Learning and machines: AI and fintech at the Bank of England – speech by Louise Eggett

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Speech

Thank you to WIRED for the invitation to speak today.

My name is Louise Eggett and I am Head of the Fintech Hub at the Bank of England. Today, I'm going to discuss our approach to fintech, and particularly our latest work on AI and machine learning. Reflecting as I prepared these remarks, learning has really been at the heart of our approach to supporting safe innovation. It's learning that's come from a commitment to broad engagement: with industry, with others in the public sector, and with our overseas counterparts. And, as I'll explain as I touch on our digital regulation agenda, it's a process that continues, with and without the machines.

The Bank's fintech journey

Let me start with what we mean by "fintech" and why it's important to the Bank. We think about fintech (or financial technology) in its broadest sense – everything from small, innovative start-ups and new business models, to technology companies engaging with the financial sector, to the use of technologies in our regulated banks and insurers. We're interested in developments not just in the UK but also in other markets around the world, recognising that technology doesn't stop at the border.

Our overarching philosophy is to support safe innovation and adoption of technologies in financial services. Innovation can benefit consumers, firms, markets and the wider economy. For example, better data analytics can enable more affordable and accessible financial services, as well as improving firms' risk management. Given the Bank's mission to promote the good of the people of the UK through monetary and financial stability, we want to ensure the UK can harness these benefits.

However, change is rarely risk-free. For the banks, insurers and other firms we regulate, risks to safety and soundness may increase if they introduce technologies without fully understanding their implications and limitations. Meanwhile, novel technologies may change or amplify risks to financial stability, such as operational and cyber threats. Therefore, it is important we keep pace with developments and take the right actions to mitigate risks, promote stability and facilitate safe innovation.

I'm going to talk later about how machine learning is affecting financial services. The Bank has done its own kind of learning when it comes to new technologies. We began our fintech journey in 2016, with the **Fintech Accelerator**. For two years, we worked with industry on a series of experiments. These included: using distributed ledger technology to explore the synchronised movement of different currencies across real-time gross settlement systems; machine learning techniques that could analyse vast quantities of

unstructured data; and cyber security tools collating threat intelligence into a searchable repository.[1]

These experiments were invaluable in helping us understand the benefits, risks and trade-offs of these technologies. And collaborating with others also gave us a first-hand insight into different ways of working. Back then, the contrast was between a central banking culture and fast-growing tech companies. Little did we know how much the world of work would change for all of us over the years that have followed.

Although we haven't stopped experimenting, the creation of my team, the Fintech Hub, more than four years ago now, represented a shift in the way we work – to analysing the policy implications. That means taking what we've learned about new technologies and business models, and applying it to our policies, to make sure they really can support safe adoption and achieve the right regulatory outcomes. The team operates as a centre of excellence, working with colleagues across the Bank to understand what fintech means for their role, be that decentralised finance, cryptoassets, AI, or Open Banking (to name but a few). This audience will recognise how quickly these fields are developing, and hence the importance we place on engaging with people like you to learn what's happening in the market.

Overall, we're learning to think as a more digital regulator. Yes, there might be new risks, and we'll need to mitigate those. But we also see regulation, done right, as promoting stability, confidence and trust. This supports entrepreneurs and innovators, through a stable background against which to experiment and invest. And it supports their potential customers, to try new products and services with confidence.

From experimentation to regulation

So, having described our approach, what innovations do we see making their mark on financial services? Many of the technologies transforming the world today are general-purpose. They're not specific to financial services and can be used together. For example, AI and machine learning applications often run on the cloud, and can analyse data collected from the internet of things - just consider the use of telematics and wearable devices to generate inputs for insurance pricing. In a sense, financial services has always been a keen user and early adopter of technologies. But, in recent years, we have seen the pace of innovation and adoption accelerate, not least in the wake of the Covid-19 pandemic.

Take cloud computing as an example, which provides the bedrock for so many other innovations. Where correctly configured, cloud users benefit from enhanced computing

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[1] **A full list of the POCs, including write-ups**

capabilities and more resilient technology infrastructure. But the cloud does come with its own operational risks, particularly where provided by third parties.

Our response has come in three parts. First, we were amongst the first regulators globally to develop standards for **operational resilience**. Second, our **outsourcing and third party risk management policies** have been holding firms responsible for their operational resilience, whether or not they rely on third parties to deliver their important business services. Third, we have launched a **Discussion Paper** on the systemic risk implications, recognising that no single firm can adequately monitor or manage the risks that certain third parties may pose to financial stability, market integrity and consumer protection. This most recent publication, currently open for feedback, explores how the Bank and FCA could use the powers proposed in the **Financial Services and Markets Bill** to assess and strengthen the resilience of services provided by critical third parties.

Payments is another area seeing rapid innovation. The use of physical cash continues to decline, as the **public appetite for digital payments has soared**. Fintech firms, among others, are developing alternatives to traditional forms of money. And we, among other central banks globally, are exploring the possibility of issuing a digital form of central bank money – a **central bank digital currency** (or CBDC). There is not time today to discuss this in detail – it would be a session of its own, and colleagues have set out our thoughts elsewhere.[2] I can say, though, that we are exploring a retail UK CBDC with pace and purpose. We've committed to publish a consultation paper, with HM Treasury, during 2022. That paper will not be a decision on whether to issue a CBDC. Instead, it will seek views on whether to move to the next stage of our work, with an increased focus on technology.

A CBDC, sitting alongside cash, is just one particular digital concept that may form part of future central banking. Let me give just two examples of other ways in which we're already embracing technology to improve our own capabilities as a central bank and regulator. Our programme to renew the real-time gross settlement (RTGS) service, the UK's high-value payment system, will deliver payments technology fit for the future, supporting the future capability of payments and significant innovation of this critical national infrastructure. Within the PRA, a dedicated RegTech, Data and Innovation Division is bolstering our efficiency, effectiveness, and data culture, through phased investment in tools, technology, processes, and skills. This encompasses the joint Bank-FCA plan to transform data collection in the UK financial sector: a multi-year project to ensure that the Bank gets the data it needs to fulfil its mission, at the lowest possible cost to industry.

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[2] See, for example, Tom Mutton's **update on our CBDC work at FS tech in July 2021** and our discussion paper on **new forms of digital money** (June 2021).

Artificial intelligence and machine learning

Now I am going to focus on a particular general-purpose technology that is a key component of our digital regulation agenda – artificial intelligence (and machine learning). AI is in use in various sectors across the economy, although finance is one of the **most advanced**. Perhaps this is because the use of data and statistical modelling are not new to financial services.

AI can bring benefits to consumers, firms, and the wider financial system. It can increase predictive power, permit more granular classification and segmentation and capture non-linear relationships. It can analyse much larger data volumes and novel data sources. At the same time, more complex techniques may lack explainability. And the continuous learning and almost daily recalibration of certain models may amplify prudential risks and perhaps even financial stability risks. That's why our focus has been on supporting the safe adoption of AI.

Our first step was a joint **Bank-FCA survey** in 2019. The idea was to cut through the noise to a more granular understanding of how the technology was being used in UK financial services. We saw firms using AI across a range of business areas – 67% of respondents, in fact. And firms already recognised that risk management may need to evolve. When we looked again, **in 2020**, we found that the Covid-19 pandemic and subsequent economic shock had accelerated the pace of AI adoption within UK banks.

At that stage, we could have jumped straight to regulation. But we wanted to learn more and recognised the best approach was to engage with practitioners in this rapidly developing field. So we established the **AI Public-Private Forum (AIPPF)**, to further the dialogue on AI innovation and to explore how best we could support its safe adoption within financial services. The AIPPF brought together a diverse group of experts from across financial services, the tech sector and academia, along with public sector observers.

The AIPPF published its report earlier this year. One of its conclusions was that regulators can support innovation and adoption of AI, including by providing clarity on the application of existing regulations. In response, today we have published, with the FCA, a **Discussion Paper**, to keep up the open dialogue. Given the wide-ranging implications of AI, we are keen to hear from as many different stakeholders as we can: financial services firms, professional services, law firms, technology companies, trade associations, academia, or wherever else you sit. Please do read the paper and let us know your thoughts. The consultation is open until February.

Let me give you an insight into our thinking to date. We see the primary drivers of AI risk relating to three key stages of the AI lifecycle: (i) data, (ii) models, and (iii) governance. Allow me to say a few words on each.

First, data. AI needs high-quality data and good data management. The existing regulatory framework around data management is something of a patchwork. There are various UK rules and international standards covering data quality, infrastructure, resilience and governance. These all sit alongside the UK's **data protection laws**. The framework is certainly complex, but is it complete, viewed in the light of AI? Could there be value in creating a more unified approach to data management and regulation in UK financial services?

Second, models. We have learned from industry that model risk management is increasingly important in managing AI-related risks. However, the current scope of model risk management regulation in the UK is very limited. We have principles for models in specific areas – such as internal capital or stress-testing. But the use of models, as a key basis for informing important business decisions, has increased significantly in recent years. This includes, but isn't limited to, AI models. We've been **consulting separately** on a more holistic set of model risk management principles for banks. These principles should raise the standard of model risk management at UK firms, recognising it as a risk discipline in its own right. They should also support the safe adoption of newly advanced technologies like AI.

Third, good governance is essential for supporting the safe and responsible adoption of AI. It underpins proper procedures and effective risk management across the AI lifecycle. Thankfully, we have a good starting point in UK regulation - our **Senior Managers Regime**. But the use of AI may raise tough questions for boards and senior management. What level of expertise should we expect of them? And what might reasonable steps look like?

Why is now the time for a Discussion Paper? For two reasons.

First, alongside the Discussion Paper, we've published today a further **Bank-FCA survey** on the use of machine-learning in financial services. This is increasing, becoming more widespread, and becoming more mature. 72% of respondents reported using or developing the technology. All the firms we surveyed expect their use of AI to increase over the next few years.

What is striking compared to 2019 is that AI is being used in more and more business areas – from customer engagement to risk management, fraud detection to trading. Within financial services, banking and insurance remain the sectors with the highest number of applications. Some of the most advanced AI applications are in credit underwriting and

insurance pricing. These are core business areas where decisions have a significant impact on customers, firms and the financial system.

Not only are AI applications becoming more widespread. The technology is more mature and embedded in day-to-day operations. 44% of the AI applications were in the pre-deployment or pilot phase in 2019, compared to just 10% this year. In fact, 79% of AI applications are deployed across a considerable share of, or are critical to, their business areas.

The second reason for looking at regulation now is the evolving wider national and international policy debate on AI. The **UK government has published draft principles** on AI regulation, with a white paper forthcoming. Internationally, the European Union has proposed an **AI Act** and Canada has implemented its **AI and Data Act**, to cite just two jurisdictions. We speak regularly to our UK and global regulatory counterparts, learning from each other's experiences. Our Discussion Paper distils our best wisdom so far, but we look forward to more learning from the feedback.

Conclusion

To conclude. Over the past few years, the digitalisation of the economy has accelerated. So has the pace of innovation and adoption of technology within financial services. As regulators, we've approached these changes with an open mind and acknowledging where we have much to learn, about the machines as well as how to work with them. Our internal journey, from experimentation, to understanding, to making policy, is not over yet. As we look forward, I encourage you again to engage with our consultations, on AI, cloud, model risk management and, in due course, central bank digital currency. By working together and learning from each other, we can develop the regulatory framework in a way that promotes stability and resilience, facilitates competition and in turn supports entrepreneurs and innovators.

Thank you.