WHITE PAPER | DECEMBER 2022

Square management

Initio

DECENTRALIZED FINANCE: CUSTODY AT A CROSSROADS

MAXIME LIÉNART & RENAUD JOSEPH

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Authors: Maxime Liénart & Renaud Joseph

CONTENTS

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1.
INTRODUCTION

Custody is probably not the most well-known or dazzling side of the investment world. Nonetheless, without the unglamorous safekeeping activities, trades settlement, clearing oversight, tax servicing, and corporate actions execution done by the custodian on behalf of its clients, the finance industry as we know it today would simply not be the same. To use a common analogy, if the fund manager is the architect of the investment process, the custodian is the engineer ensuring all the plumbing and maintenance is done. But how does one do that when the structure is under (re-)construction?

The world of custody is generally viewed as a low-margin commoditized service with limited room for growth or innovation. With the emergence of new classes of digital assets, and new ways of distributing them, this might not be true anymore. As decentralized finance is becoming too big to ignore, this article attempts to show how the custodial industry will be forced to redefine its identity in order to adapt to this new paradigm.

2.

RISE OF THE CRYPTO-ASSET

When we talk about digital assets, we often think primarily of bitcoin-like cryptocurrencies. In fact, cryptocurrencies are just one kind of digital assets which are based on distributed ledger technology (DLT), and which serve as a general-purpose medium of exchange for peer-to-peer payments, without the need for a central counterparty. If retail investors are indeed passionate about blockchain, it is above all digital security tokens, i.e. liquid representations of traditional assets on a DLT platform, and the tokenization process that attract the attention of institutional investors.

Digital tokens are more broadly defined by the IMF as "digital representations of value, made possible by advances in cryptography and distributed ledger technology [which] are denominated in their own units of account and can be transferred from peer-to-peer without an intermediary.[1]" The most noticeable difference between a cryptocurrency and a token is that the former has its own blockchain, whereas the latter is built on an existing blockchain or DLT platform.

In this context, "tokenization" refers to the ability to digitalize, fractionalize, store, and transfer ownership rights on underlying instruments on a DLT platform. Tokenization will thus increase the liquidity and the affordability of traditionally illiquid and capital-intensive investments such as real estate property, fine art or collectibles, which in turn will pave the way for a new demographic of investors who will get exposure to a wider range of investment options. Four broad categories of tokens coexist today[2], each with its specific business case, stakeholders, and regulatory framework:

The growing participation in decentralized finance by both retail and institutional investors was powered by multiple market forces.

- First, early adopters have recognized the opportunity to invest capital in embryonic technologies with a venture-type risk/return profile.
- Second, with the development of the blockchain, digital asset owners have acknowledged the market need for liquidity

1. IMF, 2021.
2. For the purpose of this article the IFRS classification of digital tokens is used. However there is no industry consensus on this categorization as of today.

and started to perform market-making activities and related services to decentralized finance protocols.

- Third, traditional market participants and institutional investors have seen in these initiatives an opportunity for higher yields in a diversified alternative asset class.
- Fourth, aware that their network can only scale with user adoption, blockchain communities have encouraged the proliferation of projects on their platform.
- Finally, early adopters and creators of crypto-assets have seen decentralized finance as a new venue where they can invest in products and services aligned with their long-term view.

Together these five factors have contributed to the massive expansion of a new financial ecosystem. The data published by the companies active on the blockchain and the surveys carried out among their investors speak for themselves. For example, the number of digital wallets created on the blockchain has doubled[3] and the number of cryptocurrencies in existence has quadrupled during the last 3 years[4] (cf. chart 1).

Category	Description	Intrinsic value	Example
Payment tokens	Digital coins issued directly by the blockchain protocol on which it runs and whose main purpose is to serve as a medium of exchange, store of value, and unit of account. They currently operate independently of a central bank	None. Value is derived from supply and demand only	Bitcoin
Security tokens	Traditional asset like stocks and bonds which have been converted into digital tokens on a decentralized ledger. They can provide an entitlement to a share of a company's future cash flows, and sometimes a voting right.	Value is derived from the financial performance of the issuing entity	DAOs (Decentralized Autonomous Organization) are digital investment vehicles shared by an internet community
Utility tokens	Tokens that grant users with access to a product or service, and which derive their value from that right. Utility tokens can be traded between holders but are not primarily used as a medium of exchange	Value is derived from the demand for the issuer's product or service	Filecoin provides its holders with decentralized data storage
Asset-backed tokens	Representation of ownership of a physical asset external to a blockchain (for example, natural resources such as gold or oil)	Value is derived on the value of the underlying asset	DIAM is a token issued by diamDEXX and backed by physical diamonds

3. Blockchain.com, 2022.
4. Statista, 2022.

This growing interest in decentralized finance is echoed by global institutions as 90% among the 1100 companies surveyed by Coalition Greenwich last year expect their clients' or proprietary portfolios to include digital assets before 2026[5]. The global tokenized asset value is expected to grow at a 62% compound annual growth rate between 2020 and 2027. A 2021 Bank of International Settlements survey also shows that 86% of central banks are interested in developing a central bank digital currency (CBDC), with 60% experimenting proof-of-concept, and 14% already running pilot projects.

Chart 1. Total number of unique wallets created on Blockchain.com (million)[6]

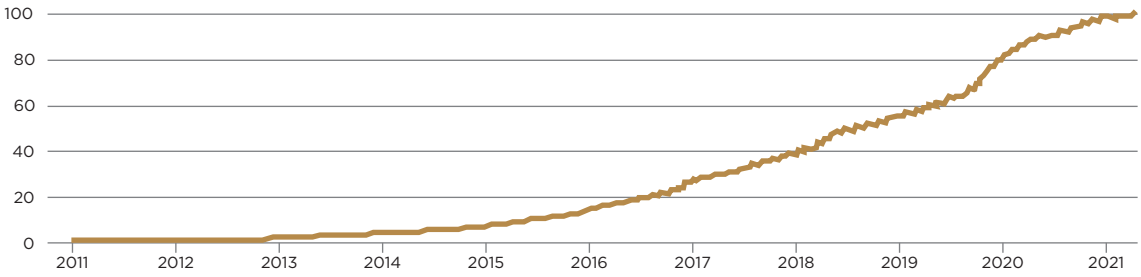


Chart 2. Estimated growth of tokenization market ($ trillion)[7]

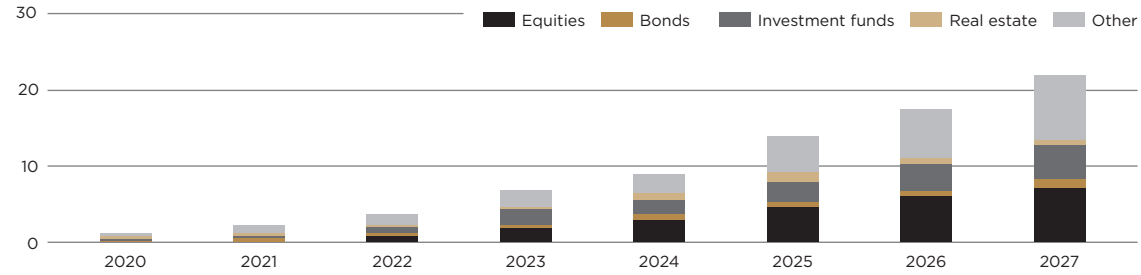
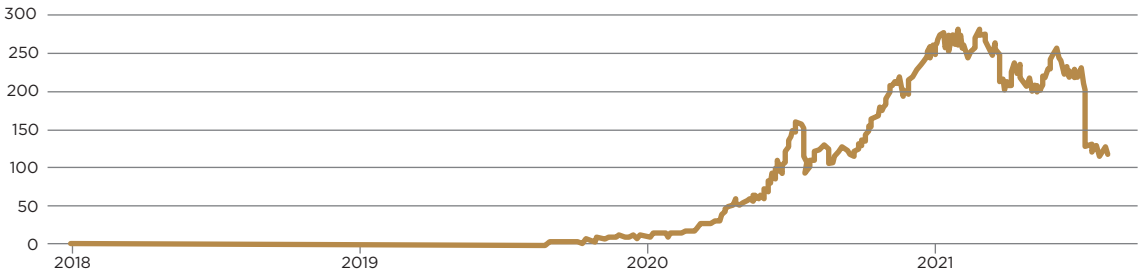


Chart 3. Total value of assets locked in decentralized finance transactions ($ billion)[8]



5. Coalition Greenwich on behalf of Fidelity Digital Assets, 2021.
6. Blockchain.com, 2022.
7. Finoa, 2018.
8. Defillama, 2022.

Another of the industry's KPI used to measure the size of participation, is the dollar value of crypto-assets "locked" in smart contracts on a particular blockchain[9]. As we can see in the chart 3, the total value of assets locked (TVL) has increased tenfold between 2020 and 2022.

It is worth noting that, while many institutional investors and governments are drawn to decentralized finance for the technology, a significant part of this trend is due to retail investors being attracted by the high rate of returns that can be earned in decentralized finance (DeFi).

With the growing appetite for digital assets, and with more and more companies acknowledging the added-value of crypto-assets, the opportunity for the traditional financial institutions to develop a new range of services catering to this new asset class is enormous. Among them, custodians are well-positioned to capture a large share of this growing de-mand by leveraging their size, reputation, existing network, and established security protocols to safeguard digital assets.

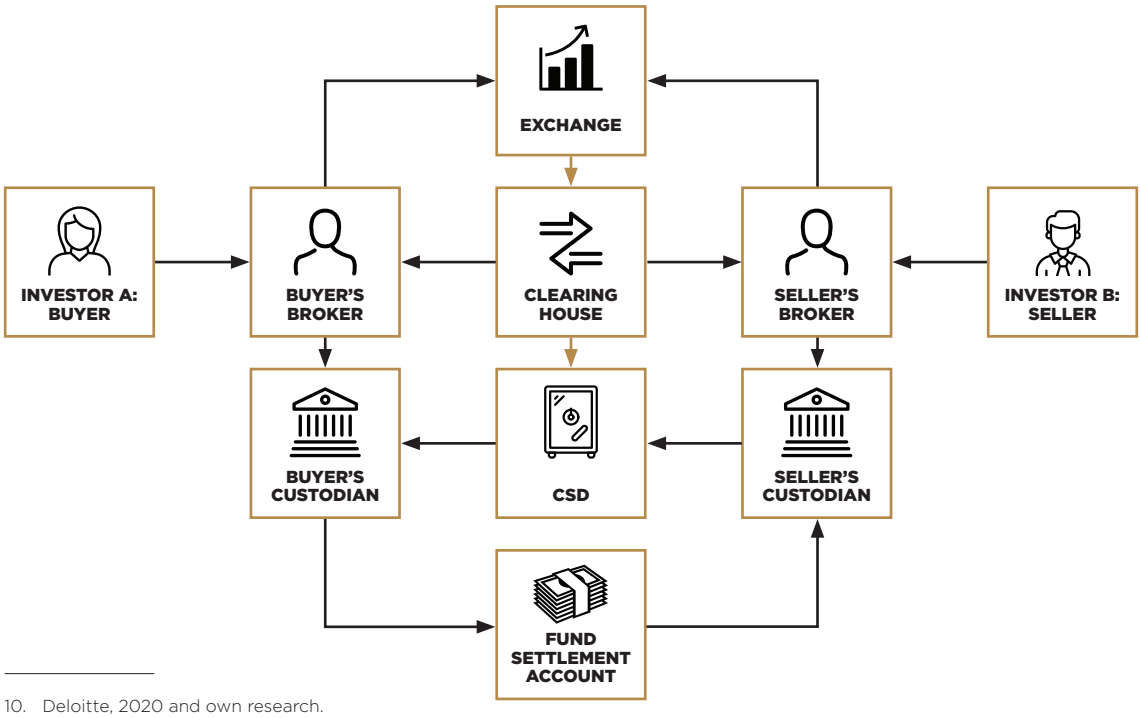
9. For more details on smart contracts traded on decentralized exchanges, see Joseph, R. (2021). *Decentralized Exchanges: The Future of Exchanges?*

3.
TIME FOR A CUSTODY UPGRADE

As we mentioned in the introduction, the custodian can be compared to the "vault" of the marketplace whose main role is to safekeep and administer investors' securities both physically and electronically, in order to prevent any risk of loss, theft, or fraud.

The following figure illustrates the intricate network of intermediaries within traditional capital markets. Custodians play a crucial role in ensuring that these various counterparties work together in the fastest and most efficient way possible, by facilitating the safekeeping and transfer of investor's assets, thereby ensuring the integrity and stability of the market. In this traditional setup, custodians act as the middleman between investors and the market:

Figure 1. Traditional bilateral market infrastructure[10]



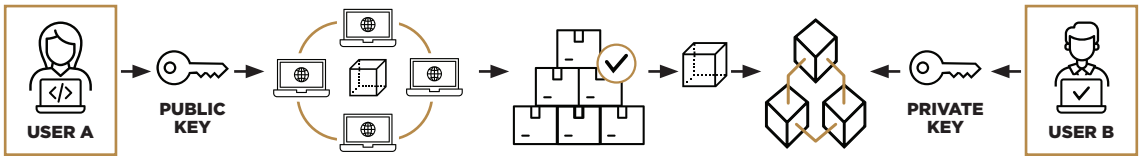
10. Deloitte, 2020 and own research.

- *Investor A, the buyer, liaises with her broker, who is a clearing house member, and whose role it is to act as an intermediary between the investor and exchange, and agree on the transaction details.*
- *Investor B, the seller, contacts his broker who will take the opposite side of the trade.*
- *Once the transaction has cleared, the buyer's broker will transfer the purchased security on to the buyer's custodian for safekeeping via a clearinghouse. This operation will be mirrored on the sell-side, where the seller's broker will pass the proceeds of the sale on to the seller's custodian for safekeeping at a central security depository (CSD).*
- *In essence, custodians ensure the investors' transaction is settled in an efficient fashion, and investor's proceeds are kept safe.*

By contrast, in a decentralized infrastructure where tokenized securities are exchanged, the custodian's safekeeping role would be slightly different. Indeed, ownership on a decentralized exchange is authenticated by means of a "private key", i.e. a randomly generated binary digit that is used to encrypt and decrypt information and is only made available to the originator of the encrypted content. This private key grants its owner access to the assets and enables him/her to sign a transaction on the blockchain.

Whenever two parties want to transact, each needs to generate and exchange two distinct "keys": one private, the other public. The public key is a long series of characters which is essentially derived from the private key and is available to all participants in an online directory. In order for the transaction to settle, this public key must be paired with the corresponding private key and validated by the network. This can be done in a matter of seconds. This mechanism is illustrated in the figure below:

Figure 2. Decentralized multilateral infrastructure[11]



- *If User A wants to transfer assets from her account on the shared ledger to Investor B's account, she will use a cryptographic algorithm to digitally sign a proposed update to the shared ledger of blockchain in which she is a member. This proposed update is then broadcasted to all computers (or nodes) which constitute the blockchain.*
- *The network of nodes checks the user's credentials, then validate the transaction via a consensus process using known algorithms.*
- *Once verified, the transaction is then combined with other transactions to create a new block of data on the shared ledger. A verified transaction can include cryptocurrency, contracts, securities, or other data.*

11. Blockchain.com, 2022 and own research.

- *The new block is then added to the existing blockchain, eventually becoming permanent and immutable. The transfer is now completed.*
- *As soon as the transaction is finalized the properties of the asset transferred are updated to reflect the cryptographic credentials of User B. The proceeds and assets are safekept almost instantaneously in each investor's personal wallet, and accessible via their private key.*

Since the private key is all that is required to confirm a transaction on a decentralized exchange, it is of paramount importance to keep it safe from cyber vulnerabilities. This is particularly important for some types of DLT where transactions are irreversible and asset recovery in case of theft is extremely difficult. This is where an opportunity emerges for custodian to offer institutional security in managing, and secure storage of these private keys on behalf of the clients who lack the technical know-how to do so themselves. Global custodians could indeed partner with insurance companies to evaluate and protect crypto-assets, and leverage their existing client relationships, branding, and network to become a one-stop shop to store all asset classes - traditional as well as digital. However, this opportunity will not materialize without avoiding certain pitfalls.


70.111
20.556
31.012
48.991
31.012
12.002

4.

NAVIGATING UNCHARTED WATERS

The idea behind the fact that a unique ledger shared between all market participants can constitutes the immutable and immediate accounting record of any transaction done within the network, introduces a lot of benefits. But it also introduces a fair amount of – new – risks as well.

First, unlike traditional custody, digital custody's main challenge is essentially maintaining the asset holder's private key. This means that cryptography and IT security in the broad sense, is becoming central to the custodial industry. Any mishandling of the private keys, or any vulnerabilities in the DLT can translate into funds wired or assets transferred to the wrong location, with few or no recourse. Nowadays, the most common technologies used to secure private keys are called multi-signature ("multi-sig") and multi-party computation (MPC). The former is a digital signing process which was invented specifically to deal with Bitcoin, and which enables two or more users to sign transactions as a group, thereby preventing anyone with access to the private key from accessing the crypto-assets associated with that key. The latter is a more recent technology which has quickly become the new industry standard for private key security, as it simplifies operational handling and allows distribution to other blockchains as well. Both technologies dilute the single point of failure that can exist since the private key is never stored on a single device at any point in time, which discourages any attempts at hacking.

In parallel, the choice between "cold storage" (if the user's wallet is offline, such as a hard drive or a USB flash drive) and "hot storage" (if the user's wallet is online) is crucial in terms of security and day-to-day management of digital assets. In cold storage systems, the private key share is usually not connected to the internet, which potentially reduces online hacks which is a factor many investors are concerned of. Unfortunately, it also means it is slower as a human intervention is needed to scan QR codes, handle private keys and run maintenance jobs, and thus subject to human errors. In hot storage systems, the user's pri-vate key is safekept online and thus benefits from ease-of-use, configurability, and scale, but suffers from increased vulnerability to hackers. The choice between these two systems ultima-tely depends on the use-case.

A second challenge is the shortening of the settlement cycle. Where a normal transaction between two market participants using SWIFT network usually takes 2 to 3 business days to settle, transactions on the blockchain happen almost immediately. This is indeed a challenge

because during these 2 or 3 business days, an analyst or back-office employee could double-check the transaction and would have the time to reverse it if need be. As the settlement cycle shorten, this is no longer possible, and as such operational risk increases. On the one hand, clearers such as DTCC argue that the shortened cycle would reduce market risk and margin requirements, which will allow investors to put this freed collateral to work. On the other hand, the netting activity performed by the clearing house disappears in a decentralized system, which can have harmful consequences: real-time gross settlement of digital assets would indeed require that each transaction on a DLT platform be prefunded on an unsecured basis, which could limit market liquidity and risk-mitigating benefits of today's netting mechanism. Moreover, as transactions netting disappear, the number of transactions in the exchange will increase, along with the need for a real-time reconciliation process and the probability of potential transaction failures.

A third challenge is the programmability of the DLT which allows the automation of certain tasks. For instance, automated tools (including smart contracts) can facilitate, execute, or enforce certain parts of an agreement based on predefined rules. DLT indeed allows information to be embedded in the ledger, permitting the self-execution of instructions. The elimination of human intervention in general and the automation of contract terms in particular, could improve efficiency by reducing the probability of human error, increasing speed of execution, and simplifying back-office processes, but these tools are not immune to malicious or defective code. In that case the integrity of the data on the ledger could be questioned, with all the unpleasant consequences that it entails. Moreover, simultaneous auto-mated execution of interdependent contracts could potentially cause the same kind of adverse and unpredictable patterns in the market as rogue algorithm trading have in the past.

The adoption rate is yet another challenge. As clients may combine the needs for both traditional safekeeping of their assets and direct digital access to the DLT systems via APIs, the future of custody will require the coexistence of both legacy and new applications. Digital custody will need to be managed alongside traditional custody to offer a seamless client experience. Typically, as organisations grow, so do their layers of legacy systems, and a migration to a dual-architecture able to cope simultaneously with existing and future technologies will neither be cheap nor easy. Custodians will need to provide customer asset protection, position management and record keeping no matter the state of the technology. Nevertheless, the current architecture will need to be adapted: current models are indeed constructed around a bilateral only structure, whereas future digital models have the inherent capability to be both multilateral and decentralized. Today, a lag already exists between asset managers who want to trade digital assets, and back offices that are struggling to be operationally ready.

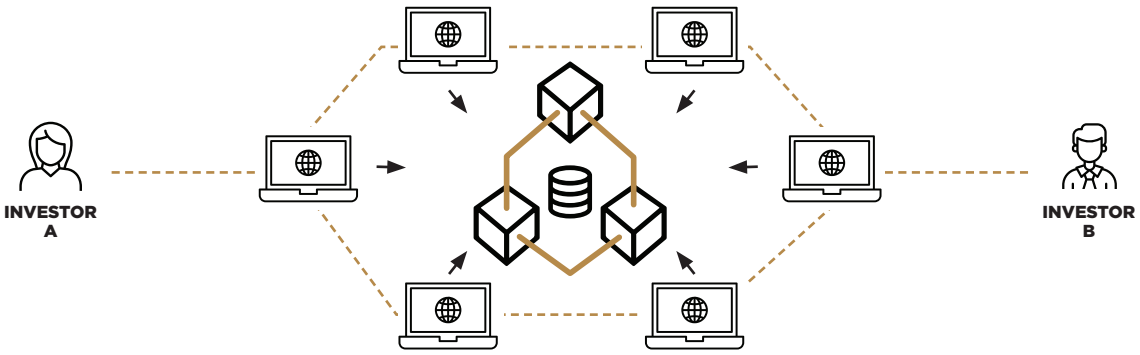
A few large corporations are embracing these challenges, though. For example, BNY Mellon, one of the world's largest custodians, is working on offering crypto custody by developing a digital asset custody platform. Other actors, such as VISA, are trying to bridge the digital assets world by developing crypto API services[12].

12. VISA, 2022.

Figure 3. Example of a traditional market infrastructure[13]

- *Multiple intermediaries are involved to transfer actual value between two counterparties. This means additional costs as each intermediary commands a processing fee.*
- *Each intermediary must maintain its own records on its own database to facilitate the transfer of assets and build trust*
- *Transaction data is copied, processed, and transferred by each participant's operation department. This creates additional operational risk.*
- *Sharing of operational capacity and data is limited.*

Figure 4. Example of a decentralized market infrastructure[14]



- *A distributed network of computers (nodes) on the blockchain maintain a unique and shared record of the transaction data.*
- *Transaction data is immutable.*
- *Trust is enabled by cryptography and traceability.*
- *Sharing of operational capacity and data is central to the system.*

This interoperability problem will further extend to the jurisdictional specificities between different countries. For example, whereas German regulators recently passed an electronic securities bill allowing digital securities or tokens to be recorded on an electronic ledger thereby enabling digital custody[15], other countries' regulation on the subject might not be as advanced.

13. HSBC, 2020 and own research.
14. Deloitte, 2020 and own research.
15. Ledger Insights, 2020.

What works in one country won't necessarily be transferrable to another.

This leads us to the last but not the least of the challenges, as navigating the new crypto sea means considering its regulatory aspects as well. Indeed, the compliance with requirements such as "Know You Transaction" (KYT), "Know You Customer" (KYC), "Combating the Financing of Terrorism" (CFT) and "Anti-Money Laundering" (AML) will continue to apply. The 5th EU Anti-Money Laundering Directive and the global FATF Guidance for a Risk-Based Approach to Virtual Assets and Virtual Asset Service Providers share a common understanding of the role of a digital custodian, encompassing the creation of an adequate compliance framework granting accountability in the marketplace. This starts with the identification of investors and beneficial owners, for instance. However, in a world of pseudonymised transactions irreversibly and instantaneously settling on a decentralized platform, this means future compliance checks - which are currently a manual and time-consuming process - will need to be reviewed and automated.

The issue is that custodian banks are not necessarily structured to be able to cope with fast-paced technological requirements. In that case it will often be decided to incorporate a new start-up which has already developed the solution to reduce operational costs (see the emergence of RegTech start-ups, for instance). These changes are unlikely to happen overnight and will call for an international regulatory alignment beforehand. These compliance processes are indeed as essential for the security, and the streamlining of tokenization as the development of the technology behind it. Regulators from various countries including China have acknowledged this need and are pushing in the direction of a global governance framework to regulate the emerging tokenized economy. This challenge is daunting, and its complexity further increased by the unregulated status of third-party intermediaries dealing with crypto-assets, which makes the operating environment ambiguous for traditional financial institutions. The European MiCAR regulation is certainly a step in the right direction[16]. A commonality of rules and standards, given this fragmented ecosystem made of different type of actors, different protocols and different technologies is indeed needed in order to navigate these unchartered waters safely.

16. For more details on MiCAR regulation and its implications, see Tang, A. (2022). *Regulatory Challenge of Cryp-to-assets in the EU (MiCAR).*

5.

USE CASES IN PERE INDUSTRY

The various benefits of tokenization advertised in this article have caught the attention of a sector which is known for its complexity, inefficiency, lack of transparency and long settlement cycle, i.e. the private equity and real estate industry.

Saying that the PERE industry is an inefficient industry is an understatement. An obscure network of brokers, accountants, legal counsel, and intermediaries, each one using its own siloed infrastructure and information system, is the definition of "multiple points of failure". In this framework the automation and programmability of the DLT could be used to overcome the hurdles of an industry plagued by inefficiencies, inaccuracies, and data duplications. The obvious goal is to improve and accelerate processes while reducing operational and administrative costs. Rather than using intermediaries to perform basic tasks such as payment processing, client reporting or proxy voting, these would all be retrieved by token-owners on a DLT platform.

A specific use case in the real estate industry is its use of non-fungible tokens (NFTs) to authenticate ownership of a property. Today, deeds which need to be drafted by notaries, verified by lawyers, and sometimes amended by insurance companies are used to represent real estate ownership. Tomorrow, NFTs could be used to make this process more straightforward by bypassing these intermediaries since DLT technology is able to verify ownership and settle transactions altogether. The technology has already been developed by Propy for instance, and some properties have already been sold as NFT in the US.

Another area which is ripe for disruption by DLT automation is the transfer and signature of shares certificates, which is currently done manually. On a DLT, there is indeed no need for a manual signature, or a client call-back to perform identity checks, and AML/KYC procedures. On a DLT, the investor would only need to upload his/her credentials and created his/her on-chain identity, which would grant him/her access to a secured online interface to initiate and settle the transaction. On the company side, tokenization and the automated treatment of deal data could no doubt facilitate the screening of opportunities for their portfolios. VC firms have understood this and has begun the tokenization of their funds in 2018 to increase access to capital and streamline the communication between GPs and LPs.

A second advantage is the improved liquidity of tokenized assets. Real estate and private equity are notoriously illiquid investments with long lock-up periods and inputs from various interme-

diaries. These niche investments are typically marketed to a small circle of high-net worth individuals with a long-term horizon. Tokenization disrupts this market by allowing these assets to be fractionalized and distributed globally on a digital platform. This increases the liquidity, reduces the barrier to entry and gives access to a broader range of opportunities to retail investors who previously lack the necessary capital for this asset class. For private issuers and SMEs, this would translate into a higher probability of hitting their fundraising target as they access a much larger investor pool and a lower issuing cost. Many technology companies such as Telegram or Hyundai Digital Asset Company have already raised funds this way by offering tokens in Initial Coin Offering (ICO). Additionally, real estate-backed ICO could enable companies to issue digital tokens backed by real estate and sell them to investors wishing to invest in this sector. This tokenization can increase the liquidity of real estate investment and their ease of access in a similar fashion as REITs.

Lastly, using a DLT to store the data related to a fund or a deal could help increase the transparency of the industry. Today, investment updates and other relevant company information are manually provided by the PERE fund upon investor's request, which takes time and resources. Tomorrow, investors will have access to real-time information on the DLT and will be able to act accordingly without delay. Moreover, as the data is encrypted, this is a much safer way to share information to LPs.

Tokens will enable PERE funds to improve their value chain by creating more transparent, responsive, and accessible products by improving and streamlining operations in the back- and middle-offices.

6.

THE ROAD AHEAD

Over the past few decades, the financial industry has proven its ability to adapt to new trends and customer needs. However, few eras have tested its ability to adapt to customer demands like the one we are experiencing now. As the market continues to evolve, custody seems to be the common anchor on which other use cases in the field of crypto asset servicing can be gradually built by financial institutions and blockchain pioneers. Custodians are positioning themselves as regulated entities specializing in both the custody of traditional and digital assets.

In order to continue to provide their services in an ever-evolving field, custodians must invest heavily in their technology infrastructure, build links with the various public and private DLT platforms, and intensively leverage their network capacity. This technological evolution is a prerequisite for the development of "smart tools" that streamline and accelerate operational processes and exceptions management. This will allow custodians to remain relevant to customers by offering better service quality at lower cost.

This necessary technological evolution also requires an evolution of the business model. The current asset-centric model will have to be augmented by a more data-centric, open platform approach in which the custodian will provide access to a range of optional services, effectively becoming a hub for custodial services and data management solutions. In the future it is indeed likely that this data and its processing will generate the most value for custodians. That is the reason why custodians need to develop new platforms, build new partnerships, and aggregate data from multiple sources in order to adequately meet the new needs of their clients.

In the end, clients will continue to expect improvements in the delivery of core custody capabilities alongside the provision of additional optional services linked to their crypto-assets. In order to improve their service proposition and customize their user experience with regards to settlement, corporate actions, tax and reporting services, custodians will need to combine various elements.

The first element is the broadening of the asset classes to be custodied. Retail and institutional investors will continue to adjust the asset mix in their portfolio to chase higher yields, comply with new regulations or adapt to new investment constraints. Custodians will play a critical part in ensuring that traditional assets as well as new less-standardized crypto assets are safekept and accessible to clients in a secure and cost-effective way. The existing custody landscape will be

transformed both by investors' recent appetite for new classes of assets and by new service offerings driven by technological innovation.

The second element is linked to the way custodians deliver and price their services and provide insightful information to their clients. In a world of decreasing processing time and increasing asset mobility, custodians will be more and more required to provide self-service tools with unbundled pricing. At the same time, institutional investors will want real-time bespoke solutions that give them greater visibility and transparency across the value chain.

The third element is the evolution towards a new data-centric model. By becoming data aggregators on their own platforms, custodians will be able to provide clients with deeper insights resulting in operational and strategic advantages. However supplying bespoke insightful and real-time data sourced from third-party providers as well as internal databases to clients via multiple channels will be an additional challenge.

The last element is access. Custodians must ensure their clients can access and operate securely in every market on a worldwide scale, all the time. This is especially true for digital assets which can be traded on a 24/7 basis. This means that the infrastructure and local expertise will need to be build, enhanced, and extensively utilized. A rapidly changing macroeconomic environment requires institutions and investors to quickly shift their focus and take decisions. Custodians can bridge the gap between local and global by providing transparency, real-time data, global access via multi-channels infrastructure and ensuring a seamless supply of custody-enabled services.

With these different elements in mind, a 2018 McKinsey study estimates that two new types of custodians will emerge: ecosystem orchestrators and data powerhouses[17].

Ecosystem orchestrators leverage technology and partnerships with fintech companies to supply core custody, fund administration as well as a variety of new services to clients in an open-platform approach. Ecosystem orchestrators meet the expectations of institutional investors who need a growing range of services but value the security of conventional custody infrastructure. As new clients' requests are expected, and asset managers need to cope with additional operational risks, there is indeed a need for a comprehensive data aggregator that is able to provide both behavioural information and technical insights on transactions, risk, collateral or liquidity management, regulatory reporting, tax and cost analysis. In that framework, it seems that an ecosystem orchestrator could strive by acting as a single point of contact in this constellation of services and tending the needs of the clients in a holistic manner. The key value proposition of this type of custodian is essentially its profound understanding of its clients and its ability to provide them with value-added solutions integrated into their own value chain.

The second new type of custodians is a data and analytics powerhouse that aims at generating significant revenue streams from insights on markets, investor's behaviour, risk analytics and

16. McKinsey & Company, 2018.

regulation. As data is considered as a strategic priority, the focus for this custodian is data collection, data processing and its conversion into insightful client-centric information. Where conventional static data are already provided by classical "utility-like" custodians, the data powerhouse will succeed by being able to extract and process data in real-time, thanks to a range of powerful tools and DLT infrastructure. Clearly, this positioning will require truly differentiating data usage and advanced analytics capabilities to create intellectual property that can be monetized at scale. Nonetheless, as this model is expected to earn high revenues and margins, it is already attracting competitors, such as banks, and stock exchanges participants, who might start an arms race in information and DLT technology.

7.

CONCLUSION

To date, custodians have always been able to adapt to client demand for new services and capabilities as existing products mature and become commoditized, but no change has shaken up this industry as radically as the one initiated by DLT technology and the crypto-asset craze.

The promise of a more efficient market, characterized by peer-to-peer trading, instant settlement, and increased automation within a decentralized structure is indeed appealing to retail and institutional investors alike. However, it also fundamentally calls into question the role of custodians in this new ecosystem and requires an evolution from the traditional intermediated asset-centric business model to a more disintermediated and data-centric one.

The emergence of innovative models proposed by non-financial new entrants is already contributing to this paradigm shift, but also raises the question of the legal and regulatory framework in this new market. There are still a number of regulatory, technical, and operational challenges to overcome if we are to create a healthy and secure DLT environment for the exchange of security tokens.

The establishment of partnerships with local subject matter experts and sub-custodians is one possible way to meet the new needs of customers and get to market quickly without de-tracting from core business priorities. This would give custodians the time needed to adapt their business model, update the value chain while controlling the new risks. Building competence and gaining stakeholder's trust in this process is likely to be done gradually through early proof-of-concept engagements. Custody can no longer simply evolve - it must upgrade - to remain relevant to clients over the long term.

8.

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