ARTICLES

FUTURE-PROOF REGULATION AND ENFORCEMENT FOR THE DIGITALISED AGE

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REGULATION OF CRYPTO-ASSETS IN THE EU: FUTURE-PROOFING THE REGULATION OF INNOVATION IN DIGITAL FINANCE

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ABSTRACT: The 2023 EU regulation of markets in crypto-assets (MiCA) is a timely and ambitious response to the regulatory challenges of a fast-developing and technology-intensive field. The new regulation expands the regulatory perimeter, thus enabling EU-wide supervision of crypto-asset service providers and issuers of the so-called "stablecoins". As such, the MiCA is in line with the key objectives of the 2020 EU Digital Finance Strategy: it updates the existing EU regulatory framework to facilitate digital innovation while protecting European consumers. "Same activity, same risk, same rule" approach is at the core of the MiCA regime. The new regulatory intervention, however, is to be put to test by the incessant technological and business model innovation within the crypto industry. Is this new regulation future-proof? This paper identifies and explores the two main points of vulnerability that often undermine the future-proof nature and, ultimately, the effectiveness of regulatory interventions in innovative sectors. First, it analyses the structures that define the scope of the new framework, and their capacity to adjust to and incorporate innovation falling outside of the regulatory perimeter. Second, the paper explores the mechanisms that ensure the regulatory and supervisory framework under the MiCA remains relevant and able to address the changes in the amplitude and sources of risks. Against this background, the paper discusses two features indispensable for a future-proof regulation: the openness of the regulatory perimeter, and the regulatory capacity for risk anticipation.

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I. INTRODUCTION

A series of events that took place in 2022 led to a dramatic decline in the markets in crypto-assets. From the collapse of the so-called Terra/Luna "stablecoin" in spring,[1] to the failure of the FTX in the autumn,[2] the "crypto winter" befell the entire crypto ecosystem.[3] Understandably, the reaction from the regulators across the globe concentrated around the issues of consumer and investor protection, and the potential risks to financial stability emanating from the highly interconnected crypto industry.[4] These issues have been central to the 2020 MiCA proposal by the European Commission (EC), that predated the crisis. In line with the Digital Finance Strategy for the EU,[5] the proposed framework aims at unlocking the potential of the markets in crypto assets – the objective that it balances against the need to ensure consumer and investor protection as well as financial stability. As the chills of the "crypto winter" show no signs of wavering, the dual objectives of MiCA will constitute a test to its effectiveness in promoting security, financial stability and innovation in the markets in crypto-assets.

EC's 2020 Digital Finance Strategy for the EU outlines key digital innovation trends, and underscores the impact of digitalisation on the process of innovation as well as on the evolution of business models. The EC outlined four key trends: (I). Digitally enabled growth and economies of scale that allow firms to offer better quality services at lower costs; (II). Accelerating innovation cycles, where innovation becomes open, collaborative, and with higher level of communication; (III). Innovation processes driven by the availa-

[1] S Lee, J Lee and Y Lee, 'Dissecting the Terra-LUNA Crash: Evidence from the Spillover Effect and Information Flow' (2023) Finance Research Letters.

[2] T Conlon, S Corbet and Y Hu, 'The Collapse of FTX: The End of Cryptocurrency's Age of Innocence' (14 December 2022) SSRN paper ssnr.com; D Yaffe-Bellany, 'Embattled Crypto Exchange FTX Files for Bankruptcy' (11 November 2022) The New York Times www.nytimes.com.

[3] D W Arner and others, 'The Financialization of Crypto: Lessons from FTX and the Crypto Winter of 2022-2023' (University of Hong Kong Faculty of Law Research Paper-2023) 2.

[4] S Lee, J Lee and Y Lee, 'Dissecting the Terra-LUNA Crash' cit. 2; DW Arner and others, 'The Financialization of Crypto: Lessons from FTX and the Crypto Winter of 2022-2023' (2023) Finance Research Letters; see also, E Akyildirim and others, 'Understanding the FTX Exchange Collapse: A Dynamic Connectedness Approach' (2023) Finance Research Letters; G Cornelli and others, 'Crypto Shocks and Retail Losses' (BIS Bulletin 2023); L McLellan, 'FTX Bankruptcy Will Show Importance of Regulatory Approach' (3 February 2023) OMFIF www.omfif.org.

[5] Communication COM (2020) 591 final from the Commission on a Digital Finance Strategy for the EU (Digital Finance Strategy).

bility of digital data and information technology that enables service providers to maximise its value; and, finally, (IV). Shifting market dynamics, drastically changing market structure and incumbent business models.[6] One of the objectives of the Digital Finance Strategy is to ensure that EU legislation is future-proof and that the new as well as existing frameworks do not hamper innovation in financial services. The EC approaches future-proofing by suggesting "regular legislative reviews" and "interpretative guidance" that would ensure the regulatory frameworks in the EU do not limit technological choices by prescribing or prohibiting the use of specific technologies, and that at the same time the frameworks remain effective, meeting their objectives.[7] While acknowledging that regulatory uncertainty is detrimental to technological innovation in finance, and harmful to consumers and investors, the EC envisages to conduct regular analysis with the aim to identify emerging issues and offer guidance by means of interpretative communications with the view to ensure effective response to these issues.[8] The EC outlined regulatory and supervisory treatment of crypto-assets as one of the priority areas for issuing such interpretative communication in light of its legislative proposal. Moreover, the European Forum of Innovation Facilitators (EFIF) is to further advance cross-border supervisory coordination, create common data space and innovation testing facility.[9]

The legislative proposal[10] issued by the EC alongside its Digital Finance Strategy constituted the cornerstone of the EU regulatory framework for crypto-assets. The final text of the Regulation for the Markets in Crypto-Assets (MiCA)[11] emphasises that "legislation adopted in the field of crypto-assets should be specific, future-proof and be able to keep pace with innovation and technological developments and be founded on an incentive-based approach".[12] As such, the new MiCA framework and the debates surrounding the regulation of crypto-assets in the EU is a fascinating example of EU legislators and regulators embarking on the challenge of future-proofing their intervention in the context of fast-changing innovative markets, characterised by high-pace of technological development, changing user demand, and evolving risk landscape.

MiCA has four main objectives: legal clarity and certainty, supporting innovation and fair competition, ensuring consumer and retail investor protection, and promoting financial stability.[13] The main question this paper addresses is whether the new framework is future-proof considering key digital innovation trends and evolving market reality in

[6] *Ibid*. 2-3.

[7] *Ibid*. 11-12.

[8] *Ibid*. 12.

[9] *Ibid*. 8.

[10] Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets and amending Directive (EU) 2019/1937.

[11] The final text voted by the European Parliament on 20 April 2023 (hereinafter "the Final Text"), available at www.europarl.europa.eu.

[12] *Ibid*. recital 12.

[13] *Ibid*. recitals 5 and 6.

terms of risks emanating from the innovative services. Focusing on the two-fold nature of the objectives of the new framework, that is to support innovation while addressing its risks, the following sections of the paper are structured as follows: section II sets the scene by discussing regulatory impacts on innovation and crypto-assets as innovation; section III analyses the activity- and risk-based regulatory framework for crypto-assets in the EU under the MiCA; section IV engages with the core question of the paper, discussing the challenges of future-proofing EU regulation of crypto-assets from the innovation perspective; section V concludes.

II. Regulating innovation in the digitalised age

II.1. Impact of regulation on innovation

Regulatory interventions in the EU, including those targeting innovative markets, have traditionally been targeting market failures with the aim to ensure the "proper functioning" of the EU internal market.[14] As such, the two main approaches, distinguished in the EU regulation acquis, are horizontal and sector-specific regulations. Recently, ever more voices advocate in favour of more horizontal approach to regulatory interventions, in particular amidst the growing importance of datafication and digitalisation of the European economy.[15]

It is undeniable that regulation has an impact on innovation. EU regulation has been shown to have impact at all stages of the innovation process from R&D to commercialisation and diffusion.[16] This impact, however, is not always positive and regulation may have negative effects on innovation. From reducing the incentives to innovate by increasing regulatory burden associated with innovative products or services and reducing potential for profit-making, to perpetuating uncertainty, regulation may have hampering effects on innovative activity.

Although legal certainty, low regulatory burden (compliance costs), timing of interventions and regulatory flexibility are generally deemed to be innovation-enhancing, the impact of these regulatory characteristics is not unequivocal.[17] While legal uncertainty is generally considered to be detrimental to innovation, it may have positive effects at early stages of technological development (*e.g.*, when market entry barriers remain low).

[14] J Pelkmans and A Renda, 'Does EU Regulation Hinder or Stimulate Innovation?' (19 November 2014) CEPS www.ceps.eu 12; More generally on core justifications for regulatory interventions, R Baldwin, M Cave and M Lodge, *Understanding Regulation: Theory, Strategy, and Practice* (Oxford University Press 2011, 2nd edition).

[15] See, for instance, the discussion of the regulation of innovation in the payments sector. Expert Group on Regulatory Obstacles to Financial Innovation (ROFIEG), Thirty Recommendations on Regulation, Innovation and Finance Final Report to the European Commission of 13 December 2019, 88.

[16] J Pelkmans and A Renda, 'Does EU Regulation Hinder or Stimulate Innovation?' cit. 8; also, P Aghion and others, 'Impact of Regulation on Innovation' (NBER-2021).

[17] J Pelkmans and A Renda, 'Does EU Regulation Hinder or Stimulate Innovation?' cit.10-12.

The same applies to the timing of the intervention, where early intervention may be detrimental in the markets with innovation based on immature technologies whereas later interventions may be less effective due to higher entry barriers, rigid market structure and strong network effects.

In the context of digital innovation in finance, key regulatory obstacles to innovation have been delineated in the 2019 report by Expert Group on Regulatory Obstacles to Financial Innovation (ROFIEG).[18] Composed of regulators, industry representative and academics, ROFIEG was tasked with analysing "the extent to which the current framework for financial services is technology-neutral and able to accommodate FinTech innovation and whether it needs to be adapted, also with a view of making the framework future-proof".[19] Amongst the main issues affecting innovation, the ROFIEG report emphasised regulatory fragmentation, lack of level playing field between market incumbents and new entrants, unfair competition between large incumbent platforms and smaller entrants providing downstream services, and the lack of comprehensive framework for access to, processing and sharing of data.[20] The report, largely using the terms "technology neutral" and "future-proof" as closely correlated (if not synonymous), focused on ensuring that the forthcoming regulation is informed by the opportunities and risks stemming from the uses of new technologies in the financial sector without targeting specific technologies. This need to understand and target the risks associated with new technologies led to the prominence of the "same activity, same risk, same rule" approach to regulation underpinned by activity-based (*i.e*. functional) and risk-based approaches to regulating technology-enabled innovation in finance.[21]

Despite the emphasis on regulatory obstacles to innovation, the effects are usually reciprocal. Indeed, the process of innovation often leads to the erosion of regulatory effect(iveness), derailing regulatory and supervisory efforts away from reaching their objectives. Financial sector regulation provides abundant examples, from the innovation in financial instruments that seriously undermined the regulatory objectives of financial stability and effectiveness of supervision and led to the 2008 crisis,[22] to the instances of the technology-enabled innovation in finance that lead to substantial regulatory gaps. Perhaps the most vivid illustration of the latter phenomenon is the case of the new data-driven business models in retail banking, leading to the revision of the payment services

[18] Expert Group on Regulatory Obstacles to Financial Innovation (ROFIEG), Thirty Recommendations on Regulation (2019) cit.

[19] *Ibid*. 9.

[20] *Ibid*. 13-14.

[21] *Ibid*. 67-68.

[22] C Ford, *Innovation and the State: Finance, Regulation, and Justice* (Cambridge University Press 2017) 24-50.

directive.[23] Considering the fast-paced technological and market developments, innovation in crypto-assets is deemed to become a new test to the effectiveness of regulatory interventions in innovative markets.

II.2. Crypto-assets as innovation: a moving target

The use of crypto-assets in providing innovative financial services has many facets. From raising capital by means of coin or token offerings, to the use of cryptocurrencies as means of exchange and storage of value replacing commercial bank (or private) money, to the so-called "stablecoins" – asset-backed cryptocurrencies – aimed at replacing central bank or government (public) money, crypto-assets have made their way from individual crypto-wallets to bank balance sheets.[24] From the peak of initial coin offerings (ICOs) in 2017-2018,[25] to the publication of Libra's White Paper in 2019, and the repercussions of the 2022 FTX collapse on the banking sector,[26] new uses and applications captivate the markets across the globe, and attracted attention of supervisors and regulators.[27] As such, crypto-assets came along with several promises, but also a number of risks.

The new opportunities and benefits to the financial service users are largely associated with reduced transaction costs and the capacity of distributed ledger technology (DLT) to facilitate peer-to-peer financial transactions. The promise of cheaper money transfers between individuals (payments or remittance systems),[28] customers and merchants (e-commerce) and investors and businesses (SME finance) is based on the decentralised and distributed nature of DLT, immutability of transactions and real-time settlement that can simplify the underlying infrastructure, cut-out intermediaries, and increase liquidity of financial assets.[29]

DLT-based projects and solutions continue to be (re)shaped in search of the best value propositions to business and individual users. The spectrum of technology-enabled

[23] See, for instance, the example of payment initiation services. European Payment Institutions Federation, EPIF Position Paper on Payment Initiation Services (PIS) (July 2013).

[24] R Corrias, 'Banks' Exposures to Cryptoassets: A Novel Dataset' (BIS Monitoring Report-2022) 101-106.

[25] I Gächter and M Gächter, 'Success Factors in ICOs: Individual Firm Characteristics or Lucky Timing?' (2021) Finance Research Letters 1-2.

[26] B Smith-Meyer, 'The Crypto "Contagion" that Helped Bring down SVB' (14 March 2023) POLITICO www.politico.eu.

[27] A Narain and B Moretti, 'Regulating Crypto' (September 2022) IMF www.imf.org; H Allen, 'Beware the Proposed US Crypto Regulation: It May Be a Trojan Horse' (17 November 2022) Financial Times www.ft.com.

[28] P De Filippi and A Wright, *Blockchain and the Law: The Rule of Code* (Harvard University Press 2018) 63-65.

[29] See, for instance, T Adrian and T Mancini-Griffoli,'Technology Behind Crypto Can Also Improve Payments, Providing a Public Good' (23 February 2023) IMF www.imf.org; R Garratt and H Song Shin, 'Stablecoins versus Tokenised Deposits: Implications for the Singleness of Money' (BIS Bullettin-2023).

products and infrastructure is continuously expanding. Decentralised models for the provision of financial services (known as DeFi)[30] and non-fungible tokens (NFTs)[31] as unique digital property certificates continue to thrill the minds of institutional investors and consumers alike, opening new frontiers and expanding the scope of crypto-asset markets.

At the same time, risks stemming from the use of crypto-assets in finance have several dimensions that have also been expanding over time with a more wide-spread use of crypto-assets in the EU financial sector. First, the rise of innovation in cryptocurrencies[32] and popularity of ICOs[33] brought about consumer and (retail) investor protection issues and recurring instances of fraud.[34] Second, cyber security risks stemming from both centralised and decentralised uses of DLT-based solutions which despite their immutability are susceptible to cyber-attacks. Cyber-attacks thus pose risks to user funds as well as privacy.[35] This is complemented by the related concerns over fraud and money laundering, where crypto-assets – in particular, cryptocurrencies – have increasingly represented an attractive venue of illicit money flows.[36] Third, crypto-assets are increasingly deemed to pose risks to financial stability. Largely rejected at first due to the relatively low volume of crypto-asset transactions,[37] the increasing exposure of banks' and investment firms balance sheets to crypto-assets (including as a result of tokenisation of traditional assets) has prompted a wider recognition of the potential threat.[38] In parallel, a

[30] OECD, *Why Decentralised Finance (DeFi) Matters and the Policy Implications* (19 January 2022) www.oecd.org.

[31] L Ante, 'Non-Fungible Token (NFT) Markets on the Ethereum Blockchain: Temporal Development, Cointegration and Interrelations' (2022) Economics of Innovation and New Technology 1–19.

[32] GD Marzo, F Pandolfelli and VDP Servedio, 'Modeling Innovation in the Cryptocurrency Ecosystem' (2022) Scientific Reports 1.

[33] P de Filippi and others, 'Regulatory Framework for Token Sales: An Overview of Relevant Laws and Regulations in Different Jurisdictions' (Blockchain Research Institute and COALA-2018) 6-7.

[34] According to some estimates, as many as 80% of ICOs have been fraudulent, resulting in investors losing all their money. ESMA, 'Advice Initial Coin Offerings and Crypto-Assets' (9 January 2019).

[35] V Wylde and others, 'Cybersecurity, Data Privacy and Blockchain: A Review' (2022) SN Computer Science 127.

[36] R Coelho, J Fishman and D Garcia Ocampo, *Supervising Cryptoassets for Anti-money Laundering* (FSI Insights on policy implementation, No. 31, April 2021); Chainalysis Team, 'Cryptocurrency Brings Millions in Aid to Ukraine, But Could It Also Be Used For Russian Sanctions Evasion?' (28 March 2022) Chainalysis blog www.chainalysis.com.

[37] See, for instance, ESMA, 'Initial Coin Offerings and Crypto-Assets' cit.

[38] "While the cryptoasset market remains small relative to the size of the global financial system, and banks' exposures to cryptoassets are currently limited, its absolute size is meaningful and there continue to be rapid developments. The Committee believes that the growth of cryptoassets and related services has the potential to raise financial stability concerns and increase risks faced by banks. Certain cryptoassets have exhibited a high degree of volatility, and could present risks for banks as exposures increase, including liquidity risk; credit risk; market risk; operational risk (including fraud and cyber risks); money laundering / terrorist financing risk; and legal and reputation risks"; Basel Committee on Banking Supervision, 'Second Consultation on the prudential Treatment of Cryptoasset Exposures' (June 2022) BIS www.bis.org.

threat to financial stability has been recognised in the wake of the emergence of the above-mentioned "stablecoins".[39] Most significant of those was the Facebook (now Meta) proposal of a "global stablecoin" Libra (later Diem). According to the 2019 white paper, the objective of the Libra project was to eliminate the volatility characterising cryptocurrencies, and thus enable mass adoption of blockchain-based solutions and offer a 'global currency and financial infrastructure' to Facebook's 2.5 billion users.[40] The considerations relative to the risks arising from the potential for a fast-paced and global adoption of such crypto-assets have triggered attention from regulators across the globe.[41]

III. (Future-proof) Regulation of crypto-assets in the EU

III.1. The MiCA Framework, its objectives and challenges

The new framework distinguishes between three types of crypto-assets,[42] defines crypto-asset services and sets up an authorisation regime for crypto-asset issuers and service providers. The MiCA thus complements the existing framework for regulating financial services and instruments in the EU, thus filling the gap in supervisory and regulatory treatment of crypto-asset related financial services and "stablecoins".

The MiCA proposal by the EC has been met with considerable support from the side of regulators and supervisors, including the European Supervisory Authorities (the ESAs), industry groups as well as academics.[43] While the proposal had been welcomed as an important step forward towards ensuring better consumer protection and potential risks to financial stability,[44] voices of caution have been raised with respect to the effects of new regime on further innovation and crypto activities in the EU. Two potential side effects of crypto-asset regulation on innovation emphasised by various commentators concerned i) the stringency of certain rules and their proportionality in view of different levels of risk and different degrees of decentralization of services, and ii) the potential of the EU regulatory intervention to lead to crowding out of the largest crypto-asset service providers and token issuers based outside of the EU, thus reducing the amount of innovation in Europe.[45] These concerns, not entirely unfounded, reflect the difficult task facing EU

[39] ED Martino, 'Regulating Stablecoins as Private Money between Liquidity and Safety. The Case of the EU "Market in Crypto Asset" (MiCA) Regulation' (Amsterdam Law School Research Paper-2022).

[40] Libra Association Members, *An Introduction to Libra: White Paper (2019)* librenotlibra.info.

[41] See, for instance, A Diez de los Rios and Y Zhu, 'CBDC and Monetary Sovereignty' Bank of Canada' (February 2020) www.bankofcanada.ca.

[42] See recital 18 of the preamble to the final text, describing the three types of crypto-assets as classified under the regulation.

[43] I Hallak, 'Markets in Crypto-Assets (MiCA)' (EPRS-2022) 2-3.

[44] *Ibid*.

[45] See, for instance, G Pavlidis, 'Europe in the Digital Age: Regulating Digital Finance without Suffocating Innovation' (2021) Law, Innovation and Technology 464–77; T van der Linden and T Shirazi, 'Markets in

regulators in search of the right balance between the innovation objectives, such as facilitating wider adoption of crypto-assets, and the need to address the risks emanating from the novel activities in the market. The choices thus made inevitable affect the architecture (structure) of the new framework.

The core of the structure of the regulatory framework under the MiCA corresponds to the four main objectives of the regulation:

- legal certainty and clarity;
- support for innovation and fair competition;
- consumer and investor protection and market integrity;
- financial stability.

The main elements and tools of the framework are built around the unified notion of crypto-assets, the authorisation regime, and a new standard for consumer and investor protection in the sector.

First, the regulation defines crypto-assets as "digital representation of value or rights which may be transferred and stored electronically, using distributed ledger technology or similar technology",[46] and provides a categorisation of crypto-assets falling within the scope of the framework. Thus, the MiCA distinguishes between crypto-asset related services, including the custody and administration of crypto-assets on behalf of third parties; the exchange of crypto-assets for fiat currency that is legal tender and/or for other crypto-assets; or the execution of orders for crypto-assets on behalf of third parties.[47] Moreover, the regulation defines e-money tokens and asset-referenced tokens as types of crypto-assets that purport "to maintain a stable value" by referring to the value to several fiat currencies or commodities (asset-referenced tokens) or to a single fiat[48] currency (e-money token), thus regulating the offering of "stablecoins".[49]

Second, in addition to an authorisation regime applicable across the EU and enhancing legal clarity necessary to support innovation in the markets for crypto-assets, the regulation adopts a wide definition of "crypto-assets" and "distributed ledger technology" to ensure it captures all types of crypto-assets used in finance and currently falling outside of the scope of EU legislation on financial services. The MiCA thus attempts to enhance innovation in crypto-assets by providing legal certainty and a supervised access to the EU internal market for a wide variety of service providers and business models.

Crypto-Assets Regulation: Does It Provide Legal Certainty and Increase Adoption of Crypto-Assets?' (2023) Financial Innovation 22; INATBA Marketing, *INATBA Policy Position on Market in Crypto-Assets (MiCA) Regulation* www.inatba.org.

[46] Art. 3(1)(5) of the final text.

[47] For the complete list see art. 3(1)(17) of the final text.

[48] The term "official currency" as defined in art. 3(1)(8) of the MiCA means an official currency of a country issued by a central bank or other monetary authority and covers currencies of EU member states other than the euro.

[49] Arts 3(1)(6) and 3(1)(7) of the final text.

Third, the authorisation regime under the MiCA introduces a consumer and investor protection standard aimed at ensuring market integrity. Authorised service providers are obliged to meet the governance, disclosure and information requirements, disclosing key characteristics, functions and risks associated with the purchased crypto-asset. The framework, moreover, provides consumers with rights (*e.g.*, right of withdrawal) and adequate complaint handling procedures.

In light of these key structural elements, the effectiveness of the approach undertaken by the EU regulators has been questioned both with respect to its scope as well as its approach to tackling risks arising in the new crypto-asset markets.

With regard to the scope of the new framework, Zetzsche and others argued that defining the scope of the applicability of the MiCA framework[50] is insufficient as it makes it vulnerable to "the risks of re-characterisation and re-qualification of tokens" by their issuers, undermining the effectiveness and efficiency of the new regime.[51] The authors also questioned the intention of the EC to specify the definitions contained in the regulation by adopting delegated acts. Aimed at adapting the scope of the framework to the changing technological and market realities, the effectiveness of this approach has been called into question due to the length and complexity of the process of drafting and of the adoption of such new standards in the form of delegated acts.[52]

A number of concerns with respect to the ability of the MiCA framework to address the changing amplitude of risks. Some authors have raised issues with respect to consumers' rights in case of insolvency of a crypto-asset service provider,[53] the problem that has been reiterated in the bankruptcy cases of the "crypto winter".[54] Others have emphasised the need to ensure that the "significance" thresholds do not allow for "gaps" in supervision of largest market players to the detriment of consumer and investor protection[55]. With respect to the emerging financial stability risk, Martino argued that the MiCA fails to ensure the balance between consumer and investor protection, innovation, and

[50] Arts 2(1) and 2(2) of the final text.

[51] DA Zetzsche and others, 'The Markets in Crypto-Assets Regulation (MiCA) and the EU Digital Finance Strategy' (2021) Capital Markets Law Journal 203-225.

[52] *Ibid*. 220. These concerns have to some extent been considered and addressed by the legislators, with the recital 18 of the preamble to the final text stating with respect to the asset-referenced tokens, that this "second type [of crypto-assets] covers all other crypto-assets, other than e-money tokens, whose value is backed by assets, so as to avoid circumvention and to make this Regulation future-proof".

[53] I H-Y Chiu, 'A Legal Mapping of the Crypto Economy and the Drivers for Institutional Change' in I H-Y Chiu and J Linarelli (eds), *Regulating Crypto Economy : Business Transformations and Financialisaton* (Hart Publishing 2021) 12.

[54] J Oliver, 'FTX Clients to Vie for Priority Payouts in US Bankruptcy Case' (21 December 2022) Financial Times www.ft.com.

[55] M Arnold and S Chipolina, 'European Central Bank Official Warns of "Gaps" in Forthcoming Crypto Rules' (5 April 2023) Financial Times www.ft.com.

financial stability objectives, with the latter remaining secondary.[56] Increasingly considered as a safe and "flight to" asset, that is an asset to which investment could be converted in case of a shock or instability in the market, e-money and asset-referenced tokens may lead to amplified financial stability risks due to insufficient safeguards against liquidity shortage under the proposed framework.[57] This vulnerability, moreover, may be further exacerbated by the expansion of the DeFi segment, currently left outside of the scope of the MiCA. Is the new framework future-proof in light of these challenges?

III.2. Activity- and risk-based approach to regulating innovation

The essence of future-proofing of crypto-asset regulation under the MiCA appears to be in its technology neutral nature *vis-à-vis* technological choices made by innovating service providers. This "neutrality" towards technological development manifests through the focus of the framework, on the one hand, on the specific function of the innovative service (activity-based approach) and, on the other hand, on the specific risks and the intensity of such risks that emanate from crypto-assets and service providers (risk-based approach).

a) Activity-based approach

The activity-based approach to regulating innovative products and services means that the same regulatory requirements should apply irrespective of whether the activities (*e.g.,* services offered) "are led by an incumbent financial institution, BigTech or start-up (whether or not controlled by a financial institution)".[58] This approach is opposed to a traditional (for the financial sector) "institutions-based" or "entity-based" approach,[59] and is meant to apply to the entirety of the rules applicable to the activity of a financial service provider (including organisational, prudential, disclosure, or conduct-related requirements).[60]

The (intended) impact of this approach on innovation is manifold. For one, the activity-based approach reduces the risks of regulatory intervention leading to uneven playing field between market actors, common to the regimes relying on the institutions-based approach.[61] By ensuring a level playing field is maintained between service providers, those innovating by bringing new technology into the provision of the service fulfilling the

[56] ED Martino, 'Regulating Stablecoins as Private Money between Liquidity and Safety' cit.

[57] *Ibid*.

[58] Expert Group on Regulatory Obstacles to Financial Innovation (ROFIEG), Thirty Recommendations on Regulation (2019) cit. 68.

[59] DA Zetzsche and others, 'The Markets in Crypto-Assets Regulation (MiCA) and the EU Digital Finance Strategy' cit.; see also, K Pistor, 'Host's Dilemma: Rethinking EU Banking Regulation in Light of the Global Crisis' (ECGI - Finance Working Paper No. 286 2010; Columbia Law and Economics Working Papers No. 378 2010) 70.

[60] Expert Group on Regulatory Obstacles to Financial Innovation (ROFIEG), Thirty Recommendations on Regulation (2019) cit. 68.

[61] For the discussion in the context of financial stability, see C Borio, S Claessens and N Tarashev, 'Entity-based vs Activity-based Regulation: A Framework and Applications to Traditional Financial Firms and Big Techs' (FSI Occasional Papers-2022).

same function do not face different rules or remain outside of the regulatory perimeter as a result of innovating.

Another facet of the activity-based approach from the innovation perspective is a more proportionate allocation of regulatory burden associated with authorisation and compliance with regulatory requirements (operational, prudential, conduct requirements). This is contrary to the situation where an entity-based regime would entail an equal regulatory burden for market actors engaged in activities subject to regulatory requirements in full, as well as for those who only provide financial services (and functions) in part together with non-financial functions.

b) Risk-based approach

Risk-based approach under the MiCA manifests through the divergent requirements (organisational, prudential or conduct) that are based on the risks emanating from a specific activity. With explicit reference to the need for a risk-based approach,[62] the MiCA foresees that, similar to other financial services, the EU approach to crypto-assets should be guided by the principles of "same activities, same risks, same rules" and of technological neutrality.[63]

In the context of digital finance, the principles have been spelled out in the 2019 ROFIEG report, suggesting that the assessment of the functional similarity of an activity should be done by looking at its effects, such as consumer risks, and that same activities that do not pose the same risks can be subjected to different regulatory requirements.[64] The report further acknowledges, that "[d]escribing the risk that an activity creates is more complex, as this requires an assessment of all consequences of that activity in its broader context".[65]

The evolving and complex nature of risks arising from the wider use of crypto-assets in the financial system has been underlined by international financial standards setting bodies. Recently, the Bank for International Settlements (BIS) has emphasised the changing nature of the risks to the financial system stemming from increasing exposure of banks to crypto-assets.[66] The BIS Committee on Banking Supervision underlined the potential of the growing size of crypto-asset markets and banks' exposure to increase financial stability concerns and risks faced by banks, such as liquidity risk, credit risk, market risk, operational risk (including fraud and cyber risks), money laundering and terrorist financing risk, and legal and reputation risks.[67] More specifically focusing on crypto-assets marketed as "stablecoins", the Financial Stability Board (FSB) outlined the emergence

[62] Recital 6 of the preamble to the final text.

[63] Recital 9 of the preamble to the final text.

[64] Expert Group on Regulatory Obstacles to Financial Innovation (ROFIEG), Thirty Recommendations on Regulation (2019) cit. 68.

[65] *Ibid*.

[66] Basel Committee on Banking Supervision, 'Second Consultation on the prudential Treatment of Cryptoasset Exposures' cit.

[67] *Ibid*. 1.

of asset-specific risks as these become more spread globally: risks stemming from the existence of a stabilisation mechanism; risks coming from the usability of these crypto-assets as a means of payment and/or store of value; and the potential reach and adoption across multiple jurisdictions.[68] The risks defined by BIS and FSB have been reflected in the operational, prudential and conduct requirements of the MiCA applicable to crypto-asset service providers and offering of "stablecoins" (asset-referenced and e-money tokens) to European consumers. Are these efforts sufficient to ensure the future-proof nature of the new framework?

IV. Future-proofing the EU Regulation of crypto-assets

IV.1. The challenge of future-proofing regulatory intervention in innovative markets

EU regulation of markets in crypto-assets reflects the almost inevitable dilemma of how to strike the right balance between two components of future-proof regulation of innovative markets: on the one hand, future-proof regulation should not hinder innovative producers from introducing novel goods and services, and from reshaping their business models to be able to meet constantly changing consumer demand and to compete in the market; at the same time, such regulation has to provide these same innovators with legal certainty and clarity of the applicable rules while ensuring consumers and market integrity are protected from potential new or changing risks.

This challenge has been largely framed, both in the regulatory theory and impact analysis literature as well as in the literature on future-proof and better regulation, as the challenge of flexibility and responsiveness of regulation.[69] Flexibility or flexible regulation has been defined both by reference to the possibility of regulatory subjects (innovating producers) to choose between different paths of compliance, as well as for the regulators themselves to amend and adjust the regulatory framework over time.[70] The former is usually manifested through less rigid and top down regulatory approaches, such as co-regulation, but also by means of a more principles-based approach, notably by reliance

[68] Financial Stability Board, 'Review of the FSB High-level Recommendations of the Regulation, Supervision and Oversight of "Global Stablecoin" Arrangements, Consultative report' (11 October 2022) www.fsb.org 1.

[69] For discussion of flexible regulation in the context of financial innovation and more broadly, see A Mcquinn, 'Supporting Financial Innovation Through Flexible Regulation' (4 November 2019) ITIF www.itif.org; C Ford, 'Financial Innovation and Flexible Regulation: Destabilizing the Regulatory State' (2013) North Carolina Banking Institute 27; N Cortez, 'Regulating Disruptive Innovation' (2014) Berkeley Technology Law Journal 175-228. On responsive regulation, see J Black and R Baldwin, 'Really Responsive Risk-Based Regulation' (2020) Law and Policy 181-213. In the context of future-proof legislation and policy, see S Ranchordas, M van 't Schip, 'Future-Proofing Legislation for the Digital Age' (University of Groningen Faculty of Law Research Paper Series-2019) 12.

[70] S Ranchordas, M van 't Schip, 'Future-Proofing Legislation for the Digital Age' cit. 14.

on the principle of technological neutrality. The latter – flexibility for regulators to fine-tune regulatory requirements and standards – in practice, has been approached by recurring to a multi-level design of regulatory architecture with diverging degrees of detail and different timelines for revision at each level.[71] In the financial sector and beyond, regulatory technical standards became one of the main tools to achieve such flexibility.[72] In literature, the possibilities for relying on periodic revision and temporary rules, such as sunset and sunrise clauses, or experimental legislation, have been offered as potential solutions in the debates over better regulation.[73]

The new MiCA framework offers a fascinating example of EU legislators and regulators embarking on the challenge of future-proofing their intervention in the context of fast-changing innovative markets. Considering the high-pace of technological development, changing consumer demand, and evolving risk landscape, the new framework for crypto-assets also provides a test ground for the mainstream approach to regulating innovation in the EU – the activity- and risk-based regulation. This approach has been solidified in the recent years, in particular with the advent of interventions in the markets disrupted by the FinTech industry, and the following sections discuss its implications on the future-proofing of the MiCA.

IV.2. Activity-based regulation of crypto-assets: future-proofing the regulatory perimeter

a) The challenges of future-proofing from the innovation perspective

The activity-based regulation, focusing on the functions of the specific (novel) services offered by market actors rather than on the entity as a whole, has been aimed at incorporating innovative service providers within the regulatory perimeter without subjecting them to disproportionate regulatory burden. From the standpoint of regulators and supervisors, the future-proof nature of this approach consists in ensuring the level-playing field amongst market actors engaged in activities that produce the same level of risk. The principle of technological neutrality, as discussed above, implies that the same conditions

[71] The three levels could be distinguished as *i)* legislation (directives and regulations), *ii)* regulatory technical standards and guidelines, and *iii)* (mandated) industry standards, with more general rules and principles defined at the first level, and the most specific (technical) at the third level.

[72] Regulatory Technical Standards are adopted by the European Commission as delegated acts under art. 290 TFEU in accordance with arts 10 to 14 of Regulation (EU) No 1093/2010 of the European Parliament (EBA regulation) and of the Council and Regulation (EU) No 1095/2010 of the European Parliament and of the Council (ESMA regulation). See EBA regulation: Regulation (EU) No 1093/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Banking Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/78/EC; and ESMA regulation: Regulation (EU) No 1095/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Securities and Markets Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/77/EC.

[73] S Ranchordas and M van 't Schip, 'Future-Proofing Legislation for the Digital Age' cit. 15.

apply to these market actors regardless of the use of new technologies or changing business models over time. Two issues can be raised with respect to the effects of this approach on technological and business model innovation.

First, despite the objectives of the activity-based regulation, the authorisation regime that underpins this approach is prone to erecting entry barriers for new service providers. Often developed in consultation with market incumbents alongside early, and more established, entrants, authorisation-based regimes tend to have an effect akin to a sieve, with the most established entrants acquiring authorisations upon the entry into force of the regime, while less capable actors leave the market. Examples include the revised payments services framework (PSD2) with the spike in authorisations during the first two years of its implementation in 2018.[74] In many instances this has a positive effect for consumers, since most of the speculative actors with low value proposition leave the market. However, this positive effect tends to be of temporary nature. With authorised entities obtaining larger market share and benefiting from network effects,[75] the entry to the regulated market becomes less attractive for small innovative players due to the regulatory costs associated with the authorisation procedures and low incentives stemming from the size of the market. Thus, despite their objective of creating a level playing field within the market, activity-based regimes almost inevitably lead to innovation outside of the regulatory perimeter. This, in turn, undermines the future-proof nature of regulation and, in the absence of level playing field and entry barriers for innovative service providers outside the regulatory perimeter, may stifle innovative activities.

Second, the future-proof nature of the activity-based approach to regulating innovation is further challenged by its tendency towards standardisation. The flexible and technology-neutral approach aims at leaving the choice with respect to the best available and most secure technology to the service providers, who are best positioned to serve changing consumer demands. However, the regulatory regimes, such as flexible frameworks introducing minimum requirements, tend to incentivise standardisation. This, in turn, leads to a certain rigidity and inflexibility in terms of consumer-facing solutions by regulated service providers despite allowing for flexibility (and discretion) with respect to the paths of compliance.

One example from the MiCA is the proposed regime for the custodial services. Art. 75(1) of the final text foresees a certain standard content for client agreements, with the requirements for crypto-asset service providers to define the applicable communication

[74] For the analysis of the EBA register data on payment and e-money service providers exhibiting this trend, see Mastercard, *Q4 2021 Open Banking tracker* b2b.mastercard.com; KPMG, *The Netherlands: Europe's number [one payments and e-money fintech hub?* assets.kpmg.com.

[75] Authorisation regime tends to amplify the trends and market features affecting competition and innovation, in particular in the digital markets. On this relation between regulatory and non-regulatory barriers to entry in finance, see Financial Services Authority and the Bank of England, *A Review of Requirements for Firms Entering into or Expanding in the Banking Sector: One Year On* www.bankofengland.co.uk.

and authentication technologies and security features. In addition, art. 75(3) requires regulated service providers to lay down a custody policy with internal rules defining (and potentially restricting) their customers' choice of options to keep and access cryptographic keys. If today, in the unregulated crypto-asset services market, consumers are subject to security risks that are often difficult to adequately assess, the regulatory framework comes in bringing a minimum-security standard. Whilst this is likely to bring benefits of better security to some users, others may find the standardised environment restrictive of their choices compared to an unregulated environment and the options offered by unauthorised service providers.

The two issues – the entry barriers and uneven playing field between regulated innovative service providers and those outside of the regulatory perimeter, as well as the inevitable tendency towards greater standardisation based on minimum requirements introduced by regulatory frameworks – do not necessarily result in negative effects of regulation on innovation. Indeed, it is common if not inevitable that certain innovative market actors and service users/user groups[76] exist and emerge outside of the regulatory perimeter, and that more mature markets and technologies have higher levels of standardisation that are better suited for mass adoption of new products and services. From the perspective of future-proof regulation, the challenge, however, is to ensure the regulatory framework is designed in such a way that enables to bring new actors and their users within the regulatory perimeter without the need to overhaul the entire regime. This meaning of future-proofing is further emphasised by the innovation objective – "niche" markets for specialised consumers[77] constitute an important part of the process of innovation and, as such, an inseparable part of the regulatory objective of supporting innovation. It also highlights a wider spectrum of challenges to the activity-based approach. Today, the main concerns raised in the literature and policy debate consider the limits of the scope of the MiCA framework, and the effectiveness of the activity-based approach that may be undermined by the issuers' efforts to re-characterise or re-qualify tokens (regulatory arbitrage).[78] The innovation-focused lens offers a broader view of the obstacles to level-playing field with innovating actors (unwillingly) excluded from the scope of the framework, and emphasises the need for regulatory safeguards that would ensure flexibility and "openness" of the regulatory perimeter.

[76] For instance, von Hippel's "lead users", who are always "at the leading edge of the market". See, E von Hippel, *Democratizing Innovation* (MIT Press 2006) 22-23.

[77] See, for instance, M Farhana and others, 'Dynamic Capabilities Impact on Innovation: Niche Market and Startups' (2020) Journal of Technology Management & Innovation 83–96.

[78] DA Zetzsche and others, 'The Markets in Crypto-Assets Regulation (MiCA) and the EU digital Finance Strategy' cit. 220.

b) Ensuring the flexibility and openness of the regulatory perimeter: the regulatory safeguards for future innovation under the MiCA Framework

The neutrality of definitions of distributed ledger technology and crypto-assets under the MiCA[79] is a step in the direction of future-proofing the regulatory perimeter, leaving the entry possibility open for future technological and business model innovations. In addition to the technologically neutral definitions, the new framework includes several clauses aimed at ensuring the flexibility of its (material) scope. For one, both the preamble and the text of the MiCA specify the cases for the application of the framework (at least in part) to the use of non-fungible tokens (NFTs), otherwise excluded from its scope.[80] Moreover, the regulation defines the scope of the applicability of the new rules to the decentralised finance (DeFi) application, by limiting its application to the instances of intermediation of otherwise automated and autonomous structures.[81] Finally, the MiCA includes an explicit limitation with respect to its applicability to the digital (crypto) wallets with hardware and software providers of non-custodial wallets excluded from its scope.

Despite the neutrality of the definitions with respect to the technology underpinning crypto-assets and related services and the clearly defined limits to the scope of the MiCA, its consistent and effective implementation is likely to be challenged by the innovation-driven change in crypto markets. This is particularly relevant with respect to the scope of the framework, with shifting application and new use cases for NFTs, fluctuating decision-making and control structures in DeFi and more wide-spread uses and wider range of actors offering crypto wallets. These ongoing changes will raise many questions to national regulators and supervisors as to the interpretation and implementation of the framework.

Technological and business-model innovation has challenged the effectiveness of EU regulatory interventions before, underlining the importance of supervisory coordination alongside technological neutrality. Such coordination is important to avoid regulatory arbitrage and unnecessary regulatory burden and/or entry barriers for innovative service providers. This has been recently highlighted by the European Banking Authority (EBA) in its proposal to merge the Payment Services Directive (PSD2) with the E-money Directive (EMD2).[82] The EBA underlined that merging two regulatory instruments would advance

[79] Under art. 3(1)(1) of the final text, the distributed ledger technology is defined as "a type of technology that support the distributed recording of encrypted data", whereas crypto-asset services are defined as "means a digital representation of value or rights which may be transferred and stored electronically, using distributed ledger technology or similar technology" under art. 3(1)(5) of the final text.

[80] Recital 11 of the preamble to the final text, that provides that the MiCA applies "to crypto-assets that appear unique and not fungible, but whose de facto features or features linked to de facto uses would make them either fungible or not unique".

[81] Recital 22 of the preamble to the final text, stating that crypto-asset services provided with no intermediaries involved and in an entirely decentralised manner are not covered by the scope of the MiCA.

[82] European Banking Authority, Opinion of the European Banking Authority on its technical advice on the review of Directive (EU) 2015/2366 on payment services in the internal market (PSD2), 2022, EBA/Op/2022/06.

"harmonisation, simplification and consistent application of the legal requirements" for payment and e-money service providers, help to avoid regulatory arbitrage in the EU, and ensure the level playing field and a future-proof regulatory framework.[83] The problem has been further spelled out in the EBA's recent report on supervisory practices, where the absence of clear guidance from under the PSD2 made it hard to ensure that market actors employing innovative business models are authorised under the regulatory framework in a manner that is consistent across the EU, thus creating additional regulatory burden and undermining the level playing field.[84] Therefore, the technological and business model neutrality that underpin the activity-based approach in the context of innovative sectors requires consistent efforts from the EU regulators in coordinating and aligning regulatory and supervisory practices. Such coordination is crucial to ensure the openness and flexibility of the regulatory perimeter, indispensable for future-proof regulation that supports innovation.

The innovation-centred lens thus delineates additional challenges to activity-based and neutral regulatory interventions, such as the new MiCA framework. These additional innovation-related considerations are also essential in addressing the potential effects of entry barriers erected by the authorisation regime and the restrictions on consumer choices that result from the mandated minimum-security standards. Supervisory coordination, understood as harmonisation of supervisory practices through coordinated interpretation as opposed to additional legislative measures, is destined to play the central role in ensuring that the borders of the regulatory perimeter with respect to crypto-assets remain equally open in all EU jurisdictions, and hence future-proof.

IV.3. Risk-based approach to regulating markets in crypto-assets

The implementation of the risk-based approach under the regulatory framework for crypto-assets, on the one hand, largely focuses on existing risks to consumer protection, protection of consumer funds and privacy. On the other hand, divergent risk-based requirements have been adopted in response to the evolving risk to the financial stability due to increasing banks' exposure to crypto-assets and the potential for global "stablecoins". Both instances raise important issues with respect to the future-proof nature of the regulatory framework and its effects on innovation in markets in crypto-assets in the EU.

When it comes to risks and risk-based approach, the risk regulation literature emphasises the importance of "anticipation" or "predicting" of risks.[85] For regulators, who introduce risk-based measures to mitigate the risks emanating from the products and services offered in the market, the risk-based approach offers tools to design a framework that accounts for existing risks but also ensures that innovation-driven change does not lead to a

[83] *Ibid*. 4.

[84] European Banking Authority, Report on the Peer Review on Authorisation under PSD2, 2023, EBA/REP/2023/01 34.

[85] S Ranchordas and M van 't Schip, 'Future-Proofing Legislation for the Digital Age' cit.13.

blind spot about new risks. However, as can be seen from the consumer protection, financial stability and market integrity-related provisions of the MiCA framework, the instruments employed by the regulator bear very limited anticipatory (or predictive) capacity.

With respect to consumer protection-related risks, such as safety of consumer funds and protection of privacy (including cyber risks and identity fraud), the flexible and technology-neutral framework under the MiCA largely delegates the risk assessment and the necessary adjustment of approaches to risks and risk-evaluation to the market actors. This traditional approach relies on regulatory subjects' due performance of reporting duties. According to the text of the MiCA,[86] the report on the developments in the markets in crypto-assets shall be based upon the data collected by the EU regulators (ESMA in close cooperation with EBA) based on the input from the national competent authorities.[87] This means that the authorised service providers have to provide their home competent authorities[88] with data that would allow the authorities to get an overview of the market developments. Data provided by the market actors includes the quantitative data regarding fraud, scams, hacks, the use of crypto-assets for payments related to ransomware attacks, cyberattacks, thefts or losses of crypto-assets in the EU, types of fraudulent behaviour, and the numbers of user complaints received. The regulatory risk-anticipatory and predictive capacity, therefore, will be largely based on the aggregate data reliant on the input obtained from the market, and on the analysis of trends and tendencies based on the accumulated reporting data. Although the new framework foresees communication channels necessary for accumulating the necessary information about the tendencies and potential new or amplified risks or risk concentration, it appears to stop short of addressing the challenge of risk anticipation, reinforcing the reactive nature of risk regulation with respect to innovative development in the markets in crypto-assets.

In what concerns the risks to financial stability, the framework's predictive or anticipatory tools also appear to be based on the periodical revision of the regulatory thresholds. With respect to "significant" asset-referenced and e-money tokens ("global stablecoins"), the regulation foresees a possibility for review of the appropriateness of the thresholds between significant tokens and non-significant tokens.[89] Such review, to be performed by the European Commission, may then be followed by a legislative proposal.

[86] Art. 141 of the final text.

[87] Arts 141 and 141(k). See, in particular, art. 142 of the final text providing a detailed regulation for the input sources and composition of the report on latest developments on crypto-assets, including the developments in DeFi applications in the financial sector.

[88] Home competent authorities refer to the national competent authority of the "Home Member State" as defined in art. 3(1)(22) of the MiCA, in most cases the competent authority granting authorisation.

[89] Recital 59 of the preamble to the final text. Some have already questioned the appropriateness of the currently set thresholds for 'significant' tokens and issuers. See, for instance, M Arnold and S Chipolina, 'European Central Bank Official Warns of "Gaps" in Forthcoming Crypto Rules' cit.

In terms of adjustment of supervisory practices to evolving risks (and risk levels), the framework, from the innovation perspective, is likely to be guided by European Forum of Innovation Facilitator (EFIF)[90] and the reporting by ESMA and EBA.[91] The cross-border co-operation and interaction-enhancing function of the EFIF will be further complemented by a cross-border testing facility.[92] This is an important development. To date, regulatory innovation in the form of innovation hubs or regulatory sandboxes[93] has been limited across the EU.[94] With the enhanced convergence at EU level the information obtained in the EU-wide cross-border setting from innovation facilitators and regulatory sandbox facilities will provide better indication of new trends, as well as of the potential sources of risks to financial stability. However, similar to traditional reporting, the supervisory capacity to respond to emerging risks to financial stability will largely be based on the accuracy, quality and timely analysis of reported data.[95]

The anticipatory and predictive capacity of these risk-related regulatory instruments under the MiCA framework appears to be limited by the reliance on the conventional market-based input in compliance with reporting obligations. Where the risk-related market developments require change in regulatory requirements, the space for manoeuvre for the EU regulators in adjusting risk-based framework, such that would not require an overhaul of the framework (that is, without adopting "MiCA2" within 2-3 years after the entry into force of the current framework, a possibility that is implicit in the recitals of the final text of the regulation), appears to be limited to the adoption of regulatory technical standards

[90] Digital Finance Strategy, 8. EFIF work, under coordination by the European Supervisory Authorities (the ESAs) is aimed at sharing experiences from engagement with firms through innovation facilitators (regulatory sandboxes and innovation hubs), sharing of technological expertise, and consolidating views on the regulatory treatment of innovative products, services and business models. For more detail, see www.eba.europa.eu.

[91] Arts 141-142 of the final text.

[92] Digital Finance Strategy, 8. See, EFIF, Procedural Framework for Innovation Facilitator Cross-Border Testing (2021) www.eiopa.europa.eu.

[93] As defined by the EBA, the "innovation hubs" are institutional arrangements allowing regulated or unregulated entities (unauthorised firms) to engage with the national competent authority in the discussion of FinTech-related issues or "to seek clarification on the conformity of business models with the regulatory framework or on regulatory/licensing requirements (*i.e*. individual guidance to a firm on the interpretation of applicable rules)". Regulatory "sandboxes", in turn, are defined as a controlled space in which financial institutions and non-financial firms "can test innovative FinTech solutions with the support of an authority for a limited period of time, allowing them to validate and test their business model in a safe environment". EBA, *Discussion Paper on the EBA's Approach to Financial Technology (FinTech) (2017)* www.eba.europa.eu 7; Communication COM(2018) 109 final from the Commission to the European Parliament, the Council, the European Central Bank, the European Economic and Social Committee and the Committee of the Regions of 8 March 2018 on FinTech Action Plan: For a More Competitive and Innovative European Financial Sector www.eur-lex.europa.eu. 8-9.

[94] European Banking Authority, *ESAs Publish Joint Report on Regulatory Sandboxes and Innovation Hubs* (7 January 2019) www.esma.europa.eu 39.

[95] See, for instance, the discussion at EFIF Meeting, October 2022, digital-finance-platform.ec.europa.eu.

(RTS) by the European Commission. As known from the existing framework, such as MiFID2 and PSD2 regimes, the process of developing regulatory technical standards is prone to similar defects as market input-based supervision, where the effectiveness of the RTS as a tool is undermined by the limited "predictive powers" of regulatory agencies and the need for the balancing between the general and neutral yet precise technical requirements.[96]

Two more innovative regulatory instruments and approaches are widely discussed in the literature and are of relevance in the context of the MiCA. For one, innovation hubs and regulatory sandboxes are considered to be able to offer regulators and supervisors complementary "market intelligence" and thus "constitute a source for understanding potential risks and their mitigating elements".[97] According to some authors, sandboxes can be characterised as a form of "opportunity-based" regulation, distinct from the more traditional risk-based regulation by the "active nurturing" of innovation and learning by regulators.[98] This view of sandboxes and innovation hubs reiterates the strategic importance of the EFIF framework, discussed above, yet at the same time raises questions as to whether such EU-level coordination instrument is sufficient in view of the existing inconsistencies in the national practices and approaches to regulatory sandboxes and innovation hubs.[99]

In addition, ever more voices suggest incorporating technological regulation to enhance the anticipatory and predictive powers of the regulatory and supervisory frameworks in digital finance, such as the MiCA. The proponents of technological solutions suggest stepping up the efforts of incorporating the tools allowing regulators and supervisors to use distributed ledger technology as a regulatory technology.[100] For instance, by incorporating specific requirements and/or restrictions into the technological architecture of asset-referenced and e-money tokens, in order to ensure compliance with existing requirements and proactive evolution (towards stricter/higher thresholds) in anticipation of increasing risks.[101] Other solutions include the so-called RegTech tools which facilitate

[96] DA Zetzsche and others, 'The Markets in Crypto-Assets Regulation (MiCA) and the EU digital Finance Strategy' cit. 220-221.

[97] IOSCO, 'The Use of Innovation Facilitators in Growth and Emerging Markets, Final Report' (2022) FR08 www.iosco.org.

[98] DM Ahern, 'Regulators Nurturing FinTech Innovation: Global Evolution of the Regulatory Sandbox as Opportunity Based Regulation' (9 March 2020) Indian Journal of Law and Technology 4.

[99] For details, see European Supervisory Authorities, 'Report. FinTech: Regulatory Sandboxes and Innovation Hubs' (2018) www.esma.europa.eu 74.

[100] R Auer, 'Embedded Supervision: How to Build Regulation into Decentralised Finance. Bank for International Settlements' (BIS Working Papers-2019) 3.

[101] For instance, where increasing volumes in terms of issue, trade, number of active users, changes in underlying asset classes can be observed. Cf A Collomb, P De Filippi and K Sok, 'Blockchain Technology and Financial Regulation: A Risk-Based Approach to the Regulation of ICOs' (2019) European Journal of Risk Regulation.

reporting by focusing on one-stop reporting platforms or platforms for collection, analysis of data and supervisory workflows, that combine risk data and risk reporting to enable extracting the maximum value from the reported data.[102]

Considering the above, the risk-based (as well as the activity-based) approach to regulating market in crypto-assets appears to be largely limited to the expansion of the regulatory perimeter to enable the supervision of the emerging players. This supervision, however, is likely to face similar obstacles to its effectiveness as experienced by national and European supervisors in other highly innovative sectors due to the lack of risk anticipation and predictive capacity against the fast-changing risk environment, and the rigidity of the borders of the authorisation-based regulatory perimeter. Framed with the innovation perspective in mind, the discussion of the effectiveness of the core principles underpinning the new framework, and of the tools it offers to the national and EU supervisors, would benefit from incorporating the considerations and possible solutions for enhancing the openness of the regulatory perimeter and risk anticipatory capabilities of the framework that have been presented in this *Article*.

V. Conclusions

This *Article* sheds new light on the challenges facing the regulatory regime for markets in crypto-assets in the EU under the MiCA framework. The analysis in this paper has been performed from the innovation perspective, considering the fast-paced technological and market-driven change characterising the crypto industry. The paper focused on unpacking the design elements and the specific instruments of the new framework that are intended to take account of changing market reality as well as to ensure that the scope of the rules and the instruments available to regulators and supervisor remain relevant and able to adjust to such changes (future-proofing). The paper complements the ongoing debate over the approaches to regulating markets in crypto-assets by looking at the two main components of the MiCA as future-proof regulation.

First, the *Article* analysed the activity-based regime based on technology neutral definitions and authorisation-based market entry. Focus on the MiCA's objective to facilitate innovation and uptake of crypto-assets in the financial sector allowed for an extended inquiry into the challenges of designing a regulatory framework with an open and dynamic scope. The innovation-centred lens thus helped to uncover the regulatory challenge of striking the balance between legal clarity and certainty with respect to the personal scope of the regulatory framework and the delineation between different activities and functions that might be treated differently by the regulation. A future-proof regime in the context of innovation-driven change needs to be complemented by a consistent effort of regulatory and supervisory coordination. Such coordination at EU level is an indispensable safeguard ensuring that the regulation does not lead to erecting unnecessary regulatory obstacles or additional

[102] EFIF Meeting cit. 3.

burden for innovating service providers, in particular in case of business model innovation. Under the MiCA framework, coordination is thus also central to ensuring the openness and flexibility of the regulatory perimeter, ensuring that such flexibility does not undermine the level playing field nor lead to regulatory arbitrage.

Second, with respect to the risk-based approach, the innovation-centred perspective of the *Article* highlighted the challenges brought by the changing risk landscape. The *Article* emphasised the need for incorporating within the regulatory design the mechanisms of adjustment to the changes in the amplitude and location of risks within the regulated markets. This capability of the regulatory framework is central to ensuring that activities producing the same risks are regulated by adequate rules. Fast-paced innovation, such as observed in the markets in crypto-assets, requires traditional market-input based methods for risk mitigation to be complemented by the more innovative instruments that can enhance regulatory and supervisory capacity to anticipate and predict changes in the risk environment. Regulatory sandboxes and technological regulation appear to be two potentially effective instruments which, however, are yet to be fully embraced into the EU regulators' and supervisors' arsenal. The innovation-centred lens adopted in this *Article* offers an additional consideration for further research and discussion view the view of fine-tuning both the existing requirements as well as the use of the novel regulatory tools.