

Developments in AI and blockchain – how do we protect investors and supervise markets effectively?

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I'm delighted to take part in this year's event. My remarks today will cover developments in two areas of digital innovation that have been in the headlines lately: first, crypto assets and distributed ledger technology, informally known as blockchain; and second, artificial intelligence, or AI.

Across the financial sector, there are growing applications and use cases of blockchain and AI. The underlying technology is highly sophisticated; indeed, at times AI applications can make it seem like we are living in the realm of science fiction. Our job as regulators is to keep track of innovative finance, and to assess new tools and practices against our core priorities. At ESMA, we need to ask ourselves continually: how do we protect investors, promote stable and orderly markets and supervise markets effectively?

Crypto risks materialise

Recent months have seen some highly concerning events unfold in the world of crypto assets. Foremost among them was the collapse of FTX, one of the most prominent crypto trading platforms, in November. Headquartered in the Bahamas, FTX was part of a complex corporate structure spanning several continents, allowing users to buy and sell crypto coins, tokens and

derivatives, sometimes with high leverage. Its bankruptcy sent shockwaves across the entire crypto industry¹ and is likely to cause major detriment to retail investors, including in the EU.²

The relevant authorities are continuing their investigations into this complex case, and I will not discuss it in detail. But we should recognise that the episode is an important juncture in the development of crypto markets. ESMA and other authorities have been warning publicly for some time about the severe risks crypto assets can pose to investor protection and market integrity. Crypto assets are typically not backed by any tangible value and their price is highly volatile. Most operate outside the scope of EU regulation, meaning that consumers do not have rights or protections if things go wrong. Yet crypto assets appeal to many consumers, who increasingly can trade them at the touch of a button via one of the many FinTech apps. We continue to see crypto assets promoted also on social media, with consumers exposed to unverified information and often wildly exaggerated claims.

The existence of crypto scams and fraudulent activities had been evident for some time.³ But with FTX, the risks have materialised at a larger scale. Fundamentally, the episode corroborates existing concerns about often weak or flawed corporate governance and controls in the crypto asset space.⁴

Markets in Crypto Assets (MiCA) regulation

The new MiCA regulation was developed without prior knowledge of the scale and nature of the problems that arose at FTX. MiCA is nonetheless an important milestone in crypto asset regulation. It will introduce new protections for investors, and new rules for market participants through a common EU regime. Crypto Asset Service Providers (CASPs) will for the first time be subject to authorisation and supervision by national competent authorities.

¹ Major coins, like Bitcoin and Ether, lost 20% in value in the space of a week following the FTX collapse. Several stablecoins de-pegged temporarily. Several crypto lenders, e.g. BlockFi and more recently Genesis, also filed for bankruptcy. Public information suggests that EU investors represented a limited share of the FTX user base.

² According to bankruptcy filings, EU customers would represent less than 10% of the total

³ According to Chainalysis, [2022 was the biggest year ever for crypto hacking, with USD 3.8 bn stolen from cryptocurrency businesses](#)

⁴ See ESAs (2022) [EU financial regulators warn consumers on the risks of crypto-assets](#), 17 March; ESMA (2021), [ESMA sees high risks for investors in non-regulated crypto-assets](#), 17 March; ESAs (2018), [ESAs warn consumers of risks in buying virtual currencies](#), 12 February

At the same time, and while it is the first comprehensive regulation of previously unregulated crypto-assets in the world, we must acknowledge that MiCA is not a silver bullet. For a start, it is inevitably limited in geographic scope. Service providers outside the EU have a prominent role in crypto markets, and it seems likely that this will continue to be the case. If consumers in the EU seek out the services of providers based outside the Union, they will be outside the scope of MiCA. And among CASPs within the EU, the protections for investors are not at the level of those in MiFID. Nor are the market integrity rules as stringent as those in MAR. In short, crypto asset markets will not suddenly turn into mature, established securities markets and it is important that we make that distinction clear to investors.

Another difference is the surveillance capabilities that authorities have in traditional financial markets compared to crypto assets markets. In traditional markets, unlike crypto markets, reporting and market surveillance regimes have been developed and strengthened over many years, and competent authorities have extensive information at hand to supervise firms and assess risks. On top of this, crypto-assets markets continue to evolve quickly. MiCA will therefore need to be kept under review in light of market developments and their impact, notably on the perimeter of MiCA, with a particular emphasis on non-fungible tokens (NFTs) and decentralised finance.

ESMA will have a substantial role in implementing and applying the new MiCA regime, which is an urgent task for us. From a policy perspective, we will have to draft dozens of technical standards and guidelines, working closely with the EBA.

ESMA will also have coordination duties under MiCA. As many service providers are concentrated outside the EU, we will need to continue to cooperate closely with our counterparts internationally. Within the EU, ESMA's role will be to support a convergent approach across national supervisors, including through regular information updates on significant CASPs. ESMA will also have the task of creating and maintaining a public register with detailed information on E-Money Tokens (EMT), Asset-Reference Tokens (ART), CASPs, and complaint handling. We will need to build a user-friendly register to promote transparency of these aspects of the crypto market.

A final observation on MiCA is that ESMA will be given intervention powers, somewhat analogous to those we have in MiFIR, which we last exercised in 2018. ESMA will be able to

prohibit or restrict the provision of services by CASPs, or the distribution or sale of crypto assets, in case of threats to investor protection, market integrity or financial stability. This is an important and challenging new mandate for ESMA.

Blockchain applications beyond crypto

I would not like to leave you with the impression that blockchain technology only creates risks and problems. This technology has other applications beyond crypto assets. Our job as regulators is to identify where applications can bring benefits to markets and investors, where there are risks and how we can ultimately support beneficial innovation. DLT-based financial instruments, for example, have the potential to speed up settlement cycles and to bring greater efficiency to back-office functions.

Recognising this potential, the DLT Pilot Regime aims to support the development of the trading and settlement of DLT-based financial instruments. The Pilot will enter into application in less than two months from now (on 23 March 2023) and will allow the uptake of MTFs and CSDs that leverage on blockchain technology in a controlled environment. The potential benefits include enhanced speed, efficiency and transparency, because of the reduced number of intermediaries and greater automation involved. As long as such automation is reliable, it can benefit markets and, ultimately, investors.

NCA's will authorise and supervise firms under the Pilot but ESMA will have an important coordination role to support convergence across the EU. For example, we will have the possibility to issue opinions to the national authorisations and will provide guidance on several aspects of the Pilot.

Recent leaps in artificial intelligence

I will now turn to the topic of artificial intelligence, or AI. Since its launch in November, ChatGPT has been in the headlines. It is a chatbot that, while imperfect, often has an impressive – and uncanny – ability to reply to questions. It is therefore a tool within the field of Natural Language Processing, or NLP, which itself is a subfield of AI. At the same time, it is an example of machine learning, using vast amounts of training data in the form of text gathered from across the Internet. Human beings have helped train it, not just in devising the underlying code, but also in giving the tool feedback on the quality of its verbal output.

ChatGPT has reportedly been kept rather busy since appearing on the scene, apparently even passing an MBA exam.⁵ This clearly poses some immediate and urgent questions for educational establishments – and in the financial sector, for administrators of professional exams and qualifications. It also raises questions for authorities such as ESMA, which I will come to shortly.

But first, to set the scene, let's return to the year 1950. Alan Turing, the great pioneer of computer science, proposed an "imitation game" – since renamed the Turing Test – to determine whether a machine exhibits intelligent behaviour.⁶ A series of questions is asked to the machine as well as to its human competitor. The machine passes the test if another person asked to judge the responses cannot tell which response comes from the machine and which from the human competitor.

At the time, this prospect may well have seemed far-fetched. Indeed, almost three-quarters of a century later, ChatGPT does not always give entirely convincing answers, but it does a remarkable job nonetheless. Sometimes it is worth taking a step back to marvel at how far we have come. And I note that there are several firms competing to innovate in this area. We can expect NLP tools to continue to improve.

What do advances in NLP mean for financial markets and regulators? A direct potential application of new chatbots is in consumer interactions. The European Commission's proposed AI Act – which applies across the economy, not just the financial sector – recognises the importance of transparency in this regard, requiring that clients be made aware that they are interacting with a bot.⁷ Another potential application of NLP tools is to automate compliance procedures, such as around disclosures, or even to write analyst reports.

ESMA has been closely following developments in NLP and in AI more broadly. Last week, we published a research article on current and potential applications of AI in securities markets.⁸ We have not seen a fundamental or disruptive shift to using AI tools, but some noteworthy

⁵ Financial Times (2023), "[AI Chatbot's exam pass poses test for business schools](#)", 21 January

⁶ Turing, A. (1950), "Computing Machinery and Intelligence". *Mind*, Volume LIX, Issue 236, October, pp 433–460

⁷ See Article 52 of the [Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence \(Artificial Intelligence Act\) and amending certain Union legislative acts, COM/2021/206 final](#)

⁸ Bagattini, G., Benetti, Z. and Guagliano, C. (2023), "Artificial Intelligence in EU Securities Markets", ESMA TRV Risk Analysis article, ESMA50-164-6247, 1 February

developments prompt continued monitoring, dialogue and analysis by ESMA and other authorities. Increasingly, asset managers are using AI in investment strategies, risk management and compliance. However, very few currently have a fully AI-based investment process and publicly promote the use of AI. Traders, brokers, and financial institutions are using AI tools to optimise trade execution and post-trade processes, reducing the market impact of large orders and minimising settlement failures. And other entities such as credit rating agencies are now making use of AI tools to support their data analysis and sourcing of information. AI and NLP tools can also add value to us as regulators and supervisors. With ever more data and information that we need to make sense of, these tools can help drive more efficient and effective data-driven and risk-based supervision.

AI-based processes can bring benefits in the form of speed and efficiency. But where will all this lead in terms of risks? Without wishing to speculate, it is worth considering plausible scenarios when assessing current and potential risks. Increased uptake of AI in the financial sector may lead to the concentration of systems and models among a few 'big players'. More generally, AI models may be more complex and less transparent than more traditional statistical approaches, even if AI researchers are developing techniques to aid explanation. To address these issues, financial entities will need appropriate governance frameworks to ensure accountability and responsible use of AI tools.

Concluding remarks

To sum up, recent media focus on two major events – the FTX collapse and the ChatGPT launch - have highlighted some important longer-term developments around blockchain and AI respectively. Regarding crypto-assets, MiCA will address some key issues, though we must be conscious of its limits and remain vigilant to ongoing and emerging investor protection risks in the area. ESMA's work to implement MiCA – and to coordinate at EU and international levels – will be important to ensure the rules are applied as effectively as possible.

Regarding AI, ESMA has recently assessed market trends. We see benefits to investors and markets from a range of AI-based tools, but remain conscious of the potential risks. We will continue to reach out to industry stakeholders and exchange information with other authorities to ensure we keep up with developments in this fast-moving field.

Thank you for your attention.