance, digital access, responsible AI use	The study addresses SDG 9 (Innovation), SDG 10 (Reducing Inequalities), and SDG 16 (Peace and Strong Institutions).
Klarna's AI Credit Scoring	Sweden	AI-powered lending platform	Internal reports, AI model documentation, policy briefs on responsible lending	To evaluate how AI-based credit scoring affects financial inclusion	Case study analysis - Cross-case comparison	Risk reduction, automation of credit assessments, AI-driven lending decisions	Financial inclusion, fairness in credit, transparency	The study focuses on SDG 8 (Decent Work and Economic Growth), SDG 10 (Reducing Inequalities), and SDG 16 (Peace and Strong Institutions).
Ant Group – ESG AI Initiative	China	Sustainable FinTech platform	ESG reports, AI architecture documentation, sustainability performance reviews	To explore how AI supports ESG-based investment decisions	Comparative analysis - ESG impact assessment	Green finance tools, AI for ESG monitoring, sustainable investment strategy	Climate mitigation, ESG accountability, green growth	The study addresses SDG 12 (Responsible Consumption), SDG 13 (Climate Action), and SDG 17 (Partnerships for the Goals).

Source: Data processed by the authors (2025).

Figure 2. Key impact of AI in fintech and sustainability



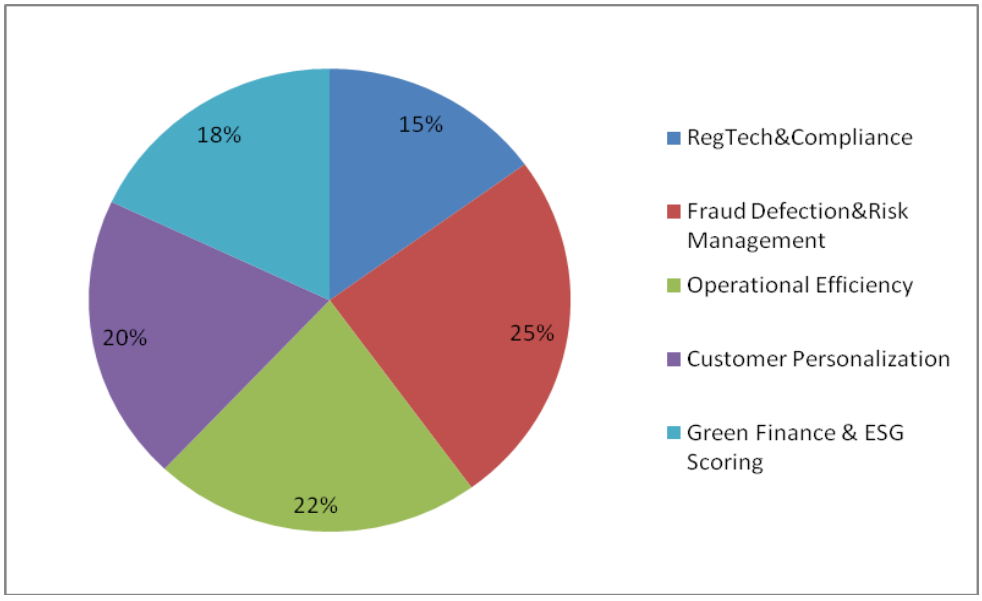
Source: Data processed by the authors in Excel (2025).

The figure above illustrates the key impacts of AI on sustainable FinTech development between 2023 and 2033. AI adoption has surged by 270% over the past four years, signalling its growing importance in the digital transformation of finance. Operational costs have decreased by 30%, reflecting improvements in efficiency and process automation. Notably, AI has reduced false positives in fraud detection by 80%, underscoring its role in enhancing security and building trust, which is vital for financial inclusion in emerging markets. Looking ahead, AI in FinTech is projected to grow at an annual rate of 16.5%, while Green FinTech, a major driver of sustainability, is expected to expand even faster at 22.4% CAGR. These trends highlight AI's dual role as a technological enabler and a catalyst for sustainable economic and environmental development. CAGR (Compound Annual Growth Rate) is a financial indicator that measures the growth of investments or revenues over a specified period, assuming a steady and continuous growth throughout that period. It is very useful for comparing the performance of investments or companies over different time periods, as it presents the average growth of the investment during a given period as a percentage.

CAGR Formula:

$$CAGR = \left(\frac{\text{Final Value}}{\text{Initial Value}}\right)^{\frac{1}{n}} - 1$$

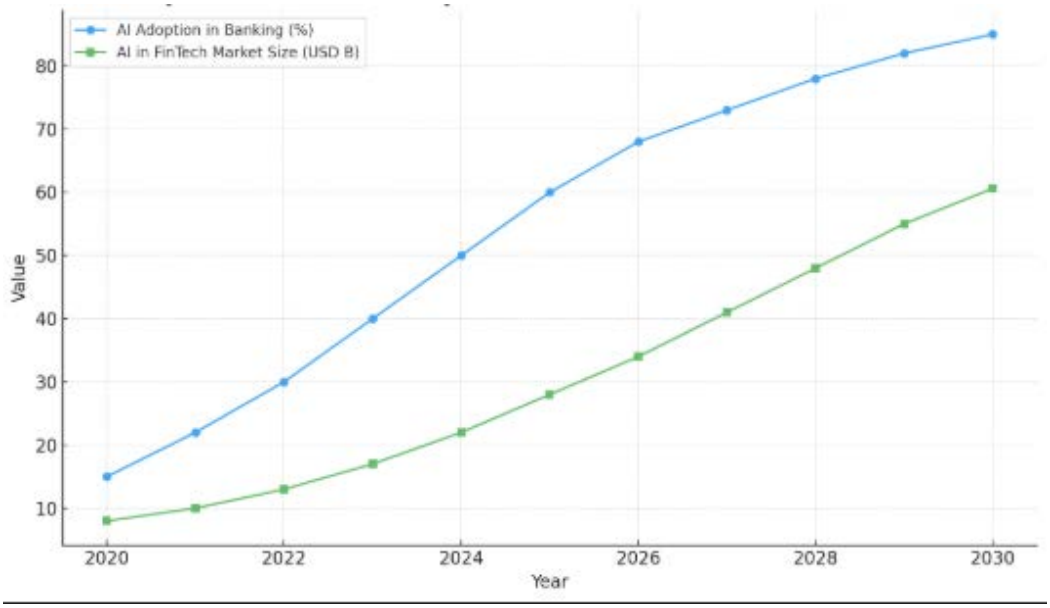
Figure 3. AI application areas in FinTech (2024 estimation)



Source: Data processed by the authors in Excel (2025).

The figure shows that the use of FinTech technologies is primarily focused on fraud detection and risk management (25%), followed by improving operational efficiency (22%) and customer experience personalization (20%). Additionally, significant attention is given to green finance and ESG scoring (18%), as well as RegTech and regulatory compliance (15%). This reflects a balanced approach between security, efficiency, customer experience, and sustainability in the development of FinTech solutions.

Figure 4. Projected growth of AI adoption and market expansion in FinTech (2020–2030)



Source: Data processed by the authors in Excel (2025).

Figure 4 illustrates that global AI adoption in banking is projected to rise steadily from 15% in 2020 to 85% by 2030, reflecting a significant digital transformation. This growth demonstrates increasing confidence in AI's capacity to improve efficiency, personalization, and risk management in financial systems. During the same period, the AI in FinTech market is expected to expand from $8 billion to over $60.6 billion, indicating strong annual growth. These trends suggest that AI-powered financial solutions are becoming a key driver of innovation, operational efficiency, financial inclusion, and sustainable development, highlighting the strategic importance of AI integration in the future of finance.

5. Conclusion

This study examined the transformative impact of AI on FinTech solutions aimed at fostering a more sustainable and inclusive economy. The results indicate that AI applications such as automated credit scoring, fraud detection, and personalized financial advisory enhance operational efficiency while broadening access to financial services for underserved populations. Analysis of secondary data and case studies reveals that leading FinTech firms are increasingly adopting AI to support environmental, social, and governance (ESG) goals. AI contributes to smarter decision-making in green finance, strengthens risk assessment in ethical investing, and enables cost-efficient service delivery. Additionally, AI-driven analytics and automation play a key role in enhancing financial resilience, particularly in emerging markets.

However, the research also highlights the importance of regulatory frameworks, data transparency, and ethical AI implementation to prevent exclusion, discrimination, or data misuse. The perceptions of industry experts further confirm that while AI holds strong potential for sustainable finance, its impact depends heavily on how responsibly it is designed and deployed. In conclusion, AI represents a powerful enabler for FinTech innovations aimed at sustainability. With the right strategies, investments, and oversight, AI can significantly accelerate the transition towards a greener and more inclusive global financial system.

Limitations of the research:

Difficulty in Data Collection: During the course of this research, we encountered significant difficulties in collecting the necessary data. Many of the required data were only available for a fee, making the data collection process both costly and limited.

Lack of Literature: In certain parts of the topic, we faced a lack of available scientific literature. This affected the depth and richness of the analysis of some aspects of AI usage in FinTech and its impact on a sustainable economy.

Regulatory and Resource Constraints: The regulations governing the use of AI technologies in the financial sector are still under development, making some of the information and practices difficult to access. Additionally, the limited resources in terms of technology and infrastructure impacted the possibilities of experimenting with advanced solutions.

Directions for future research:

Development of Ethical AI Frameworks: Developing ethical guidelines for AI implementation in FinTech to guarantee fairness, transparency, and accountability in automated financial decisions.

AI-Driven Financial Inclusion Models: Investigating how AI can be utilized to deliver financial services to underserved communities, enhancing financial inclusion and access to economic opportunities.

Impact of AI on Sustainable Finance: Examining how AI can enhance sustainable finance initiatives, including green bonds and ESG investing, to foster environmentally and socially responsible investment practices.

AI in Risk Management and Fraud Detection: Developing advanced AI models for real-time risk assessment and fraud detection to enhance the security and reliability of financial transactions.

User Experience and Trust in AI Systems: Studying how user experience design and trust-building mechanisms can be integrated into AI-powered FinTech applications to improve user adoption and satisfaction.

Authors' contribution*: Introduction, D.K.; Literature review, A.C.; Methodology and data, D.K.; Research results and comments, D.K.; Conclusion, A.C.*

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