The road to institutional DeFi

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The application of decentralised finance (DeFi) for institutional use cases has the potential to create a new financial paradigm – one based on the principles of cooperation, composability and open-source code; and underpinned by open, transparent networks. In this white paper, we dive into the history to date of DeFi and how it is likely to develop in the future, with a focus on how this might impact the institutional financial services

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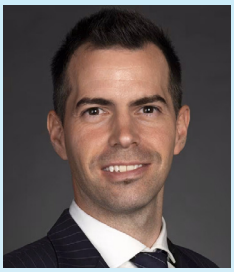
Published June 2024

Contents

Foreword



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The evolution of decentralised finance (DeFi) – and the potential to apply it to institutional use cases where financial applications are built on blockchain technologies deploying smart contracts – is being met with great interest by industry spectators.

Proponents see a strong case for the rise of a new financial paradigm, which is based on the principles of cooperation, composability, open-source code; and is underpinned by open, transparent networks. As a space that has moved into the spotlight, the road to utilise DeFi for regulated financial activities is now under construction.

The continuously evolving macroeconomic and global regulatory landscape has hampered widespread meaningful progress, with developments predominantly occurring in the retail space or via incubated sandbox style settings. Over the next one to three years, however, institutional DeFi is widely expected to take off, converging with greater digital asset and tokenisation adoption – financial institutions have been preparing for this eventuality for several years.

This trajectory is fuelled by progress related to blockchain infrastructure, in the form of Global Layer 1,[1] or Interlinking Networks to accommodate organisations that are operating under regulatory-compliance requirements. Possible solutions to address key uncertainties for regulated entities are also emerging,[2] including compliance and balance sheet requirements, as well as the anonymity of blockchain wallets and how to satisfy know-your-customer (KYC) and anti-money laundering (AML) requirements on public blockchains. As these conversations advance, it is becoming clear that centralised finance (CeFi) and DeFi are not binary; and that comprehensive adoption at the institutional end of the finance spectrum might only be viable for those organisations with a blend of centralised operating governance in the ecosystem.

In institutional circles, exploration in this space is generally positioned as a voyage of discovery into a domain that shows attractive potential for innovative investment products to be developed, to reach new pools of consumers and liquidity previously untapped, with new digital-based operating models and more cost-efficient market structures. Only time (and innovation) will tell whether DeFi evolves to exist in its purest form, or we instead see a compromise that allows for degrees of decentralisation to enable a bridging of financial worlds.

In this white paper, we reflect on the recent history of DeFi and seek to demystify some frequently used terms, before taking a closer look at several key driving forces in the DeFi domain. Finally, we will consider what lies in store for the institutional financial services community on that road to institutional DeFi.

1

The DeFi landscape explained

In this section we set out the foundations for understanding the difference between traditional and Decentralised Finance (DeFi), as well as the new attributes which characterise the proposition of DeFi for the institutional community.

1.1 What is DeFi?

At its core, DeFi is the offering of on-chain financial services, such as borrowing, lending, or investing, without reliance on a traditional centralised financial intermediary. Lacking official and universally agreed definitions in a fast-evolving space, typical DeFi services and solutions can be recognised as including elements of the following:

— Self-hosted wallets that allow investors to be their own custodian.

— Smart contract custody that uses codes to maintain and manage the custody of digital assets.

— Staking contracts that use codes to calculate and disburse rewards in proportion to deposited value and/or to vary rewards according to variables.

— Asset exchange protocols that allow one asset to be exchanged for another and used in Borrowing or Decentralised Exchange (DEX) such as Uniswap, one of the early movers in the DeFi ecosystem which uses smart contracts to execute trades.

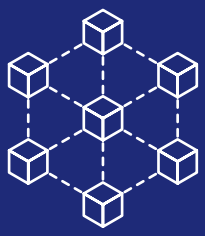
— Securitisation and rehypothecation-like structures that issue a different asset based on an underlying “wrapped” asset; and in which the issued asset can have secondary market value.

1.2 What is institutional DeFi?

Institutional DeFi – the focus of this paper – refers to the institutional adoption and adaptation of DeFi structures, as well as institutional participation in decentralised apps (dApps) or solutions. By exploring this topic within the confines of financial industry regulatory frameworks, the benefits of DeFi can be transferred into the traditional financial marketplace for opening the possibilities to create new cost efficiencies and effectiveness, as well as to generate paths towards new growth. These new paths include the tokenisation of real assets and securities, as well as the integration of programmability into asset classes and the emergence of new operating models.

The differences between institutional DeFi and traditional DeFi are outlined in Figure 1.

Figure 1. A comparison between institutional DeFi and traditional DeFi

	 Institutional DeFi	 Native DeFi
Asset custody	Custody of underlying assets held by licenced digital asset custodians and/or licensed banks	Custody of underlying assets held by smart contracts
Investors	Investors would have been KYC'd by licenced financial institutions. Digital identities are created	Investors may not be KYC'd or may be KYC-ed by non-regulated institutions or non-standardised accepted standards
Investor/asset protection	Investor suitability tests. Non-cash assets protected according to terms and conditions	No investor suitability tests. No standardised terms and conditions governing asset protection
Jurisdiction	DeFi structure sponsored and established by a licensed organisation	Established by "borderless" DAO

Source: Deutsche Bank

1.3 DeFi – a history

2020

In the open environment, DeFi-linked projects excited the crypto market in the summer of 2020, ushering in a new era. Due to its high liquidity, pricey assets, and high mining returns, DeFi took off during the Federal Reserve's (the Fed) big quantitative easing (QE), reactivated in response to the Covid-19 pandemic, with total assets (total value locked or TVL) in DeFi services rising from US$1bn to more than US$15bn by year end.[3]

2021

New DeFi projects found heavy funding during this period – and there was a relative saturation in the number of projects and associated coins/tokens launched that sought to ride the momentum. Total DeFi users spiked to a peak in late 2021, with a total of more than 7.5 million unique users having transacted in the DeFi ecosystem – representing a 2550% increase from a year earlier with a TVL peaking in November 2021 at US$169bn (based on data from DeFiLlama).[4] New household terms and names like Uniswap and Yield Farming were introduced into daily financial lives.

2022

Over the year, this landscape shifted following a multitude of interest rate increases and a significant rise in inflation. Combined with a variety of bad actor activity in the ecosystem, DeFi experienced its fair share of troubles, including some well-documented collapses.[5] This has meant that the entire market was forced to take a backward step and allow for a phase of deliberation and rationalisation through the latter half of 2022.

Q1 2023

The trend became further pronounced in early 2023, as private funding in the fintech DeFi domain dried up, in tandem with the rising costs of funding, as reflected in a 69% decrease in deal activity year on year (YoY) (as at Q1 2023, according to Fintech Global Research). This resulted in a decline of TVL in the DeFi system to less than US$50bn by April 2023 and a low of US$37bn by late October 2023.[6]

Q2/3 2023

Despite the significant downturn and the concurrent "crypto-winter", which saw crypto asset values fall, the fundamentals of the DeFi community remained resilient, with a steady growth in users by volume and many DeFi projects holding steadfast, with a focus on building products and capabilities.

Q4 2023

Late 2023 saw a growth spurt, catalysed in part by regulatory approvals for spot crypto ETF products for the first time in the US, broadly received as a big indicator of acceptance for digital assets to further blend into the traditional financial product landscape. More notably, this left the door open for institutional players to get more heavily involved in these new age ecosystems, which will bring much-needed liquidity to the space.

1.4 Delivering the early promises of DeFi

In the native crypto asset space, the DeFi movement has led to coded structures that have demonstrated how DeFi can work without the participation of certain intermediary institutions, often involving smart contracts and/or peer-to-peer (P2P) basis.

Due to the low cost associated with access, DeFi services saw rapid adoption at its inception – and quickly proved its value in offering efficient asset pooling with lower intermediary fees and applying economic behavioural finance techniques to manage demand, supply and price.

These new benefits are possible because DeFi re-engineers or replaces existing intermediary activities with smart contract programmability for greater efficiency, which, in turn, changes workflows and transforms roles and responsibilities. In the "final mile" with investors and users, DeFi applications (aka DApps) are the vehicles that deliver these new financial services. As a result, existing market structures can change.

Pioneering Institutional DeFi activity

There are many institutional use cases that can be drawn from the DeFi space, which leverage the tokenisation of real assets and securities. Below are examples that attempt to encapsulate the nexus where financial service products meet technology and regulations to create new value; exemplifying why institutional DeFi is an attractive proposition.

"There are compelling use cases which promise to bring new asset classes and products to market, harnessing the power of tokenisation, platforms, ecosystems and new sources of data to drive benefits through the value chain offering improved governance and actionable insights"

Justin Chapman, Global Head of Digital Assets and Financial Markets, Northern Trust

USE CASE
#1

Interoperability, 2023

By using DeFi constructs in the institutional space, self-hosted wallets can enable a distributed asset safekeeping model with both omnibus and segregated digital accounts (addresses) that are simultaneously available to facilitate transaction movements, settlement and reporting. One such important use occurs in smart-contract based bridges that connect different blockchains to allow interoperability and avoid fragmentation by choice of blockchains.

Applicability: As a joint to link public, public permissioned and private networks to minimise fragmentation while allowing high degree of access and participation.

Example: Interlinking Network Model (INM) interlinking-networks-technical-paper-vfinal.pdf (mas.gov.sg)

USE CASE
#2

Refinancing tokenised financial instruments with stablecoin, 2023

DeFI systems can also be utilised for traditional industry's financing, albeit not at scale just yet. For example, security tokens representing some real-world financial instruments can be placed into a smart contract "vault" as collaterals against stablecoins that are then received and converted into fiat currency.

Reference: Société-Générale-FORGE MakerDAO Société Générale – Forge borrows DAI Stablecoin from decentralised finance protocol Maker DAO to extend loan | SG Forge

USE CASE
#3

Tokenised fund in asset management, 2023

Distribution of the tokenised fund units or tokens can occur over the blockchain for direct accessibility by suitably qualified investors, with Investor records first maintained on-chain while smart contract-based facilities allow faster or near-instantaneous subscription and redemptions using regulated stablecoins. As a further step, the tokenised fund unit, which represents hiqh-quality liquid traditional financial instruments, can act as collateral.

Example: Blackrock BUIDL, USA BlackRock Launches Its First Tokenized Fund, BUIDL, on the Ethereum Network (yahoo.com)

2

The evolution of institutional DeFi market structures

The concept of a DeFi-driven market presents an intriguing market structure that is inherently dynamic and open, with a native design that will challenge the norms of the traditional financial markets. This is leading to differing opinions on how DeFi can integrate or collaborate with the broader financial industry ecosystem, as well as what shape the new market structure might take.

2.1 Governance, trust and centralisation

In the institutional sphere, there is a greater emphasis on governance and trust, with a need for ownership and accountability in the roles and functions that are performed. Though this may seem contradictory to the decentralised nature of DeFi, many believe it to be a necessary step in ensuring regulatory adherence and providing clarity for institutional players to adapt and adopt these new services. This dynamic gives rise to the notion of a "decentralisation illusion" in institutional DeFi, as the need for governance inevitably leads to a degree of centralisation and concentration of power within the system.

Even with a degree of centralisation, the new market structure would nevertheless likely be more streamlined than what we have today, due to the resultant significant reduction in organisational intermediary activities. The outcome will be that sequential interactions can become more parallel and concurrent. This in turn should help to reduce the number of inter-entity interactions, which can unlock operational efficiencies and reduce costs. Under such a structure, governance activities, including anti-money laundering (AML) checks, can also become more effective – as fewer intermediaries enable greater transparency.

2.2 Potential for new roles and activities institutional DeFi ecosystems

The pioneering use cases set out in Section 1.4 highlight how today's market structure might evolve in the next wave of DeFi innovation.

In this way a public blockchain could become a de-facto industry utility platform in the same way the internet became a delivery infrastructure for online banking. Launching institutional blockchain products on a public blockchain already has certain precedents,[7] particularly in the money market funds space. The industry should expect further progress – for example, in the area of tokenised or virtual funds, asset classes and intermediary services; and/or with a permissioned layer.

3

Participation in DeFi markets – operating in public, private or permissioned blockchain network

The very nature of DeFi for the institutional community is both a daunting and compelling proposition.

Figure 2: Blockchain type

Generic blockchain types	How they work: Consensus layer	Challenges	Benefits
Public	Open participants	Identity of these participants	Wide accessibility, range of innovation, low cost to access, adoption and go-to-market
Public Permissioned	Mix of white-listed and open participants	Identity of participants at the public layer	Wide accessibility, range of innovation, low cost to access and adoption, a high degree of controllability via white-listing
Private	White-listed participants	Cost and network effect, reduced innovation cadence	Controlled participants
Private – Public	White-listed participants with public chain used as evidence recording but no transaction records	Mix of private and public chains' challenges	Attempts to harvest the mix of private and public chains' benefits

Source: Deutsche Bank

Engaging, operating and transacting in the type of open ecosystems provided by DeFi offerings could be seen to conflict with the closed loop or private environments associated with traditional finance, in which clients, counterparties and partners are well known and risk is accepted in line with the appropriate levels of disclosure and due diligence. This is one reason for much of progress in the institutional digital asset space to date occurring in the private or permissioned blockchain network space, where a well trusted governing party acts as the "Network Operator" and the owner is responsible for approving participants into the network.

By comparison, public chain networks offer potentially open-ended scale, with low barriers to entry and ready-made opportunities for innovation. These are environments that are decentralised in nature, founded on a principle to be without a single point of failure and where the user community is incentivised to "do good". The consensus protocol that keeps the blockchain secured and consistent (Proof of Stake (POS), Proof of Work (POW) are primary examples) can differ across different chains. This is a way that participants – as validators – are able to contribute and be rewarded in what we consider to be the "blockchain economy".

Figure 3: Consensus type

Type of Consensus (non-exhaustive)	Briefly	Example
Proof-Of-Work	It uses a level of competitive computational effort to evidence consensus	Bitcoin
Proof-Of-Stake	It uses a level of collateral deposits to incentivise consensus	Ethereum
Proof-Of-Authority	A central authority appoints a set of validators to determine consensus	Hyperledger Besu

Source: Deutsche Bank

3.1 Outline of a participation checklist

When assessing any digital asset and blockchain ecosystem participation, major consideration should be given to the maturity of the blockchain and its respective roadmap, what can be agreed as settlement finality, liquidity, interoperability with assets of other chains, regulatory angles, adoption; and to risk assess the network technology, cybersecurity, continuity plans and the core community and developer participants in that network. A degree of standardisation in the technology as well as common understanding of taxonomies could further pave for applications to grow.

With this understanding, private chains look less risky and become more attractive. However, the comparatively lower risk level of private chains vis-à-vis public chains should also be measured by expertise availability, vendor dependency, accessibility, size of liquidity and the costs of creating, maintaining and running the private chain, which can make-or-break initiatives. Imagine if every bank had to run its own private internet for its own internet banking applications. Cost is a critical factor in the quest for success and needs consideration; especially at this transition period when blockchains will be operated in parallel with existing technology stacks.

Ultimately, firms must get comfortable with the level of transparency and new ways of doing things they can accept and manage while maintaining laser focus on both their own and their respective client interests in terms of data and asset protection. Regardless of which side you sit with DeFi, asset custody and safekeeping are paramount. It is critical that novel methods are understood – like assets held by smart contracts as an extension of custody – and grey areas in these areas are substantively addressed, which can help mitigate risks and regulatory concerns.

As another example, identities are important and one of the fundamentals in this pursuit of institutionalising DeFi would be the deployment of verifiable credentials. These credentials will facilitate governance to provide institutions with safeguards when seeking to engage in these open blockchain ecosystems. Verifiable credentials enable anybody to use cryptographic proofs to evidence who they are, removing the need to directly share personally identifiable information (PII) about themselves, while storing such PII materials offchain or in encrypted decentralised ways for added protection.

Hence, with such digital identities at the "DApps" layer, centralisation of governance in areas like investors' access and exits of institutional DeFi structures can enable reliable know-your-customer (KYC), sanction checks and money laundering prevention. Additionally, trading-market abuse detection and other market integrity measures like investor suitability would be new guardrails that can be implemented. Digital identities would help with risk pattern identifications, while preserving transaction confidentiality and banking privacy.

In doing so, the core benefits of cost effectiveness and innovation value of DeFI are preserved, blended with the centralisation of certain key attributes to enable a successful regulatory balancing act.

Early development and assessments of blockchains on the institutional side have been championed in recent years. Notably, the multi-phase industry level Project Guardian launched in June 2022 by the Monetary Authority of Singapore (MAS), seeks to progress the path of institutional grade DeFi with the evolution "open and interoperable" networks and explore the potential for interlinking markets.[8]

This aligns with the broader industry innovation vision of enabling scale, liquidity and new market connectivity through use of blockchain based technology without compromising the financial stability and integrity of the ecosystem. How to accomplish this at scale with regulatory compatibility really is the trillion-dollar question for institutional DeFi.

4

Regulatory bumps in the road

4.1 Frameworks without intermediaries

Undoubtedly, a long road stretches ahead full of innovation, discovery and retrospect/introspect. The DeFi regime has required regulatory bodies, standard setters and policy makers alike to reconsider their conventional oversight frameworks, which have been built with intermediaries at their epicentre. Given the potential for an absence of regulatory and supervisory access points in decentralised systems, DeFi is most certainly driving a paradigm shift.

4.2 Market integrity and investor protection

Momentum and cross-jurisdictional progress in this space has been growing since the end of 2023: December marked the release of the IOSCO Policy Recommendations for DeFi, which outlines nine principal policy recommendations that address market integrity and investor protection core risks.[9] This follows their Policy Recommendations for Crypto Assets which was released in November 2023 and is positioned to be complementary to those covering DeFi. With these two interoperable global policy recommendations, an activity that is not governed by one would be governed by the other.[10] As a result, the regulatory landscape is now clearer and should be further clarified as the IOSCO recommendations become implemented by its members globally.

This clarity is also facilitated by global regulatory principles of same activity, same risks, same regulations as well as technology neutrality. This has meant that a tokenised traditional financial instrument should be regulated based on its nature as a financial instrument, rather than being treated differently simply because it is tokenised. Since tokenisation is a technological process, existing technology risk regulations would apply. A financial institution's balance sheet management of its exposure to this new technology is increasingly subjected to interpretations of how key unique features of the technology should be perceived and accounted for as risks.

"Institutional DeFi has great potential – not only the ability to make current TradFi transactions cheaper and more efficient, but also the ability to facilitate new and innovative business models. While much remains to be done, we are already seeing advancements in technology, standards and regulation"

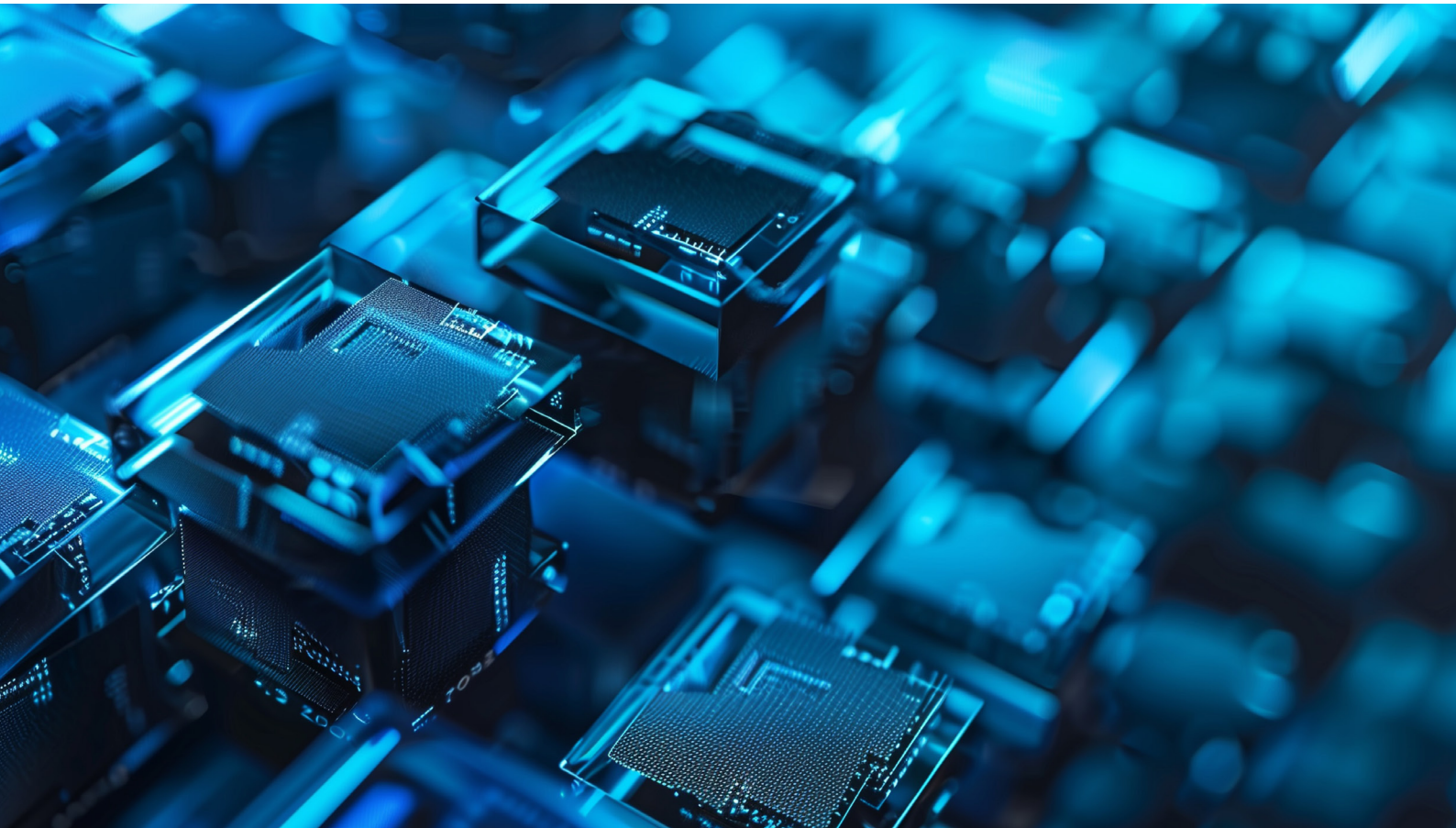
Sabih Behzad, Head of Digital Assets and Currencies Transformation, Deutsche Bank

4.3 Prudential treatment

The balance sheet implications from participating in the digital asset space are a further challenge on the regulatory evolution front. The Basel Committee's (BCBS) final standard on the prudential treatment of banks' crypto assets was also released in December 2023 for consultation following targeted amendments specific to stablecoins that were identified a year earlier. This focused on a combination of recognising the market,[11] credit and liquidity risks inherent in crypto asset related activities (inherently including DeFi) and defining disclosures and required safeguarding measures. The BCBS standard also addresses the need for classification of asset types broadly into group 1 and group 2 based on classification criteria that reflects potential risks to be managed. Another Basel consultation on the disclosure requirements closed on 31 January 2024. As recently as 16 May 2024, the BCBS anounced a one-year delay in the implementation date to 1 January 2026.[12] How institutional DeFi would be classified in these contexts is yet to be substantively tested.

These are significant milestones in the industry's journey of discovery. They are a product of multi-year intensive joint public sector and industry advocacy work to understand, discuss, calibrate and arrive at agreed interpretations, which will likely pave the way for further progress as markets and technologies evolve in unison. Establishing and aligning on an understanding of how to contemplate new digital domains, including the risks associated with participating in them, will serve as critical foundations and guardrails for innovation with increasing regulatory clarity.

A number of use cases demonstrate that innovative technology, when combined with fitting regulations, is a very powerful force for change that will reshape and reorder business models and markets.



5

DeFi: where next?

The lightbulb did not evolve from a continuous improvement of candles but came from a continuous improvement of alternative technologies to address the shortcoming of wax-made candles.

If we reflect on the above and believe in the potential power of a broadly regulated or institutional version of DeFi, we must accept that it needs a core set of tenets, standards and prerequisite capabilities to be built into the fabric of that ecosystem. Realistically, only then will institutional players adopt it as a new growth vehicle and move forward with sufficient safeguards as well as regulatory certainty.

2024 looks set to be a defining moment after what has already been a tumultuous period for all forms of DeFi. Regulatory implementation is a driving force, which will continue to determine the velocity of institutional interest and adoption in the digital domain. It could be argued that DeFi amplifies the challenge of risk management, anti-money laundering and information privacy. However, when considered in conjunction with the opportunity that institutional DeFi presents, including financial inclusion, it's hard to ignore its potential benefits for new products, services and operating models in the future of a digital first financial industry.

The technology itself is maturing and increasingly well understood. Regulations are becoming clearer, and the necessary expertise is now more accessible as learnings from pilots are absorbed. For example, increased regulations and expertise in control functions such as compliance and audit can facilitate the introduction of DeFi into the financial industry.

The industry is now at a "post-proof of concept" stage that requires that visible and successful "live" products graduate into scaled up commercial products. This transition will help crystalise the benefits, whether in cost efficiencies or new growth, and further advance the journey along the institutional DeFi road. It remains to be seen how the factors covered here will influence – or inhibit – the trajectory of institutional participation in regulated DeFi.

The continuing technology, innovation and regulatory maturity in critical areas of cross-chain interoperability, oracles, digital or decentralised ID solutions and trust anchors can only add fuel to adoption momentum needed to reach a critical mass. While the road to institutional DeFi may not take us "to the moon", it's certainly going to be an exciting ride toward a new and intriguing destination.

6

Glossary* and references

Blockchains
A particular family of database structure with decentralised network and employing cryptography to serve as a record and settlement layer for transactions. Ethereum is an example of a public blockchain.

Decentralised Applications (Dapps)
Software applications built out of smart contracts, often integrated with user-facing interfaces using traditional web technology.

Decentralised Autonomous Organisations (DAOs)
Entities whose rules are defined and enforced in the form of smart contracts.

Digital assets wallet
Software interfaces for users to manage digital assets based on blockchain. With a non-custodial wallet, the user has exclusive control of funds through their private keys. With custodial wallets, private keys are managed by a service provider.

Digital assets
Tokens representing value that can be traded or transferred within a blockchain network. Bitcoin and other cryptocurrencies were the first blockchain-based digital assets. Others have a range of intended functions beyond payments.

Governance systems
Software-based mechanisms that manage changes to smart contracts or other blockchain protocols, often based on tokens that allocate voting rights to stakeholders.

Oracles
Data feeds that allow information from sources off the blockchain, such as the current price of a stock or a fiat currency, to be integrated into DeFi services.

Smart contracts
Blockchain-based software code that carries out, controls, and documents relevant events and actions according to predefined terms and rules.

Stablecoins
Digital assets whose values are pegged to a fiat currency, a basket of fiat currencies or other stable-value assets.

Total Value Locked (TVL)
Total Value Locked (TVL) is a metric used to measure the total value of digital assets that are locked or staked in a particular decentralized finance (DeFi) platform or decentralized application (dApp). The higher the TVL, the more trustworthy the platform or dApp is perceived to be.

* The glossary here is the authors' own and is included here to facilitate understanding; it is not a proposal of definitions. Readers may refer to regulatory and industry, for example GFMA, publications for official glossary terms

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