BLOCKCHAIN AND DEFI TECHNOLOGY

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DeFi in TradFi: expected impacts, implementation challenges and policy aspects

Decentralized Finance (DeFi) refers to new ways of providing financial services that aim to eliminate the need for traditional centralised intermediaries. The underlying rationale does not lie in the type of services provided by most DeFi applications as they substantially mimic those provided by the traditional financial markets; rather, it lies in the way they are provided, given that DeFi creates an ecosystem that relies on automated protocols. This is made possible by (more or less) decentralised ledgers of transaction ("permissionless blockchains") coupled with automated algorithms ("smart contracts"), thus allowing financial services through "decentralised applications" (dApps).

Some features underpinning DeFi applications such as automation, or the "composability" of services may have an impact on the innovation of traditional financial markets even where governance remains centralized. For example, programmable, self-executing contracts may allow for process automation and potentially lower frictions in settlement activities (e.g. shorter settlement time) and consequently may reduce operational costs, thus enhancing access to financial services.

Moreover, decentralized technologies could also improve the interoperability of payment systems in cross-border payments and foster the use of digital identities that can reduce compliance costs for the financial sector in customer on-boarding and payment authentication.

Finally, it may increase transparency of financial infrastructures and foster innovation, given that both smart contracts' code and the transactions registered on blockchains could be potentially publicly observable, traceable and verifiable by everyone.

On the other hand, potential benefits are always complemented by several risks, also from the legal standpoint. Firstly, such open ecosystems often lack a robust and transparent governance. In addition, both protocols and underlying DLTs are not immune from operational risk; flaws in the code could make it vulnerable to exploitation; cyber risks are magnified, as the use of smart contracts – including the so called "bridges" allowing the transfer of assets across different blockchains – may lead to an increase of the attack surface and heighten dependence on third parties, due to greater reliance on developers to deploy and maintain the underlying code. An additional source of concern relates to money laundering.

Insofar, no DeFi applications have actually achieved wide-scale adoption; in principle, regulators and supervisors can significantly contribute to enabling the financial system to explore the potential benefits of DLTs, smart contracts and tokenisation. For example, the BIS-lead Project Mariana tested the cross-border trading and settlement of wholesale CBDCs. The relevant DeFi components, particularly automated market makers, might represent the foundation for the next-generation of financial market infrastructures.

In addition, the Eurosystem has started to considered potential solutions for central bank money settlement of wholesale financial transactions recorded on distributed ledger technology (DLT) platforms aiming to gain insights into how various solutions can enhance the interaction between TARGET services and DLT platforms. Banca d'Italia significantly contributes to this work with a solution centred on the Eurosystem's TIPS instant payments platform and DLT-agnostic APIs to synchronize the asset-leg and the cash-leg, making an instantaneous Delivery versus Payment transaction possible on a 24/7 basis.

DeFi underlying technologies have created very challenging scenarios to regulators that need to strike the right balance between promoting innovation and mitigating the relevant risks. One possible avenue clearly relates to ongoing collaboration between the public and private sectors, for example in the joint definition of standards and best practices. The memorandum of understanding signed by Banca d'Italia and two Italian universities for the definition of smart contracts standards for financial services represents a concrete example in this regard.

Public and private sectors' collaboration reinforce the definition of standards and best practices.

From the supervisory perspective, technological innovation requires authorities to reconsider and adjust current methods and tools to capture the new nuances of traditional risks, exploring new opportunities offered by innovation and the use of new technologies.

In this evolving landscape, financial intermediaries are also called upon to do their part; in particular, they should take prudent decisions in selecting developers and technology providers, aiming to effectively mitigate third-party risks, prevent business continuity, lock-in scenarios, and address IT/Cybersecurity concerns, will play a pivotal role in navigating the complexities of an ever-changing technological environment, ensuring the resilience and security of financial services.

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Blockhain: promises for the financial sector and challenges to overcome

If the tokenisation of finance is still a nascent phenomenon, it has gained significant attention in the last years. Thanks to blockchain technologies, the tokenisation of financial assets could lead to potential efficiency gains in post-trade activities, through greater automation, increased transparency and improved traceability. In the longer term, the tokenisation of real-world assets could increase the liquidity and accessibility of their underlying markets (e.g. real estate) and the intrinsic characteristics of tokenised assets such as fractionalisation and programmability could enable the creation of new services or innovative products.

Blockchain technologies have been primarily used to issue crypto-assets and offer financial services on crypto-assets with the so-called "decentralised finance" or DeFi. And, crucially, these activities have been deployed on public blockchains, i.e. open and decentralised infrastructures with no prominent operator, with the ostensible aim of avoiding traditional financial intermediaries.

However, TradFi players are increasingly trying to leverage blockchain technologies through experiments and new services to harvest the potential benefits of tokenisation. For example, in France, some traditional banking institutions have recently begun issuing digital green bonds on public blockchains. This demonstrates the determination of TradFi players not to be outdone by crypto-assets players. As a result of this competition, the tokenisation of finance is emerging in a fragmented way between DeFi and TradFi, each relying on different types of standards. There is still a long way to go to allow the market to embrace blockchain, and this will require to solve a number of operational and regulatory issues.

With regards to operational issues, the challenge for central banks and financial supervisors is to securely support and accompany innovation. This involves two main lines of action. First, by helping financial players to test their innovative solutions in a secure environment. At the European level, the exploratory Pilot Regime on the use of DLT for financial market infrastructures will enable us to move from theory to practice through real-life experimentation, raising real questions and challenges, such as the finality of settlements. It will also allow us to identify potential barriers in the current regulatory framework, in order to build a robust framework supporting innovation while guaranteeing investor protection, market integrity and financial stability.

Furthermore, central banks can provide market participants with a more secure and trusted settlement asset than private stablecoins, which carry liquidity risk, but remain widely used due to the lack of a tokenised form of central bank money. From this point of view, CBDCs could be a game-changer in terms of legal certainty. With this in mind, the Eurosystem has recently launched exploratory work on three solutions to settle transactions on tokenised assets in central bank money, including CBDC, the latter using the DLT provided by the Banque de France.

Alongside the operational challenge, there are also important regulatory issues. In the EU, central banks and financial supervisors have framed connections between TradFi players and the crypto-asset market. On the one hand, the MiCA regulation, which will come into force in 2024, contains provisions allowing certain financial institutions to issue tokens and provide financial services on crypto-assets. On the other hand, the new standards set by the Basel Committee on Banking Supervision, which will apply from 2026, remain rather conservative on the holding of crypto-assets by banks for their own account, in order to limit the risks of contagion to TradFi.

When it comes to DeFi, there are still regulatory uncertainties regarding the management of this decentralisation. It is not clear whether, within the current regulatory framework, TradFi players will be able to seize all the opportunities offered by the use of public blockchain and the adaptation of the innovations brought by DeFi. Decentralised market infrastructures challenge the current regulatory framework based on the PFMIs and some key concepts, such as "system operator", "transfer order" or "accounts".

We want to support and accompany innovation, while preserving financial stability.

In addition, DeFi is not yet fully covered by the current MiCA regulation, which prevents it from being vested directly by TradFi players. This is why the French supervisor (ACPR) proposed regulatory avenues for DeFi in a discussion paper[1] published in April 2023. The paper's proposals could inform a "MiCA 2" regulation alongside other issues such as crypto-conglomerates and the treatment of NFTs.

The operational and regulatory challenges ahead go hand in hand. By overcoming these challenges, we want to support and to accompany innovation, while preserving financial stability.

1. *https://acpr.banque-france.fr/en/decentralised-or-disintermediated-finance-what-regulatory-response*

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Technology will modify, not metamorphose, financial markets

Technological forecasting is a risky business. Paul Krugman's 1998 prediction that by 2005 the internet would have proved to have no greater economic impact than the fax machine should make lesser economists shy away from making predictions that risk a similar fate. One must be cognisant not just of the tendency to overestimate short-term impacts but also to underestimate long-term ones. Further complicating this thankless task, innovations can unexpectedly cross sectors, as Nvidia's transformation from a gaming company to the centrepiece of the AI revolution attests.

Anticipating blockchain and DeFi's likely impact on financial markets poses similar difficulties. There are clearly use cases for distributed ledger technologies and other DeFi elements such as smart contracts, ranging from clearing to market making and proxy voting that are already being implemented by corporations, market infrastructure providers and regulators alike. It is possible that this will eventually completely transform the structure of financial markets.

The more likely outcome, however – carefully treading the treacherous grounds of forecasting – is a piecemeal implementation of these technologies in certain parts of the existing market infrastructure, improving efficiency over time. How widespread those changes will be naturally depends on the regulatory environment, but also on other factors. Financial market actors are typically adept at economically rational decision making. If implementing a blockchain-based solution can feasibly bring benefits, we should expect it to happen in any reasonably competitive market.

If market structures do not change in the way we expect, we should therefore consider whether the main obstacle really was technical. Low take-up could also be an effect of excessive upfront investment, or implementation requiring alterations elsewhere in the system to function efficiently, making coordinated efforts necessary. Financial markets are highly interconnected ecosystems; changes to individual parts can seldom be done in isolation.

One should also be careful not to put too much faith in technological solutions to non-technical issues. Consider bond trading, for example. It is possible that the efficiency of issuance and trading can be significantly improved by tokenisation and moving the process to a blockchain. What it is not likely to do however, counter to what is sometimes implied, is markedly increase liquidity. The limited liquidity of (corporate) bonds follows from the nature of the instrument and the buy-and-hold strategies of its main investors rather than from trading limitations. Blockchain/DeFi solutions are technical tools, not agents of metamorphosis.

That underscores an important distinction between the potential of new technologies to improve existing market processes and the idea that they will completely transform them. This is particularly relevant for DeFi, which is not just a technology but also an ambition for a conceptually new way of organising financial markets. It remains comparatively minuscule (at the time of writing the total value locked is roughly equivalent to Verizon's $49bn bond offering in 2013) and the financial stability risks are likely overplayed, but the central idea of total disintermediation merits consideration. The ambition seems to miss a crucial point – intermediaries are not at the centre of financial markets by chance or because of technical limitations. They are the (highly regulated) effect of decades of deliberate efforts to construct a stable financial market infrastructure.

The regulatory search for a central accountable entity is not just a knee-jerk reaction, but a necessity for market functioning. Financial markets do not necessarily require trust between counterparties, nor even mainly in the market infrastructure as such, but they do require trust in the rules governing that infrastructure and the authorities' capacity to enforce them. Total decentralisation would obstruct that ability.

We should be careful not to put too much faith in technological solutions to non-technical issues.

What, then, should be the regulatory approach? Firstly, humility and openness to innovation. There should be no undue hurdles to new ways of structuring financial market processes – perhaps they should even be incentivised – if they can operate safely. Still, technology-neutrality must remain a guiding principle and the overarching goal of market integrity should not bend to enable specific technologies. Regulators should be proactive early on, engage with market players and recognise self-regulation as a starting point for later formal regulation. Regulatory sandboxes and observatories are appropriate initiatives underway around the world. Finally, given the global nature of capital flows, regulatory efforts must be internationally coherent, benefitting from discussions in multilateral fora.

This can help ensure that innovations translate into improvements in market functioning. Blockchain and other DeFi technologies have great potential. Just don't mistake the tools for the final construction.

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View from the US: Responsibly innovating with blockchain and DeFi

Disruptive technologies – which blockchain, distributed ledger technology (DLT), and decentralized finance (DeFi) may be – typically garner reactions from disbelief, to varying levels of acceptance and adoption, to utopian dreaming. The potential benefits of DLT and DeFi, including transparency, accuracy, efficiency, and open access, suggest that the technologies should not be ignored. But new technologies, even those that are new ways of doing old things, often bring new risks. The task of market regulators and participants is to harness the benefits while safeguarding essential protections.

DLT revolution – great promise or greatly exaggerated?

On one end of the spectrum is the vision that financial activity can be migrated to, and radically enhanced by, the blockchain. The promise of transparency, access, reliability, and speed from automated systems of engaging in and recording transactions through a decentralized ledger system, undergirded by encryption, can be enticing. However, realities temper this promise with pragmatism.

To name a few challenges, many have rightly questioned how truly decentralized DeFi is in current blockchain applications, without which, many of the purported benefits of added transparency and reliability can give way to opacity and vulnerability to manipulation and fraud. The need for security, accountability, and user protections sometimes counsel for the use of permissioned blockchains, but at some levels of scale, a good internal ledger system may be more appropriate than a blockchain platform and DeFi protocols. Some disintermediation can reduce costs, but intermediation adds meaningful protections and can sometimes be costly to replicate if reverted to a bilateral basis.

In cleared derivatives, for instance, even if operating via decentralized protocols, a central counterparty (CCP) would still enter into the transactions interposing itself as common counterparty after novating a bilateral trade, through which CCPs provide the default management and loss mutualization functions that have spawned safer swaps and futures markets. CCP members provide an important layer of protection to the resilience of the derivatives clearing ecosystem, beyond their role as intermediaries facilitating trades.

Use cases conceived, and observed

Against this backdrop, a few use cases emerge as possibilities. As a decentralized system of records with the underpinnings of automation and encryption, a natural candidate to streamline is the trading and settlement cycle. In derivatives, application of DLT can be explored for steps including matching, execution, confirmation, settlement, and data reporting, as well as life cycle events. Setting and calling initial margin, as well as determining, calling, and processing variation margin, can also be candidates for exploration.

Using DLT or DeFi will not inoculate actors from responsibility to abide by the rules.

Nonetheless, such possible incorporation of DLT is not without risks and challenges. Implementation at a scale to be meaningful may require integrating multiple systems that presently may not be interoperable. Where a process requires several sequential steps, different speeds at different stages could result in the slowest link capping the speed of the sequence, at best, or logjams at worst.

And, while speed and automation can have positive potential, the same speed and automaticity would take place in a time of stress. Observers noted the speed at which the failures of Silicon Valley Bank and Signature Bank occurred in the U.S., which in that case was largely driven by social media. The speed of DLT brings this to another level. Layer on top of this the speed and opacity that artificial intelligence can bring, and the onset of distress could occur at a dizzying pace – too fast to rein in?

Risks, and regulatory responses

Regulators cogitating policy approaches to DLT frequently harken back to the idea of same activity, same risks, same regulation/regulatory outcome. Indeed, this has underpinned IOSCO's Policy Recommendations for DeFi released last year. The same protections expected of the traditional financial sector – including anti-fraud/anti-manipulation, governance, accountability of responsible persons, customer protection, market integrity, and mitigation of systemic risk – would need to be maintained if providing traditional financial services via DLT. As evidenced by the ever-increasing number of enforcement actions brought by the CFTC and other US regulators against bad actors using innovative technologies, using DLT or DeFi will not inoculate actors from responsibility to abide by the rules. In addition, in the context of using DLT, ensuring operational resilience and risk management would be elevated as important safeguards.

DLT clearly offers promise and potential, but must be explored and pursued responsibly.

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DeFi - The next wave of automation in traditional finance

Decentralised finance (DeFi) is the next evolution of the technology underpinning crypto-assets and distributed ledgers. It is enabling a reduced reliance on centralised intermediaries, cost savings, and more transparent financial services.

The sector has innovated quickly, creating net new concepts such as *automated* market makers like the Uniswap Protocol. In just five years, the Uniswap Protocol has safely processed over €1.65 trillion in transactions.

Foreign exchange (FX) is a €6.9 trillion market where DeFi can reduce remittance costs by up to 80%, according to our analysis of data from Uniswap Protocol pools.[1] This evolution of FX opens the door to 24/7/365 markets, offering unprecedented access and liquidity. The Bank of International Settlements concluded recently: *"DeFi elements tested in (our project to improve foreign exchange), specifically automated market makers, could form the basis for a new generation of financial market infrastructures."*[2]

Some jurisdictions – led by the EU and its flagship MiCA framework – have taken early steps to regulate crypto-asset activities, but international competitiveness is a relay race that never ends. The next leg we expect is adaptations of traditional frameworks that enable tokenisation. With other jurisdictions pushing ahead on tokenisation, the EU's pilot regime to test distributed ledger technology may not be sufficient for the Union to maintain its early lead. At Uniswap Labs, we are following these developments closely because we believe that tokenisation will change how we think about, create, and exchange value.

DeFi is the continuation of financial markets' relentless pursuit of efficiency and innovation.

The big question for policymakers is how to create these frameworks while preserving the advantages of the technology – instead of recreating the inefficiencies and dependencies of traditional financial markets. Consider DeFi's enhanced resilience to cyberattacks: re-centralising DeFi by requiring the participation of intermediaries would erase this benefit by re-introducing honeypots of data and vulnerability.

We believe the solution is to lean into the technology's inherent consumer protections. For example, because all transactions happen on a public ledger, anyone can monitor the financial health of intermediaries in real-time. Regulators should take advantage of this real-time reporting rather than requiring the laborious and lagged quarterly reporting of current financial institution supervision.

Still, while DeFi improves on traditional finance in some areas, other risks persist, and new ones arise. The challenges are surmountable. Regulators need to develop a deep understanding of the novel technology. In response, industry needs to create new innovations that mitigate risks that could prevent DeFi from reaching its full potential. For example, public-private innovation on digital identity and security standards is one underexplored area that could enhance consumer protection and combat illicit activity.

DeFi is the continuation of financial markets' relentless pursuit of efficiency and innovation. Markets have always embraced technology, reshaped operations, and pursued offerings in order to meet client demands, and this time is no different. As more markets change, the regulatory system cannot remain stagnant. It must keep up, embrace new opportunities, and evolve to mitigate the novel risks.

1. *Adams, Austin and Lader, Mary-Catherine and Liao, Gordon and Puth, David and Wan, Xin, On-Chain Foreign Exchange and Cross-Border Payments (January 18, 2023). Available at SSRN: https://ssrn.com/abstract=4328948 or http://dx.doi.org/10.2139/ssrn.4328948*
2. *BIS Innovation Hub (BISIH) (2023): Project Mariana Cross-border exchange of wholesale CBDCs using automated market-makers, September 2023.*

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Crypto comes of age - And banks are joining the party

The world of finance is undergoing a radical transformation, with 80% of global finance leaders due to adopt crypto in the next three years. Far from signalling a 'Crypto Winter', the industry is now poised for a seismic shift in interest from traditional finance players. If the debut of the Bitcoin ETF is anything to go by, where $4.6 billion exchanged hands on the first day, then crypto is on the cusp of a new era in financial services.

As momentum builds for blockchain and digital assets, banks now recognise that this technology offers faster, cheaper, more secure, and more transparent value exchanges. The crypto industry is maturing, and companies focused on real-world utility are rising above the noise of bad actors and industry myths to deliver progress and exceptional services via blockchain technology.

Regulators have a vital part to play in securing our industry's long-term future.

The Rise of blockchain in traditional banking

The hype cycles of crypto, like those we've seen in the past, can stifle progress but what truly endures amid the noise is genuine innovation and utility. That's why we're seeing traditional institutions break ground in the crypto space and find opportunities to partner with digital asset firms, and blockchain providers, to upgrade their infrastructure and improve their services.

Payments are crypto's pioneering application and serve as the gateway to a new world of possibility in crypto. There's already clear use-cases and instant benefits being delivered, providing unrivalled speed, transparency, efficiency, and cost-savings. Take the XRP Ledger, for example, currently being used by *Heirloom* to help individuals manage their digital identity online in a way that is stable and energy efficient but fast in terms of its transaction times.

But beyond payments, blockchain technology is making significant in-roads within traditional banking. We've seen banks like HSBC and BNP Paribas adopt bespoke custody technology to expand client exposure to digital assets, offer staking, and digitise traditional investment assets, like securities, all while meeting customer need for security.

Regulators have a vital part to play in securing our industry's long-term future.

Smart contracts, deployed on blockchain networks, deserve special mention too. They can automate financial processes like loan agreements and derivatives, boosting efficiency, transparency, and fostering financial inclusion. We're already seeing many institutional financial players experimenting and testing different solutions that adopt smart contracts and distributed ledgers, helping bridge the gap between crypto and traditional finance.

Regulatory challenges in the digital age

It could be argued that the future of crypto within traditional finance is at risk, however, due to an absence of clear regulation and operating guidelines from jurisdictions around the world. It's critical that regulators remain in-step or ahead of the industry so that crypto can continue to innovate safely and build long-term relationships with banks and financial institutions. After all, frameworks designed for traditional financial systems will not adequately address the unique characteristics and challenges posed by decentralized technologies.

Jurisdictions are currently moving at different speeds and a lack of cohesion or interoperability could jeopardise growth and banking adoption. The EU, Singapore, Japan, Brazil, and the UAE have made considerable progress, which is welcome, but ongoing collaboration between the industry and regulatory bodies is crucial to fostering innovation while ensuring consumer protection, market integrity, and financial stability.

Notably, the EU's Markets in Crypto Assets (MiCA) regulation has led by example globally. By laying down specific rules tailored to the sector, MiCA not only offers legal certainty for all actors wanting to operate in the EU, but also operational clarity that will fuel crypto innovation across the region, and ultimately, sets a precedent for other frameworks worldwide. This is global best practice, so it's no wonder that we've already seen a number of crypto providers and finance institutions expand operations within Europe to benefit from this clarity. And we'll no doubt see this trend continue as this regulatory position resonates with banks. With the final rules being put in place this year, we're nearly there in Europe.

The crypto industry has left its old 'Wild West' label behind as it demonstrates to banks and institutions how the solutions it is building can improve payments, digitise financial processes and instruments, and provide better services to their customers. Pro-active regulation, like the EU has achieved, has been key to this. This engagement by regulators needs to continue alongside ongoing innovation by industry. Continuing innovation needs operating frameworks that are agile and forward-thinking, and which balance the need to protect customers with nurturing growth. As the financial landscape continues to evolve, embracing the transformative power of blockchain and digital assets is not just an option, but a necessity for those looking to stay relevant.

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Blockchain has the potential to change financial markets fundamentally

For the purpose of this article, we will define blockchain as a new technology that combines a series of distributed ledgers in which a chain of transactions is recorded when these transactions are verified according to a defined consensus mechanism. Decentralized finance is an approach to offer financial services without centralized institutions. Because the approach is decentralized it is often based on blockchain technology.

Most discussions about blockchain today are limited to process efficiency for financial institutions. It is argued that once a transaction has been agreed, processing it can be much faster and less costly. However, if you look at most of the costs associated with settlement, they are technology agnostic. One could even argue that the parallel processing of digital and traditional assets increases complexity for financial service players.

More fundamentally, with blockchain technology existing assets can be digitalized as well as fractionalized and new crypto assets can be issued.

The impact of all of this goes well beyond process efficiency: Less Intermediaries are required in the settlement but also the distribution value chain and therefore business models and fee structures are disrupted. Assets may be mobilized therefore enabling a secondary market – however they will not become more liquid through technology alone. Moreover, new financing opportunities become available especially for SMEs and startups. Also, institutional and retail clients can choose to invest in additional asset classes and finally cross-border infrastructure may be facilitated.

Hence blockchain has the potential to support two priorities of the EU: the capital market-based financing of SME's and the Capital Markets Union.

Policy aspects are addressed for now, but significant practical challenges remain to be solved

With MiCa and the DLT pilot regime the EU has made progress with regard to most of the policy aspects. However, the DLT pilot regime is to limited. Being able to trade a digital security on a regulated market without the requirement to keep it with a CSD is needed as a further step forward. Also, the EU lacks a mutually accepted digital currency to settle digital assets in Delivery-vs-Pay.

In addition, there are significant practical challenges. For example, the legal framework needs to be solid enough, especially for cross-border transactions. Otherwise DLT could be used on top of the paper-based process. Thus, sufficient market participants are needed that to act as trustworthy custodians for digital assets. Also, a common DLT infrastructure that enables seamless interaction is crucial to avoid the need to bridge many DLTs in the end.

And finally, the fundamental question for each blockchain use case needs to be answered: Is there already an existing infrastructure and what would the investment be to change it, and are the benefits worth it?

Whether traditional or challenger – the innovator takes it all

The race for leveraging the blockchain technology is well underway. Traditional players such as DekaBank are exploring services for customers along all three dimensions. Firstly, the infrastructure to support issuers in issuing digital assets, customers in terms of self-custody wallets, digital asset custody and tokenization. Secondly, in the issuance of digital assets themselves: digital bonds as well as digital investment funds. And finally, by investing in a shared infrastructure for the distribution of digital assets called SWIAT.

DeFi will not be more than a fix for missing centralized infrastructure

Most technology enthusiasts completely underestimate the specific know how and resources (e.g. liquidity, capital) required to provide financial services. Technology is a major input for delivering financial services, but not the output. Many discussions are about what is technically feasible, but not about what adds value to customers, markets or institutions or what makes sense from a policy makers perspective.

...with blockchain technology existing assets can be digitalized as well as fractionalized and new crypto assets can be issued.

This is why structures without centralized institutions will not work. People who would otherwise hold their money in a current account or a fixed-term deposit will not be able to grant a larger and more complex loan. They simply lack the liquidity, the ability to assess the credit risk and price it accordingly. They would also not be able to cover the risk of loan defaults. The situation is similar for a stock exchange or any other trading venue. The operation of a trading venue already requires a central institution.

In addition, market makers are needed to ensure liquidity. Finally, from the point of view of stability, certain roles on the financial markets should only be assigned to institutions that meet exceptional requirements - for example, central securities depositories.

Therefore, DeFi will be limited countries, types of financial instruments or participants that would otherwise not have access to the relevant services.

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Leading the Path to the Future: Advancing the Digital Asset Ecosystem

Over recent years, there has been increased momentum in the adoption of digital assets and distributed ledger technology (DLT). While industry reports continue to project growth in digital assets, last year, most projects (74%) involved six or fewer participants[1], highlighting the next challenge for the financial industry: how to progress from the current smaller, isolated projects to meaningful, industry-wide initiatives that support the scale of the global financial markets? After years of exploration, many in the industry want to see results. Three things will be critical to realizing these results: leveraging FMIs to advance the ecosystem, ensuring use cases deliver real near-term value and working with regulators to protect, and propel the ecosystem.

Leveraging FMIs to advance the ecosystem

As regulated entities governed by rules that promote safety and soundness, orderly markets and the safekeeping of investor assets, FMIs have a proven track record in establishing operational standards and maintaining high levels of operational resilience. Because of this, FMIs are well positioned to bring these same benefits to the digital asset ecosystem.

For example, FMIs can help progress digitization efforts by encouraging standardization of smart contract controls, data and processes. Smart contracts, which are decentralized computer applications that can automatically execute agreements based on predefined conditions, offer the potential streamline and automate thousands of disparate financial processes. However, if each financial institution develops their own smart contract standard, spread across infinite DLT technology stacks, it could create a patchwork of decentralized systems that are more complex than today's systems and processes. To avoid fragmentation, FMIs can help to develop consistent standards and controls that support an interconnected ecosystem while providing governance of decentralized applications to ensure they remain compliant and secure. This mutualization function will reduce industry costs and accelerate the industry-wide adoption of Web3.

Delivering Real Near-Term Value, with new business and operating models

As we consider the path forward, the industry must shift its approach from a re-platforming mindset to seeking new business and operating models that maximize the value of the tech. Solely replicating existing processes or undertaking lengthy and costly re-platforming exercises will not lead to the successful digitization of financial markets on any near-term timeline. We need to think differently and lean into what differentiates this technology and the impact it could have on our ecosystem. Several potential use cases come to mind: first, use cases that notably improve the rails upon which assets move (think infrastructure for private and alternative assets which are massive in size, but still incredibly manual in nature), and second, use cases that create meaningful capital efficiencies (think solutions that facilitate streamlined and optimized movement of collateral measured in seconds, not days).

DTCC's recent acquisition of Securrency to form DTCC Digital Assets, a developer of institutional grade, digital asset infrastructure, underscores our commitment to unlocking the value of digital assets and providing new operational capabilities and models to guide the industry safely through its transformation. The new capabilities will be a key enabler to fostering industry-wide collaboration to promote acceptance and adoption of digital assets.

Working with regulators to protect - and propel - the ecosystem

Safety and soundness are a top priority for regulators around the world. As the digital asset ecosystem evolves, regulators will continue to expect those performing regulated activities in the form of digital assets to adhere to the foundational requirements which ensure the same, if not greater, integrity of our markets. This means considering any shifts in business/operating models and market structures that may result in the use of the underlying technology. We are still in the early days of DLT adoption and what's possible - we should work closely with regulators to advocate for rules that evolve alongside the industry's use of the technology.

It is likely that broader adoption of new models will drive significant industry transformation.

Ultimately, digital assets present a tremendous opportunity for financial markets - as use cases come to fruition leveraging the learnings from past exploration, it is likely that broader adoption of new models will drive significant industry transformation. FMIs will play a critical role in helping drive industry consensus around the standards, controls and frameworks that will enable scale. At the same time, the industry will seek new ways to operate and deliver client value. We expect that regulators will stay close to the topic and set guardrails to help protect investors and the market. And in the end, real transformation will occur. With time and focus, the industry will see results.

1. *ISSA 2023 Survey, "DLT in the Real World", July 19, 2023*