AI IN FINANCIAL SERVICES: AVOIDING THE BIG RISKS

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NOVEMBER 2023
ACKNOWLEDGEMENTS

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ABOUT FINANCE INNOVATION LAB

The Finance Innovation Lab is a UK-based charity working for a financial system that serves people and planet – one that is democratic, sustainable, just and resilient. The Lab began as a collaboration between WWF-UK and the Chartered Institute of Accountants in England and Wales in 2009, and became an independent charity in 2015. Today, we cultivate a community of systems-changemakers and work on initiatives that impact mental models and power dynamics in finance for deep, lasting change. Our work focuses on growing purpose-driven finance, shifting mainstream finance, influencing law, regulation and policy, and building the power of our community.

ABOUT THE FINANCIAL INCLUSION CENTRE

The Financial Inclusion Centre is an independent, not-for-profit think-tank. Its aims are to:

- promote greater financial inclusion and provision so that consumers’ core financial needs are met; and
- promote fair and inclusive, efficient and competitive, well-governed and accountable, properly regulated financial markets.

We focus on two groups of consumers:

- consumers who could be, but are not, providing for themselves; and
- consumers who are not commercially viable for mainstream financial services and need alternative solutions to meet their core financial needs.
EXECUTIVE SUMMARY

How to address the risks presented by Artificial Intelligence (AI) is high on the agenda of governments around the world. The launch of ChatGPT-4, and the wave of calls from industry leaders for regulation to curb potentially catastrophic outcomes, have sparked global interest in understanding the use and risks of AI. This has ranged from concerns about existential threats to humanity’s existence, international safety, replacing jobs and increasing the digital automation of everyday life. Notably lacking from this debate is a discussion around the impact of AI on arguably the UK’s most influential industry, financial services.

The financial services industry plays an important role in a wide range of industries and services. It affects every citizen’s life and is a major contributor to the UK’s total economic output. But it also poses a major risk, as demonstrated by the catastrophic consequences for the wider economy in the aftermath of the Global Financial Crisis of 2007–09. The government has set out its ambition for a pro-innovation approach to AI regulation, one that aligns with its objective to make the UK a global leader in fintech and enhance the competitiveness and growth of the financial sector. Financial services is an industry with data at its core, and as such is ripe for utilising AI to provide insights and analysis and to automate decision-making. While this could bring some benefits, there are significant risks, some known and others unknown, that need to be assessed by the regulators. These include risks to financial stability, consumer protection and the net-zero target – and they are too significant to ignore.

AI presents the next step in the use of data in financial services and is already being applied by some financial firms, who are also exploring its increased adoption at a significant pace. The government should focus its attention towards what’s happening with AI today and how these risks may evolve. The reality is that the immediate risk from AI is not a robot apocalypse but a new financial crash, one with potentially catastrophic consequences. It is for this reason that we believe a precautionary regulatory approach to AI, one that can get ahead of innovation, is now required, along with a risk-based regulatory framework that could prevent these risks from emerging. In addition, the UK should be making a much greater effort to include voices from civil society organisations and the public into the debate about the future of AI. In no sector is this more important than in financial services, where the variety of circumstances requires a multitude of solutions, many of which require specialised and lived experience. Without this type of society-wide engagement, there is a risk that the development, introduction and monitoring of AI processes in financial services will not serve society. With technology as powerful as AI, and an industry as influential as financial services, ensuring that the public interest comes first should be central to the government’s approach to AI.

INTRODUCTION

Over the course of history, technology has played a leading role in the advancement of human civilisation. It is a relationship that has proven fruitful, increasing living standards and productivity, but often at significant societal social cost, disrupting the labour market or changing the nature of communities. This is a common reality of the adoption of new technology in the drive towards prosperity and increased productivity and is at the heart of our economic system. To limit upheaval and produce transformative change, we need to
ensure that new technology serves society and contributes to the public good, while minimizing or compensating for negative impacts. Failure to do so risks causing significant social and economic damage, exacerbating inequalities and placing too much influence in the hands of a powerful few.

The financial services industry plays an important role in a wide range of industries and services, affecting every citizen’s life, and contributes over 8% of the UK’s total economic output. The sector also poses risks, as demonstrated by the catastrophic consequences for the wider economy in the aftermath of the Global Financial Crisis (GFC) of 2007–09. Over the past few decades, a major feature of the growth in technology has been the intersection between technology and financial services. While the primary functions of finance remain unchanged, technology has shifted from being a support service, secondary to the financial market providers, to the primary interface. Driven by the use of our personal data, technology in financial services is now determining the design, distribution and access criteria of financial services. Some of these developments have, however, failed to ask difficult but fundamental questions about the social purpose of new technology and how it can transform finance to benefit people and the planet.

The use of Artificial Intelligence (AI) represents the most complex and advanced application of our personal data, and as such has received a remarkable amount of media attention. The highest-profile warnings have come from the international tech industry, whose leaders have predicted that in the future AI could pose profound and existential risks for humanity and have called for immediate regulation. This is an unusual but fitting reaction to a complex technology that’s developing at a significant pace with potentially unprecedented consequences. There are many more, particularly civil society, organisations that are campaigning for a safe and fair introduction of AI, with strong regulations and safeguards, to benefit the majority. Given how enormous the consequences of AI could be, it is vital that the government and regulators actively engage with all parts of society to gain a fair and representative understanding of the potential impacts, and focus on supporting the overall public good. This will result in fairer policy outcomes and protect against the risk of regulatory capture by the powerful tech and financial services industries.

Governments around the world have declared their intentions to harness the benefits of AI. The question for debate is how they intend to manage the potential risks, and how much they wish to leave to chance. The UK has set out its stall with a pro-innovation approach to AI regulation, aiming to become a world leader to ensure its safe and reliable development. This approach aligns with the government’s objective to make the UK a global leader in fintech and to enhance the competitiveness and growth of the financial sector.

1 Hutton, ‘Financial Services: Contribution to the UK Economy’.
2 Nicholls, ‘Lifting the Lid on Fintech’.
3 Perrigo, ‘Elon Musk Signs Open Letter Urging AI Labs to Pump the Brakes’.
4 Barten and Meinderstra, ‘An AI Pause Is Humanity’s Best Bet For Preventing Extinction’.
5 Public Law Project, ‘Key Principles for an Alternative AI White Paper’.
6 Open Rights Group, ‘Letter to Rishi Sunak: AI Summit is dominated by Big Tech and a “missed opportunity”’.
8 UK Gov, ‘A Pro-Innovation Approach to AI Regulation’.
9 UK Gov, ‘UK to Host First Global Summit on Artificial Intelligence’.
This paper aims to introduce three important caveats to a pro-innovation approach to AI. First, a focus on innovation does not automatically result in better outcomes for consumers or society more broadly, particularly in financial services. Second, there is no guarantee that any economic or productivity benefits of AI-led innovation will be enjoyed by those outside the wealthy, and currently well-served, citizenry, thus risking the exacerbation of inequalities that cause financial exclusion and poor consumer protection for many. Third, the focus on competitiveness and growth requires a proper framework to judge the benefit of AI in finance from environmental, economic and societal perspectives.

Behind the hype and news stories about the existential risk from AI sits the reality that it is already a common feature in how many industries interact with customers. While the public discourse is focused on risks from cutting edge and powerful AI developments – as was the recent global AI Safety Summit hosted by the UK – we should not ignore the very real and urgent harms caused by AI processes that are already happening. There are significant cracks in the foundations on which upcoming AI regulation is intended to be built, which, if left unrepaired, will result in major risks across the economy.

In no area is this more apparent than financial services, an industry with data at its core, and as such, one that is ripe for utilising AI to provide insights and analysis and to automate decision-making. As this paper will demonstrate, while there may be benefits to be gained from AI in financial services, there are significant potential risks, the extent of which are unknown – and potentially unknowable – that may lead to consumer harm, financial instability and hinder the transition to a net-zero economy. The impact of AI on financial services, arguably the UK’s most influential industry, requires urgent attention from government and regulators. A lack of action risks deferring responsibility for implementing this powerful technology to the big firms that can develop and implement AI without a framework to limit the potential risks and harms.

There is no better way for the UK to lead the way in AI than to focus on the delivery of positive social outcomes from AI and avoid the many significant risks. This can be achieved by placing the broader public interest, consumer protection, economic stability and climate concerns at the heart of the government’s strategy. Given that many of the risks are significant, and the impacts difficult or even impossible to estimate, it also means employing a precautionary approach to AI regulation. This should be the aim of the government’s AI agenda. If the government worked collaboratively with civil society organisations and citizens, there would be a chance that the potential of the transformative opportunities presented by AI could be harnessed, helping to make the financial system democratic, sustainable, just and resilient.

**IMPACT OF AI IN FINANCIAL SERVICES**

AI presents the next step in the tradition of technology and financial services. However, the excessive focus on existential risks from AI ignores the fact that its use is already a reality, and the financial services industry is exploring its increased adoption at a significant pace. While the recent surge of interest in AI regulation was sparked by the launch of ChatGPT-4

10 Philippon, ‘Finance, Productivity and Distribution’.
and the realisation of the potential growth in foundation models, such as generative AI, many firms have already adopted machine learning (ML) capabilities in their processes. A survey carried out in 2022 by the Bank of England and the Financial Conduct Authority (FCA) of firms in financial services found that nearly three quarters (72%) of those surveyed said they were using or developing ML applications, with the expectation that the number of ML applications would increase 3.5-fold over the next three years. Since this survey, some of the world’s largest banks have stated their ambition to expand their use of AI technology and it is likely that there will be an increase in the performance and complexity of AI models in financial services.

It is claimed that AI in financial services can bring benefits to consumers, firms and the financial system as a whole. For consumers, there is the opportunity for more personalised financial products and services, as well as a more seamless customer journey. For firms, it could improve their predictive power, streamline processes and increase profitability. For the financial system, scale and complexity could be better managed and fraud and cybercrime tackled. However, the introduction of a more data-intensive and automated approach raises new concerns that current inequalities, which lead to financial exclusion and poor consumer protection, may be exacerbated, and increased complexity may pose a major risk to financial stability. In addition, if there are benefits, we are yet to know whether they will translate into higher revenues and profits for the industry or also enhance the welfare of citizens. The difference in the definitions of ‘digitisation’ and ‘digitalisation’, as outlined below, demonstrates how current UK legislation on data and consumer protection, which is focused on digitisation, is limited in addressing the outcomes of AI.

**Digitisation**: The process of converting text, pictures or sound into a digital form that can be processed by a computer.

**Digitalisation**: The adaptation of a systems process (e.g. algorithms, machine learning).

**Current and potential use of AI in financial services**

To provide a system-wide view of the current and potential impact of AI on financial services, we have provided a structural map of the sector in the UK that is split into three different levels: wholesale, retail and the end-user. The financial sector workforce and environmental impact are also included. While there are some areas that are not yet greatly affected by AI, there are many that will be and have already embedded ML applications.

13 Jones, ‘Explainer: What Is a Foundation Model?’
14 Bank of England and FCA, ‘Machine Learning in UK Financial Services’. (Note, the sample is not representative of the entire UK financial services industry as no responses were received from smaller fintech firms or start-ups.)
15 Noonan, ‘Bank Chiefs Relish Prospect of AI Boost to Productivity’.
18 Diagram influenced by Chat 1 in McAteer, ‘An Economic and Social Audit of the “City”’. 
Financial sector workforce

For employers and Human Resources departments, automation and data-based decision-making are expected to increase productivity, reduce costs, provide new insights, and improve decision-making and accuracy. For example, efficiencies are expected in the recruitment process, with the automation of the interview selection process and AI-based hiring programmes potentially offering more accurate and relevant information on applicants, increasing diversity and reducing human bias. AI might also support management tasks, offering automated task assignment and work performance evaluation, along with personalised learning and training. According to the TUC, aspects of the employment relationship such as recruitment, line management, monitoring and training are increasingly being managed by AI in place of a person.

Wholesale and institutional markets

ML and AI applications have a natural home in the data-driven areas of wholesale and international markets. For example, a sizable proportion of asset management companies are now using AI and statistical models to run trading and investment platforms. Using carefully designed and tested algorithms, AI/ML systems may bring increased efficiencies, better assessment, management and pricing of risks, along with improved regulatory compliance and new tools for prudential surveillance and enforcement, which could contribute positively to financial stability.

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19 Price, ‘Finance Industry Needs Three Years to Prepare for the Impact AI’.
22 Boukherouaa et al., ‘Powering the Digital Economy: Opportunities and Risks of Artificial Intelligence in Finance’.

Retail financial services

Retail financial services are the most consumer-facing element of the financial services supply chain. Banks and insurance providers may benefit from improved efficiency of data processing and automated decision-making in terms of credit assessment, underwriting and claims processing. The use of automated decision-making in lending and Robotics Process Automation is already helping companies to gain a competitive advantage by automating repetitive, rules-based human tasks, such as account opening and closing, claims processing and customer service. This enables financial institutions to operate around the clock, deliver cutting-edge services and improve the client experience while increasing efficiency and accuracy.23

The end-user

The end-user interacts with AI mainly at the customer interface, using, for example, a chatbot, and may do so without knowing they are interacting with a new technology. Nevertheless, they may already be subject to the outcome of ML/AI decision-making processes. AI can also enable a more seamless customer journey and experience with the use of Natural Language Processing, plus voice, document, image and facial recognition.24 With financial firms benefiting from lower operating costs, there is the possibility that this might result in lower costs for consumers, making certain products and services affordable for groups that would have otherwise been unable to afford them and improving financial health with more personalised products.

Environment

AI is being applied to support the transition to a net-zero economy, in industries such as energy and transport, where it can help model policy and climate-risk analysis, and optimise processes and supply chains.25 In financial services, AI can be used to forecast carbon prices26 and to foresee natural disasters such as wildfires and floods, which can better inform risk profiling and product pricing in areas such as insurance, and inform activities in wholesale markets.27

Potential risks from AI in financial services

A well-functioning financial services industry is integral to the success of the UK economy. The GFC 2007–09 resulted in the deepest recession in terms of lost output since quarterly data were first published,28 leading to disastrous consequences for the economy and people’s lives. The avoidance of similar events is the purpose of the regulators’ financial stability objectives. The increased use of ML/AI models, as well as the rise of cybercrime and misinformation, may amplify systemic risks and potentially lead to financial and environmental crises.29 This is intensified by the adoption of foundation models, such as generative AI, which is being increasingly adopted in financial services despite little

25 Minevich, ‘How To Fight Climate Change Using AI’.
26 Shahzad et al., ‘Forecasting Carbon Emissions Future Prices Using the Machine Learning Methods’.
27 Kyriakopoulou, ‘What Opportunities and Risks Does AI Present for Climate Action?’
28 Allen, ‘Recession and Recovery’.
understanding of the risks to firms and consumers. With a technology as powerful and unknown as AI, it is necessary to review these risks to understand how best they can not only be avoided, but also transformed into positive outcomes.

**Protecting the integrity of financial markets**

One of the FCA’s main objectives is “to protect and enhance the integrity of the UK financial system, and to make sure that markets are effective, efficient and reliable”. Achieving this enables markets to work well and benefits firms, individuals and society as a whole. The application of ML/Al in financial services presents potential conflict with this objective. For example, one of the most common applications replaces the work of human analysts tasked with directing investments based on their knowledge and research of the market. While this may result in quicker decisions and a short-term increase in profits, there is a risk that the data underpinning the AI model is inaccurate, resulting in the
misallocation of resources and subsequent loss in profit. For example, if AI-driven trades are not trained about risk management properly, they may take higher risks to maximise profits. Should such a situation occur, it would risk eroding the integrity of financial markets and ultimately reduce the markets' ability to support the economy. Given the important role of the UK’s financial services sector, both domestically and internationally, AI could have disastrous consequences for the integrity of the financial markets if left unchecked and unregulated.

**SYSTEMIC RISKS**

The world’s financial markets are fragile at the best of times, and can respond negatively to unexpected events. There are several systemic risks presented by using AI in financial services.

**Instability and undermining public trust**

Over the past few decades data-driven algorithms have played an increasingly central role in the trading strategies of financial services firms. In the modern era, these use ML and AI models acting independently and adapting trading strategies based on learning, and this is set to increase over the coming years. This presents a serious risk to market stability, particularly in unstable markets, which, due to the interconnected nature of financial markets, could increase systemic risk. Generative AI is particularly susceptible to herd mentality bias and mispricing risk if, for example, it captures data at times of market euphoria, or based in inaccurate reporting, with human investors following suit. These ‘hallucinations’, where generative AI produces inaccurate information, have been recognised by financial firms as a potential risk to firms and consumers relying on or trusting AI as a source of financial advice or information. The rise in popularity of AI-driven robo advisors to support portfolio management, trading and risk management has increased the complexity of models, which can be difficult for managers to monitor and scrutinise, meaning they may step away from managing potential crises. Gary Gensler, the chair of the US Securities and Exchange Commission, recently said that the immediate risk from AI is not a robot takeover but a new financial crash, and that the likelihood of an AI-driven financial crisis within a decade would be “nearly unavoidable” if there were no regulatory intervention. These risks, combined with privacy concerns, could undermine the public’s trust in the integrity and safety of an AI/ML-driven financial system.

**Cybersecurity risks**

New tech-driven processes present new avenues for cyberattacks, particularly in an industry as lucrative and important as financial services. Unique and more sophisticated threats presented by ML/AI include ‘data poisoning attacks’, where the manipulation of data at some stage of the lifecycle allows attackers to evade detection and prompts ML/AI to make harmful decisions or to extract information. Constant oversight of the algorithm is required.

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30 Shabsigh and Boukherouaa, ‘Generative Artificial Intelligence in Finance: Risk Considerations’.
31 Svetlova, ‘AI Ethics and Systemic Risks in Finance’.
33 Bartram, Branke, and Motahari, ‘Artificial Intelligence in Asset Management’.
34 Financial Times, ‘How to Prevent AI from Provoking the next Financial Crisis’.
35 Boukherouaa et al., ‘Powering the Digital Economy: Opportunities and Risks of Artificial Intelligence in Finance’.
to ensure safety. Financial firms have expressed concern that the opaqueness of advanced AI models might make it difficult for them to distinguish between poor model performance and cyberattacks, reducing their ability to mitigate and potentially resulting in systemic risks to financial markets. According to the International Monetary Fund (IMF), the use of foundation models presents significant new challenges to cybersecurity, and its adoption in sensitive and heavily regulated sectors such as finance warrants “careful contemplation”. Both the wholesale and retail segments of the financial system are exposed to this risk. This has been evidenced by the vulnerability found in Log4, an open-source logging library commonly used by apps and services across the internet, that allowed attackers to break into systems, steal sensitive information (such as passwords), extract data and infect networks with malicious software. Even if financial firms have the capability to monitor for new risks, they are helpless if there is a vulnerability embedded in the software from the very beginning.

**Misinformation**

A significant risk presented by ML/AI is the use of corrupt data that leads to poor decision-making. This risk is particularly acute in financial services and foundation AI, such as generative AI, where not only could billions of pounds be at risk, but so could financial stability. This area of financial services is also at risk of misinformation, fuelled by social media, which can impact price formation across global markets. Such a scenario could become systemically important if the misleading information spread in the financial system. This has already happened: on 22 May 2023, a suspected AI-generated image purporting to show the Pentagon in the aftermath of an explosion spread across social media just as the US markets opened. This jolted global financial markets, with the S&P 500 declining by about 0.3% to a session low, until US officials clarified it was a hoax. The impact may have been limited in that instance, but it demonstrates the potential risk of AI-generated content for the financial markets. Financial services regulators will need to think about how to prevent bad actors from systematically using ‘fake news’ to target individual companies or manipulate markets.

**Consumer protection**

Protecting consumers is a main objective of the FCA and important steps have been made in this regard over the past few years, culminating in the introduction of the FCA’s Consumer Duty. This sets out to ensure that financial firms offer consumers products and services that meet their needs, fair value and appropriate support when needed. However, the increased use of ML and AI processes risks weakening the effectiveness of the Duty and that of existing consumer protection regulation.

The absence of transparency around the complex and opaque decision-making algorithms, and the business model driving the policy rules that guide them, is resulting in firms lacking the comprehensive oversight and technical knowledge about how systems they have procured take decisions. This makes it difficult for regulators and consumer groups to

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36 Boukherouaa et al.
37 Bank of England and FCA. ‘FS2/23 – Artificial Intelligence and Machine Learning’.
38 Shabsigh and Boukherouaa, ‘Generative Artificial Intelligence in Finance: Risk Considerations’.
40 Alba, ‘How Fake AI Photo of a Pentagon Blast Went Viral and Briefly Spooked Stocks’.
understand potential unfair decisions.\textsuperscript{41} It also risks governance being of poor quality at financial firms where board members do not have the required expertise in AI and therefore do not understand the outcomes created by their AI processes. A concerning parallel can be drawn here with the lead-up to the GFC 2007–09, where non-executive directors had little knowledge of the impact their firms’ products were having on consumers and the wider economy. It is imperative that financial firms utilising AI have good governance and sufficient oversight in place to ensure that new AI processes are scrutinised, and processed via the normal risk assessment, to ensure fair outcomes.\textsuperscript{42} This also applied to third-party providers of AI solutions, who should provide sufficient information to enable effective governance of some of their products.

The consultation and development of the Consumer Duty occurred in advance of the increased profile of AI, resulting in a lack of clarity with regard to how a firm needs to prove that their use of AI is in accordance with consumer protection. This needs to be addressed to ensure that the regulators can assess the use of AI from a consumer protection perspective. AI/ML models, as with traditional models, can reflect biases and inaccuracies in the data they are trained on, and potentially result in unethical outcomes if not properly managed.\textsuperscript{43} This can lead to consumers experiencing unfair bias relating to their gender, ethnicity and disability, in terms of access to products, pricing of products and services received.\textsuperscript{44} Biased or discriminatory decisions can arise from bias in the underlying data on which the AI model is trained, with the data reflecting historical biases in society, or being incorrect or unrepresentative of society, leading to biased decisions for consumers.\textsuperscript{45} A recent study using the hypothetical scenario of a mortgage assessment via video interview and AI to create a risk score found that applicants may perform poorly due to regional or ethnic accent, speech impairment and other impairments that may constitute disability, such as neurodivergence.\textsuperscript{46} While this type of ‘customer segmentation’ is not new in financial services, data-driven technology such as AI enables financial providers to segment customers with even more precision. Left unmanaged, this would enable existing biases to be embedded and replicated even more effectively within decision-making systems.

The increased use of data also presents a challenge around data privacy, as there is no clear line of evidence that a person’s data has been used ethically and according to their preferences. Collecting, storing and ethically using personal data is a heavy responsibility and requires the highest level of compliance with data protection laws. For example, consumers seeking insurance or credit may not be aware of the information obtained, or the methods used to determine the products offered. If this is achieved via social media, the data may be collected without the content provider’s awareness or consent, also raising the risk of the data being inaccurate or incorrect, resulting in a detrimental outcome for the unknowing consumer.\textsuperscript{47} While AI is data-hungry, this presents a privacy overreach, taking data out of the context from which it was originally obtained.

\textsuperscript{41} Financial Services Consumer Panel Evidence Review, ‘Financial Services Firms’ Personal Data Use – Is This Leading to Bias and Detriment for Consumers with Protected Characteristics?’
\textsuperscript{42} Shaw, Patricia, The AI Book (published by Fintech Circle), Ch. 7: Trust, Transparency and Ethics – Good governance in Financial Services, published April 2020.
\textsuperscript{43} BIS, ‘Newsletter on Artificial Intelligence and Machine Learning’.
\textsuperscript{44} Maple, Szpruch, and Epiphaniou, ‘The AI Revolution: Opportunities and Challenges for the Finance Sector’.
\textsuperscript{46} Lawrence-Archer and Naik, ‘Analysis: Effective Protection against AI Harms’.
\textsuperscript{47} Maple, Szpruch, and Epiphaniou, ‘The AI Revolution: Opportunities and Challenges for the Finance Sector’. 
The implications of using AI systems in Human Resources departments raises the risk of recruitment bias, which could result in the workforce being unrepresentative of its customers and therefore being less likely to adequately meet their needs.\(^4\) An industry’s workforce should reflect the society it serves. This is especially important in the delivery of financial services, as without adequately representing the make-up of society it will fail to provide appropriate services or care. There is a risk that if the decision-making process is based on data that is subject to bias on the basis of race, gender, sexuality or religion, this will not be achieved and will reduce the industry’s ability to meet the needs of society. Warning should be taken from the now-defunct Amazon AI recruiting tool, which showed bias against women.\(^4\)

### Financial exclusion

Financial and digital exclusion remains prevalent in today’s society. In the UK 1.1 million adults are classified as ‘unbanked’, and many more have been excluded from the financial system: 3.8 million adults, or 7% of the population, were refused a financial product or service in 2022,\(^5\) and 28% of people today feel locked out of the financial system, up from 20% last year. This rises to 45% of people from a Black and minority ethnic background and 47% of people aged 18–34.\(^6\) In the modern world, exclusion can also arise from a lack of digital skills and capabilities: 4 million people are still unable to complete a single basic digital task to get online, 7 million households have no broadband or mobile internet access and 1 million people have cut back or cancelled their internet packages in the last year due to affordability issues.\(^7\) The use of ML/AI in financial services risks offering few improvements and potentially contributing to financial exclusion. For example, poorly performing systems could produce flawed risk profile assessments, resulting in customers who are mistakenly considered high-risk finding themselves locked out of the market. The insurance market is also at risk of excluding, or pricing out, high-risk consumers due to the outcome of the AI-driven decision-making process, when they would have been more favourably viewed by a more conventional approach.\(^8\) There is also the potential risk of exclusion for citizens with a small digital footprint who may be excluded from accessing financial services due to a thin credit file and lack of digital ID. This presents a vicious cycle, because although they want to engage with the financial ecosystem, they are unable to because they cannot surmount the first hurdle of ID and verification, which also relies heavily on credit file data. There is therefore a risk that AI may exacerbate the digital poverty trap that affects many people in the UK.\(^9\)

### Financial crime

In addition to increased and new opportunities for cybercrime, ML/AI in financial services presents new risks for financial crime more generally. New technology creates new opportunities for crime and fraudulent activity, as evidenced by the sharp increase in losses to crypto fraud over the past year\(^10\) and the substantial increase in fraud and computer

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\(^{4}\) Dennis and Aizenberg, ‘The Ethics of AI in Human Resources’.
\(^{49}\) Dastin, ‘Amazon Scraps Secret AI Recruiting Tool That Showed Bias against Women’.
\(^{5}\) FCA, ‘Financial Lives 2022’.
\(^{51}\) Plend, ‘Financial Inclusion Report’.
\(^{52}\) Communications and Digital Committee, ‘Digital Exclusion’.
\(^{53}\) Ostmann and Dorobantu, ‘AI in Financial Services’.
\(^{54}\) Faith, Hernandez, and Beecher, ‘Digital Poverty in the UK’.
\(^{55}\) Venkataramakrishnan, ‘UK Crypto Fraud Losses Jump 40%’.
misuse offences over the past two years.\textsuperscript{56} AI-driven scams that use deepfake technology to present credibility are already in circulation on social media networks.\textsuperscript{57} These have the potential to make fraud and money laundering activities more sophisticated and harder to detect.\textsuperscript{58} Weakness in the performance of AI to detect or provide safeguards against financial crime could make systems less effective compared with conventional systems. In addition, the complexity of the models, and lack of human understanding and oversight, could make it difficult to identify weaknesses.\textsuperscript{59}

**Environment**

AI is data-intensive and its increasing use risks jeopardising the important role that the financial services industry has to play in the transition to a net-zero economy. There is a risk that the significant amount of energy required to power AI models does not necessarily result in better service delivery but has increased fossil fuel use or drawn the limited amount of supply of renewable energy away from other uses.\textsuperscript{60} These risks are largely due to the intensive energy consumption required by data centres to fuel the data economy. A single data centre can consume the equivalent electricity of 50,000 homes and significantly contribute to the national energy consumption of its host nation, which could lead to transference to poorer nations as whether nations strive to meet their environmental targets. According to the ODI, in the next 10 years there could exist the data centre equivalent of a trash island.\textsuperscript{61} Data transmission is also increasingly dependent on satellites, with an estimated 7,000 in space, a number that is expected to increase with increased launch of satellites by private companies. Satellite data has been used by high frequency traders to gain faster data transfer speeds to inform their stock market activity. This is not only energy-intensive, but it also gives an advantage to those who have the means to invest in this technology.\textsuperscript{62}

**Reinforcing monopoly power**

The increased use of and reliance on ML/AI processes will also entrench power in the hands of technology companies, which are increasingly making inroads into finance but are not subject to strict oversight. Platform businesses, such as Apple, Amazon, Google and Meta, act as an intermediary between users, extracting value from their activities on the basis of the data generated, and have become the dominant data-driven business model of our economy. Benefiting from ‘network effects’ and economies of scale, these Big Tech platforms have become some of the largest firms in the world.\textsuperscript{63} Their dominance means that they will be able to scale-up the use of AI much faster than smaller firms, benefiting from greater data insights, computing power and financing. A healthy and well-functioning market requires a multitude of business models. This imbalance of power will reduce the diversity of firms in financial services and disadvantage smaller firms that offer specialised services to specific groups. This could result in the reduction of purpose-driven finance organisations, which would lead to the financial services industry being less able to

\textsuperscript{56} ONS, ‘Nature of Fraud and Computer Misuse in England and Wales: Year Ending March 2022’.
\textsuperscript{57} SkyNews, ‘Martin Lewis Warns against “frightening” AI-Generated Scam Video’.
\textsuperscript{58} Bank of England and FCA, ‘FS2/23 – Artificial Intelligence and Machine Learning’.
\textsuperscript{59} Ostmann and Dorobantu, ‘AI in Financial Services’.
\textsuperscript{60} Clough, ‘Expert Explainer: Net Zero or Net Hero?’
\textsuperscript{61} Snaith, ‘Data Centres, Cloud Infrastructures and the Tangibility of Internet Power’.
\textsuperscript{62} Inverarity, ‘Beyond the Cloud(s): The Role of Satellites in Data Sharing’.
\textsuperscript{63} Nicholls, ‘Lifting the Lid on Fintech’.
adequately serve the wide-ranging financial needs of society. The increased power of Big Tech and large financial firms will be reflected in their influence on government policy and reduce the opportunity and involvement of civil society organisations, consumer groups and the citizenry. This places too much influence in the hands of the financial services lobby and AI industry, ignoring the risks of AI to vulnerable groups and increasing the possibility of regulatory capture by industry lobbyists.

**REGULATING AI IN FINANCIAL SERVICES**

At the time of writing, no AI-specific regulations exist anywhere in the world. This is concerning but is also an indicator that we are at the preliminary stage of our relationship with AI. There is a unique opportunity here, as it is advantageous to implement rules and regulations at the early stage of something new: we can guide the development of this potentially powerful technology in the common interest. Waiting until it is established could leave it too late to ensure that AI’s integration into sectors such as financial services happens in a manner that is climate-conscious, protects consumers, leads to good social outcomes and maintains financial stability.

A comparison can be made with the government’s approach to regulating the Buy-Now-Pay-Later (BNPL) market, which, despite an FCA call for urgent regulation to reduce consumer harm made in February 2021, has yet to be regulated. More than two years on, the BNPL market has doubled in size, which has led to vulnerable citizens falling into debt and the increased use of credit cards to pay off debts. Introducing effective regulation at an early stage may have reduced consumer harm.

The UK and EU represent the two dominant approaches to AI regulation. The vertical strategy being adopted by the UK proposes no additional specific AI regulation, with existing sector regulators implementing a set of AI principles. For example, AI in financial services will be regulated by the FCA and AI developments in the pharmaceutical sector will be regulated by the Medicines and Healthcare products Regulatory Agency. It also includes horizontal cross-cutting frameworks, such as human rights, equalities and data protection law. This approach is intended to establish the UK as an AI superpower by encouraging innovation while providing a framework to ensure risks are identified and addressed.

In contrast, the EU’s horizontal approach proposes an AI Act, scheduled to be agreed by late 2023 or early 2024, which lays out rules for AI across all sectors and applications and establishes four levels of risk posed to fundamental rights. AI deemed to pose an unacceptable risk will be prohibited (e.g. the use of real-time remote facial recognition systems used in public spaces), and high-risk systems will be subject to requirements and conformity assessments. While this risk-based approach provides overarching rules for AI, its rigidity could stifle innovation and make it impossible to keep pace with developments, such as foundation models; these factors render the risk-based approach less effective.

The UK’s approach could also be hindered by foundation models, as a vertical approach, offering little or no holistic oversight, could allow their growth to occur without the necessary guardianship to reduce harms. In addition, the UK’s regulators will require

65 Packman, ‘Buy Now Pay Later: The Link To Credit Cards Is Causing Harm’.
66 UK Gov, ‘A Pro-Innovation Approach to AI Regulation’.
67 Roberts, ‘AI in the EU and UK: Two Approaches to Regulation and International Leadership’.
additional financial and intellectual support to offer services proportionate to the potential impact of AI, with measures to avoid regulatory coherence between the individual bodies.

The financial services industry is served by a regulator born out of the GFC 2007–09. The FCA has strategic objectives to protect the consumer from bad conduct, to protect the integrity of the UK’s financial system and promote effective competition in the interests of consumers. The FCA also oversees the functioning of the Financial Ombudsman Service, the free-to-use complaints and dispute resolution service, and is supported by the Financial Services Consumer Panel, an independent statutory body, set up to represent the interests of consumers in the development of policy for the regulation of financial services. Structurally speaking, in comparison to other sectors (e.g. employment or public services), the financial services industry has good sector-specific regulation that provides customer redress. However, the data reforms currently going through Parliament propose removing the need for human supervision in the automated decision-making process. The consequences of this alone require the review of consumer protections in the age of AI and digitalisation.

CONCLUSION

This paper has demonstrated that while there are benefits to integrating AI into financial services, there are also significant risks to society and consumers, particularly those in vulnerable circumstances, to maintaining financial stability and the industry’s role in supporting the transition to a net-zero economy. We can anticipate many of the risks of AI, based on the harms that are already caused by the current provision of financial services, and confidently predict that without an updated approach to regulation and consumer protection they will remain and intensify. In the case of financial stability, the risks are potentially catastrophic. The UK’s approach to regulation should therefore not focus on innovation or becoming an ‘AI superpower’, as this would only lead to lighter-touch regulation and the realisation of the risks. Chasing innovation is dangerous if risk-avoidance is not baked into the regulatory approach. Instead, we need a precautionary approach to get ahead of innovation and develop a regulatory framework that prevents these risks from emerging. The inherent difficulty of knowing what risks may arise from AI, combined with the lack of transparency and intense complexity of decision-making algorithms, logically leads to a precautionary approach to regulation. This shift towards a more proactive approach, particularly in the context of the implications of AI in financial services, has been supported by industry experts.

In combination with a risk-based precautionary approach, the UK should be making a much greater effort to include voices from civil society organisations and the public into the debate about the future of AI. In no sector is this more important than in financial services, where the variety of circumstances requires a multitude of solutions, many of which require specialised and lived experience. As noted by the Ada Lovelace Institute, governing AI effectively is a “sociotechnical challenge: one that requires the meaningful involvement of people and communities, particularly those most affected by the development and use of AI.

68 Financial Ombudsman Service, ‘Who We Are’.  
70 Lawrence-Archer and Naik, ‘Analysis: Effective Protection against AI Harms’.  
72 Maple, Szpruch, and Epiphanio, ‘The AI Revolution: Opportunities and Challenges for the Finance Sector’. 

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systems.” Without this type of society-wide engagement, there is a risk that the development, introduction and monitoring of AI processes in financial services will not serve society. With technology as powerful as AI, and an industry as influential as financial services, ensuring that the public interest comes first should be central to the government’s approach to AI.

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73 Davies and Birstwistle, ‘Seizing the “AI Moment”: Making a Success of the AI Safety Summit’. 
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