



BANCA D'ITALIA
EUROSISTEMA

Regulating new distributed ledger technologies (DLT): market protection and systemic risks

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Rome, 3 May 2022

1. Introduction

More than ten years after the creation of Bitcoin, we are observing significant developments in crypto-assets and in their whole ecosystem at global level. The magnitude and speed of the change stem in particular from the profound innovation brought about by distributed ledger technology (DLT), the new 'objects' generated through it (among which, crypto-assets) and the new players – other than traditional intermediaries – entering the market.

It is not an exaggeration to say that DLT introduced a new paradigm in the financial world, one that is based on three strongly interconnected but distinct dimensions. The first is the technological dimension, with the introduction of a distributed market infrastructure, which makes it possible to transfer value or rights without a centralized authority. The second dimension is the way in which value is represented digitally, with the introduction of tokens that can either be 'unbacked' by an underlying asset (e.g. Bitcoin) or act as a digital representation of financial instruments or other assets ('backed crypto-assets'). The third dimension is the entry of new players into the market, which may also operate in a decentralized manner through specific governance mechanisms.

These three dimensions (e.g. technology, tokens, new players) also form the basis of 'decentralized finance' (DeFi). They can be analysed individually in a consistent and effective manner and thus encourage the use of traditional analysis conducted by type of intermediary and/or product. However, only a holistic assessment that leverages specialized skills and resources in different sectors will make it possible to monitor risks and choose the most appropriate regulatory and supervisory responses.

My speech reflects the supervisor's views. Supervisors need to understand market developments and try to mitigate risks for intermediaries, for financial stability and for consumers, pending a European regulatory framework and well-established standards

at the international level. I will focus on three aspects in particular: the crypto-asset ecosystem and the related risks; the ongoing regulatory changes, and the activities carried out by the Bank of Italy so far. Finally, I will try to provide an integrated view of the challenges that lie ahead for prudential supervisors.

2. DLT, crypto-assets and the entry of new players

When confronting a complex problem, it is often useful to break it down into its constituent parts. I will therefore make a distinction between DLT, the monetary and financial instruments based on such technology, and the economic agents involved (regulated and non-regulated).

An electronic DLT register is a distributed system whose 'status' at any given point in time is shared and accepted by the counterparties involved. In a traditional system, this outcome is achieved through a trusted third party. With DLT, the synchronization of the shared ledger is possible between counterparties that do not coordinate and do not enjoy mutual trust.

Without delving into some very complex aspects, I will only stress that this architecture does have implications for regulators and prudential supervisors. For example, as with traditional systems, DLT-based systems too must guarantee some key conditions: be resilient to cyber-attacks; support a high volume of transactions at a low cost – and I would also add, in an environmentally sustainable manner; and have robust and identifiable governance. The latter is an issue that may be particularly critical when the technical decentralization of the DLT structure (which relies on multiple nodes) is not accompanied by a protocol controlled by a single entity responsible for the management of the ledger.

In any case, the decentralized nature of DLT may make it difficult to maintain and update the protocol governing it, for example to improve its security or efficiency. In particular, not all DLT protocols guarantee the desired conditions for efficiency, scalability, sustainability and good governance. The approach commonly adopted by the various international regulators and bodies is that of technological neutrality. However, this approach need not be accepted without question.¹

As regards crypto-assets, it is first of all useful to distinguish between those that are not backed by collateral in the form of monetary or financial instruments ('unbacked crypto-assets') and those that are backed by such instruments ('backed crypto-assets'). The latter can be split into two groups: instruments that are similar to electronic money, for which the underlying collateral is deposits and liquid assets; and what are known as 'tokenized' financial instruments, some of which are similar to investment funds.²

¹ On this point, see Bains, P. "Blockchain Consensus Mechanisms: A Primer for Supervisors". IMF, Fintech Notes, 3, 2022.

² Other instruments also exist, such as utility tokens, which give access to networks or communities for various purposes, or non-fungible tokens (NFT), which make it possible to transfer the ownership of artwork or other non-homogeneous goods.

The industry is already developing more complex and riskier products by combining crypto-assets and structured finance products and offering derivatives contracts for crypto-assets (which may in turn not be backed by an underlying asset), loans collateralized by crypto-assets, and the possibility of increasing risk exposure through a heavy use of leverage, in some cases giving rise to pyramid schemes.³

Finally, there are economic players that create and make it possible to transfer crypto-assets and provide related services. In this new scenario, entities with which we are well-acquainted – namely banks, financial intermediaries, electronic money institutions, payment institutions, central market infrastructure providers, and external providers of critical functions, not only IT – coexist with completely new players.

These include, for example, electronic wallet providers and operators of platforms for trading crypto-assets and exchanging them for traditional currencies. It is therefore important to ensure that these players and the intermediaries that are currently being supervised are made to follow the same rules, in accordance with the usual approach of ‘same activity, same risk, same rules’. The European legislator is concentrating its efforts in this direction.

Other players in the crypto landscape – those characterized by “decentralized” governance mechanisms – are more difficult to capture through the entity-based approach traditionally used by supervisors and will require further consideration. I will return to this point later on.

3. The risks for intermediaries

Compared with the significant development of the market observed in other countries, intermediaries have been more cautious in Italy. Data collected through the Bank of Italy’s Fintech Survey of the Italian Financial System in 2021 show that only a small number of intermediaries have so far partnered with specialized players to enable their customers to buy and store crypto-assets such as Bitcoin and Ether. Pilot projects are underway in the areas of financial asset payments and ‘tokenization’.

The situation is rapidly changing, thanks above all to third-party agreements. Highly innovative projects might be launched before the rules are updated. As supervisors, we need to be ready to manage this transitional phase carefully. Indeed, we must reconcile the need to avoid taking on excessive risks, unless they are adequately mitigated, with that of allowing the system to reap the benefits of innovation.

The risks to be monitored going forward will depend on the role that each intermediary will play in the value chain and on the specific business model adopted.

³ These are schemes that promise very high returns compared with market rates by using funds paid in by other investors; as we all know, the entire scheme collapses as soon as investors demand that the funds be returned to them. The use of smart contracts associated with crypto-assets has facilitated this kind of scam. See Chen, W., Zheng, Z., Cui, J., Ngai, E., Zheng, P., Zhou, Y. (2018), “Detecting Ponzi Scheme on Ethereum: Towards Healthier Blockchain Technology”, *Web Economics, Monetization, and Online Markets*, April 2018. See also SEC, “Ponzi Schemes using virtual currencies”, Investor Alert.

Once the Commission's legislative initiative on crypto-assets is finalized (see Section 4), supervised entities will be able to undertake new activities. Offering custody services for crypto-assets, including to retail customers, is certainly one of the areas that could grow in importance. In addition, some intermediaries may want to offer crypto-asset trading services or payment services via stablecoins. They could also be directly involved in the issuance of stablecoins and the management of the connected reserves. Finally, investment service providers could put out new products to allow customers to invest in crypto-asset baskets, as is already the case in other jurisdictions.

When monitoring the different risk profiles, it is important to carefully consider the new elements brought about by DLT and crypto-assets.

A special emphasis should be placed on operational risks, which can be very complex to understand given the completely new technologies involved and which may take on a systemic dimension. Monitoring and countering these risks requires careful management of the IT infrastructure and of cyber-security.

The secure storage – either on own account or on behalf of customers – of cryptographic keys, which for all practical purposes represent ownership of a crypto-asset and enable transactions in crypto-assets to be made, requires major investments and technological expertise; collaboration with specialized players can certainly be a reasonable option, but in turn requires careful monitoring of outsourced functions and proper management of relations with third parties. As we all know, the European Union is currently working to introduce – through the Digital Operational Resilience Act (DORA) regulation – an oversight framework for critical ICT third-party service providers for the financial sector, which could certainly include providers of crypto-asset management services.

The DORA provisions on ICT risk governance and management reinforce the key role and responsibilities of corporate governing bodies in defining risk appetite strategies and policies and in managing ICT risks. The members of these bodies must have a full understanding of the systems adopted by intermediaries and the risks to which the latter are exposed. In the same vein, the internal control systems are assigned specific tasks aimed at ensuring the smooth functioning of the intermediary and the effective monitoring and management of all ICT risks, including those arising from third-party contracts, even when they are outside the scope of outsourcing (e.g. in the case of subcontracting).

Crypto-assets are issued and circulate on a large number of blockchains with different characteristics in terms of governance, security and performance. In some cases, they are fully decentralized and not subject to any form of regulation and supervision. It is therefore crucial that financial operators have the ability to understand and discern the risks related to the operation of unsupervised and not easily supervisable infrastructures.

The expansion in the range of services offered may introduce additional market and liquidity risk dimensions, which intermediaries are well aware of and used to managing

but which may also take new forms. For example, in order to make it easier for customers to trade (e.g. to exchange or purchase crypto-assets for cash), intermediaries may need to hold crypto-assets directly, thereby becoming exposed to market risks stemming from their high volatility.⁴

Additional complexities arise for intermediaries that are directly involved in issuing stablecoins that have a monetary function. The way in which these schemes work makes them similar to constant net asset value (NAV) money market funds, with the well-known issues stemming from possible cliff effects arising as soon as there is a mismatch between the underlying asset and the nominal value of the token used as a means of payment, also as a result of poor liquidity risk management. Any loss of public trust could have systemic consequences, with a contagion effect also for “sound” issuers, as was the case for money market funds during the 2008 crisis. Similar risks relate to the quality and nature of the reserves to which stablecoins are pegged.⁵

I would also like to stress the importance of properly monitoring the risks of money laundering and terrorist financing (AML/CFT), which are linked to the anonymous or ‘pseudo-anonymous’ nature that crypto-asset transactions can have, especially if they take place via electronic wallets managed independently by users, without involving any intermediary (‘unhosted wallets’); this topic has garnered greater attention in recent months, also in relation to concerns that crypto-assets could be used to circumvent the international sanctions imposed on Russia.

As pointed out, among others, by the Financial Action Task Force (FATF),⁶ the implementation of these measures will pose challenges relating, for example, to identifying and tracking the beneficial owners of transfers, especially in cases where they do not hold crypto-wallets with entities obliged to comply with anti-money laundering rules or hold them with entities legally established in countries where anti-money laundering rules are not fully compliant with FATF standards.

4. Regulatory developments

The supervisory authorities’ thinking is nevertheless developing within a national regulatory and legal framework that is still unsettled. The Civil Code and the legislation governing financial services still lack a definition for crypto-assets that can be applied for prudential purposes or to protect users.

⁴ For example, on 3 May 2021, the price of BTC stood at \$57,209; on 20 July it had lost more than 47 per cent of its value, but subsequently appreciated by 121 per cent between then and 20 October.

⁵ A well-known case is, for example, the high share of commercial paper held by Tether to support its stablecoin, USDT. Here the risk is twofold: problems with Tether could affect the commercial card market, and the fragility of some of these commercial cards could lead, in some scenarios, to the collapse of the whole scheme. For these reasons, Tether has agreed to sharply reduce this type of reserves and, in accordance with an agreement reached with the New York Attorney General’s Office, has been subject to operational and transparency constraints since last February (which include the periodic publication of details of its reserves).

⁶ FATF, *Updated Guidance for a Risk-Based Approach to Virtual Assets and Virtual Asset Service Providers* (October 2021).

It is also important to keep in mind that the existing body of law does not include comprehensive and specific rules on the issuance of crypto-assets and that the draft EU regulations currently under discussion could still contain regulatory gaps that will have to be carefully assessed and addressed.

The only reference currently found is in the regulations governing anti-money laundering and in measures imposed on service providers regarding the use of virtual currency and digital wallet services.⁷ Specifically, Italian law⁸ recognizes broader concepts of virtual currency and virtual asset service provider (VASP), applying definitions consistent with those proposed by the FATF.

*Crypto-asset service providers are required to meet due diligence, record keeping and suspicious transaction reporting requirements.*⁹

The Commission's proposal made in July 2021 to reform the AML regulatory and institutional framework at European level follows an approach similar to that of the Italian legislature, recognizing all crypto-asset service providers as obliged entities. In addition, the proposal, in line with the FATF standards, extends to virtual currency transfers the obligation (already in force for fiat currency transfers) to submit information on the payer and the payee in order to ensure traceability.

Some European countries have also recently adopted different regulatory approaches to crypto-assets, which – although inspired by reasonable principles – risk fostering regulatory arbitrage. There is thus a consensus that what is needed is a structured, harmonized and technologically neutral European regulatory framework that can accompany the dissemination of technologies while preserving the stability of the system.

This is what the European Commission intended to do by adopting the Digital Finance Strategy, under which the Markets in Crypto-Assets Regulation (MiCAR) aims to regulate the issuance, offering to the public or admission to trading of crypto-assets that cannot be classified as financial instruments and the provision of related services.¹⁰

More specifically, MiCAR introduces specific rules based on disclosure requirements and prudential rules for stablecoins issuers, which are distinct from asset-referenced

⁷ Legislative Decree 231/2007, as amended by Legislative Decree 125/2019, on preventing the use of the financial system for laundering the proceeds of criminal activities and terrorist financing.

⁸ Legislative Decree 125/2019, transposing the 5th AML Directive.

⁹ Verifying crypto-asset service providers' compliance with AML regulations is the responsibility of the Italian Finance Police (Guardia di Finanza) and of the UIF (for the latter, only with respect to reporting requirements). The Ministry of Economy and Finance (MEF), instead, has the power to impose sanctions for violations of AML regulations (with the Finance Police or the UIF initiating the sanction proceedings).

¹⁰ MiCAR does not apply to crypto-assets that fall under the definition of financial instruments (i.e. under MiFID). For these instruments, the EU Regulation on the introduction of a pilot regime for DLT-based financial market infrastructures, which is also part of the regulatory measures under the Digital Finance Strategy, is in the process of being adopted.

tokens (ARTs) and e-money tokens (EMTs).¹¹ Due mainly to the technical complexity, there are no plans for an issuance authorization and supervision regime for crypto-assets other than stablecoins, which are in many cases issued in a fully decentralized manner through IT protocols without any specific controls.

However, these crypto-assets would be subject to the rules on public offerings, admission to trading (with disclosure and conduct obligations) and would fall under the rules governing services provided to customers (e.g. foreign exchange, custody). MiCAR also introduces a licensing and supervision regime for crypto-asset service providers (CASP), to which prudential and organizational requirements similar to those for traditional intermediaries will apply, as well as a code of conduct vis-à-vis their customers.

It also recognizes the important role that supervised intermediaries could play as crypto-asset issuers and service providers. In fact, the current proposal envisages that only banks and electronic money institutions (EMIs) would be allowed to issue stablecoins anchored to a single legal tender (the EMTs). Banks would also be allowed to issue ARTs, subject to compliance with limited obligations of notification of and approval by the competent authority.

Similarly, some or all of the crypto-asset services may be offered by supervised intermediaries (including banks, securities investment firms, asset management companies, and EMIs) under existing authorizations, subject to notification to the national authority of an updated business plan and guidance on the upgrading of governance and control arrangements. For intermediaries already subject to prudential rules (e.g. banks and EMIs), there will be specific clauses to avoid overlapping requirements and the new arrangements described above will be without prejudice to the prerogatives of prudential authorities.¹²

There is room for refining the text during the negotiations, while nonetheless hoping for its rapid conclusion. There is also the need to safeguard financial stability and consumer rights. In particular, a clear distinction should be made between the two categories of stablecoins governed by MiCAR and the obligation of redemption at par value that applies to e-money tokens only; it is therefore reasonable to imagine that the latter will function as a medium of exchange. Conversely, in our view, the widespread use as a medium of exchange of stablecoins linked to a basket of assets, not to a single currency, could pose significant risks to financial stability.

¹¹ EMTs and ARTs are crypto-assets that aim to maintain a stable value with reference, respectively, to only one legal tender (EMTs) or other values or rights, including legal tender (ARTs). EMTs are treated as e-money, upon which the rules governing them are based, except for certain derogations and additional rules to take account of specific technological features. They are redeemed at their par value and there is always a direct redemption right against the issuer. ARTs generally provide for a direct redemption right against the issuer at market value, which necessarily fluctuates, to prevent them from becoming similar to deposits.

¹² The proposed text does not, however, regulate the prudential requirements applicable to banks' crypto-asset exposures; this issue is being discussed by the Basel Committee (BCBS) and should be incorporated in a future revision of the CRR, expected to begin after 2025.

5. The Bank of Italy's activity

Since 2015, warnings to supervised intermediaries and to users have been published by the Bank of Italy – including jointly with CONSOB and in agreement with the UIF – to call attention to the risks associated with the purchase and holding of crypto-assets, the complexity of the underlying technologies, the lack of legal and contractual protection, and the possibility – ultimately – of losing all funds invested.

The Bank of Italy – in line with the stance of the European Supervisory Authorities (EBA, ESMA, EIOPA) and the guidance expressed over time by international bodies (FSB, FATF) – has recommended to intermediaries that they be particularly prudent and noted the importance of managing operational risk – including legal and reputational risk – arising from the distribution of third-party services (e.g. wallets).

Drawing on our practical experience, we have also urged intermediaries that have developed partnerships with third parties to put into place specific operational constraints to restrict and monitor the activity of crypto-asset customers.¹³ Intermediaries that consider offering crypto-asset-related services should therefore identify specific anti-money laundering safeguards that make it possible, for example, to correctly identify and profile customers, to monitor transactions in real time and to identify anomalous transactions; particular attention should be paid to the due diligence carried out on third parties (regulated and non-regulated) involved in various capacities in the provision of services.

Although there are no specific transparency rules, intermediaries have been urged to focus on the need to properly convey to customers that crypto-assets are not regulated. It was again stressed that it is important to ensure that the intermediaries' oversight functions and decision-making bodies are fully involved before undertaking new activities.

The Bank of Italy has also sought to promote the development of healthy innovation in this field with a comprehensive, integrated chain of innovation facilitators, including the Fintech Channel, a web-based channel open to anyone who would like to dialogue with the Bank on innovation topics; Milano Hub, our centre for supporting the digital evolution of the market; and the Regulatory Sandbox, which was developed under the guidance of the Ministry of Economy and Finance's Fintech Committee and is based on close liaison between the banking, financial and market infrastructure supervisory authorities.

Similarly to the other two channels, the Regulatory Sandbox has generated a large response from Fintech intermediaries and operators interested in testing innovative products and services built around DLT and crypto-assets in a controlled environment; it also offers the Bank a privileged vantage point to observe the industry up close,

¹³ The safeguards adopted by intermediaries include, for example, imposing limits based on the customer's income and capital position, using only the current account held with the bank chosen to acquire crypto-assets or receive payment in case of sale, and prohibiting the transfer of crypto-asset from external wallets to the wallet hosted by the partner.

providing it with useful information that it can use to push for regulatory intervention, both at national and European level.

In order to enhance the dataset available, we are now considering conducting a dedicated survey to obtain an up-to-date and comprehensive picture of how this business area is developing.

6. Conclusion

The ecosystem that has been built around crypto-assets is still at a stage of development that is complex, fluid and highly uncertain as to its final configuration.

While MiCAR may represent significant progress, this is just the first step of a longer journey that will need to continue in the future. On the one hand, consistent with the current financial services framework, it introduces rules for clearly identified entities, both natural and legal persons, and their activities and services. However, the continuous development of decentralized finance raises new challenges and requires that further action be taken, for example with regard to the rules applicable to new organizational forms, apparently without a central authority and collectively controlled by users, such as Decentralized Autonomous Organizations (DAOs).

It is worth considering assigning specific responsibilities to the developers of IT protocols (e.g. in the case of 'smart contracts')¹⁴ and introducing governance or risk management safeguards for decentralized organizations. In addition, other entities or activities remain outside the scope of application. These include unhosted wallets, i.e. software enabling peer-to-peer exchanges between DLT users, which raise the spectre of cyber and money laundering risks, the spread of which makes it more difficult for the authorities to monitor the phenomenon.

However, our institutional role remains that of 'monitoring' this significant change in the system, identifying possible instances of market failure and mitigating its risks, without impairing innovation. It will therefore be necessary to continue to work to understand the benefits that the development of DLT-based financial services can offer to the financial and economic system as a whole, recognizing that, under certain conditions, the market can 'internalize' or mitigate certain risks through new technologies. But we need to be ready to quickly detect any new forms of risk.

To this end, the 'dialogue' between market operators and authorities, including through the forum of innovation facilitators, must be strengthened in order to preserve the necessary openness to innovation and compliance with the very demanding time frames prompted by international competition.

Finally, the interaction between the traditional intermediation model and the decentralized model needs to be monitored, favouring robust and sustainable technological

¹⁴ They usually deny any responsibility, asserting that such lies instead with the entire user base (pseudonymity).

solutions. In this regard, the main challenges relate to identifying the scope of the regulatory perimeter and to preserving the necessary clarity concerning the governance profiles (who is responsible for what and how) in a potentially 'fragmented' world.

Innovation prompts us to question business, supervisory and regulatory paradigms that have been firmly established for decades, such as that of entity-based supervision. Close cooperation between the authorities involved is therefore required to monitor risks in a holistic manner and exploit information and expertise synergies to ensure that these risks are treated in a consistent way.

In conclusion, in this environment of rapid technological development, an unprecedented scenario is taking shape, integrating financial and technological components, as well as responsibilities relating to prudential supervision, banking and investment products, oversight of the payment system (infrastructure, products, services), financial stability and consumer protection.

The Bank of Italy will continue to monitor the market, in cooperation with the other authorities, and stands ready to take action, if necessary even before the European regulatory framework is updated to this effect, through the publication of specific guidelines for users, intermediaries and providers of technology solutions in relation to crypto-assets.

It will also pay close attention to the increasing integration of the prudential supervision of financial intermediaries, critical function providers and oversight of the smooth functioning of the payment system in relation to crypto-assets. In addition, it will intervene with all the other tools at its disposal to detect and prevent potential threats to the protection of users and to the stability of the system.

