Crypto and DeFi technology applications in finance

1. Main use cases of crypto and DeFi technology in finance and related benefits

The Chair stated that crypto and decentralised finance (DeFi) have emerged as potential disruptors of traditional finance. Distributed Ledger Technology (DLT), which supports these activities, allows for innovative features such as the tokenisation of securities, which could make traditional assets, such as real estate or private equity, more accessible to a wide range of investors. DeFi introduces new features such as smart contracts and decentralised execution that could automate financial agreements, reduce the need for intermediaries and improve the speed and cost of financial transactions.

An official noted that a poll conducted during the recent BIS Innovation Summit showed that half of the respondents were expecting DLT or blockchain to become widely and significantly adopted in the financial sector three years from now.

An industry representative emphasised that the use of crypto technology and of DeFi technology, which may open financial services to the potentialities of Web3[1], is still at a very early stage of development but these technologies have strong potential. The level of adoption of crypto technology is only at about 4% to 5% of the population. This corresponds to the state of development of the internet in 1999. In addition, crypto and blockchain technology do not exist in a vacuum but were developed to solve problems and have potential applications in many different areas of finance. Most major financial firms have had a significant blockchain and crypto agenda over the last few years working on the development of blockchain use cases for financial services.

One of the highest usage of blockchain is for financial infrastructures at present, with the objective of improving the efficiency and costs of middle and back office processes for security and commodity transactions in particular. Settlement periods for these transactions are still pretty long, between T+3 and T+1, because they go through quite archaic infrastructure and technology and several intermediaries. Blockchain provides instantaneous settlement leading to faster order execution and significant cost savings, which benefit financial institutions, but can also be potentially passed on to end-users. However, development is still at an early stage for the use of blockchain for the trading, clearing and settlement of securities.

Many use cases are also being developed in the payments area, the industry speaker observed. With a blockchain-based platform, money can be remitted very cheaply and almost instantaneously both at the domestic and cross-border levels, without having to go through intermediaries such as correspondent banks. The use of crypto technology also facilitates financial inclusion, which is a major challenge in many parts of the world. Crypto is being used for payments and also to send money back home by people who may not have access to a bank account. The cost of that is very low. Many multinationals are also experimenting with blockchain and Web3 today to improve customer service and engage more closely with clients and also to achieve cost savings.

A second industry representative explained that, four and a half years ago, the Swiss stock exchange, which has been operating a regulated electronic stock exchange for over 25 years, set up a digital exchange based on blockchain technology to support asset exchanges and safekeeping. The objective was to implement this new technology and test new use cases in a safe and reliable way in the context of a regulated platform with a trading and post-trading licence. This digital exchange is also established on the principles of strong governance, risk management, security standards and compliance processes, with AML at the forefront of its objectives, in line with the principles governing traditional financial market infrastructures.

A third industry representative stated that asset managers are evaluating the potential of digital securities and tokenisation supported by blockchain technology. While cryptoassets such as Bitcoin do not seem to add any proven value in the investment world notably in terms of correlation with traditional securities, digital securities and of the tokenisation of certain assets such as real estate, may have a strong transformative potential. Digital securities do not change the nature of the product itself, but facilitate their distribution and help to optimize the value chain with potential benefit for issuers and investors. Buying a fund today requires going through multiple intermediaries. If that distribution is directly handled by the asset manager, that will have a significant impact on costs. In Germany, there is an example of direct distribution of securities with Siemens, which issues bonds directly without going through any intermediaries. According to the ECB, there is an outstanding €20,000 billion in euro denominated securities, and about 6% of this amount is issued every year. If only a portion of that volume was issued digitally, that would amount to a

1. Web3 is considered to be the future of the internet, a decentralized form of the internet, where users become owners. Rather than using centralised platforms and apps to connect to the internet, browse, interact, and make transactions online, as with the current internet (Web2), users in the future.

significant number of securities in absolute terms that could reap the benefits of tokenisation.

The industry representative added that many traditional banks are considering the development of new services to cater for the needs of their retail and institutional clients holding digital and crypto assets. These adaptations to the digital world will be a key focus of financial institutions in the coming years.

A fourth industry representative agreed that blockchain technology has strong potential and may bring attractive new features in the market such as eliminating the need for reconciliations and confirmations between the counterparties to a trade. Their bank has started very thorough experiments using real test cases and setting up their own digital assets platform, which is integrated into the bank's systems and business processes in order to offer digital asset solutions. This platform that covers all the steps of tokenisation, including legal and compliance aspects, technology and business processes, has been used to issue tokenised bonds for a few institutional and corporate issuers. Their bank is also developing custody solutions for digital assets and is already a custodian for a small number of digital assets. This however remains a small market at present.

An official explained that the BIS Innovation Hub was set up three years ago by the BIS in collaboration with several central banks across the world to explore and experiment with new technologies such as blockchain from two perspectives. One is to assess how these technologies can potentially change the financial systems as they exist today in order to anticipate possible evolutions. Another objective is to evaluate how central banks and supervisory authorities can use these technologies for improving the way they conduct their own activities. The aim is to test the use of new technologies, learn from these experiments and report back to the central banking community and the whole public sector. The implementation of these new technologies will depend to a certain extent on regulations, but ultimately on the potential benefits for users e.g. in terms of cost savings and the impact on competitive positioning in the market

The official described the main areas of application of blockchain technology currently explored by the BIS Innovation hub. A first area is cross-border payments which are still slow, opaque and expensive in many places. Several projects are being run, using central bank digital currencies (CBDCs) in order to explore how the use of DLT can improve the payment infrastructure needed for executing cross-border payments and execute cross-border payments more efficiently by reducing notably the dependence on the correspondent banking system. A second area investigated in the context of a project called Mariana is the use of technology underlying DeFi platforms, such as automated market making (AMM), to improve liquidity and settlement efficiency in the foreign exchange trading and settlement area. AMM solutions are based on smart contracts that use liquidity pools to transfer digital assets automatically, without the traditional process of matching buyers and sellers. The aim is to assess how new technologies can be used to alleviate some of the frictions that are typically a problem in the financial system. Finally, experiments are led in the area of green capital markets. DLT and smart contracts are being used to track and transfer digitised carbon forwards, which is a way for capital markets to contribute to the green transition.

2. Conditions for a successful implementation of crypto and DeFi technologies

An industry representative mentioned that an issue for their bank in implementing blockchain-based solutions is that they want to stay away from the cryptocurrency world. Their perception is that cryptocurrencies such as Bitcoin, have no real economic value and have major negative environmental impacts. In addition, the pseudonymous aspect of crypto wallets has attracted many fraudsters, which means that there is the risk for banks of being exposed to stolen assets and of indirectly facilitating criminal transactions, which is a strong reputational risk for regulated entities.

Developing the use of these new technologies, while avoiding the cryptocurrency business, is however quite challenging, the industry speaker acknowledged, because, in practice, cryptocurrencies represent 90% of the applications of the new blockchain technology. There is a need for a reliable digital currency on the blockchain for facilitating digital securities transactions in a safe way. This is necessary to be able to benefit from the instantaneous features of the blockchain and to avoid reconciliations. If payments are executed outside the blockchain, much of the potential benefits will be lost. Banks are currently assessing how this can be done in a safe and efficient way. One option is developing their own stablecoin, but using this stablecoin on a public blockchain will expose them to the same cyber and AML risks as with other stablecoins, since they will be using the same infrastructure and filtering transactions seems difficult. Conversely, using a private blockchain will make it difficult to reach a wide enough market. Even if wholesale markets focus on certain counterparties, they still require being connected to quite a wide number of stakeholders.

A regulator shared the view that there is potential for improvement in the efficiency of different processes such as securities issuance and transaction settlement and cross-border payments, with the use of DLT technology, but for such developments to be successful there needs to be sufficient trust in the market in order to achieve mass adoption. Building trust is not only about the proper functioning of the technology, but requires adequate regulation and an adequate risk mitigation approach in a context where hacking cases and frauds are widespread.

In order to build sufficient trust, all the risks posed by crypto technology need to be taken into consideration in a sufficiently comprehensive way, the regulator stressed. This includes traditional operational, cyber

and ICT risks as well as risks that are more specific to the crypto ecosystem. These specific risks include oracle or mining risks, governance risks and legal risks and also market risks posed by unbacked cryptocurrencies and counterparty risks related to crypto custodians. Finally, the AML risk needs close consideration. The anonymity and the instant nature of transactions on the blockchain is very attractive for criminals, hackers and people trying to circumvent sanctions.

An official agreed that there is scope for this technology to improve the way financial markets operate, including in the way that financial instruments are distributed and transactions executed. It is for the private sector to innovate and to come up with propositions that deliver on the potential of this technology, but that new ecosystem has to operate in a context where risks are appropriately managed and that does not pose significant consumer protection and market integrity issues. Evolutions in the way transactions involving traditional asset classes are executed and the plumbing of those markets should be encouraged, as long as we protect against financial stability risks and the possible implications of these changes for the overall financial system.

3. Policy approach to the use of crypto and DeFi technologies in different jurisdictions

A regulator stated that, in order to build trust in these new crypto technologies, the policy measures need to cover all the risks from their use in a sufficiently comprehensive and granular way, while avoiding a one size-fits-all approach and allowing sufficient flexibility. Many specificities need to be considered such as the differences between operating a securities settlement system on a private blockchain and providing this service on a public blockchain. And when the service is provided on a public blockchain, it is important to consider whether the access to the application is permissionless, which poses higher risks, or restricted through e.g. a whitelisting function in the smart contract. There are different bespoke DLT regulations, such as the EU Markets in Crypto-Assets (MiCA) regulation and the DLT Act that was implemented in Switzerland in 2021. These are very helpful to bring legal clarity in the use of blockchain solutions on different aspects related to financial regulation, but also on questions such as the treatment of bankruptcy with regard to crypto assets. However, this field is very dynamic with continuous new market developments. Since updating the framework takes time, supervisors need to be able to intervene in a timely manner to address emerging risks. This is the reason why the approach «same business, same risks, same rules» remains key.

Taking the example of DeFi, which aims to replicate traditional financial services, like trading or lending, in a peer-to-peer way, the 'same activity, same risk, same rule' approach states that DeFi activities should be regulated in the same way as traditional financial activities, the regulator noted. The challenge however is that, in most cases, the developers of DeFi applications argue that these activities are supported by smart contracts which are self-executing and open access and that no one is really accountable for the delivery of these services. In practice, it has been observed that at the current stage of development of DeFi platforms, there is very often a core group of people having a material influence on these applications. Different criteria have therefore been developed by FINMA, the Swiss regulator, to determine accountability for DeFi applications. A first criterion is whether some people are controlling further developments of the application through an admin key or a majority of governance tokens. A second criterion is whether the application depends on specific input provided through an oracle. A third criterion is whether people are having business relations with the end users or getting revenues from the application. Those are all criteria that help to determine who may be held accountable for the services delivered by a DeFi application, and that may facilitate the enforcement of the applicable regulation, solving some of the key challenges posed by DeFi.

An official concurred that while the 'same activity, same risk, same rule' approach is the usual way forward, these structures based on new technologies such as crypto and DeFi technologies bring new models and new complex risks that regulators have not had to think about before. When talking about DeFi for example, there are very different models of decentralisation that may have different exposures to risks such as cyber risks. The authorities are in a learning phase on these issues with significant focus on understanding the different propositions from the private sector, their transformative potential in markets and the risks they may pose. The UK authorities have also been thinking about the best model for allowing these kinds of systems to develop in an appropriate way. The UK's Financial Market Infrastructure sandbox[2], the first iteration of which will be implemented this year, is an example of how the UK approaches this challenge.

The FMI sandbox structure will allow public authorities and regulators to evaluate with firms that want to launch innovative propositions based on DLT technology, the degree of flexibility that may be needed in terms of regulation to allow that proposal to be implemented in the context of the sandbox. The value of a sandbox is to allow technically expert supervisors to sit with the firm through the lifecycle of a new proposition and assess how it operates before it can be moved to scale. Part of the reason for setting up this sandbox and adopting a different

2. Participating platforms in the FMI Sandbox will have access to modified legislation that allows them to innovate while continuing to comply with regulatory standards, enabling them to test and scale digital technologies in FMIs where they otherwise could not. If the new practices tested in the sandbox are successful, HMT can make permanent changes to UK legislation, and participating platforms will have the opportunity to continue providing their services outside the sandbox. The ability to adapt regulation in response to practical experience should be a powerful tool in facilitating innovation, without compromising regulatory standards.

policy approach to these new developments is that they tend to cut across existing provisions in regulation.

An adequate regulatory response is necessary, but not sufficient, the official added. A whole range of other elements need to be in place for these new structures to operate in an adequate way, such as appropriate legal and fiscal rules. The UK Jurisdiction Taskforce recently conducted an extensive assessment that established that digital instruments can work under English law, which is an important aspect, since English law is widely used for securities markets.

Answering a question from the Chair about whether EU digital finance regulations can adequately support the uptake of crypto and DeFi based platforms, an industry representative stated that, when thinking about DeFi, blockchain or digital assets, regulators must remember that financial services providers are providing a service based on technology but are not themselves technology service providers. In addition, all financial activities cannot be conducted with a smart contract. For example granting a loan or market making should continue to require the intervention of traditional financial institutions.

The industry speaker agreed with previous comments that a safe environment is needed to encourage investors and issuers to use DLT-based solutions and to foster the development of a market of sufficient size. Regulators are currently approaching these issues in an appropriate way with the EU DLT pilot regime. It should allow the identification of requirements in EU legislations such as MiFID that may not be compatible with digital assets. The DLT pilot regime will also allow to better evaluate how transactions can be executed in a DLT environment e.g. to what extent order execution and settlement can be combined. A challenge with the implementation of the DLT pilot regime however is to obtain sufficient participation from the industry. A further issue to consider is that securities laws still differ to a certain extent across the EU, which will not change in a digital environment.

4. Expected impacts of MiCA and pending issues

An industry representative stated that a further element to consider for the use of crypto and DeFi technologies is the implementation of MiCA in the EU by the end of 2024. Under MiCA, cryptoasset service providers (CASPs) will have to be authorised and will be subject to a range of rules in terms of governance, risk management, segregation of funds, and transparent communication. It however has to be borne in mind that none of these very basic safeguards will exist in the crypto market until MiCA is implemented and also that MiCA will not apply to DeFi, which will remain unregulated for the time being, while banks that serve the same clients with the same activities are already subject to strict rules.

An industry representative stressed that cryptoassets account for a small fraction of financial assets. Furthermore, the amount of illicit money that goes through crypto channels only represents 0.05% of what goes through the banking system. At present, between $800 billion and $2 trillion is being laundered via traditional banking channels and fiat currencies on a yearly basis. In addition, very few people have self-custody crypto wallets at present, because this requires being comfortable with technology. However, crypto adoption is fast among the younger population, and this will support the development of crypto technology over time. The risks posed by crypto need to be properly addressed while promoting innovation. MiCA is an attempt to strike that balance.

An official agreed that traditional financial players should look at developments in the crypto industry as a wake-up call to improve the current financial system. The crypto world has pointed out several areas that need to be improved in terms of efficiency or financial inclusion. Cross-border payments in the EU are still too inefficient, and a fast payment system is still awaited. There are already 60 or so fast payment systems around the world. More should be done on this front in the EU.