MiCA and DeFi

("Proposal for a Regulation on Market in Crypto-assets" and "Decentralised Finance")

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1. What is MiCA?

The European Commission published a proposal for a Regulation on Markets in Crypto-assets (MiCA), on the 24th of September of 2020, as an element of the Digital Finance Package, adopted at the same date and including as well a Digital Finance Strategy[3], a renewed Retail Payments Strategy[4] and legislative proposals on market infrastructures based on distributed ledger technology and digital resilience. This Digital Finance Package aims to support the European Union's ambition for a recovery that embraces the digital transition. By making rules more digital-friendly and safe for consumers, the European Commission aims to leverage synergies between high innovative start-ups and incumbents in the financial sector while addressing associated risks.

MiCA results from an extensive and long-standing market monitoring and participation in international policy work, since the rise of Initial Coin Offerings in 2017 and 2018, from the advice received from the EBA (European Banking Authority) and ESMA (European Securities and Market Authority), on the 9th of January of 2019, and from the public consultation of the European Commission on an EU framework for markets in crypto-assets, which occurred between 5th of December of 2019 and 19th of March of 2020. It also seems to respond to the policy debate about global stablecoins caused by Facebook's Libra proposal in June 2019.[5]

MiCA is a bespoke regime for all crypto-assets not covered elsewhere in European Union financial services legislation, for their issuers and their service providers, providing a single licensing regime across all European Union member states. MiCA has the purpose of providing legal certainty and instilling appropriate consumer and investor protection levels, financial stability, and market integrity to a growing, innovative and

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[3] European Commission, 2020, Communication on a Digital Finance Strategy for the EU (Communication) COM 591 final, available at: https://ec.europa.eu/transparency/regdoc/rep/1/2020/EN/COM-2020-591-F1-EN-MAIN-PART-1.PDF. Accessed 27 April 2021.

[4] European Commission, 2020, Communication on a Retail Payments Strategy for the EU (Communication) COM 592 final, available at: https://ec.europa.eu/transparency/regdoc/rep/1/2020/EN/COM-2020-592-F1-EN-MAIN-PART-1.PDF. Accessed 27 April 2021

[5] Zetzsche et al., 2020a, p. 4.

previously unregulated market without posing obstacles to the application of new technologies.

The draft regulation has an extensive scope by defining the term "crypto-asset" broadly as "a digital representation of value or rights which may be transferred and stored electronically, using distributed ledger technology or similar technology". Although, besides the crypto-assets covered in European Union financial services legislation being excluded, other exemptions exist in MiCA, mainly in public offers of crypto-assets, and a taxonomy is established, as there are different for each type of crypto-assets, as these can be designed in a variety of ways and entail the ownership of a variety of rights, financial and non-financial.[6] This exclusion of crypto-assets covered in European Union financial services legislation and taxonomy of crypto-assets covered in MiCA can be summarised as follows:
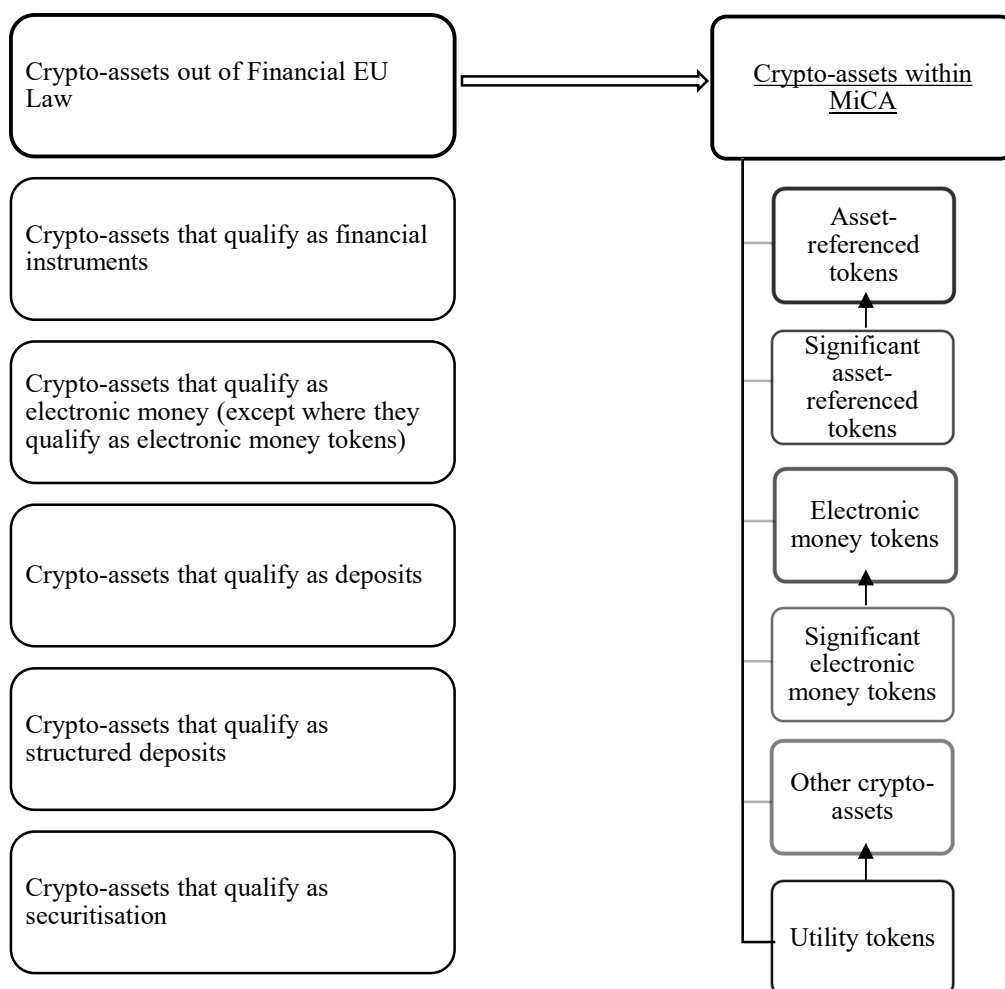

Figure a- Taxonomy of crypto-assets in MiCA

Firstly, it should be noted that the issuers of crypto-assets shall explain why the crypto-asset is not covered in European Union financial services legislation in the

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[6] Ibid., p. 5.

information provided in a public offer, accordingly to MiCA. This obligation can be, in some cases, very challenging. It may create harmonisation difficulties, mainly due to the open concept and the different transpositions from the Member States of transferable securities in MiFID II (Directive 2014/65/EU), which will require an important coordination work from the competent national authorities and ESMA (European Securities and Markets Authority).

Regarding the taxonomy of crypto-assets, two categories of crypto-assets were created for the so-called stablecoins: asset-referenced tokens and electronic money tokens. This distinction of stablecoins was made due to their widespread adoption and potential to be used as a payment method and a store of value.[7]

Asset-referenced tokens mean a type of crypto-asset that purports to maintain a stable value by referencing several currencies that are legal tender, one or several commodities, one or several crypto-assets, or a basket of such assets and electronic money tokens means a type of crypto-asset the primary purpose of which is to be used as a means of exchange and that purports to maintain a stable value by referring to the value of a fiat currency that is legal tender. This latter category shall be deemed to be electronic money as defined in Article 2(2) of Directive 2009/110/EC, with the specificity of electronic money tokens being issued, transferred and stored using a distributed ledger technology, which justified the creation of specific rules for them in MiCA.

To respond to the risks for the financial stability that an asset-referenced token or electronic money token may pose if they reach a large scale in terms of market capitalisation, number and value of transactions and other factors, two sub-categories have been created in MiCA, significant asset-referenced tokens and electronic money tokens. The rules foreseen in the draft regulation regarding these sub-categories of crypto-assets, deemed as significant, consist of additional obligations, such as remuneration policies, governance arrangements and the participation in a college of issuers chaired by EBA (European Banking Authority) that aims to facilitate the exercise of the supervisory tasks of this authority.

The remaining category of crypto-assets is delimited by the negative, called other crypto-assets and composed of all crypto-assets covered by MiCA that are not asset-referenced tokens nor e-money tokens. Inside this catch-all category is the sub-category of utility tokens, a type of crypto-assets intended to provide digital access to a good or service, available on a distributed ledger technology, and are only accepted by the issuer.

This taxonomy defines the way MiCA is structured. However, the subject of this draft regulation is mainly related to the disclosure requirements for the offering and admission to trading of crypto-assets and the authorisation and supervision of crypto-asset service providers and issuers of asset-referenced tokens and issuers of electronic money tokens. For this reason and the quasi-financial nature of crypto-assets, posing many of the same risks of financial instruments, MiCA is inspired in MiFID II, Prospectus Regulation,

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[7] "(…) stablecoins have the potential to reach globally systemic dimensions from a financial stability perspective", ibid.

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Market Abuse Regulation, Payment Services Directive and Electronic Money Directive. Nevertheless, the framework established in MiCA tries to be proportionate and support innovation by not being so demanding as the above-mentioned financial legislation.

An easy demonstration that MiCA is inspired in financial legislation is to observe that most of the crypto-assets services are the same as most of MiFID II services, namely, custody and administration, placing, reception and transmission of orders, execution of orders, providing advice and operation of a trading platform.[8] The only crypto-assets services that were not mentioned are related to the payment services: the exchange of crypto-assets for fiat currency that is legal tender and the exchange of crypto-assets for other crypto-assets.

MiCA requires anyone seeking to provide crypto-asset services in the European Union to have been authorised in a Member State for the services it wishes to undertake. For this purpose, it needs to establish a registered office in that state. An authorisation provided by one Member State will be valid across the European Union.

The proposal is now going through the ordinary legislative procedure of the European Union, and the aim is to have a Regulation in full effect by 2024. In the meantime, many market participants will consider the impact of MiCA on their business models and structures.

2. What is DeFi?

DeFi (Decentralised Finance) is an ecosystem of decentralised applications (dapps)[9] that provide financial services built on top of peer-to-peer and trustless networks, meaning they do not need a central authority,[10] which started to be relevant in size by 2020[11]. DeFi is usually described as an open, permissionless, and highly interoperable protocol stack built on public distributed ledger technologies to replicate existing financial services more transparently and openly.[12]

DeFi may comprise a provision of financial services by multiple participants, intermediaries, and end-users across various jurisdictions, with a purely technological infrastructure to facilitate interactions between different agents.[13] "*As blockchain technology mature and evolves to process a greater number of transactions, the*

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[8] , "(…) portfolio management of cryptoassets – an activity undertaken by many emerging crypto-asset funds – is missing", ibid.
[9] "dapps are programs running on a decentralised network that can execute automatically when certain conditions are met, where transactions are affected in a secure and verifiable way, and legitimate state changes persist on a public blockchain." – Ethereum Foundation, 2020, "What are dapps?" [Online], available at: https://ethereum.org/en/dapps/#what-are-dapps. Accessed 29th April 2021.
[10] Katona, 2021, p. 76.
[11] "The value of funds that are locked in DeFi related smart contracts recently reached USD 10 billion", Schär, 2020, p. 2.
[12] Ibid. p. 1.
[13] Zetzsche et al., 2020b. p. 4.

technology could provide a platform on which to run code-based systems that are increasingly untethered from human control".[14]

In this chapter, we give an overview of the DeFi ecosystem by describing the technical infrastructure of the technology and the different applications within the financial industry.

2.1. DeFI Architecture

This sub-chapter illustrates a simplified version of how DeFi is structured by providing a general and non-technical overview of its layers. DeFi uses a hierarchical multi-layered architecture with different purposes. It differentiates between three main layers, as shown in Figure 2: the settlement, the protocol, and the interface layers.[15]
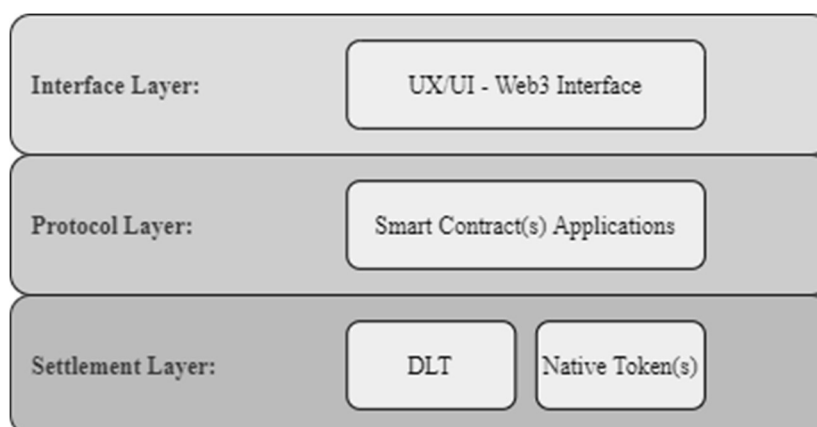

Figure b- DeFi Layered System

2.1.1. – The Settlement Layer (Layer One):

Layer One consists of the distributed ledger technology (DLT)[16] and its native asset, containing the basic operating rules of the ecosystem[17]. Ideally, the DLT comprises the hardware layer where a *peer-to-peer* network of computers is required to compute transactions and store them in order in a distributed database. In a blockchain[18], each agent in the network is a "node", and it validates and organises incoming transactions into

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[14] Filippi and Wright, 2018, p. 147.

[15] For a technical conceptual framework based on a OSI Model, please see 11. The proposed framework in this article was strongly influenced by Fabian Schär model, but for simplicity reasons we opt for a different approach.

[16] DLT is used in Figure 2 for a technologically agnostic approach. However, for "decentralised finance" to be effective it is required for a DLT to be decentralised by default. For our study, decentralisation is only achieved if (1) the architecture of the system is distributed (2) and if no individual or entity controls the system. The distribution of network governance is only possible if there is a distributed architecture. For a better understanding see https://medium.com/@VitalikButerin/the-meaning-of-decentralization-a0c92b76a274. Accessed 2 May 2021.

[17] Katona, 2021, p. 81.

[18] As defined by Dr. Keir Finlow-Bates, "*Blockchain comprises a time-stamped hash-linked list distributed over a peer-to-peer network with a consensus algorithm for incentivizing data consistency and utilizing asymmetric key cryptography for identity and access management.*" See Finlow-Bates, 2020, p. 16. Blockchain is the most used sub-category of DLTs for DeFi applications according to https://defipulse.com/. Accessed 2 May 2021.

blocks that are broadcasted to the network. These transactions may contain value and information. The value is expressed in the network's native asset, and the information is code that can pass data and trigger actions. The native token is used to transfer value, be used as a means of exchange, run applications, and incentivise "nodes" to maintain neutrality.[19]

2.1.2.   The Protocol Layer (Layer Two):

Layer Two comprises the compiler and the ability to create Application Programming Interfaces (API). A compiler is a program that converts current high level to low-level programming languages.[20] In this layer, developers may write code, compile it into bytecode (machine language) and deploy it onto the DLT. Additionally, developers may create an API that will allow other developers to interact with the deployed code. An API is a set of definitions and protocols for building and integrating application software that let a product or service communicate with other products or services without understanding how they are implemented.

Layer 2 includes the programming languages that may be compiled, such as Solidity or Python, smart contract[21] standards, and any assets issued on top of the settlement layer. Furthermore, all standards used for specific applications, such as those described in subsection 2.2 and aggregators that may connect several applications and protocols, are included.

2.1.3.   The Interface Layer (Layer Three):

Layer Three creates user-oriented applications that allow users to interact with an application through a web page. The purpose of interfaces is to enable the program to enforce the properties embedded in the code via objects familiar to most users, such as text boxes, buttons, or any interaction found on a web page.[22]

2.2. DeFi Categories

This sub-section aims to describe the current major applications of DeFi. There are categories termed "stablecoins" and "derivatives", which formally refer to the representation of a particular instrument; however, the scope of this sub-section is to determine the applications at a protocol level. As a result, those terms are merely used for technical ease of reference.

Currently, Decentralised Finance has seven major classes[23]:

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[19] For a better understanding, see https://medium.com/@micheledaliessi/how-does-ethereum-work-8244b6f55297. Accessed 2 May 2021.
[20] Perumal et al, 2018, pp. 100-104
[21] Regarded herein as self-executing programmes, with no human interaction and carried through computer-running codes, see Raskin, 2017, p. 306.
[22] https://www.cs.utah.edu/~germain/PPS/Topics/interfaces.html. Accessed 2 May 2021.
[23] Lau, et al, 2020, pp.13-16

2.2.1. Stablecoins: Stablecoins are crypto-assets that typically transact on a distributed ledger and rely on cryptographic validation techniques to be transacted, intending to achieve stable value relative to fiat currencies. In principle, stablecoins allow users to protect the nominal value of their holdings.[24] Fundamentally, there can be three different types of stablecoins; the fiat-backed stablecoins, the asset-backed stablecoins and the algorithmic stablecoin.

2.2.1.1. Fiat-backed stablecoins aim to maintain a stable value by being collateralised by the fiat currency that it may represent.[25]

2.2.1.2. Asset-backed stablecoins aim to maintain a stable value via collateralisation of several fiat currencies, one or more commodities, to one or more other crypto-assets or a basket of such assets.[26]

2.2.1.3. Algorithmic stablecoins aim to maintain a stable value via inbuilt stabilisation functions that provide for the increase or decrease of the supply of such crypto-assets in response to changes in demand.[27]

There may be some use-cases where a stablecoin may be hybrid.[28]

Decentralised stablecoins (b., c.) aim to solve the trust issue that may arise from fiat-backed stablecoins (a.). Ideally, decentralised stablecoins are created in a decentralised manner via an over-collateralisation or algorithmic method, operate fully on decentralised ledgers, are governed by decentralised autonomous organisations, and anyone can publicly audit their reserves. Thus, one can conclude that the core components of a decentralised stablecoin are as follows: [29]

- **Collateral:** This is the store of primary value for a stablecoin. The collateral *per se* can be exogenous and is primarily used in other protocols; endogenous, where the collateral was created to be collateral within the protocol or implicit, where the design lacks an explicit store of collateral.

- **Agents:** The collateral providers and the stablecoin users.

- **Governance:** The functions and parameters that govern the protocol.

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[24] https://www.bis.org/cpmi/publ/d187.pdf. Accessed 3 May 2021.
[25] https://tether.to/wp-content/uploads/2016/06/TetherWhitePaper.pdf. Accessed 3 May 2021.
[26] https://makerdao.com/en/whitepaper/#notes. Accessed 3 May 2021.
[27] https://www.ampleforth.org/papers/. Accessed 3 May 2021.
[28]Terra is a blockchain protocol that supports stable programmable payments and open financial infrastructure development. It is supported by a basket of fiat-pegged, seigniorage share style stablecoins which are algorithmically stabilized by its native crypto-asset, Luna as described in https://terra.money/Terra_White_paper.pdf. Accessed 3 May 2021.
[29] Klages-Mundt et al, 2020, pp. 59–79.

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- **Issuance:** A mechanism to control the issuance of stablecoins.

- **Oracles:** A mechanism to import external data onto the blockchain, such as price-feeds.

2.2.2. Lending and Borrowing Markets: These protocols aim to provide lending and borrowing services to anyone who collateralises their crypto-assets and use them to obtain loans. Additionally, lenders can also earn a yield on their assets by contributing to lending pools and earning interest in such assets.[30] However, these markets are not comparable to peer-to-peer lending since the crypto-assets are not directly lent between individual agents but are borrowed against the smart contract reserves: crypto-funds aggregated and pooled together by lending agents.

Due to the nature of DeFi and blockchain, where borrows are pseudo-anonymous, there are no mechanisms to identify the agent, access his credit score and ability to repay the loan, and enforce any legal proceedings against a default. To prevent borrowers from defaulting their debt obligation and creating a credit risk for the loaners, borrowers must collateralise their position to cover the debt value. Due to the historical volatility and illiquidity of the various crypto-assets, an over-collateralisation is required. In a scenario where the underlying asset's market price crashes, it would not affect the lending market funds since there would be sufficient collateral to cover the borrower's debt value. The debt is usually issued against USD or stablecoins representing USD.

The borrower must ensure that the collateral value is always above a pre-determined liquidation threshold set by the protocol, or the "liquidators" can purchase the locked collateral at a discount and close the borrower's debt position.[31]

2.2.3. Exchanges (DEXs): DEXs "*were born from the desire to address the vulnerabilities of centralized platforms*"[32], so they aim to provide an exchange between one or more crypto-assets with non-custodial solutions. As a result, users are under complete control of their assets and do not need to transfer and store crypto-assets on an exchange. Based on the mechanism for price discovery, there may be different variants, such as:[33]

2.2.4. Order Book DEX: Maintaining the state of an order book is a computationally expensive task, and, given the design of trustless and public

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[30]https://github.com/aave/aave-protocol/blob/master/docs/Aave_Protocol_Whitepaper_v1_0.pdf.
Accessed 3 May 2021.
[31] Perez et al, 2020, p 4.
[32] ESMA, 2019, p 44.
[33] Werner et al, 2021, pp 3-4.

distributed ledger technologies, it is not feasible to host it on-chain. Consequently, a user wanting to execute an order will sign a transaction allowing the DEX to execute the trade on his behalf when certain conditions are met. Orders are matched either manually or algorithmically; however, this will always involve a degree of trust on off-chain mechanisms[34] that may be susceptible to manipulation.[35]

2.2.5. Automated Market Maker (AMM): AMM is a decentralised protocol that relies on a mathematical formula to price assets. Since the assets are priced according to a pricing algorithm, the AMM does not require an order book. The liquidity to create the market is provided by the liquidity providers.

The liquidity providers provide funds to a liquidity pool, where reserves for two or more assets are locked into a smart contract. Each liquidity provider receives newly minted liquidity tokens to represent his share of a pool's liquidity. A trade may occur when a user deposits an asset, thus providing more liquidity for that particular asset, and withdraws the reserves of one or more other tokens deposited in the pool.

As the reserve ratios for a pool's assets change as liquidity is withdrawn and added, a liquidity provider may receive a different token ratio upon his liquidity share than the ratio he initially deposited. This risk is known as impermanent loss.[36]

2.2.6. Derivatives: Derivatives are contracts that derive their value from the performance of an underlying asset, event, or outcome. Without an underlying to derive its value from, derivatives per se are valueless.

Since the development of derivatives contracts to help reduce the risk for farmers, the uses and types of derivatives contracts and the derivatives market size have increased significantly. Derivatives can be used to manage risks associated with the underlying, but they may also result in increased risk exposure for the other party to the contract. Nowadays, derivatives are no longer just used to reduce risk but are also part of the investment strategies of many fund managers and retail investors.

2.2.6.1. Typical Derivatives: Typical derivatives contracts, where futures and options are included, can be defined by having an underlying size and price, an expiration date and a settlement mechanism.

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[34] https://idex.io/document/IDEX-2-0-Whitepaper-2019-10-31.pdf . Accessed 4 May 2021.
[35] Daian et al, 2019 , p 1.
[36] https://uniswap.org/docs/v2/advanced-topics/understanding-returns/. Accessed 4 May 2021.

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2.2.6.2. Perpetual Swaps: These type of contracts are a mix of future contracts and contracts-for-difference, where there is no set expiry date, and the settlement may be satisfied via the delivery of the underlying asset. Furthermore, traders may decide to keep their position by providing a funding transaction if their position is underfunded.[37]

2.2.6.3. Synthetic Assets: are collateral-backed tokens whose value fluctuates depending on the underlying asset reference index without directly taking a position in that asset. Some platforms allow the creation of crypto-backed synthetic assets that provide on-chain price exposure to commodities, stocks, indices, or other assets.[38]

2.2.7. Portfolio Management: DeFi protocols allow the automation of on-chain assets portfolio management. Crypto-assets are deposited and pooled into smart contracts and are allocated according to an investment strategy encoded in the smart contract or actively managed by a pool manager. The investment strategy may vary from a rebalancing of the portfolio[39] to yield aggregating strategies[40].

2.2.8. Payments: Blockchain allows anyone to send value without a trusted intermediary or depository; however, a transaction may take up quite some time to be confirmed and irreversible in the blockchain. DeFi payment protocols allow to process instant, high-volume micropayments that may remove the risk of delegating custody of the crypto-assets to trusted third-parties.[41]

2.2.9. Insurance: Insurance is a risk management strategy in which an individual receives financial protection or reimbursement against losses from an insurance company in the event of an unfortunate incident. DeFi insurance protocols are, so far, restricted to on-chain risk coverage, where any agent may purchase cover for unintended uses of code in any smart contract offered from the list of the insurance protocol. When an event similar to The DAO hack happens, the agent would be covered from any financial losses resulting from such hacking.[42]

3. How MiCA addresses DeFi?

MiCA does not expressly refer to DeFi, as it is an emerging technological trend in a very early state to be institutionalised by the Law. Notwithstanding, it is still possible and

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[37] https://www.bitmex.com/app/perpetualContractsGuide. Accessed 4 May of 2021.
[38] https://synthetix.io/. Accessed 4 May 2021.
[39] https://www.dhedge.org/. Accessed 4 May 2021.
[40] https://yearn.finance. Accessed 4 May 2021.
[41] https://matic.network/. Accessed 4 May 2021.
[42] https://nexusmutual.io/. Accessed 4 May 2021.

helpful to analyse whether the categories of DeFi correspond to activities that are covered by MiCA or not.

Regarding stablecoins, the type of crypto-assets that correspond to stablecoins, i.e., asset-referenced tokens and electronic money tokens, was already mentioned above. MiCA only refers to stablecoins in the recitals, which is understandable because it is not a very rigorous and objective term. The fiat currencies, commodities and crypto-assets whose value crypto-assets refer to may be stable over a given period but no longer in another period. In this sense, the stable value is stable as it always refers to the value of those particular fiat currencies, commodities, and crypto-assets, although they can be highly volatile in macroeconomic terms.

MiCA, in its recital (26), states that "*So-called algorithmic 'stablecoins' that aim at maintaining a stable value, via protocols, that provide for the increase or decrease of the supply of such crypto-assets in response to changes in demand should not be considered as asset-referenced tokens, provided that they do not aim at stabilising their value by referencing one or several other assets*". This recital is incomprehensible and contradictory because if a crypto-asset do not aim at stabilising its value by referencing one or several other assets, it would never be qualified as an asset-referenced token. According to MiCA, it does not seem to us that the aim of an asset-referenced token or an electronic money token is related to the assets that crypto-asset is backed, but rather to the assets this crypto-asset is pegged. If our interpretation is correct, any algorithmic stablecoins would be covered by MiCA, they would be qualified as asset-referenced tokens or electronic money tokens, depending on the assets their value aims to reference, and this recital should be amended.

In accordance with MiCA, the issuers of asset-referenced tokens shall only be legal entities established in the Union[43], except the offer does not exceed EUR 5 000 000 over a period of 12 months or is solely addressed to qualified investors. These issuers are subject to several obligations. For instance, they shall always provide holders of asset-referenced tokens with clear, fair and not misleading information. Therefore, the crypto-asset white paper on asset-referenced tokens shall include information on the stabilisation mechanism, the investment policy of the reserve assets, the custody arrangements for the reserve assets, and the rights provided to holders.

In relation to electronic money tokens, as they are, in fact, electronic money, only credit institutions and electronic money institutions are authorised to issue them. Issuers of electronic money tokens shall also produce a crypto-asset white paper and notify it to their competent authority, except if the electronic money tokens are only held by qualified investors or the average outstanding amount of electronic money tokens does not exceed EUR 5 000 000 over a period of 12 months.

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[43] MiCA only provides a legal framework for a regional stablecoins, not solving many issues from cross-border payments. For instance, MiCA does not establish cooperation rules where EBA or national competent authorities sit in supervisory colleges set up by authorities of third countries, see Zetzsche et al., 2020a, p. 27. Nevertheless, a lot of international work is underway as regards global stablecoins, see Noble, 2020, p. 19.

Regarding derivatives, some of them are qualified as financial instruments, namely the ones defined in point (44)(c) of Article 4(1) of Directive 2014/65/EU and referred to in Annex I, Section C (4) to (10) thereto. These derivatives are out of scope of MiCA, pursuant its article 2, paragraph 2 (a), but there is still a set of derivatives that do not fulfil the criteria of Directive 2014/65/EU (mainly related to the reference underlying, whether the instrument is over-the-counter or exchange-traded and the settlement method of the instrument) to be qualified as financial instruments. If so, and if those derivatives are crypto-assets, they shall be subject to MiCA and be qualified be as asset-referenced tokens, electronic money tokens or other crypto-assets (the "catch-all" category), depending on the characteristics of those instruments.

As regards DeFi services, most of them are not covered by MiCA, such as portfolio management, insurance, lending and payments, although in this latter case, the payment services of electronic money tokens are regulated by Directive (EU) 2015/2366, as they are deemed as electronic money. The only case covered by MiCA is DEXs, which can be framed as the service of exchange of crypto-assets for other crypto-assets or the service of operation of a trading platform for crypto-assets. In the first case, the business model is similar to a currency exchange, where the service provider freely determines the price for exchanging crypto-assets against fiat currency or other crypto-assets. In the second case, operating a trading platform, the service provider manages a multilateral system that brings together third-party buying and selling interests for crypto-assets.

To comply with MiCA, service providers must be legal entities with a registered office in a Member State and authorised by the competent national authority of the Member State where the registered office is located. In terms of the duties of crypto-assets service providers, they are very similar to investment firms and crowdfunding service providers. Crypto-assets providers should always act honestly, fairly and professionally in the best interest of their clients, provide their clients with clear, fair and not misleading information and warn them about the risks associated with crypto-assets and comply with some prudential requirements.

In light of the above, a problem arises with the relation between DeFi and MiCA, which is the fact that, in DeFi, the operation of services is supposed to be decentralised and not controlled by one entity or a small group of entities and the obligation of always having an issuer or service providers that are legal entities responsible for complying with MiCA provisions. MiCA only applies to natural and legal persons and the activities, issuances, and services performed and provided by them. In some DeFi projects, it seems a stretch to consider that exists a natural or legal person who performs or provides those activities[44].

Nevertheless, most DeFi projects have some degree of centralisation, which generally means having an identifiable intermediary that would be the liable entity within MiCA. As stated in the latest recommendations of the Financial Action Task Force (FATF), DeFi *"applications or platforms are often run on a distributed ledger but still usually have a*

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[44] Schillig, 2021, p. 37.

central party with some measure of involvement, such as creating and launching an asset, setting parameters, holding an administrative " key" or collecting fees"[45].

In other cases, DeFi projects are purely decentralised models that rely only on smart contracts and, therefore, are not within the scope of MiCA since its provisions would not apply if there is no legal or natural person to be held accountable. For this reason, it is essential to know when we are facing a decentralised protocol, so when MiCA does not apply to a DeFi project.

4. What is a decentralised protocol?

The term "decentralised" is used in several different senses across the DLT industry. Firstly, the term is used in the Settlement Layer, where a network of nodes comprises a permissionless blockchain through peer-to-peer connections between unrelated and independent agents, rather than relying on a central server or a central organisation. This axis of decentralisation is referred to as the architectural distribution.[46] For the purpose of this article, we shall assume that the Settlement Layer in which the DeFi protocols are built is always sufficiently distributed.[47]

Secondly, the term may refer to the decentralisation of custody of crypto-assets (non-custodial of crypto-assets by an intermediary). In traditional finance, custody is a core financial service in which the custodian holders in safekeeping assets on behalf of the client. Usually, this type of service is endorsed by the custodian's reputation, together with the legal and regulatory framework. The core reason for using custodians is the security of not having the assets lost or stolen. As a result, security and trustworthiness become symbiotic pertaining to the safekeeping of assets. With the technological forthcoming of DeFI applications, the solution for proving trustworthiness without endorsement from central authorities is via a robust, resistant, and transparent technical implementation of a set of functions, in which only the client/user has access to the assets deposited in a particular smart contract.[48] In the Application Layer, a non-custodial protocol allows users to have complete control of their crypto-assets deposited in a smart contract address for a specific finality of a protocol without relying on a centralised party. The interaction between the protocol and the user is autonomous and automatic, without any contact with the development team; thus, transferring the responsibility from the intermediaries to users.

Thirdly, the term is referred to the decentralisation of management, organisation, and ownership of a protocol. Even though this type of decentralisation is fundamental across all Layers, there is a clear trend of "decentralised governance" across DeFi protocols.

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[45] FAFT, 2020, p 23.
[46] https://medium.com/@VitalikButerin/the-meaning-of-decentralization-a0c92b76a274. Accessed 5 May 2021.
[47] For further details pertaining the "decentralisation" discussion of the Settlemente Layer, see: Walch, 2019.
[48] ESMA, 2019, p 44.

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Organisations that integrate decentralised governance features within their protocols are usually known as Decentralised Autonomous Organizations ("DAO")[49], where the stakeholders hold voting rights via tokens that determine an autonomous execution of the nexus of smart contracts when certain conditions are met. The tokens representing the possibility for token holders to be part of a DeFi protocol are known as governance tokens and may give the token holder control (voting rights)[50] and ownership (cashflow rights) of the organisation.

In DeFI, political decentralisation is similar, at first sight, to shareholder voting for corporations, but, in substance, they are considerably different; in traditional corporate governance, shareholders may only part-take in macro/structural decisions, whereas in DeFi, a token holder may potentially influence any protocol element, from high-level direction to aspects of its daily operation.

A deeper understanding of what type of control is granted to the token holders is required to understand the extent of the political decentralisation of the DeFi protocols. To achieve proper governance decentralisation, protocol developers would need to implement a system in which all aspects of governance and maintenance would be relinquished to the token holders, who mostly are technologically illiterate and cannot build or maintain code.[51]

As an alternative to developing a completely decentralised system, developers allow token holders to participate in the management of the protocol by creating a mechanism in which any stakeholder may propose, discuss and vote for any improvement to be deployed by the master key holders. The control is exclusive to the developers since they are responsible for implementing any proposed changes. Consequently, the proposals, votes and decisions of the token holders are non-binding. It is common for the developers to hold the master keys of the system that allow them to shut down or disable the dapp and proceed with upgrades or emergency shutdowns.

For the reasons supra-described, the governance tokens merely represent a non-binding voting right associated with specific procedures or features, where such right cannot be compared to the control rights of the shareholders of legal entities. At the time of this article, DeFi protocols are yet to achieve complete decentralisation, and as such, they only offer a non-custodial financial solution built on top of a decentralised Settlement Layer.

It is our understanding that the term decentralised protocols should only apply for systems built on a decentralised Settlement Layer (architectural decentralisation), with no control over the user's assets (non-custodial) and in which all aspects of the decision making, code maintenance responsibilities and rights associated with control and

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[49] "A DAO may be defined as a smart contract conceptualized as a relatively autonomous and self-sufficient for-profit organization, which is jointly held by token holders and may share its earnings." See Rolo, 2019, p. 59.

[50] "Instead of asset ownership, governance token ownership applies to voting rights, as the name suggests", Harvey et al, 2021, p. 21.

[51] Mikhalev et al, 2020.

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ownership of the protocol are held by the token holders (political decentralisation) and the code is run automatically and cannot be stopped by only one entity.

For the qualification of a protocol as decentralised, other criteria can also be relevant, as the economic benefits of the developers or other persons responsible for any part of the protocol's operation. If they are entitled to any fees, the protocol cannot be deemed as decentralised. Someone who receives a remuneration is in principle acting professionally within a business activity, so there is a service being provided by someone.

Also, to be considered decentralised, a protocol cannot have any entity providing an interface to it since it would benefit from that prospection of clients, and it would be responsible for the effects that protocol reflects on the public. Additionally, there are crypto-assets services in MiCA that only entail a simple interaction with the clients, namely the reception and transmission of orders on behalf of third parties, defined in MiCA as the reception from a person of an order to buy or to sell one or more crypto-assets or to subscribe for one or more crypto-assets and the transmission of that order to a third party for execution. In this sense, creating an interface to a protocol that allows orders to buy or to sell crypto-assets entails that the entity that does that operation is a crypto-asset provider and is obliged to be authorised under MiCA.

Hence, a decentralised shall be presumed to exist when there are no fees attributed to one entity or a small group of entities, and there is no interface controlled by one entity or a small group of entities. Following finding out some criteria to help us identify when we might be facing a decentralised protocol and, therefore, an activity that is out of the scope of MiCA, one final question remains to be answered. We still aim to scrutinise how the Law should treat DeFi, which means projects that use a decentralised protocol, as we qualify it here.

5. How to regulate decentralised protocols?

Intermediation is a fundamental fact for finance operation, as commercial banks, investment banks, stockbrokers, mutual funds, insurance companies and stock exchanges form the fabric of all frameworks of modern financial structures.[52] As a functionally interconnected institutional structure is inherent to the financial system, the financial regulatory frameworks are always based on the creation of rules of conduct for intermediaries. However, this idea must be adapted following the advent of decentralised protocols that enable financial services without intermediaries.[53]

First and foremost, it is necessary to concede that a financial regulatory framework as we have today would not be enforceable to a decentralised protocol. Afterwards, from the moment MiCA enters into application, and if the growth of DeFi is accentuated at that time, an alternative form to enhance the benefits of DeFi, namely, its openness and

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[52] Lin, 2015, p. 1.
[53] "The traditional model of regulation is coming under strain in the face of increasing globalization and technological change", Weiser, 2017, p. 2017.

transparency, and to mitigate its risks must be urgently found, as DeFi "*serves as the ultimate form of 'code is law' with technology replacing state-based legal systems*".[54]

In our view, that alternative should be supported by a combination between the Regulatory State and the Entrepreneurial State.[55] Besides establishing incentives to self-regulatory contributions, public entities determine public debt management policies and others that provide funding for projects that help achieve public aims.[56] All of them act in the market just like any private entity, so it makes sense to have a public entity on these terms for DeFi since there is no possibility of having a public entity with sovereign power (*jure imperii*) within DeFi.

DeFi, in principle, does not pose serious risks to investors' protection as there are no issues related to asymmetric information, as there is no client-intermediary relationship, so the approach must be different from traditional regulation. Although DeFi can pose severe risks to the financial stability, public intervention cannot be excluded; therefore, the primordial function of that public entity for DeFi must be the prevention of those risks, such as cyber risks, frauds, price manipulation, front end issues, credit risks, exchange risks and liquidity risks.

That prevention can be done through an active intervention from that public entity in safe, reputable, compliant and adequate decentralised protocols to benefit good public management. In order to determine that a particular protocol is safe, reputable and adequate, that public entity must have the proper expertise (e.g. cybersecurity expertise) and must only choose to participate and invest in decentralised protocols that comply with anti-money laundering legislation (at least, the minimum standards set by the FATF[57]), by purchasing governance tokens.

This latter rule would also reward the developers that create a decentralised protocol with those necessary restrictions, apart from the good governance promoted by the referred public entity within those communities, integrating its efforts with private bodies who have expertise in the field and ensuring the quality of publicly disclosed information.

A critical role of this public entity must be to provide advice and disseminate information and the best practices on DeFi, instead of mandating a one-size-fits-all regulatory scheme, that is, a horizontal modelling to the detriment of a hierarchal direction.[58] This role must always regard technological neutrality in the meaning that the advice, information and best practices should focus on the financial processes that technology enables and only on the risks that technology can pose to those processes.[59]

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[54] Zetzsche et al, 2020b, p 22.

[55] "The idea of an entrepreneurial state suggests that one of the core missing links between growth and inequality (or to use the words of the EC 2020 strategy, between 'smart' and 'inclusive' growth) lies in a wider identification and understanding of the agents that contribute to the risk-taking required for that growth to occur", Mazzucato, 2011, p 67.

[56] Stewart, 2003, p. 450.

[57] FATF, *International Standards on Combining Money Laundering and the Financing of Terrorism & Proliferation*, www.fatf-gafi.org/publications/fatfrecommendations/.

[58] Weiser, 2017, p. 2022.

[59] Zetzsche et al, 2017, pp. 54-55.

With MiCA in application and crypto-assets service providers authorised by competent authorities, more helpful information about the crypto-assets ecosystem will be available for the assessments that this public entity needs to know which decentralised protocols to choose. This would also be an opportunity to foster innovation in the financial sector for, in a broader view, promote economic growth, taking into account the principles of public management, mainly related to, *inter alia*, principles of efficiency and rationality in the management of resources, maximum transparency in reporting on their activity, maximisation of citizen participation, equity and long term consideration in decisions and having reasonable means for service performance.[60]

Notwithstanding, there could be the case some serious systemic risks to the financial system that affect the financial stability severely can be identified in those decentralised protocols. Therefore, the public entity that we propose must monitor those risks and share them with the financial regulatory authorities, such as prudential supervisors, central banks and market authorities, in order for these regulatory authorities to find jointly the best way to tackle those systemic risks, eventually and tentatively with international support. These protocols typically have a global scale and are not restricted to a single country, so an international approach to the systemic risks of DeFi is the optimal approach. In this sense, this topic should be promoted in international *fora*, for instance, in IOSCO (International Organization of Securities Commissions), IMF (International Monetary Fund) and WBG (World Bank Group).

As in the proposal for a Regulation on a European Approach for Artificial Intelligence from the European Commission (announced on the 21st of April of 2021)[61], in which the operator of a high-risk AI system shall be subject to strict obligations to prevent any danger to fundamental rights, the creators of decentralised protocols that arise high risks to financial stability should also comply with preventive measures and held responsible if those measures fail and cause any damage to the financial system as a whole or fundamental rights. One example could be a DEX that does not have any AML/CFT (anti-money laundering/combating the financing of terrorism) and KYC (know your customer) controls. Therefore, these DeFi projects that arise high risks should be obliged to be registered and authorised by a financial regulator as their developers and token holders to ensure accountability.

In sum, as MiCA and financial regulatory authorities will be the cornerstones of the supervision of crypto-assets issued and traded in protocols with some degree of centralisation, a new public entity must competent to deal with financial activities provided in decentralised protocols, having the following missions:

- Prevent risks to consumers and investors by the good governance promoted in those communities by integrating efforts with private bodies who have expertise in the field and ensuring the quality of publicly disclosed information.

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[60] Dobel, 2006, pp 161-181.
[61] https://ec.europa.eu/commission/presscorner/detail/en/IP_21_1682. Accessed 5 May 2021.

- Prevent risks to financial stability by monitoring decentralised protocols and inform promptly financial regulatory authorities and international organisations of any serious signs of those risks, so these entities can determine if a specific decentralised protocol must be considered as high-risk protocol and, therefore, if its creators must comply with preventive measures to prevent any danger to financial stability and fundamental rights;
- Foster responsible innovation and economic growth by investing in safe, reputable, compliant, and adequate decentralised protocols, considering public management principles.
- Provide advice and disseminate information and the best practices on DeFi.

In conclusion, MiCA is an excellent first step to address many issues of the crypto-assets market, but DeFi is growing fast, and it will require a quick and effective response from the European institutions due to the demanding legal and regulatory challenges DeFi poses. It will also be paramount to have a harmonised approach to avoid national initiatives that fragment the DeFi market, which only makes sense with scale and an international approach. For these reasons, we present our contribution to clarify better the interaction between MiCA and DeFi and a possible way forward in regulatory vacuum areas.

MiCA and new legislation will undoubtedly address DeFi. The Law always tries to follow innovation and will certainly find the right balance between centralisation and decentralisation. Until then, we consider that it is best to have an open mind *vis-à-vis* the role the State may have regarding decentralised solutions that circumvent legal requirements, due to the risks that they pose for our society but also due to the aspirations we have for a fairer, more accessible and less unequal society.

Reference List

Daian P, Goldfeder S, Kell T, Li Y, Zhao X, Bentov I, Breidenbach L and Juels A (2019) Flash boys 2.0: Frontrunning, transaction reordering, and consensus instability in decentralised exchanges. Available at: https://arxiv.org/abs/1904.05234. Accessed 4th of May 2021.

De Filippi P, Wright A (2018) Blockchain and the Law – The Rule of Code, Harvard University Press, Cambridge.

Dobel J (2007) Public Management as Ethics. In: Ferlie E, Lynn Jr. L and Pollitt C (ed) The Oxford Handbook of Public Management. Oxford University Press.

ESMA (2019) Advice Initial Coin Offerings and Crypto-Assets. https://www.esma.europa.eu/sites/default/files/library/esma50-157-1391_crypto_advice.pdf. Accessed 5th of May 2021.

FATF (2020) Draft updated Guindance for a risk-based approach to virtual assets and VASPs. http://www.fatf-gafi.org/media/fatf/documents/recommendations/March%202021%20-%20VA%20Guidance%20update%20-%20Sixth%20draft%20-%20Public%20consultation.pdf Accessed 28th of April 2021.

Finlow-Bates K (2020) Move over brokers here comes the blockchain, Thinklair TMI.

Harvey C, Ramachandran A and Santoro J (2021) DeFi and the Future of Finance. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3711777. Accessed 3rd of May 2021.

Katona T (2021) Decentralized Finance - The Possibilities of a Blockchain "Money Lego" System. Financial and Economic Review, Magyar Nemzeti Bank (Central Bank of Hungary), vol. 20(1), pp 74-102.

Klages-Mundt A, Harz D, Gudgeon L, Liu J, and Minca A (2020) Stablecoins 2.0: Economic foundations and risk-based models. Proceedings of the 2nd ACM Conference on Advances in Financial Technologies.

Lau D, Lau D, Sze Jin T, Kho K, Azmi E, Lee T and Ong B (2020) How to Defi, CoinGecko.

Lin T (2015) Infinite Financial Intermediation. Wake Forest Law Review, Vol. 50, No. 643, Temple University Legal Studies Research Paper No. 2016-06.

Mazzucato M (2011) The Entrepreneurial State, Demos, London.

Mikhalev I, Burchardi K, Tasiaux P, Lau K and Lie E (2020) The Sudden Rise of DeFi: Opportunities and Risks for Financial Services. Available at: https://defi-pubs.s3.eu-central-

1.amazonaws.com/BCG_Crypto.com_The_Sudden_Rise_of_DeFi_Opportunitie s_and+Risks_for_Financial_Services.pdf. Accessed 3rd of May 2021.

Noble E (2020) Crypto-assets - Overcoming impediments to scaling: A view from the EU. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3748343. Accessed 27th of April 2021.

Perez D, Werner S, Xu J, and Livshits B (2020) Liquidations: Defi on a knife-edge. Available at: arXiv:2009.13235. Accessed 3rd of May 2021.

Perumal A, Deepica G, and Bindu V (2018) Simulation of Compiler Phases. Indo-Iranian Journal of Scientific Research (IIJSR), Peer-Reviewed Quarterly International Journal, Volume 2, Issue 2, pp 100-104.

Raskin M (2017) The Law and Legality of Smart Contracts, 1 Geo. L. Tec. Rev. p. 306

Rolo A (2019) Challenges in the Legal Qualification of Decentralised Autonomous Organisations (DAOs): The Rise of the Crypto-Partnership?. Revista de Direito e Tecnologia, Vol 1, no. 1. pp 33-87.

Schär F (2021) Decentralized Finance: On Blockchain and Smart Contract-based Financial Markets. Federal Reserve Bank of St. Louis Research Paper Series.

Schillig M (2021) Lex Cryptographia, 'Cloud Crypto Land' or What? – Blockchain Technology on the Legal Hype Cycle. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3804197. Accessed 3rd of May 2021.

Stewart R (2003) Administrative Law in the Twenty-First Century. N.Y.U.L. Rev. 78.

Walch A (2019) Deconstructing 'Decentralisation': Exploring the Core Claim of Crypto Systems. In: Brummer C (ed) Chapter in Crypto Assets: Legal and Monetary Perspectives Oxford University Press.

Weiser P (2017) Entrepreneurial Administration. Silicon Flatirons Center 2017, Colorado University Legal Studies Research Paper Series, Paper Number 17-1.

Werner S, Perez D, Gudgeon L, Klages-Mundt A, Harz D, Knottenbelt W (2021) SoK: Decentralized Finance (DeFi). Available at: arXiv:2101.08778. Accessed 3rd of May 2021.

Zetzsche D, Annunziata F, Arner D, Buckley R (2020) The Markets in Crypto-Assets Regulation (MICA) and the EU Digital Finance Strategy. European Banking Institute Working Paper Series No. 2020/77, University of Luxembourg Law Working Paper Series No. 2020-018, University of Hong Kong Faculty of Law Research Paper No. 2020/059.

Zetzsche D, Arner D, Buckley R & Barberis J (2017) Regulating a Revolution from Regulatory Sandboxes to Smart Regulation. 23 Fordham Journal of Corporate and Financial Law 31-103 (2017), European Banking Institute Working Paper Series

2017 – No. 11, University of Luxembourg Law Working Paper No. 006/2017, University of Hong Kong Faculty of Law Research Paper No. 2017/019, UNSW Law Research Paper No. 17-71, Center for Business and Corporate Law (CBC) Working Paper Series 001/2017.

Zetzsche D, Arner D. Buckley R (2020) Decentralized Finance (DeFi). IIEL Issue Brief 02/2020, European Banking Institute Working Paper Series 59/2020, University of Hong Kong Faculty of Law Research Paper No. 2020/010, University of Luxembourg Faculty of Law, Economics & Finance WPS, Journal of Financial Regulation – forthcoming.