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Lecture 4

FNT 628

Blockchain and Cryptocurrencies

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Decentralized Finance - DeFi

Introduction

- Decentralised Finance or 'DeFi' seeks to provide traditional financial services involving crypto-assets (i.e. mimicking the 'CeFi' or centralised finance market) in an open, decentralised, permissionless way. Decentralised finance as a high-level concept has been discussed at national and international levels following the introduction of Bitcoin. Indicatively, decentralised finance was discussed at the G20 Finance Ministers and Central Bank Governors in their meeting in Fukuoka on 8-9 June 2019 under the Japanese presidency of the G20 (FSB, 2019).
- The DeFi market is the practical application of decentralised finance and embodies this high-level concept by providing financial products and services built as decentralised applications (mainly) on the Ethereum blockchain network.
- The DeFi market started making headlines in the summer of 2020 (referred to as 'the DeFi summer'), when a number of DeFi applications appeared to gain traction with users, and has grown to a multiple of its initial size ever since.
- The total value of crypto-assets locked in DeFi applications built on the Ethereum blockchain as of November 2021 reached USD 100bn up from USD1.9bn on 2 July 2020 (c.2,150% increase in less than a year, albeit from a very low base).

Introduction

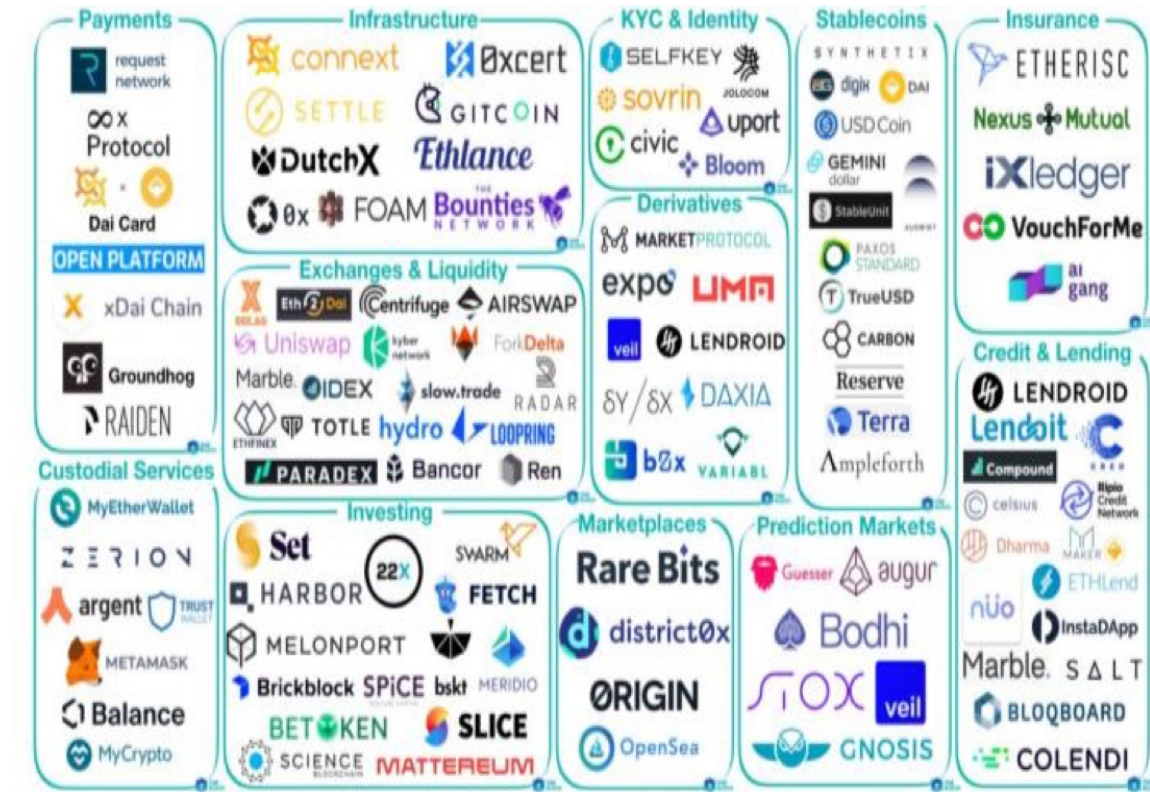
- Although the size of the DeFi market itself is still small, DeFi is rapidly growing from low levels and worth delving into for a number of reasons:
 - The DeFi market is growing rapidly and attracts an increasing number of retail investors, exposing them to high risks;
 - Increased interest and adoption of crypto-assets by institutional investors and other traditional financial service providers is leading to increased interconnections between centralised finance ('CeFi' or 'CeFi') and the parallel DeFi system through intersection or convergence points;
 - The increasing use of stablecoins, tokenised and digital assets makes the boundaries of the two systems more porous and increases risks of spillovers to the traditional financial system and the real economy.
 - Such risks are exacerbated by the recent price volatility of main crypto-assets (Bitcoin, Ether) and the recycling of profits in the DeFi space.

Definition and applications of DeFi

Definition and applications of DeFi

- DeFi is the latest trend in the crypto-asset space, and promises to replicate various activities in the traditional financial system in an open, decentralised, permissionless and autonomous way.
- DeFi applications allow for the provision of financial products and services built as decentralised applications on the blockchain. Such applications are mostly based on the Ethereum protocol, which was launched in 2015 and allows for the creation of smart contracts.
- The DeFi market brings to life the concept of 'decentralised finance' that has been in the agenda of certain policy makers following the advent of applications enabled by distributed ledger technologies ('DLT') and offering financial services without the need for intermediaries or centralised processes (FSB, 2019).
- Rather than relying on centralised parties for trust, DeFi markets are community-based networks seeking ways to automate the factors that contribute to trust in centralised institutions, and operating in a global, borderless way.

Figure 2.1. The DeFi universe: select applications by activity



Note: This figure includes self-proclaimed DeFi projects, however, not all of these projects have a fully decentralised nature (as per main characteristics described in Section 2.1.1). Also, many of the DeFi applications depicted in the chart are still in a very early stage of implementation.

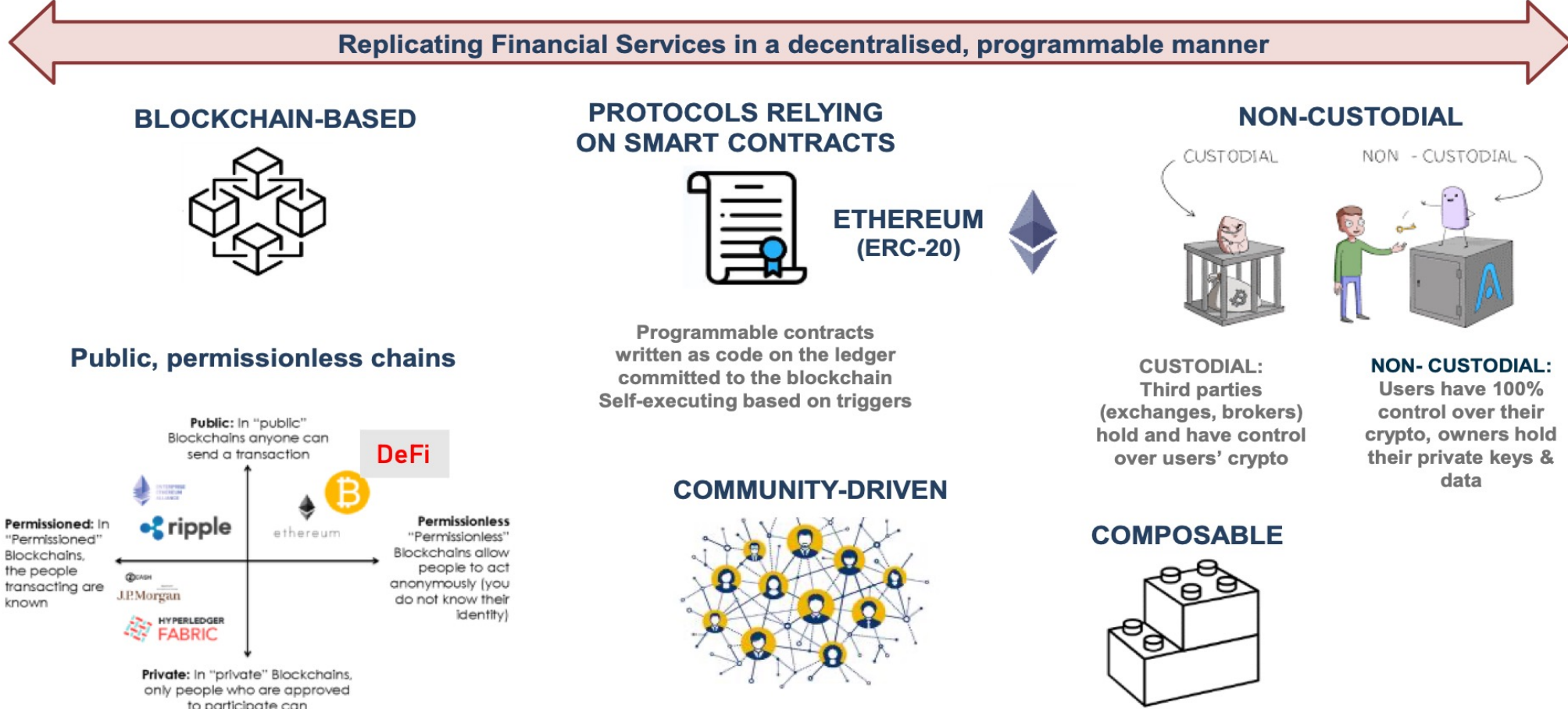
Definition and applications of DeFi

- Currently, DeFi applications aim to replicate most of the main traditional financial products and services in a decentralised manner relying on smart contracts (Figure 2.1).
- Lending is the fastest growing DeFi product, driven by yield farming, and at the time of writing of this report accounted for more than half of the TVL in DeFi applications (53% of total TVL in DeFi as of 14.06.2021)¹⁴. As of the writing of this paper, other products offered include decentralised exchanges (DEX) (33% of TVL); derivatives and synthetics; asset management; insurance; payments; and prediction markets account for the rest of the activity as of 14 June 2021.
- DeFi lending activities try to mirror market-based lending (securities lending, repos) rather than traditional consumer/retail bank lending, as most activity involves collateralised lending. Importantly, these traditionally institutional activities are being promoted to retail actors in the DeFi space. It should be noted, however, that uncollateralised lending is also possible through flash loans (see Box 2.3).
- In particular, yield farming or liquidity mining is a process allowing DeFi market participants to lock up their crypto-asset holdings in applications and generate rewards in exchange for the provision of liquidity to the system (either interest on their locked up crypto-assets or new tokens of the platform, issued as rewards).
- In other words, DeFi users use such protocols to leverage their crypto-assets or lock their crypto-holdings in DeFi protocols allowing others to borrow them for leverage, in exchange for some remuneration.

What is DeFi? Main characteristics

- Although there is no widely accepted definition of DeFi, this report defines the key features differentiating DeFi from traditional financial markets as follows:
 - Non-custodial: The non-custodial nature of DeFi is one of its main defining characteristics. In DeFi applications, no central authority or other intermediary gains access to or control over participants' digital assets; instead, participants manage their private keys, and therefore their digital assets, directly.
 - Self-governed and community-driven: Most DeFi protocols are open-source and allow the community to review and further develop the code underlying the protocols. In terms of governance, the distribution of governance tokens in many DeFi applications allows users to participate in some decision-making related to the application, depending on the specific arrangements of each application.¹⁵ The importance of the community of participants is fundamental for the materialisation of network effects, creating value as the number of participant in the network grows.
 - Composable: This is one of the most important innovations brought by DeFi. Existing components of DeFi networks (i.e. digital assets, smart contracts, protocols and applications built on top of the protocol layer) can be combined to create new applications (see Box 2.1). Composability gives ample room for the creation of innovative products and structures, and has the potential to further amplify network effects, increasing the value of DeFi products and services as participation in the network grows. The open source nature of DeFi applications is a critical enabler of this attribute, as it allows everyone to look at the code and use it to create new applications. At the same time, the recycling of assets on different applications adds to the complexity of an already complicated market, and to the risks underlying its applications.

Figure 2.3. Main characteristics of DeFi applications



Source: Author's illustration.

DeFi Vs. CeFi

- For this comparison, commercial banks will be used as an example. In the traditional world, you may use financial institutions to store your money, borrow capital, earn interest, send transactions, etc. Commercial banks carry a lengthy, proven history of performance. Commercial banks can provide insurance and have security measures in place to ward off and protect against theft.
- On the other hand, such establishments hold and control your assets to a degree. You are limited by banking hours for particular actions, and transactions can be cumbersome, requiring settlement times on the back end. Additionally, commercial banks require specific customer details and identifying documents for participation.
- DeFi is a segment that comprises financial products and services that are accessible to anyone with an internet connection and operates without the involvement of banks or any other third-party firms. The decentralized financial market doesn't sleep and therefore, transactions take place 24/7 in near real-time, while no intermediary has the power to stop them. You can store your crypto on computers, in hardware wallets and elsewhere, and gain access at any time.
- Bitcoin and most other cryptocurrencies hold these characteristics due to the underlying technology that backs these assets. Thanks to DeFi's dependence on blockchain technology, transactions are completed faster, cheaper and – in some cases – more securely than they would with human intervention.

How Decentralized Finance (DeFi) Works

- Through peer-to-peer financial networks, DeFi uses security protocols, connectivity, software, and hardware advancements.
- This system eliminates intermediaries like banks and other financial service companies.
- These companies charge businesses and customers for using their services, which are necessary in the current system because it's the only way to make it work. DeFi uses blockchain technology as a way to reduce the need for these intermediaries.

Blockchain

- A blockchain is a distributed and secured database or ledger. In the blockchain, transactions are recorded in blocks and verified through automated processes. If a transaction is verified, the block is closed and encrypted; another block is created that has information about the previous block within it, along with information about newer transactions.
- The blocks are "chained" together through the information in each proceeding block, giving it the name blockchain.
- Information in previous blocks cannot be changed without affecting the following blocks, so there is no way to alter a blockchain. This concept, along with other security protocols, provides the secure nature of a blockchain.
- Using applications called wallets that can send information to a blockchain, individuals hold private keys to tokens or cryptocurrencies that act like passwords. These keys give them access to virtual tokens that represent value. Ownership of the tokens is transferred by 'sending' an amount to another entity via a wallet, whose wallet, in turn, generates a different private key for them. This secures their ownership of the token, and the blockchain design prevents the transfer from being reversed.

Applications

- DeFi applications are designed to communicate with a blockchain, allowing people to use their money for purchases, loans, gifts, trading, or any other way they want without a third party. These applications are programs installed on a device like a personal computer, tablet, or smartphone that make it easier to use. Without the applications, DeFi would still exist, but users would need to be comfortable and familiar with using the command line or terminal in the operating system that runs their device.
- DeFi applications provide an interface that automates transactions between users by giving them financial options to choose from. For example, if you want to make a loan to someone and charge them interest, you can select the option on the interface and enter terms like interest or collateral. If you need a loan, you can search for providers, which could range from a bank to an individual who could lend you some cryptocurrency after you agree on terms.
- Some applications let you enter parameters for the services you're looking for and match you with another user. Because the blockchain is a global network, you could give or receive financial services to or from anywhere in the world.

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Goals of Decentralized Finance

- Peer-to-peer (P2P) financial transactions are one of the core premises behind DeFi, where two parties agree to exchange cryptocurrency for goods or services without a third party involved.
- Using DeFi allows for:
- **Accessibility:** Anyone with an internet connection can access a DeFi platform, and transactions occur without geographic restrictions.
- **Low fees and high-interest rates:** DeFi enables any two parties to negotiate interest rates directly and lend cryptocurrency or money via DeFi networks.
- **Security and Transparency:** smart contracts published on a blockchain and records of completed transactions are available for anyone to review but do not reveal your identity. Blockchains are immutable, meaning they cannot be changed.
- **Autonomy:** DeFi platforms don't rely on centralized financial institutions. The decentralized nature of DeFi protocols mitigates the need for and costs of administering financial services.

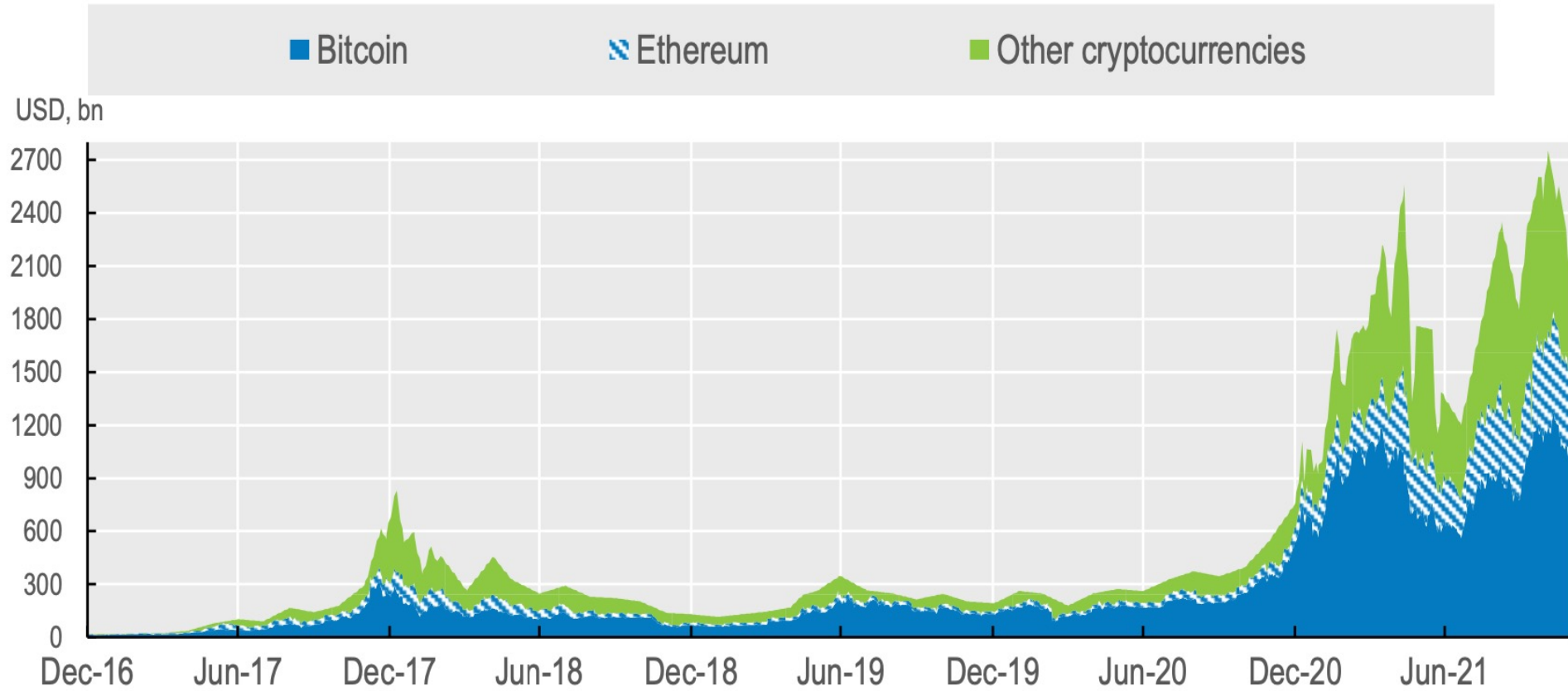
Disadvantages of DeFi

- Decentralized finance is constantly evolving. It is unregulated, and its ecosystem is vulnerable to faulty programming, hacks, and scams. For example, one of the main ways hackers and thieves steal cryptocurrency is through weaknesses in DeFi applications.
- Laws have not yet caught up with advances in technology. Most current laws were crafted based on the idea of separate financial jurisdictions, each with its own set of laws and rules. DeFi's borderless transaction ability presents essential questions for this type of regulation. For example:
- Who is responsible for investigating a financial crime that occurs across borders, protocols, and DeFi apps?
- Who would enforce the regulations?
- How would they enforce them?

Drivers and users of DeFi activity

- There are no fundamental drivers of the surge in crypto-asset prices in what is clearly a market driven by speculation given the very high returns offered by some of the products, fear of missed returns (so-called fear of missing out or 'FOMO') and recycling of profits from other crypto-asset activity. Feedback loops exist between the Bitcoin, the price of which has driven much of the activity in the entire crypto-asset market, and the evolution of DeFi measured by TVL in such crypto-assets.
- Some spillovers from accommodative monetary policy and a search for yield by retail and institutional investors may also have contributed to the DeFi trend. For some retail investors, crypto-assets such as Bitcoin are perceived as inflation hedges, although the direction of their price has thus far been highly correlated with traditional financial markets. The exponential growth of the DeFi market has a lot of the characteristics of the 2017- 18 crypto-asset bull market associated with the Initial Coin Offering (ICO) boom in terms of its drivers (OECD, 2019). Similarities exist also in terms of associated complexities and risks for participants.
- The recent price increase of Ethereum's native asset, ether (ETH), can in part be attributed to the intensity of the use of ETH for DeFi applications, as well as to the increased investor interest in NFTs, also primarily issued on the Ethereum blockchain.
- It is estimated that 90% of all listed tokens are issued on the Ethereum blockchain (Schär, 2021). The Ethereum blockchain enables smart contract functionalities, which constitute the basis of most DeFi applications. Daily transactions of ETH have reached new highs, while the activity of Ethereum-based decentralised exchanges activity (DEX) has surpassed that of CeFi exchanges in terms of daily volume (e.g. decentralised exchange Uniswap surpassed daily activity of centralised exchange Coinbase on 30 August 2020).

Figure 2.5. Crypto-asset valuations are one of the drivers of DeFi activity



Note: As of 1 December 2021.

Source: Thompson Reuters Eikon.

Drivers and users of DeFi activity

- The volatility of crypto-asset prices intensifies the fragility of the DeFi market.
- The ‘Black Thursday’ event of the 12 March 2020 was the first noteworthy stress-test event in DeFi’s short history, when Ethereum dropped by more than 20% in a day.
- Following such drop, users tried to shift their crypto from one application to another, raising ETH gas fees to 200 Gwei (a denomination of Ether, see Box 2.3).

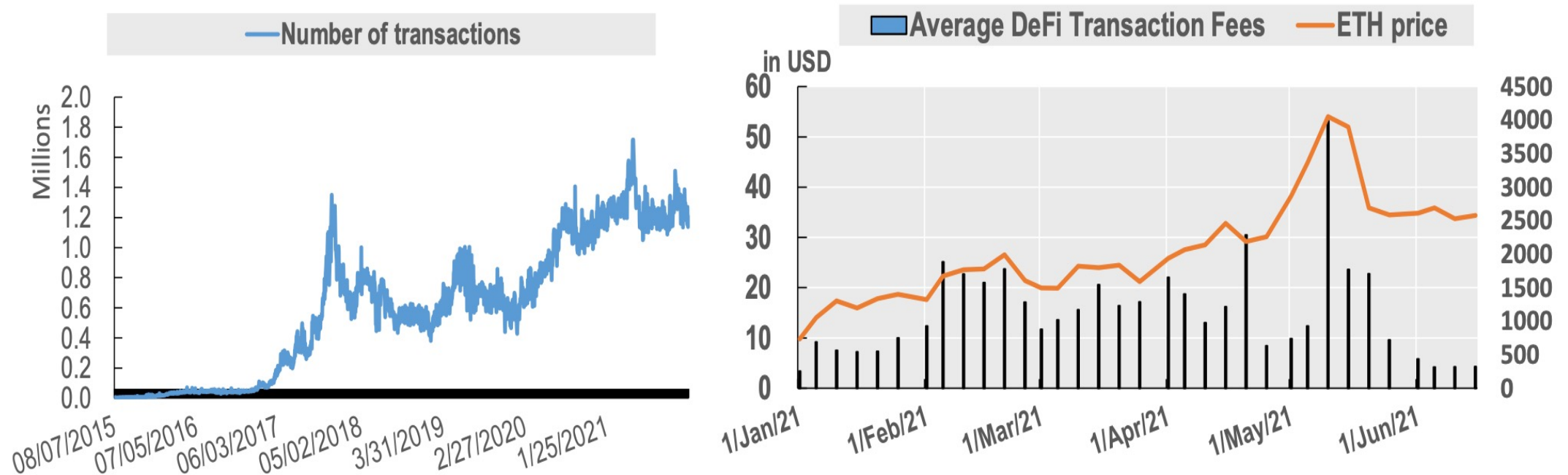
Drivers and users of DeFi activity

- Volatility spikes in the price of the Bitcoin and Ether in H1 2021 have induced further massive liquidations in DeFi protocols. In May alone, the price of the Bitcoin fell by c.30% resulting in USD 8 billion of crypto-asset liquidations happening on 18 May, on top of another USD 3.4 billion having been liquidated on 12 May, unwinding leveraged traders with long positions.
- In terms of DeFi lending protocols, USD 662m in loans unwound over 24 hours on 18 May, on top of another USD 39m on May 12.23 The second-worst day for liquidations came on 22 February, when USD 129.6m was liquidated. In order to understand the scale of these liquidations, these can be compared to a normal day of liquidations across DeFi products of USD 1m - 5 m (based on Debank statistics).
- The rapid unwinding of leveraged positions and the massive liquidations in DeFi protocols in reaction to sharp drops in the value of major crypto-assets (Bitcoin, Ether) intensifies the pressure on the valuation of such crypto-assets, given the feedback loops that exist between the two markets.
- This can prolong sell- offs and drive valuations to even lower levels, creating downward spirals, as collateral is automatically liquidated by DeFi applications putting extra pressure to the valuation of the crypto-assets used as collateral. Interestingly, this has had the opposite effect on stablecoins used to close up positions in DeFi, with stablecoins trading at more than USD 1 per coin, as stablecoins are being used as a means to exit positions in DeFi tokens.

Drivers and users of DeFi activity

- The sharp volatility of Ether also has implications to the fees paid by users as transaction costs, as these may sometimes be correlated with the price of the crypto-asset (Figure 2.6).
- As most of the DeFi activity sits on the Ethereum network, and given other recent developments around Ethereum (NFT issuance, EIP 1559), the Ethereum gas fees have reached new highs in the past year (see Figure 2.6, Box 2.3) and in some cases transaction costs exceed the value being transacted, effectively blocking users wishing to execute small trades.
- Increased fees inhibit small transactions as users are dis-incentivised to execute small-valued transaction with disproportionately high fees, effectively being priced out. This results in an increase in the size of transactions executed in response to a surge in fees, and with the consequent blocking of users' assets as users are unwilling to transact at such fee levels.
- This has disruptive effects to smaller retail investors, weakening the purported benefits for financial inclusion and democratisation of finance proposed by DeFi. This, in turn, affects liquidity conditions in DEXs or centralised exchanges for crypto-assets.
- Transactions related to stablecoins like USDT also exhibit similar behaviour in response to high and volatile ETH transaction/validation fees, whereby high fees act as catalysts for declining transaction volumes involving crypto-assets, although causality is hard to infer (Carter, 2020).

Figure 2.6. Ethereum daily transactions chart and transaction fees



Note: The cost of gas fluctuates with the supply and demand for processing power.

Source: Etherscan.io, bitinfocharts.

User base and motivations

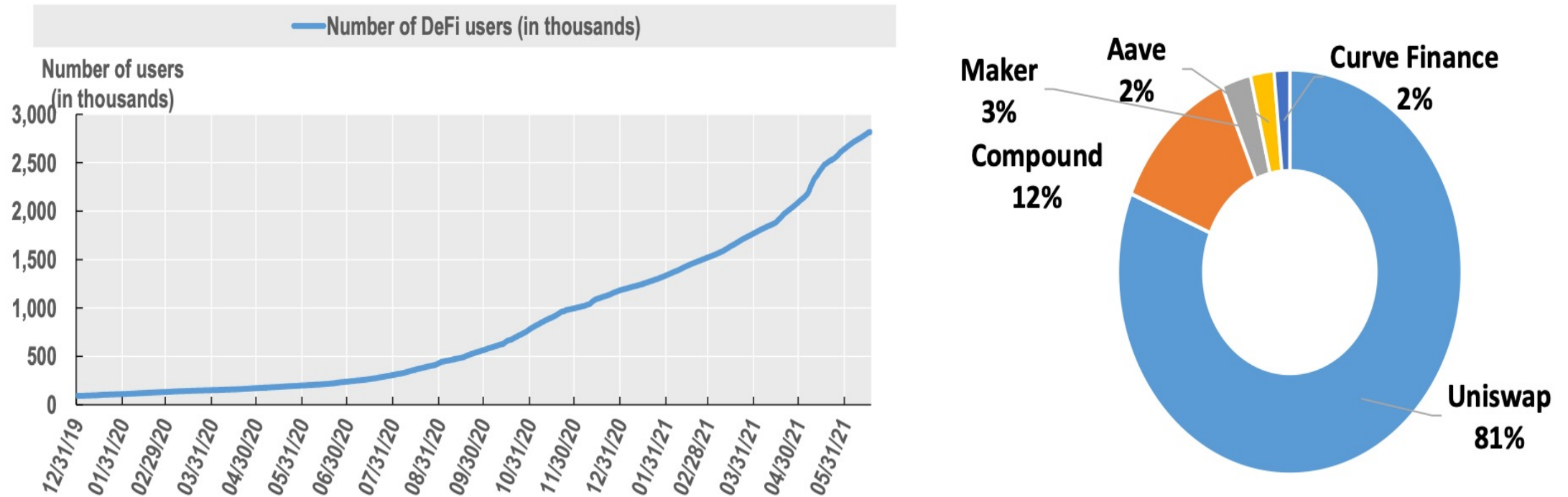
- The DeFi user base has followed a consistent growth pattern, reaching almost 3 million unique addresses using DeFi protocols as of June 2021 (Figure 2.7).
- Although the number of unique addresses accessing DeFi has grown by 65% since Q1 2021, active DeFi addresses still only represent 1.81% of all Ethereum addresses²⁵ (Consensys, 2021).
- As some DeFi applications may fall out of the regulatory scope for many countries, DeFi markets are exposed to increased risk of fraud, illicit trading, and money laundering/terrorist financing.
- This could paradoxically make the market more attractive and favour adoption by criminals and other participants seeking to circumvent laws.
- There are currently no statistics around the profile of DeFi users, given the pseudonymous or anonymous nature of their participation in such markets.
- Early adopters were mostly crypto-savvy users attracted by the novelty of DeFi and wishing to become part of the innovation brought by such applications, either as users or as contributors (given the open source nature of most protocols).

User base and motivations

- The DeFi summer in 2020 saw growing retail interest in DeFi, driven by speculation, fear of missing out and recycling of profits from other mainstream crypto-assets.
- Crypto-asset holders convinced that the value of their holdings will increase may wish to generate some yield by pledging them as collateral and through participation in liquidity pools.
- Other holders may also wish to postpone the monetisation of profits related to their crypto-asset holdings to escape taxation.
- DeFi may follow other crypto markets in attracting an increasingly large number of retail investors: recent research by the UK FCA estimates that the number of UK consumers holding crypto-assets account now for 4.5% of the UK population, up from 3.8% in 2020 (FCA, 2021).
- Nevertheless, retail investors are less likely to be specialists in crypto or in other asset classes, because they tend to invest in different products, and this could change market dynamics (e.g. day traders).
- However, there is a relatively high barrier to entry the DeFi market, as users must first hold crypto and understand how to use smart contracts. The lack of sophisticated knowledge by retail investors exposes them, at the same time, to high risks as they may not understand the risks involved or the exact mechanisms of the protocol operations (e.g. automated liquidations).

Figure 2.7. DeFi users over time

Number of users in thousands, as of 18 June 2021 [LHS] and distribution of wallets by DeFi app [RHS]



Source: Dune Analytics.

Defi vs Traditional Banking

- In the current banking system, a customer opens a savings account and earns interest on the deposit.
- The bank lends the money you and other customers have deposited to another customer or business at a higher interest rate and takes a profit on the difference.
- The idea behind DeFi, using the example above, is that you could earn the full amount of interest paid by the borrower instead of some lesser amount set by the bank.

The risks of DeFi

- Alternative financial services providers tend to be unregulated or operate illegally in a regulated space. As a result, DeFi markets lack many of the protections offered by regulated service providers. You should be cautious if considering investing in unregulated investment products on unregulated platforms. DeFi is an emerging technology and its risks differ from those in traditional markets.
- Consider these points before deciding if you want to get involved in DeFi:
 1. Provinces do not regulate these types of depository accounts or products because they are built on cryptocurrencies and not fiat currencies. Don't invest more than you can afford to lose.
 2. No restrictions or guidelines exist on who can use DeFi, so anyone can have a crypto wallet or access DeFi protocols. Do your homework and understand the technology. Although it may be accessible to everyone, it may not be *right* for everyone.
 3. Be wary of representations of full transparency and security and understand what the actual risks are. While a blockchain may be nearly impossible to alter, most alternative banking services rely on software systems that are vulnerable to hackers.

The risks of DeFi

1. No DeFi consumer protections exist. You may have no way to get your money back should a transaction go wrong; the parties involved in the transaction could literally be located anywhere in the world.
2. To borrow funds using DeFi, a borrower typically has to post an equivalent amount of digital assets on the blockchain as collateral. This means you normally can only borrow funds equal to what you already have. If you fail to make payments on a loan, the DeFi protocol may be able to automatically take your posted collateral, without giving you any notice or method to dispute.
3. DeFi requires you to have a private key to secure your wallet housing your cryptocurrency assets. A private key is a long, unique code known only to the owner of the wallet. If you lose your private key, you lose access to your funds – there is no way to recover a lost private key.
4. Given the complexity of the various lending and borrowing mechanisms at play with DeFi, an average investor may find it hard to distinguish between DeFi opportunities that have real value and those that are scams.
5. If it looks like an investment, lending or banking opportunity, there is a good chance the service and the people selling it should be registered. Use caution before you put your money at risk in an unregulated marketplace that may be operating illegally.

Opportunities of DeFi

- In theory, DeFi has the potential to create an alternative financial ecosystem based on cryptoassets providing a wide range of financial services with potentially higher levels of efficiency, transparency and integration than the traditional financial system.
- Efficiency may indeed be brought by the use of smart contracts and related automation and also the non-custodial and peer-to-peer nature of DeFi that can reduce the need for intermediaries and infrastructures and lead to a reduction of transaction costs and delays. Public blockchains on which DeFi platforms are built are also transparent by design, offering supervisors the opportunity to monitor risks more effectively, notably AML / CFT risks, and providing users with improved transparency.
- The non-custodial nature of DeFi and the interoperability of DeFi applications may also facilitate the cross-border development of DeFi services. Finally, DeFi may also contribute to enhancing resilience by removing single points of failure.

Opportunities of DeFi

- At present, however, DeFi services are not used as alternatives or complements to traditional financial services in most cases, but mainly as an additional source of speculative investment for investors in cryptoassets.
- In 2021 decentralised cryptoexchanges (DEX) and crypto lending were the largest DeFi activities by far, representing around two-thirds of total DeFi activities. Investors in DeFi bet on the new lending and staking opportunities offered by DeFi platforms offering high yields and use the increased leverage capacity and arbitrage options across cryptoassets available on DeFi platforms (*e.g.* between centralised and decentralised platforms and between different DeFi platforms).
- Some recent failures of centralised crypto lending platforms have revealed for example that some of these platforms were investing a significant portion of customer deposits in DeFi activity in search of higher returns.
- Some observers also point out that the main added value of DeFi for the wider financial system and economy lies in its underlying technical features, which may open finance to the potentialities of Web3¹⁰ and support the digitalisation of existing financial value chains, with all the potential benefits of tokenisation for financial markets and their participants, including atomic settlement of transactions¹¹. These features include smart contracts which may help to improve existing financial value chains, potentially supporting for example the settlement of securities transactions, coupon payments or market making activities.
- New types of services have also emerged on DeFi platforms, such as automated margining mechanisms for bitcoin futures¹³ and flash loans supporting arbitrage activities¹⁴. Some of these services may represent a significant risk at the current stage of development of the DeFi market, also considering their unregulated nature, but could possibly lead to new ways of designing certain financial products and services in the future.

What are the DeFi-related opportunities in the securities markets?

- Blockchain technology has the potential to be the most significant industry disrupter since the internet.
- Crypto currencies are an important use case of the digital assets universe.
- Tokenization, the process by which financial instruments are issued and settled in a blockchain system, could lead a transition towards more peer-to- peer markets that are characteristic for blockchain driven solutions.

The role of policy makers

- Supervisory authorities and international standard-setters have a role in assessing risks involved in DeFi, exploring ways to enforce existing rules in decentralised structures, and addressing any regulatory gaps.
- DeFi's decentralised nature requires policy makers to reconsider the conventional oversight framework that was built with intermediaries at its core, given the absence of single regulatory and supervisory access points and the absence of defined jurisdiction and geographical location for their operations.

The role of policy makers

- Nevertheless, the level of innovation involved in DeFi is remarkable.
- DeFi impels us to consider what value decentralisation or the use of DLTs can bring to investors, consumers, traditional financial market infrastructure and the existing processes of delivering financial products and services.
- The OECD and its Committee on Financial Markets remain committed to exploring how to foster the benefits of digitalisation for financial markets and their participants, while proactively addressing the prudential and potentially systemic risks emerging from applications such as DeFi at a global level.

The role of policy makers

- On the back of these developments, SIX has been closely following the evolution of the DeFi space and has started executing Proof of Concepts [PoCs] and pilot projects.
- One example of an initial PoC was the successful implementation of an Automated Market Maker on Corda.
- At the same time, we are exploring with our partners and clients ways to develop cryptocurrency market offerings leveraging DeFi functionality and insights.

Outlook/ Perspective

- First Institutional initiatives addressing some of the challenges mentioned above are entering the market, e.g., DeFi protocols experimenting with permissioned pools.
- As an example, Aave Arc is using Fireblocks for whitelisting while decentralized governance continues to control protocol decisions. Participants in these pools will need to be legally identifiable and accountable, which helps to manage and mitigate risks.

What are the regulatory implications?

- Although the 2020 EU Digital Finance Strategy does not mention DeFi (and neither does MiCA), a number of areas that are needed to enable tokenized securities in the EU under the digital finance strategy will be equally relevant in assessing the impact from DeFi.
- This includes progress in digital identity solutions to support meeting AML obligations, progress in digital payments solutions such as Central Bank Digital Currency (CBDC) or wholesale cash tokens, and clarity on how asset management needs to evolve e.g. how to manage investment limits and related risks stemming from DeFi smart contracts.
- Regulators have an opportunity to support the market developing a trusted DeFi offering of the future, which would in turn allow regulated financial institutions to participate

What are the regulatory implications?

- DeFi is currently a crypto-centric activity but there is no reason why tokenized financial instruments could not be used in such structures in futures.
- Investor protection will be advanced if there would be a legal framework applying to both the DeFi protocol and its participants in future.

Current and future examples of DeFi

- The Ethereum platform lets you send digital assets around the world seamlessly.
- While borrowing and lending are key advantages of DeFi, there are also applications for savings, where you can earn interest on crypto, trading opportunities, fund management, and insurance.
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DeFi currency exchanges

- DeFi currency exchanges, or DEXs, are peer-to-peer platforms enabling traders to exchange cryptocurrency with one another.
- Not only do DEXs facilitate direct trading between participants, without a middleman, but users can maintain total anonymity.
- Traders typically have control over their wallets, and can access thousands of tokens via their private key.

DeFi stablecoins

- Tied to stable currencies like the US dollar or assets like gold, stablecoins aim to eliminate the elevated volatility associated with many cryptocurrencies.
- It means stablecoins tend to be better suited for everyday transactions than other highly volatile cryptocurrencies.
- Stablecoins are easy to transfer around the world, which makes sending large amounts of money more affordable and significantly faster.
- Stablecoins also allow users to earn interest.

DeFi lending

- Rapidly growing in popularity, DeFi lending allows you to lend digital assets to others while earning interest. Lenders can pool their assets with others, setting terms through smart contracts.
- Borrowers generally need to post collateral in digital currency to secure a loan.
- This means that borrowers can, for instance, access funds in a major coin such as Bitcoin, while posting collateral in a more obscure cryptocurrency.
- If you borrow through DeFi, provided you make the interest payments, you can access Bitcoin without having to sell your collateral.
- In some cases, you can even borrow an amount larger than the collateral you provided.

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