DeFi: Defining the future of finance

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Introduction

Decentralised Finance (DeFi) has experienced tremendous growth since mid-2020. While it is still in its early days, DeFi has shown us that offering decentralised financial services at scale is possible. In this report, we have set out to share some key considerations in the areas of governance, security, tax and regulatory that we believe the DeFi ecosystem should take note. We hope that the insights in this document will be a positive contribution to the collective efforts to build the future of finance and money.

Foreword

Bitcoin and Ethereum

When the original whitepaper on Bitcoin was published in October 2008, it demonstrated that we were finally able to conduct peer-to-peer transactions without any intermediaries. This ground-breaking capability was the product of decades of work in disciplines ranging from cryptography and programming to economics and finance.

In 2008, as the world stared into the abyss of the global financial crisis then playing out, Bitcoin enthusiasts saw it as presenting the possibility of a new, wholly independent ecosystem of electronic cash. Advocates made bold claims about how Bitcoin would not only change the operation of the financial system, but also impact previously accepted ideas around data, privacy, and government.

The Bitcoin concept was further extended in 2013 with the launch of Ethereum, which provided improvements to a range of the original Bitcoin features. One of these was the concept of the smart contract. Bitcoin is principally known as a transmissible store of value, recorded on a decentralised, shared

ledger. However, because Bitcoin is written using code, conditions can be attached to the transfer of value, creating a framework for the electronic settlement of contracts. This type of framework opens up the potential for perfect execution of an agreement between parties, where payment is released simultaneously upon the delivery of goods or services. Such a capability has some very direct and relevant use cases in commerce generally – but more especially in financial services.

Ethereum very much heralded the advent of DeFi, by providing a trusted framework upon which computer code can be deployed, executing instructions exactly as written. This framework can be linked to the control of digital assets, which in turn can be used to create financial products. The providers of financial services, such as mortgages, do exactly the same. The difference is that, to date, it's been down to the financial intermediaries and regulators to ensure the products operate as intended. In DeFi, by contrast, it's down to trusting the code.

Decentralised Finance, "DeFi"

in the years following the launch of Ethereum, many developers started to realise that financial services is a natural use case for the technology. This was because the decentralised nature of its operation could be used to provide the inherent security a financial ecosystem needs to prevent

interference. While there was no single project that established the term "DeFi", MakerDAO was probably one of the first to garner a lot of attention. Subsequent projects built on this, by seeking to leverage blockchain to deliver financial services without a need for centralised intermediaries.

DeFi Total Value Locked
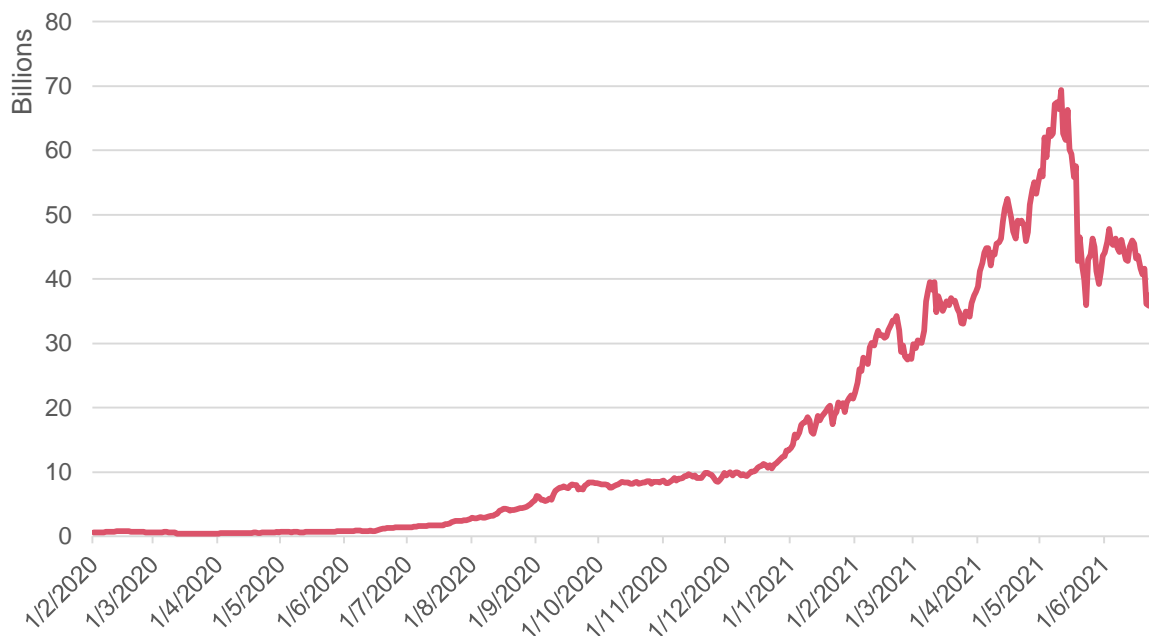
Source: The Block, Data as of 24 June 2021

Since then, the DeFi ecosystem has gradually gathered momentum. Those early projects started to mature, having launched their mainnets, (fully developed versions of their code), while new projects have continued to emerge. According to The Block, the Total Value Locked grew substantially in 2020 from $1 billion to $37 billion as of end of June 2021. This is, of course, a small number relative to the value of the entire financial services ecosystem. But it's continuing to see headlong growth, with new projects springing

up continually as people explore further how to improve interoperability or bring the existing finance system into the blockchain, while also innovating on use cases that were never possible before.

What Makes DeFi unique?

Non-reliance on centralised intermediaries

Facilitates innovation in digital payments

Experimentation with decentralised governance

One of the biggest draws to the whole idea of using blockchain technology to reinvent the finance space lies in how the market can become permissionless and open to anyone. A further attraction is the concept of composability, which means anyone can mix and match any existing DeFi offering to build a new one. The composability of such a network, effectively made of blocks of interlocking components, also means that newer innovations and needs in the finance space can be easily built on top of the network and plugged together, with everything being governed by smart contracts.

Smart contracts are programmes that automatically execute an action when a certain event occurs. This allows users to define rules governed by technology. Conditions can be defined, which, if met, will automatically trigger other actions such as

sending or receiving funds, or even the execution of other smart contracts. This type of automation enables the delivery of existing financial services over blockchain networks and allows for the creation of new services where the rules and conditions of execution are guaranteed by the network itself. The implications of using smart contracts in this way are incredibly profound for financial services.

With smart contracts being key to DeFi applications, most DeFi projects are currently built on the Ethereum network. This is due to the widespread availability of developer capability to work with Ethereum's Solidity programming language that supports the creation of the necessary smart contracts. However, there are now many other blockchain networks that allow DeFi applications as well.

Differences between DeFi and CeFi

- **Autonomy:** DeFi applications don't have restricted access and the operations are not managed by an institution or a central authority. Instead, everything is done through a smart contract and the storage is carried directly in the blockchain, making it impossible to interrupt these applications. Once the smart contract is deployed on the blockchain, the DeFi applications can run with little to no human intervention, but in practice developers build and maintain applications on top of the smart contract. If you don't like the service offer by a DApp you can easily switch to a competitor DApp without a paper burden;

- **Availability:** DeFi applications are available from anywhere in the world, at any time of the day and from your living room. The only requirement is an internet connection;

- **Transparency:** Most of the time, the code of the DApp is publicly available for anybody to look at or audit. In other words, anyone has the opportunity to understand the contract's functionality or find bugs and report them. Furthermore, all the interactions with the DApp which are represented by transactions are also public for anyone to view. As a reminder, receiver and sender are pseudo-anonymous on most of the blockchain;

- **Disintermediation:** Everybody can build an application on top of smart contracts for DeFi or interact directly with smart contracts from their crypto wallets without having to go through a third-party intermediary;

- **Interoperability:** DeFi applications can be run on several blockchains and applications can be built or composed by combining other DeFi applications.

The DeFi landscape

DeFi projects continue to be lucrative ventures. For many of these projects, the development teams retain a significant portion of the token supply, or the electronic shares used to control and secure the operation of the mainnet. This not only means that the team can benefit from speculation on prices, but also allows the firm to be party to the correct operation of the protocol, earning it rewards for effectively securing the proper operation of the network. This further encourages developers to continue improving on their protocols to entice more users onto the network.

**Below are some areas currently covered in DeFi space:**

Stablecoins
Digital assets whose price is pegged to the value of the underlying reserve assets to offer a cryptocurrency with little volatility in the price of the coin itself (DAI, sUSD)

Decentralised exchanges
Exchanges that enable users to trade their digital assets peer-to-peer without any centralised intermediaries (Uniswap, SushiSwap, Balancer, IDEX, Loopring, Bancor)
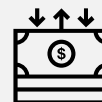
Lending and borrowing
One of the key functions in today's current financial system. With blockchain technology, users are now able to carry out such activities without intermediaries (MakerDAO, Compound)

Insurance
Allows users to get coverage for certain risks (mainly against smart contract failures and the risks related to their deposited crypto assets) without any centralised insurance intermediary (Nexus Mutual)
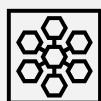
**Derivatives
(Synthetic assets)**
Contracts whose value is derived from the performance of underlying assets. Cryptocurrency-based synthetics allow users to trade the values of various assets on the blockchain network without having the need to hold the underlying assets (Synthetix, dYdX)

DeFi aggregators
These aggregators connect to the various protocols, allowing users to get the optimal yield/market rates for their transactions and creating more efficient markets in the DeFi ecosystem (yEarn Finance, Harvest Finance, ValueDeFi)

The emergence of a strategy widely referred to as Yield Farming, or Liquidity Mining, has also spurred growing interest as it further encourages users to support various DeFi protocols. Yield Farming is the idea of locking up capital in different protocols, in exchange for which a return is provided. For many of the DeFi protocols, liquidity within the protocol is crucial to the proper functioning of the protocol itself. One such example is the lending and borrowing ecosystem, where lenders are essential in providing funds for borrowers. As such, many of these DeFi protocols provide rewards for liquidity providers that lock up their cryptocurrencies on their platform. While the rewards have traditionally consisted of a share of the platform usage fee, some protocols have recently begun to further incentivise users to provide liquidity by rewarding them with tokens. These tokens are often governance tokens, which are not only used for trading but also grant rights for holders to vote on governance proposals within the protocol.

The current customer base of the various DeFi protocols has often been made up of users who are looking to maximise their returns on digital assets using Yield Farming, or to speculate on the potential upside of this new and growing market. To date, one of the biggest barriers to the mainstream adoption of DeFi has been simply how new the ecosystem is; there are still areas that need to be addressed – not least the big question around what form regulation should take when applied to a decentralised protocol, not necessarily having a legal entity or even originating jurisdiction. This is just one issue among many, sitting alongside others such as coding risk, taxation, governance, cybersecurity, money laundering compliance, asset valuation and interoperability requirements.

What the future of DeFi holds

In recent years, an array of macro and technological trends have been contributing to the exponential growth of DeFi. Whether in the form of decentralised exchanges, lending and borrowing of different asset types or through insurance products, DeFi is evolving and expanding swiftly to mirror the traditional financial services ecosystem. This new form of decentralised financial technology may eventually have an impact on the future of centralised finance entities, with DeFi potentially being seen as an alternative that's cheaper, quicker and more relevant.

This report is a high-level guide to some of the most important considerations that are now emerging around DeFi. While it has been tailored for decentralised exchanges and DeFi project owners, it has also been written for those with a general interest in this space, as well as those working in financial services.

Regulating DeFi

The crypto industry has been on the radar of regulators worldwide for several years. Many jurisdictions have developed their own local frameworks to regulate the sector or amended their existing regulatory legislation to encompass crypto activities. Larger bodies have released wider ranging requirements: examples include the Financial Action Task Force's (FATF) recommendations requiring countries to implement measures and controls to combat money laundering and terrorist financing, and the European Commission's recently-published Regulation of Markets in Crypto-assets (MiCA) proposal[1]. MiCA is an EU-wide regulatory initiative that aims to regulate crypto-asset issuers and crypto-asset service providers (CASPS).

These regulatory developments, along with the ever-increasing involvement of institutional players, underline the extent to which the crypto-industry is becoming mainstream – in turn making further intervention from regulators inevitable.

Many in the industry see the growing regulatory scrutiny as positive for its future development. But with the principles of DeFi potentially being at odds with the principles of regulation, it makes for an interesting future relationship between DeFi and regulation.

Given the decentralised nature of blockchain technology and the borderless nature in the way its services can be delivered, the jurisdictional applicability of the relevant laws and regulations is currently open to question. However, the existence of a smart contract might enable technical functionality to be implemented within DeFi products to impose jurisdictional restrictions. For example, the technology could block access by IP addresses from certain countries. The effectiveness of such measures, particularly in relation to regulatory or security issues, is likely to depend on specific local legislation. As such, the need for an umbrella regulatory framework may be greater than ever before.

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1 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020PC0593

The development of this type of legislation would need to take the following areas into account:

- Legal enforceability and conflict resolution;

- Consumer, or end user, protection;

- Data privacy considerations, especially under the EU framework of GDPR;

- AML/CFT/KYC issues.

The currently limited nature of the Anti-Money Laundering (AML) and Know-Your-Client (KYC) checks performed by DeFi platforms creates the potential for DeFi projects to be used for money laundering purposes. The industry saw an example of this risk emerge earlier this year, when KuCoin suffered a cyber breach and the hackers used decentralised exchanges (DEXs) to attempt to convert the stolen US$200 million, essentially "cleaning" the "dirty" crypto. While the use cases for DeFi are effectively endless and its evolution could have significant positive impacts, events such as this have the potential to plunge the crypto industry back into the dark days of Silkroad[2] and the like. This possibility reinforces the need for a proper regulatory framework.

In combination, all the issues we've set out here serve to make DeFi regulation a hot topic. It is also one that currently raises more questions than answers – and we will now explore some of these questions.

Who to regulate?

Traditional regulation focuses on a centralised party, a legal entity and the people behind that legal entity. Regulators approve and supervise the decision makers behind an entity and the operations that the entity undertakes. This approach poses several challenges when considering the regulatory aspects of a DeFi project, because in a truly decentralised protocol there is arguably no centralised party. The decisions and operations are performed by computer code that is programmed at the outset to perform a set task, meaning no single entity or individual has centralised control over the protocol. In cases where the project utilises a governance token to direct and make changes to the platform, the decisions are presumed to be made by a collective body of participants in a democratic way: this model too lacks the centralised control that is at the heart of traditional financial regulation.

As outlined earlier, single, global regulators are few and far between – and the ones that regulate aspects of our lives that are global in nature require coordination across the governments of all countries. One of the few examples of a truly global regulator is the Geneva-based International Telecommunications Union (ITU), which regulates the standards associated with telecommunications. In the case of the ITU, it is transmitters of radio telecommunications services that are regulated. For DeFi, where there is no physical component to regulate, there may not be a legal entity, and the reality is that effective control lies with lines of executable code, then who should be regulated?

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2 https://www.bbc.co.uk/news/technology-54833130

To address this question, let's consider whether all DeFi projects are fully decentralised. Factors that regulators may focus on include:

- If any party has the ability to control the protocol by modifying, disabling or halting the code at any time, this suggests that there is a central party that controls the protocol;

- If any party owns a majority of governance tokens and can therefore influence the protocol, it could be seen to be controlling as a central party;

- If a protocol employs individuals to provide some form of customer service, investor relations or promotion, then there must be someone behind the protocol.

While many DeFi projects aim to become fully decentralised, it may be difficult to actually achieve this at the outset. Decentralisation requires the ecosystem of participants to actively govern, contribute and take forward the protocol – and this depends on having a large volume of active users. Until a project reaches this critical stage, the developers and initial promoters behind the protocol could still be seen to be controlling the project, therefore making them the target for regulators. If a regulator is able to identify a central party that controls or is behind the DeFi platform, then that regulator is likely to want to regulate that party to ensure that the platform applies regulatory principles – even though identifying the party and where that party is centralised is likely to be a challenge.

Meanwhile, if genuine decentralisation is achieved, further questions arise. Assuming that a DeFi project is truly decentralised, would regulators seek to regulate the developers, to ensure that they embed regulatory principles into their code? At the very least, regulators would want to make sure that any protocols that allow the transfer of significant value and the use of financial products, conduct AML and CFT checks on their users.

The use of governance tokens within DeFi protocols raises another interesting question: should governance token holders bear some responsibility for that platform's application of AML guidance? Arguably, the governance token holders are driving the direction of the protocol. So, if they are knowingly allowing their platform to circumvent globally accepted AML requirements, such as those of the FATF, are they responsible for turning a blind eye and not cracking down on money laundering?

Who could regulators seek to regulate?

Centralised parties

Factors that may generate a degree of centralisation:
- Ability to control the protocol by modifying the code;
- Influence the code through owning the majority of governance tokens; or
- Employment or individuals or fundraising activities suggest a centralised party.

Governance token holders

Governance token holders drive the direction of the protocol, should they also be responsible for ensuring that the platform complies with AML requirements?

In the early stages before the platform achieves mass adoption, does a small number of individuals, usually the developers or promoters hold the majority of governance tokens.

Developers or promoters

Could regulators target developers, forcing them to build regulatory principles, such as AML checks, into their code?

Promoters could be in the spotlight, where regulators could aim to supervise the people who distribute and advertise DeFI platforms.

DeFi and AML

Various authorities around the globe are expanding and enhancing the existing AML/CFT/KYC regulatory frameworks to cope with the rising demand for financial services and the pressing need for increased security and protection against fraud. The European Commission, through its MiCA consultation, is proposing several changes to existing financial services laws to capture technology changes arising from blockchain and DLT. These changes include:

- Amending MiFID II to clarify the circumstances in which crypto-assets qualify as 'financial instruments';

- Creating a regime for securities tokens;

- Establishing a bespoke regime for the new asset class that is not covered under existing regulation (e.g. stablecoins, payment tokens and utility tokens); and

- Issuing AML directives for crypto assets.

Furthermore, the FATF recommendations[3] set out a comprehensive and consistent framework of measures that countries should implement to combat money laundering and terrorist financing.

At the same time, DeFi products – given their decentralised nature – are available to anyone in any country without any regulatory compliance framework. As a result, DeFi can easily become a tool in the hands of criminal actors. It remains to be seen how authorities would regard potential solutions to this risk. A very simple example could be that smart contracts may be programmed to perform AML/KYC checks prior to the execution of

transactions. Although there would be some technical challenges (as well as many ideological ones raised by the DeFi community), such a mechanism – if practicable – could filter a large number of suspicious transactions. Following an analysis by CipherTrace, researchers found that over 90% of DEXs within a clearly domiciled country had deficient KYC, with 81% having little to no KYC whatsoever[4]. This lack of KYC illustrates the vulnerabilities in the DeFi architecture that could be targeted by bad actors wanting to use the technology to launder money. The question here is that if regulators were to crack down on these platforms, and they were truly decentralised, could regulators actually shut them down to stop them from providing the service?

Furthermore, since a DeFi application is controlled or operated by a community of miners, nodes and users with no central entity, it would be difficult to attribute responsibility to any one person on the network. Given the difficulty of identifying a single person to regulate DeFi protocols, we could see the development of innovative supervisory and monitoring technologies – "Smart RegTechs" – which would harness blockchain and smart contracts to carry out supervisory and monitoring functions without relying on the regulation of intermediaries or institutions.

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3 http://www.fatf-gafi.org/publications/fatfrecommendations/documents/fatf-recommendations.html

4 https://www.linkedin.com/pulse/future-money-developments-you-need-know-week-issue-11-henri-arslanian/

DeFi tokens – securities or not?

Decentralisation is often achieved using the DeFi platform's native token. This allows the participant to contribute to the effective operations, such as staking to mine a block, and also to govern the platform through its governance mechanisms. These DeFi tokens take us back to a question often asked during the ICO era of 2017: are these tokens securities?

Many DeFi tokens offer the holder the opportunity to participate in the governance process, by essentially giving them a say in the growth and direction of the platform and the ability to vote democratically on the project's strategy. This sounds all too similar to shares in a company, where shareholders can vote at general meetings.

Another use of DeFi tokens is participating in the staking mechanism used to mine a block, a mechanism that generates a return for the holder. Is this return like the dividends or coupons that traditional security interest holders receive? Or could the fact that token holders are participating in the staking and therefore validation of transactions, mean that they are performing a service for their reward and are not solely receiving the return for holding the token?

Tokens held by liquidity providers on DeFi protocols, often referred to as Lending Pool tokens, allow token holders to earn returns by providing liquidity to lending pools. Are they solely generating interest peer-to-peer using the DeFi protocol as a facilitating mechanism? Or is there an element of token holders pooling their resources to generate returns, in a way that has similar characteristics to a collective investment scheme?

DeFi tokens are certainly an area of focus for regulators, who would aim to ensure consumer protection by targeting token issuers. Whether a specific DeFi token is considered to be a security would depend on the terms of that token compared to the regulatory principles in the jurisdiction of issuance – assuming this could be determined.

Current regulatory status

While more and more territories and regulators are issuing guidelines for the crypto industry, very few regulators have yet tackled DeFi. However, given the significant increase in usage, the lack of KYC on most protocols and the potential for retail users to access complex financial products, it may not be long before DeFi is brought into the crypto regulatory environment.

The European Commission's MiCA consultation proposes a far-reaching EU-wide framework aimed at crypto asset issuers and service providers. Whilst the regulation is aimed at the crypto market in general, it has been reported that its impact on DeFi could be significant due to the interpretation that each crypto asset issuer should be an entity, and hence a centralised party. However, the draft MiCA regulation does not specifically cover DeFI.

There is also an argument that the EU's 5th Anti-money laundering directive (5AMLD) should already be applied to DeFi protocols, depending on the private key storage of each protocol.

Even though the current regulatory frameworks do not specifically encompass DeFi, should the developers and other participants be seeking to ensure their protocols are compliant in regulatory terms? The crypto industry in general has seen significant moves towards regulation in recent years. Given DeFi's recent growth and hype, it would be consistent with the industry's direction of travel for developers and participants to build in regulatory principles such as AML and KYC. Furthermore, should DeFi projects want to attract investment from large mainstream institutional investors, they may find that it becomes a requirement from investors that the projects they invest in contribute to combating money laundering.

With the speed of change in the crypto industry running way ahead of the regulation setters, it is likely that by the time MiCA – or any other regulation – provides guidance on DeFi projects, then DeFi and the crypto landscape will already be significantly different from what we see today. So it's a moving target: one with which regulators will continue to struggle to keep pace.

Governance

For all organisations – be they businesses or other types of entity – governance is crucial for achieving goals and ensuring that all stakeholders can interact with that organisation reliably and securely. Governance is about making sure the right decisions are made, at the right time, using the right data. As such, the efficacy of an organisation's governance is a key regulatory parameter in ensuring it is run effectively and in a way that balances the interests of three groups of stakeholders; those that benefit from the services offered by the organisation; those that run the organisation; and those that represent the interests of society. That last group – those who represent the interests of society – are represented by regulatory bodies, who will typically only intervene when the risk of material harm is significant. For example through the mis-selling of financial products.

To date, DeFi and digital currencies have remained largely unregulated, relying on an existing package of frameworks covering Anti-Money Laundering or Counter-Terrorism Funding. This reflects the fact that, as yet, the degree of risk posed by this technology to large parts of society has been too small to warrant greater intervention. Therefore there is still no explicit definition, in a regulatory context, of governance frameworks for digital currencies or of DeFi as a technical derivative. Nevertheless, regulators are making headway; for example, the MiCA consultation includes a range of principles for governing digital assets, such as:

Governance Framework

Issuers of asset-referenced tokens[5] should have **robust governance arrangements**, including a clear organisational structure with well-defined, transparent and consistent lines of responsibility, and effective processes to identify, manage, monitor and report on the risks to which they are or might be exposed

Suitability

The management body of such issuers and their shareholders should have **good repute and sufficient expertise** and be fit and proper for the purpose of anti-money laundering and combatting the financing of terrorism

Business Continuity

Issuers of asset-referenced tokens should also employ **resources proportionate to the scale of their activities** and should always ensure continuity and regularity in the performance of their activities. For this purpose, issuers of asset-referenced tokens should establish a business continuity policy aimed at ensuring, in the event of an interruption to their systems and procedures, the continued performance of their core payment activities

Internal Control Framework

Issuers of asset-referenced tokens should also have a **strong internal control** and risk assessment mechanism, as well as a system that guarantees the integrity and confidentiality of information received

These principles are very similar to those found in the regulatory requirements for establishing and maintaining MiFID II-licensed operations in Europe, for example. Interestingly, the MiCA guidance does not extend to governance requirements associated with the blockchain technology itself. Technology is typically not regulated, except where it is used to deliver services, such as radio-telecommunications with the ITU as previously mentioned, or a product –

such as medical devices – into society. In many ways MiCA seeks to impose responsibility for ensuring the integrity of the digital assets upon the management body, with the requirement to establish 'effective processes to identify, manage, monitor and report the risks to which they are or might be exposed'. This implies a requirement to undertake some level of technical due diligence on the assets themselves.

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5 Article 3.1(3) of MiCA: 'asset-referenced token' means a type of crypto-asset that purports to maintain a stable value by referring to the value of several fiat currencies that are legal tender, one or several commodities or one or several crypto-assets, or a combination of such assets;

It needs to be noted that the MiCA document is, at this juncture, a consultation, with the UK expected shortly to issue its own consultation. It will be the responses themselves that will determine the look and feel of the relevant legislation and how it is applied to digital asset businesses. As a reminder, the MiCA document makes no reference to DeFi – so it will be interesting to see the extent to which the responses treat DeFi as something separate, or as an emanation of digital assets, and what the inherent obligations are. In broad terms, well-run businesses will adhere to the four regulatory principles listed above, so such benchmarks are a good starting-point when examining any kind of De-Fi. Further references, as they relate to best practices governing the development of open source software, can be found in initiatives such as Linux. Similarly, adherence to international standards covering quality and cyber hygiene, as defined by ISO 9001 or ISO 270001, also provide robust guidelines as to what you would expect to see in a well-run business that uses technology.

Nevertheless, there are some difficult questions ahead for the regulators. For example, what is decentralisation – and how can it be achieved and managed?

A governance token is a token whose decisions about the way of operating, key features and major changes such as "monetary" policy is voted by its holders. This is a real revolution compared to the traditional financial system where – for example – the euro is managed by the Eurosystem, which is a body of the European Union composed of the European Central Bank and the national central banks of the Eurozone.
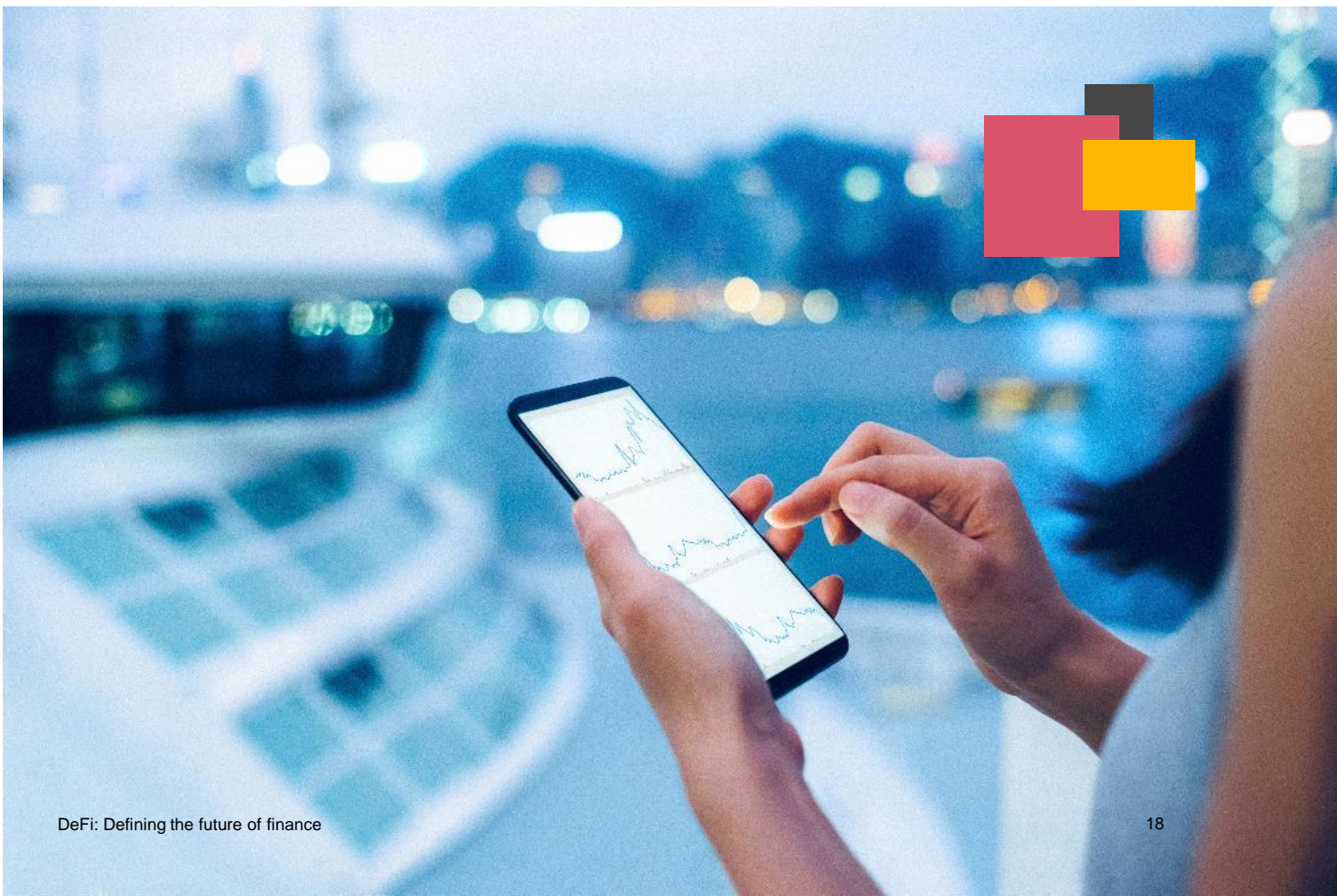
In practice, most projects are not 100% decentralised, and the degree of centralisation changes from the inception of a project. As at 10 December 2020, several of the most popular DeFi projects have finished their transition to a Decentralised Autonomous Organisation (DAO[6]). Examples here include MakerDAO, Compound and Aave, all of which have been autonomous since March 2020, June 2020 and September 2020 respectively. Behind each of these protocols there is native governance token (MKR, COMP, AAVE) to propose, vote and make decisions to develop the protocol/platform. Other projects are also progressing toward decentralisation: examples include Balancer, which allows BAL holders to vote on the future features of the protocol even if these are proposed and implemented by the core team. Depending on the level of decentralisation, each project has its own features development process, as shown in the table below:

What needs to be governed?	A proposal from the core team	A proposal from the core team or users	A proposal from the core team and developers
Example	Augur	Balancer	Compound
Vote processes	No vote	• The core team submits a call for voting to improve the protocol based on their work or from the community feedback received; • Most of the time the proposal has a 24-hour voting period; • Any address holding BAL Tokens can vote; • There is no obligation to implement the feature voted within X days. But it must be done as soon as possible.	• Any address with more than 100,000 COMP delegated to it may propose governance actions; • Any proposal made has a three-day voting period; • Any address which has voting power can vote for or against the proposal; • If the proposal receives at least 400,000 votes, it's queued in the Timelock and implemented after two days; • If it doesn't receive the appropriate amount of votes, the proposal is rejected.
Action taken by token holders	Action not relative to the protocol evolution itself	Voting for core team propositions such as implementing new functionality, introducing a protocol level fee.	• List a new cToken market; • Update the interest rate model of the market; • Update the oracle address; • Withdraw a cToken reserve.

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6 DAO is a complex type of DApp. It can best be understood as a new kind of organisation that is similar to a digital company or investment fund but not a legal entity. The DAO was created as a self-governing body operating on democratic principles that is not influenced by outside forces.

The DAO's by-laws are embedded in the Ethereum blockchain. The DAO concept builds on smart contracts which are:

• Immutable (from the perspective of individual participants): only a majority of DAO token holders can decide by vote to adapt the code (and thus the DAO itself);

• Unstoppable: the programme runs on the Ethereum blockchain, which consists of thousands of independent nodes. In order to stop the programme, you would require a majority of these nodes, which is all but impossible in actual practice;

• Irrefutable: all actions executed by the programme are transparent and recorded on the Ethereum blockchain for eternity.

The table highlights the opportunity for participation, as well as the shift from a centralised structure to one that is decentralised, or democratised. Meanwhile, the ideas around governance tokens are continuing to mature and there is still a long way to go. Other questions that need to be addressed, whether as a DeFi project or in the context of the regulatory position, include:

- How is the minting and burning of tokens, whether internal or those related to the governance of the platform, controlled transparently?

- How is platform development governed and controlled?

- Who monitors and controls the need to address security flaws?

- How are access management controls, such as those required for voting, borrowing, lending and exchanging applied? How can smart contracts be used to manage these?

- How is the provenance and quality of the underlying asset validated? How are the underlying assets, on-boarded onto the DeFi platform? What are the necessary controls around onboarding and enforcement of governance rules that must be applied and during the lock-up time of the assets?

- What role do Stablecoins have in the DeFi ecosystem? How are Stablecoins attested and governed, especially where a DeFi project is using its own Stablecoin?

- How are smart contracts governed when used in a DeFi protocol?

- What controls and defenses are applied to prevent attack by third parties?

- How is the underlying blockchain protocol governed?

- To what extent can a DeFi protocol be self-governing? Or can it be – or does it need to be – governed by an external third party?
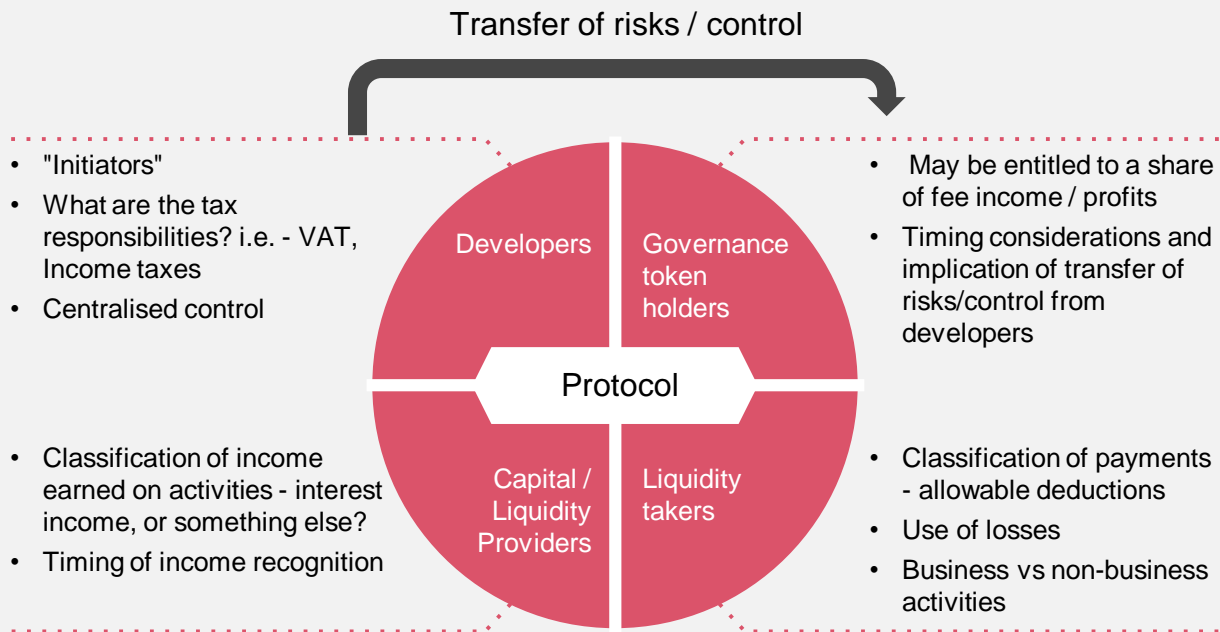
Taxation

The application of conventional tax rules to DeFi results in some novel challenges – and, at the time of writing, there has been little to no guidance provided by tax authorities on how DeFi transactions should be taxed. To narrow down the scope of the issues and provide an overview of the possible considerations in the DeFi tax landscape, it's helpful to consider tax from the viewpoints of the various transaction participants, as each has its own unique concerns.

To examine the tax issues that may arise, we start by dividing up the participants in DeFi protocols into the following categories: Developers, Liquidity Providers, Liquidity Takers, and Governance Token Holders. Then we outline the possible tax considerations each of these participants might face when engaging in DeFi transactions. We also consider whether there may be tax implications to consider at the protocol level itself in certain situations.

As highlighted above, there is currently no guidance on the tax treatment of DeFi transactions. However, as the use of DeFi protocols increases and as tax authorities become more familiar with the transactions involved, we fully expect that they will modify the application of current tax law towards DeFi, or even introduce entirely new legislation as DeFi moves from "experimental" to mainstream. In this report we have sought to highlight some of the key questions that may need to be considered as these events play out. The relevance of the comments below may vary in different tax jurisdictions, so it is always important to seek local advice.

Transfer of risks / control

Developers
- "Initiators"
- What are the tax responsibilities? i.e. - VAT, Income taxes
- Centralised control

Capital / Liquidity Providers
- Classification of income earned on activities - interest income, or something else?
- Timing of income recognition

Protocol

Governance token holders
- May be entitled to a share of fee income / profits
- Timing considerations and implication of transfer of risks/control from developers

Liquidity takers
- Classification of payments - allowable deductions
- Use of losses
- Business vs non-business activities

Taxation at a protocol level

From a tax perspective, a decentralised protocol is unlikely to be viewed as a legal entity in its own right. This raises the question of who bears legal responsibility for claims against it and who has legal ownership of assets held on the platform. For example, it could be argued that the users and/or governance token holders are operating in partnership.

The level/degree of decentralisation should be considered: applications that are more centralised could be seen as being operated or controlled by the developer or some other project initiator or sponsor, which may pass on the accountability for tax, compliance, filing obligations and other reporting responsibilities to the developer. How can the level of decentralisation be measured – and at what point would a protocol become fully decentralised for tax purposes?

If a protocol, or DApp, goes from having a central governance model (e.g. control by initiator or developer) but then undergoes a transition to becoming fully decentralised, what are the tax implications of this change? For example, is it a form of disposal? And how does the initiator or developer disavow itself of future responsibilities for tax or other liabilities?

A successful protocol, or DApp, could quickly grow to a size where exemptions and simplifications for small and medium-sized businesses cease to be available. This could expose the protocol, or its users or governance token holders, to more complex international tax reporting and filing requirements.

Taxation at the level of capital/liquidity providers

Key questions that need to be considered for those providing liquidity to a protocol include:

- How should returns be treated in cases where a cryptocurrency loan is made to a lending platform? Should they be treated as interest or as some other form of income?

- How should returns be treated in cases where a protocol issues Liquidity Pool Tokens or some other digital representation of collateral representing a portion of the provider's stake in the liquidity pool? As the liquidity pool earns returns or interest on the lending transactions (or the liquidity pool tokens increase in value), how are these treated for tax and at what point?

For example, should these earnings be regarded as income or a capital gain from an appreciation of an asset?

- Many platforms require users to stake Ether, DAI or some other asset to take out a loan or participate in a liquidity pool, being offered a new token in exchange. Does this staking crystalise a taxable disposal of the original asset for the new token, potentially subjecting the resulting gain or loss to tax? Or should it be treated more like a deposit or a pledge of collateral?

Taxation at the level of capital/liquidity takers

Key questions that need to be considered for those taking liquidity or borrowing from a protocol include:

- Can a "borrower" – i.e. a participant paying the pool for the use of Tokens or other benefits such as insurance – secure a deduction for their economic cost?

- How are expenses categorised for tax? Are these in the form of interest or some other category?

- How are business versus non-business activities distinguished and treated with respect to the corresponding ability to deduct expenses/claim losses?

- What is the nature of any payment for tax purposes as it relates to the location of the payor and whether withholding of tax is required under local law?

Taxation at the level of governance token holder

Key questions that need to be considered for governance token holders in a protocol include:

- Holders of governance tokens may be entitled to a share of fee income or profits of the platform, and are also able to vote on and control the future of the protocol. As such, given the element of control and decision-making, are governance token holders similar to equity investors – and how does this impact the categorisation of income versus return?

- Are transfers of governance tokens or other interest in the protocol subject to stamp taxes or other capital transfer taxes?

Taxation at the level of developers/initiators

There is a need to understand the degree of responsibility and liability on taxes that developers may have for the protocols they develop and how they manage this, along with the process of transitioning governance to a decentralised community.

Developers will often build in a mechanism whereby they share in the success of the platform, typically through an allocation of the native governance token. Since these token allocations are likely to be taxable in most jurisdictions, it is important to seek advice on structuring such allocations for tax purposes.

VAT/GST taxation

VAT/GST are taxes levied on consumption of taxable goods and services. The local law applicable in the country where the consumption is deemed to take place dictates which goods/services are subject to VAT/GST and who is obliged to collect the tax and remit it to the tax authorities. Depending on the local rules and the types of supplies in question, it can be either the vendor (service provider) or the buyer (service recipient) who is liable for VAT/GST towards the local VAT/GST authorities.

Therefore, the VAT/GST implications of DeFi will currently depend on the following key factors:

- Nature of the supply;
- Who the service provider is; and
- Who the service recipient is.

Other considerations

Further questions to consider include how to attribute a jurisdiction to payments/transactions if the participants are located across different jurisdictions. There may also be uncertainties around the applicability of digital services taxes.

While identifying the nature of the supply should not be that difficult, identifying the service provider and service recipient is likely to be more complex in DeFi. It requires a case-by-case analysis supported by a careful review of the legal agreements governing the protocol and – most importantly – the relationships between the protocol, its developers, and users. To date, there is no jurisdiction that considers the protocol itself to be an entrepreneur and/or the person liable for tax. Therefore, either the developers or the users are likely to be liable for tax under the rules of the current VAT/GST systems.

In Switzerland, the federal tax authorities have recently launched an initiative aiming at identifying whether the developments in blockchain technology, crypto and digital assets require changes in the existing tax legislation framework or a new legislative framework. After consultation with tax and legal experts and many industry representatives, it has been concluded that the existing legislative framework accommodates blockchain technology. On this basis, it is more likely than not that the local tax authorities will try to apply the current tax rules to DeFi, which would mean considering the developer or the user as the person liable for tax. If this is the case, legal arrangements and contractual documentation – including terms of use – will be key in determining who is liable for tax. Such arrangements should be carefully drafted and worded before they are published.

It is likely that the local tax authorities will eventually introduce specific GST/VAT rules for DeFi. However, this will take time – and will happen once and only if DeFi becomes a more commonly-used product.
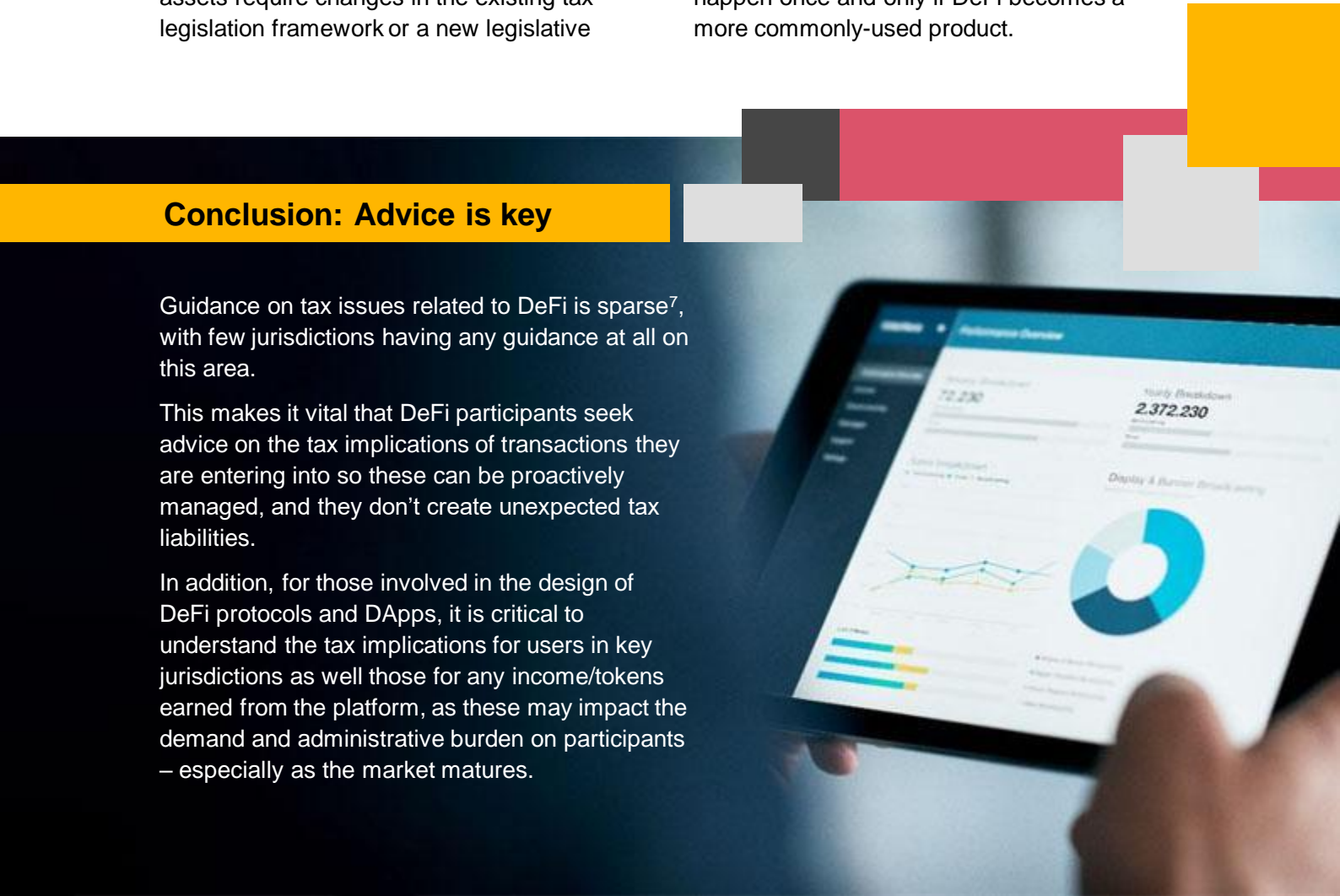
Conclusion: Advice is key

Guidance on tax issues related to DeFi is sparse[7], with few jurisdictions having any guidance at all on this area.

This makes it vital that DeFi participants seek advice on the tax implications of transactions they are entering into so these can be proactively managed, and they don't create unexpected tax liabilities.

In addition, for those involved in the design of DeFi protocols and DApps, it is critical to understand the tax implications for users in key jurisdictions as well those for any income/tokens earned from the platform, as these may impact the demand and administrative burden on participants – especially as the market matures.

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7 https://www.pwchk.com/en/research-and-insights/fintech/pwc-annual-global-crypto-tax-report-2020.pdf

Let's talk

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Glossary

DeFi - Decentralised Finance – DeFi is the delivery of financial services without any centralised intermediaries using features of blockchain technology

CeFi - Centralised Finance – CeFi is the delivery of financial services

AirDrop – An AirDrop is when a company offers its native tokens to people

DApp – Decentralised application - A DApp is an application built using smart contracts and running on a DLT

Yield farming – Yield farming is the process of making your assets available, and in exchange gaining an additional percentage of assets on a hebdo or monthly basis. Similar to a savings account in the traditional financial system.

Staking – Staking is the process of locking and put at risk several crypto-assets to show good faith to assist blockchain operations

MiCA – Market in Crypto-Assets - Pilot regime regulations proposals published by the European Commission on 23rd Sept 2020

FATF – Financial Action Task Force - An intergovernmental organisation that sets international standards which aim to prevent global money laundering and terrorist financing

KYC – Know your customer

AML – Anti-money laundering

Flash-loan – A flash-loan is a no-limit loan of crypto-assets (within the limit of available assets) for a single transaction. The transaction encompasses the action to be taken and the repayment to the lender. It's therefore a zero-risk loan