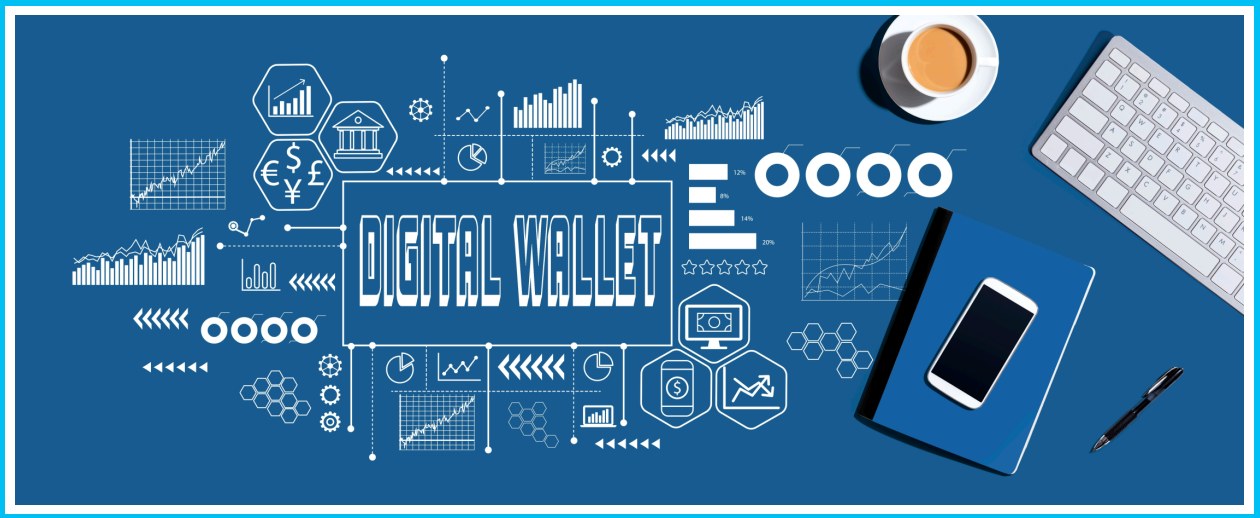
Future of Finance

DIGITAL ASSET CUSTODY: THE FUTURE LOOKS LIKE THE PAST



BY FUTURE OF FINANCE

ISSUE 1

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1.0 Introduction

The Institutional Digital Asset Custody Guide (DACG) is produced by the Future of Finance team that has monitored the market in custody services for digital assets and developments in institutional blockchain technology for several years.

Members of the team benefit from long exposure to the conventional global custody industry, including the creation and management of the leading media brand and surveys in the field.

This inaugural issue of the DACG is not a one-off. It is merely the first of a series of regular reports on developments in the digital asset custody markets. The reports will not be confined to cryptocurrencies or utility tokens or Non-Fungible Tokens (NFTs) or security tokens but cover the safekeeping of all varieties of ***digital asset.***

While cryptocurrencies continue to make up the bulk of the measurable value of digital assets, we are confident the future will be very different, as mainstream financial securities such as debt are tokenised and entirely new classes of digital assets are conceived and launched.

The *custodian of the future* will need to be able to handle crypto, securities tokens and other digital assets, as well as traditional securities and other assets. Most crypto custodians can only handle crypto. Most mainstream custodians do not handle crypto or if they do handle it in a siloed fashion. A senior official at the European Investment Banks (EIB), the biggest digital bond issuer to date, is reported to say that a key constraint has been the lack of mainstream custodians that support digital assets.

What we expect to track over time is the evolution of digital asset custody into a service that looks a lot like the traditional model of global custody in terms of roles, distribution and structure. This evolution is already in train.

The short but eventful history of blockchain technologies has tested to destruction the idea that a financial market can operate without intermediaries, let alone an institutional one. Which is why we believe the intermediation of the past will survive into the future.
But the persistence of intermediation is not the only reason why the present resembles the past. Institutions also want to outsource complex and evolving activities such as custody, because maintaining the service in-house adds no value to the business.

Major pension plans have long since outsourced global custody to banks, and the last ten years have seen the last holdouts in the funds industry follow their example. Institutions will not want to handle digital asset custody in-house. They will look to the major global custodian banks to safekeep and service their digital assets for them.

The DACG will monitor that transition as it happens. Published on a quarterly basis, the Guide will monitor the types of service providers, the regulation of digital asset custody, how digital assets are held securely and the scope of the services provided. Every report will focus on a topical or otherwise important issues in more detail.

The information published in the DACG will be based on a continually updated database of providers of digital asset custody services. Its initial incarnation is based on a survey distributed to more than 100 service providers, which attracted more than 20 responses to 44 separate questions, coupled with information on other providers drawn from publicly available sources. Selected data from the database is published at www.futureoffinance.biz, alongside information from public source about a further 81 providers to coincide with publication of this inaugural DACG. The database will be refreshed frequently, and the number of data points expanded.

The results from the Survey by individual provider can be found here.

The database as it stands today is just the starting point. We intend to enrich and refine it over time, through constant interaction with service providers - and, importantly, their customers - both face-to-face and through survey questionnaires.

Although in designing the DACG we have had the benefit of drawing on the work of others this is different: that is chiefly because we have approached the subject from a custody rather than a cryptocurrency perspective drawing on our experience of the traditional custody.

That experience also enables us to make a prediction. Just as the traditional custody industry evolved into its present oligopoly over a period of decades, so will the 100-plus digital asset custody service providers of today gradually consolidate into a much smaller number of custody giants, combined with technology firms and true specialists (the leading firms in the equivalent of DeFI in 15 years' time). We are already seeing evidence of consolidation.

We trust you will find value in the information we have managed to discover and analyse so far. We also hope that you will join us on our journey into the future of digital asset custody, even as it becomes more like the past, chiefly because you want your firm to still be there when we reach our destination.

Piers Cardew
Head of Research

2.0 Summary

The DACG will monitor developments in the digital asset custody markets, including asset types, service providers, regulation and scope of services, and publish reports quarterly.

Events in the cryptocurrency markets have exposed shortcomings in the model of digital asset custody developed to safekeep cryptocurrencies and the assets produced and used by DeFi protocols.

Although independent digital asset custodians have performed well, inadequacies in the model include lack of segregation of customer assets and opaque management structures.

This has prompted investors active in the cryptocurrency markets to encourage regulated banks to provide digital asset custody services. Numerous banks have responded to the call.

Banks, which now make up nearly half of digital asset custodians monitored by Future of Finance, were previously deterred by the small size and high risks of cryptocurrencies but see asset managers and asset owners investing in tokenised assets (as opposed to cryptocurrencies) as an opportunity.

Cryptocurrencies will remain a minority interest for asset managers, institutional investors and bank-owned digital asset custodians.

Though the market in tokenised assets remains tiny, it is the tokenisation of securities that excites asset managers and owners as a source of enhanced efficiency and higher and uncorrelated returns, including from funds and bonds as well as privately managed and physical assets.

To support asset managers and owners investing in digital assets, banks are investing in digital asset custody capabilities. Digital asset custodians that developed their original business in the cryptocurrency markets are also adapting their services to institutional needs.

Dual listing and settlement arrangements, in which the same securities are issued, traded and settled in both digital and conventional form, may prove a valuable transition mechanism to a fully tokenised future, since both digital and non-digital assets can be held in the same custody account.

Tokenisation needs the largest sources of capital - “real money” institutional investors - to engage with digital assets if the market is to attain size and scale.

Institutional investors will insist on entrusting the operational complexities of investing in digital assets to regulated custodian banks, partly because they prefer to outsource such specialist work, but also because regulation (notably in the United States) insists that they should.

Non-bank digital asset custodians, of the kind that developed to service investors in the cryptocurrency markets, will struggle to meet the requirements regulators impose on the custodians to the largest institutional investors and global asset managers.

However, banks intending to offer digital asset custody services to institutional investors and global asset managers recognise they must acquire capabilities beyond traditional custody services such as settling transactions and safekeeping and servicing assets.

The new capabilities include “staking,” collateralised lending and “prime brokerage” services pioneered in the cryptocurrency markets as well as basic service requirements such as “atomic” settlement and “air drop” management.

The new services spawned by the cryptocurrency markets also oblige digital asset custodians to master new technologies such as HSM, Multisig and MPC, and pursue new policies and procedures, all designed to protect the “private keys” essential to ownership of digital assets.

The digital asset custodians that have emerged from the cryptocurrency markets have sought to compensate for their lack of capital and fully regulated status by obtaining external certifications (such as those offered by SOC, ISAE and ISO standards) and insuring client assets against loss.

These capabilities can be developed by banks in-house, but they are also choosing to purchase them from specialist technology vendors or by acquisition.

Custodians that emerged from the cryptocurrency markets are also re-positioning themselves to adapt to the heightened scrutiny of institutional money.

They have the obverse of the challenge facing regulated banks. In the cryptocurrency markets, custody developed in isolation from the traditional custody industry, because institutional investors were not fully engaged with cryptocurrencies, relieving banks of the need to develop services.

Some digital asset custodians have now failed or withdrawn from the market, but digital asset custody continues to attract new entrants, notably from traditional exchanges.

Today, the digital asset custody market has five types of provider: technology vendors, bank custodians, non-bank custodians, bank-owned hybrid providers and non-bank own hybrid providers.

Which of these types of institutions will succeed in providing digital asset custody services to the large pools of institutional money now interested in investing in digital assets will be decided over the next few years.

Data on asset in custody is too limited and fragmented to decide definitively which type of digital custodian has the competitive edge, but the evidence that is available suggests that regulated independent, third-party custodians have the advantage.

The model of digital asset custody developed by the cryptocurrency markets is declining. The mode of custody developed in the conventional capital markets is rising, and being applied to digital assets. That is why the future is becoming like the past.

3.0 The digital asset custody model has performed very well … until now

The original digital asset custody model has performed remarkably well over time and through the crypto winter …. But Prime Trust is a black eye

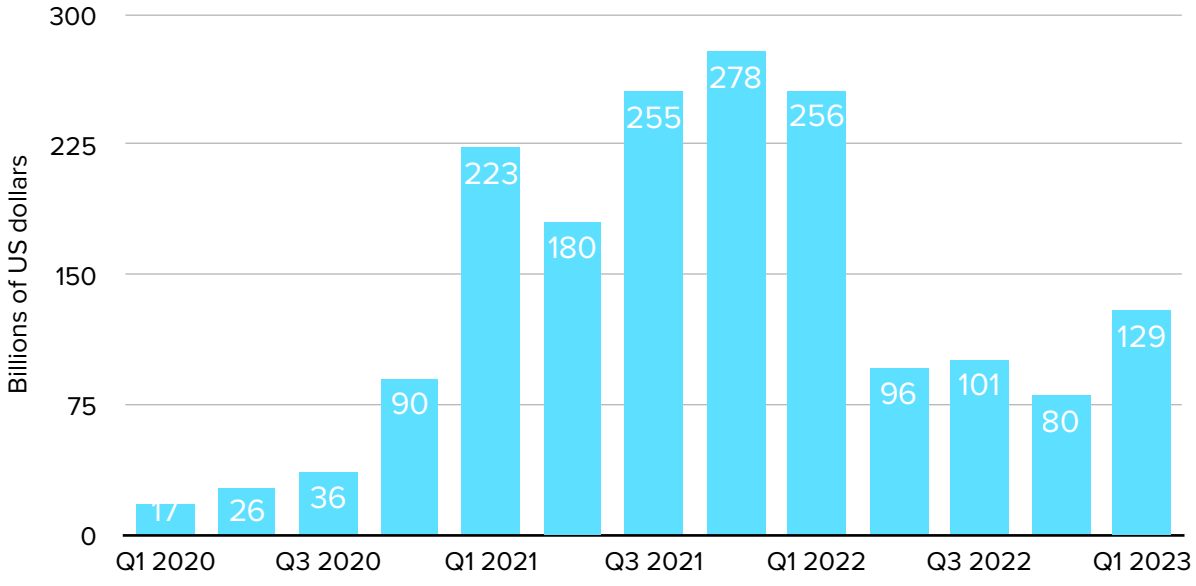
The cryptocurrency markets, in which the demand for digital asset custody first arose, have since November 2021 undergone substantial shrinkage.

The market capitalisation of the cryptocurrency market has declined from a peak of US$2.9 trillion in November 2021 to less than US$1.2 trillion in July 2023. This has greatly reduced the value of Assets under Custody (AuC) with the pioneering digital asset custodians.

The decline is well illustrated by the AuC recorded by the biggest of them, the Coinbase centralised cryptocurrency exchange (see Chart 1).

Chart 1

Customer Assets in Custody at Coinbase



Source: Coinbase Form 10Qs

Importantly, the series of failures which have accompanied and propelled the shrinkage in the value of the cryptocurrency markets, culminating in the collapse of the FTX cryptocurrency exchange in November 2022, have exposed the flaws in the existing model of digital asset custody.

Most of the unregulated and opaque exchanges on which cryptocurrencies traded, and where investors custodies their assets, often failed to segregate customer assets adequately. In seeking to recover their assets from the failed FTX, investors found they ranked alongside ordinary creditors.

"Staking," in which investors pledged cryptocurrency holdings to earn income from validating transactions on blockchain, turned out to expose holders to price volatility, liquidity and operational risks more commonly associated with venture capital investing.

Decentralised Autonomous Organisations (DAOs) turned out not to be owner democracies but oligarchic arrangements in which small groups of influential actors decided the direction of the code and the venture.

The unregulated, non-bank Stablecoins that fulfilled the role of payment device in the cryptocurrency markets turned out to be less than stable.

Even the USDC Stablecoin, whose management and transparency contrasted well with that of the larger Tether Stablecoin, would have failed if the United States government had not chosen to bail out the Silicon Valley Bank (SVB) where it held cash deposits.[1]

Throughout most of the unfolding crisis, independent digital asset custodians performed their primary duty well: customer assets were not lost.

However, this changed with the pattern of events that followed the news in June 2023 that the digital wallet provider BitGo would acquire the parent company of the Nevada-based retail trust company, Prime Trust.

When the acquisition was terminated two weeks later, it emerged that the Nevada Financial Institutions Division was placing Prime Trust into receivership and had ordered the firm to halt all deposits and withdrawals of assets in custody.[2] According to the court filing of the petition, Prime owed US$85,670,000 to its customers in fiat currency but possessed only US$2,904,000 – a gap of US$82,766,000 - and further that it owed customers US$69,509,000 in digital currency but possessed only $68,648,000. [3]

And Prime Trust was a regulated trust company, albeit based in Las Vegas. The irony is that Prime behaved as many mainstream banks have in the past – hiding a loss and trying to grow out of it. Though it had a crypto twist of inaccessible wallets as its origin.

Until this episode became public, no independent digital asset custodian had failed in its primary duty of protecting client assets. For example, despite wider troubles, Gemini, a trust company regulated by the New York Department of Financial Services (NYDFS) in the United States and the Financial Conduct Authority (FCA) in the United Kingdom, did not experience problems in its separate custody vehicle.

Nor did Genesis, which is also registered with the FCA and possesses a broker-dealer licence from the National Association of Securities Dealers Automated Quotations (NASDAQ).

However, it is significant that Genesis has agreed to outsource its institutional custody services to BitGo NY Trust Company LLC, a ten-year-old custody business which is licensed not only by the NYDFS but the Swiss Financial Market Supervisory Authority (FINMA) and the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) in Germany.

Behind such decisions lies an awareness of a worldwide push to regulate the cryptocurrency markets, most visibly in the United States.[4] But its focus is mainly to protect retail investors. In the institutional markets for cryptocurrency investment, asset managers are choosing to protect themselves. They have intensified their search for solid digital asset custodians capable of reassuring their clients that their assets are safe.

4.0 Banks enter the digital asset custody market

Naturally, security and stability are found most easily in the traditional banking sector, and bank-owned custodians are accelerating the development of digital asset custody services to satisfy asset managers' demands. Future of Finance research has so far identified 43 banks or bank subsidiaries offering digital asset custody services, including several Systemically Important Financial Institutions (SIFIs).

Table 1

New Entrants to the Digital Asset Custody Market

Name	Type	Year of entry
Caisse des Dépôts et Consignations (CDC)	Public sector bank	2021
Kookmin Bank (KODA)	Bank	2021
VP Bank	Private bank	2021
(Zodia)	Global custodian bank(s)	2021
Banque Delubac & Cie	Private bank	2022
BNY Mellon	Global custodian bank	2022
Citi	Bank	2022
Commerzbank	Bank	2022
Custodiex	Digital asset custodian	2022
GMEX	Technology vendor	2022
Hypothekarbank Lenzburg AG	Savings bank	2022
Liminal	Self-custody wallet provider	2022
Safe (formerly Gnosis Safe)	Digital asset custodian	2022
Société Générale – FORGE	Bank	2022
State Street	Global custodian bank	2022
Tetra Trust	Canadian Trust Bank	2022
AXA Investment Managers	Asset manager	2023
CACEIS	Global custodian bank	2023
CBOE Clear Digital	Central counterparty	2023
Ceffu	Digital asset platform	2023
Deka Bank	Custodian to Sparkassen	2023
Deutsche Bank	Global custodian bank	2023
DWP	Transaction bank	2023
DZ Bank	Custodian to Volksbanken and Raiffeisenbanken	2023

Source: Future of Finance Research

The number of digital asset custodians in the ***Future of Finance*** database grew from 88 in 2022 to 102 in 2023, a sizeable increase despite the withdrawal of 13 firms from the marketplace. The new entrants were mainly banks as Table 1 makes clear.
This marks a change of strategy by banks, which spurned repeated efforts to develop cryptocurrency custody services from at least 2016, even as major asset and wealth managers invested in cryptocurrencies.

The reluctance of the banks to get involved is understandable. Even at their near-US$3 trillion peak, the cryptocurrency markets were tiny by comparison with the assets under management (AuM) of the ten largest global asset managers and the AuC of the ten largest global custodians of traditional securities(see Table 2).

Table 2

The Top Ten;
Global Asset Managers and
Global Custodians (Traditional Securities)

Asset Managers	AuM	Global Custodians	AuC
BlackRock	US$ 9.1 trillion	BNY Mellon	US$ 46.6 trillion
Vanguard	US$ 8.1 trillion	State Street	US$ 37.6 trillion
Fidelity	US$ 3.9 trillion	J.P. Morgan	US$ 28.6 trillion
Capital Group	US$ 2.2 trillion	Citi	US$ 27.1 trillion
Amundi	US$ 2.0 trillion	Northern Trust	US$ 14.2 trillion
PIMCO	US$ 1.7 trillion	BNP Paribas	US$ 12.4 trillion
Invesco	US$ $1.5 trillion	HSBC	US$ 10.8 trillion
Wellington	US$ 1.4 trillion	CACEIS	US$ 5.4 trillion
Franklin Templeton	US$ 1.4 trillion	BBH	US$ 5.4 trillion
T Rowe Price	US$ 1.3 trillion	Société Générale	US$ 4.7 trillion

Source: Annual reports

What has changed for the banks?

The main reasons are:

a) The oldest of all: enough customers are saying they want some type of crypto exposure that it they need to be accommodated and the technology is fairly easily insourced. For many of these customer handling Bitcoin and Ether is enough to build a business (they are 75% of the crypto market).

b) The much, much bigger reason is the belief that DLT based Tokenisation is the future:

Firstly, for assets – stocks, bonds and a whole host of real asset types (Real Estate is the giant) and forms of finance (Trade Finance is the biggest target)

Second is the growing certainty that the future of money is tokenised. This got a huge boost with the now dead Libra project but there seems little doubt that there will be CBDCs in most major markets along with a host of regulated Stablecoins and Tokenised deposits.

Money is a bank's most core activity and it's going to run on DLT rails. Banks will have to spend massively to build digital asset infrastructure : digital asset custody is really just a part of that.

Enabling asset management clients to invest in the major cryptocurrencies, such as Bitcoin and Ether, provides custodian banks with valuable experience of how to safekeep digital assets. The investment is not large, because the technology necessary can be insourced.

Institutional interest in cryptocurrencies is likely to rise, but it is never going to be high. Though cryptocurrency evangelists point constantly to "institutional" engagement with cryptocurrencies, the truth is that *their definition of "institutional" really refers to small groups of cryptocurrency-oriented hedge funds, wealth managers servicing high net worth individuals interested in cryptocurrency investing and family offices that do not have to answer to external investors.* Bar a few genuine institutional investors such as Temasek, the Ontario Teachers' Pension Plan, the Harvard and Yale endowments.

Recent applications by leading asset managers to register Bitcoin exchange-traded funds (ETFs) do not represent a reversal of this indifference. For example, Fidelity an ETF applicant, has a thriving digital asset trading facility and custody trust company with licenses from both the NYDFS and the FCA. Fidelity deals in precisely two cryptocurrencies: Bitcoin and Ether.

EDX, the cryptocurrency exchange founded by Fidelity in conjunction with Charles Schwab, Citadel Securities, Fidelity Digital Assets, Paradigm, Sequoia Capital, and Virtu Financial, will not deal in many more: Bitcoin, Ether, Litecoin and Bitcoin Cash.

In other words, the appetite of major global asset managers for cryptocurrency is narrow as well as small. It is the longer-term opportunity that matters to them – and therefore to the banks that service them.

Larry Fink, chief executive officer (CEO) of the largest global asset manager, has said as much. "I believe the next generation for markets, the next generation for securities, will be tokenisation of securities," he told a 2022 conference. "Think about instantaneous settlement [of] bonds and stocks, no middlemen, we're going to bring down fees even more dramatically." [5]

In his annual letter to shareholders in the second quarter of 2023, Fink reiterated this point. "Tokenisation of asset classes offers the prospect of driving efficiencies in capital markets, shortening value chains, and improving cost and access for investors," he wrote. "At BlackRock we continue to explore the digital assets ecosystem, especially areas most relevant to our clients such as permissioned blockchains and tokenisation of stocks and bonds."[6]

An interview with Alexandre Kech, Head of Digital Securities at SDX

SDX is betting on openness to accelerate the adoption of tokenised assets

SDX, the exchange for digital assets built and operated by Swiss stock exchange SIX, is working to accelerate the tokenisation of financial assets in Switzerland and Singapore, two locations whose legal and regulatory environments are accommodating of the new method of raising capital. Interestingly, the future of the digital securities industry is an open one that looks to embrace competitors as well as issuers and investors as the company builds a network of networks of tokenisation platforms and their users. Dominic Hobson, co-founder of Future of Finance, spoke about the SDX strategy with Alexandre Kech, who took up the post of Head of Digital Securities at SDX in November 2022.

Key insights from this interview

- Tokenisation will take five to 15 years to achieve substantial scale, advancing through the growth of a parallel native digital asset industry alongside the traditional securities industry, with financial market infrastructures providing inter-operability between blockchain protocols and between blockchain protocols and traditional securities markets.

- Tokenised asset markets will develop through inter-operability between tokenisation platforms owned and operated by exchanges, banks and non-bank organisations, thanks partly to the adoption of new and established data standards, but also through the provision of inter-operability services such as repo and reverse repo funding for atomic settlement.

- The earliest issuers will be small and medium-sized, privately owned companies that benefit from a more up-to-date register of owners, easier transfers of ownership, the option to use their tokenised equity as collateral for borrowings and the enhanced ability to raise capital from third-party investors, including as part of preparations for an IPO.

- Established capital markets intermediaries such as CSDs and custodian banks will survive because they are trusted by the institutional issuers and investors that alone can bring scale to the tokenisation markets and are valued by regulators as the entities that can implement regulations and make investors whole in the event of losses.

- The development of secondary markets in tokens will be aided by the adaptation to the regulated institutional markets of the automated market making (AMM) and token borrowing and lending services pioneered in the Decentralised Finance (DeFi) markets, but also by the adaptation to the token markets of conventional market-making services.

- The Swiss central bank is working with SIX Group, specifically with SDX and SIS, to use central bank digital currency (CBDC) to settle real transactions with genuine counterparties in digital assets and to embed the wCBDC as the central bank money foundation of a new order of digital money that embraces tokenised deposits as the primary form of commercial bank money.

- The difficulties in the cryptocurrency markets since 2021 have increased institutional interest in regulated digital asset markets.

Watch the full interview here

Read the full transcript here

For more information go to www.sdx.com

5.0 Tokenisation is coming

Image Source: Zeeve

Despite such enthusiastic endorsement from the CEO of the largest asset manager in the world, the value of tokenised assets remains trivial.

There is frustration in the digital asset industry with the length of time it is taking to get a breakthrough, despite numerous experiments and ventures, many involving major financial institutions.

Banks, including global custodian banks, have built tokenisation engines to accommodate clients interested in issuing tokens, which rival those offered by the new breed of token exchanges that have emerged, notably in Singapore (where there are no less than seven), Switzerland and the United States.

In addition, policymakers and regulators in multiple jurisdictions around the world are rewriting securities laws and rules to accommodate token issuance, trading and settlement on regulated markets. Singapore, Switzerland, Germany and Luxembourg have all made legal and regulatory changes to accommodate tokens.

In the United States, the Securities and Exchange Commission (SEC) has given provisional approval for a National Market Exchange for security tokens. The American central securities depository (CSD), the Depository Trust and Clearing Corporation (DTCC), is exploring how to make issues on public blockchains eligible for settlement at the DTCC. The DTCC is also building an infrastructure to accommodate the tokenisation of privately managed assets.[7]

Importantly, privately managed assets are a field in which the infrastructure is not well-developed. Although in principle any asset can be tokenised, the first asset classes to be transformed are expected to be those with inefficient and expensive issuance, trading and record-keeping processes and poor liquidity, chiefly because they are not yet even securitised.

Real estate, an intrinsically illiquid asset class, is of course available in securitised form already via real estate investment trusts (REITs) and indirectly via public property companies, but tokenisation promises to improve the liquidity of the asset class. This is significant because real estate is (see Table 3) the most valuable asset class of all.

Other physical assets, such as infrastructure, are candidates for tokenisation too. Niche markets in uncorrelated asset classes such as fine art and fine wine are also being developed already.

Table 3

Asset Classes Available for Tokenisation

Sources: SIFMA, 2022 Capital Markets Fact Book; McKinsey Global Private Markets Review 2023; McKinsey, Reconceiving the global trade finance ecosystem; Investment Company Institute, Worldwide Public Tables

Asset class	Estimated market value
Fixed income	US$126.9 trillion
Equities	US$124.4 trillion
Mutual funds	US$67.9 trillion
Real estate	US$326.5 trillion
Repo	US$12.2 trillion
Privately managed assets	US$11.7 trillion
Trade finance	US$5.2 trillion
Infrastructure	US$3.9 trillion
Collectibles	US$458.2 billion
Precious metals	US$290.2 billion
Fine wine market	US$229.4 billion
Fine art	US$67.8 billion

First Quarter 2023, Total Net Assets Excluding Funds of Funds; International Capital Market Association, European Repo Market Survey Number 44, March 2023; Federal Reserve; Market Decipher; Emergen Research; PwC; Art Basel; Allied Market Research.

Both alternative and mutual funds are judged too have potential for cost savings, and several funds have been tokenised on the Singapore token exchange ADDX.

If shares in a fund or units in a trust are tokenised, it opens up the twin possibilities of wider distribution, increasing liquidity, and of pricing based on secondary market trading rather than principal-based trading. If the underlying assets are tokenised as well, it creates an opportunity to transform all the underlying data flows, delivering massive cost savings.

However, blue chip equities of the kind held by mutual funds are seen as a less urgent case for tokenisation, because issuance, trading and settlement are already relatively efficient.

Bonds, on the other hand, are seen as an early use-case primarily because the primary market processes are inefficient and secondary market liquidity is exceptionally poor in any instrument other than government debt.

The principal source of liquidity in the bond market – namely repo transactions – is also seen as an early use-case for tokenisation, with both Broadridge in the United States and HQLAx, a venture backed by Bank of New York Mellon, BNP Securities Services, Citibank, Clearstream, Euroclear, and J.P. Morgan, providing services already.

Despite its attractions, the bond market is proving hard to change. Embedded legal structures, which date back to the 1960s, and the internal operating systems of market participants are entrenched in market structures and regulations.

That said, a survey of the 20 biggest global bond issuers found half expect to issue tokenised bonds within five years. They also expect tokenisation to become the primary issuance vehicle.

Although the exact size of the tokenised asset markets is unknown, the limited size of the security token markets is a barrier to growth anywhere. They are not large enough to attract issuers, investors, broking and market-making intermediaries or investment banks to structure and distribute new issues.

However, history also shows that new markets can scale quickly. Mortgage-backed securities, money market funds and passive investing were not invented until the 1970s but today they are worth US$12 trillion, US$5 trillion and US$22 trillion respectively. The digital technology used in tokenisation suggests these timetables could be accelerated.

This expectation is reinforced by a growing sense of certainty that the future of money will be tokenised. The June 2019 announcement attempt by the then Facebook (now Meta) to launch a global, muti-currency Stablecoin called Libra, accelerated official work on regulating Stablecoins and the work of central banks on issuing Central Bank Digital Currencies (CBDCs).

There are now at least [90] central banks working on a CBDC around the world.[8] Four central banks – in the Bahamas, the Eastern Caribbean, Nigeria and Jamaica – have now issued a CBDC. More will likely follow in the next five years, solving a major obstacle to rapid tokenisation: the lack of fiat currency in digital form on blockchain networks.

It is now reasonable to suppose that in the major financial markets the current combination of central and commercial bank money will be replaced by a layered structure of digital monies consisting of CBDCs, mostly bank-issued Stablecoins and tokenised deposits, all of which will be regulated.

Since money is a core activity of any bank, and money is expected to run on blockchain-based or blockchain-influenced infrastructures, banks need to build digital asset infrastructures of their own. Digital asset custody is a crucial part of those infrastructures.
True, at least in the short-term, tokenised assets are likely to remain a relatively inconsequential asset class.

However, in all major markets these new instruments are supported by existing or new securities laws and regulations and could grow quickly. Non-traditional custodians must be able to service tokens within existing regulatory frameworks, so they are investing in digital asset custody capabilities.

One solution to this need that is being developed as a short to medium term transition mechanism is for tokenised securities to be made available to investors without independent digital asset custody services by making digital and conventional securities fungible.

It is now understood that securities in particular do not have to be issued either in conventional form or as tokens but can be issued, traded and custodied as both.

For example, SIX, the Swiss stock exchange, has enabled issuers to list bonds on both its traditional exchange and its SDX digital exchange and settle transactions in the bonds in both its conventional CSD and the CSD operated by SDX.

Obviously, the custody of cryptographically based tokens is different from conventional securities. But the dual listing the bonds (with same ISIN) on SIX and SDX means they can be traded by customers without as well as with a digital custody account.

The link that makes it work is that the SIX conventional CSD (SIX-SIS) has become a participant of the SDX digital CSD. So, a conventional security holder settles and holds the digital bond at SIX-SIS while the final settlement process happens at the SDX CSD.

This option is not necessarily unique to SIX. While SIX has built and integrated a digital exchange and CSD within its conventional exchange and CSD, in principle any two exchanges and CSDs could imitate their example.

While the dual listing seems unduly complicated for two ordinary bond issues it is in fact revolutionary and provides a roadmap for what will be a very extended process where conventional and token securities can co-exist.

One of the big constraints on a decisive move to tokenisation is the need to give issuers that want raise capital at the lowest price on a global scale access to investors that are not equipped to invest in digital assets.

The option of issuing a bond in both conventional and digital form solves it by making the instrument available on both a regular exchange (in this case SIX) and a digital native version (on SDX). This enables issuers to reach both types of investors.

The investors can hold tokens through a traditional custody arrangement as well as a digital one. If the transition from the current status quo to a tokenised future is prolonged – and it looks as if it will be – the ability to hold tokens as well as securities through the same custodian will be crucial in attracting institutional money.

6.0 Regulation is a key factor in digital asset custody

We look at how:

- the global arms race by jurisdictions to create sound frameworks and firms to collect "qualified custodian" status
- Institutional money tends to be highly regulated, particularly the bigger pools of money

The headline story about regulation is that it is coming to the crypto custody world. There is a steady tide of entities acquiring rights to operate (and increasingly in multiple markets) and a strong trend among global regulators to establish structure to normalise crypto activities including custody (Germany, HK, MiCa) as these providers try to attain "qualified custodian" status.

There is a lot of confusion around the topic. Financial service regulations are complicated and frequently hard to understand. For people coming from the crypto world, it has been a steep learning curve. The "qualified custodian" label has become a mantra that solves all issues. In reality what different types of investors require for regulatory purposes varies enormously from virtually none for hedge funds for wealthy individuals to extremely high for ERISA governed US pension funds. The starting point is what does each investor type in each market need. What different things mean can be very slippery – registered and licensed can mean very thing different things.

The broader picture is however much more complex and interesting:

- Registered? Licensed? Within the regulatory perimeter?
- What's a qualified custodian?
- What do different investors require?
- What is the SEC doing?
- Country Level review

Registered? Licensed? Within the regulatory perimeter?

There has been a lot of confusion about what different providers are allowed to do, what regulators are actually approving and for whom, and what products are within the regulatory perimeter. This has been compounded by the great variance at a global level about how each country's regulatory system is set up and exactly what each one means by different permissions: and by some

custodians giving the impression their level of permission is wider than it really is and on occasion telling outright lies.

Looking at the **UK** as an example: "Cryptoasset businesses that intend to provide in-scope services while acting in the course of business carried on by them in the United Kingdom must be registered with the FCA before they begin". "In-scope" business must comply with the MLR (Money Laundering, Terrorist Financing and Transfer of Funds (Information on the Payer) Regulations 2017) and refers primarily to Cryptoassets Exchanges or Crypto Custodian Wallet Providers.

This is a much lower threshold of qualification than to be licensed for dealing in specified assets the main areas covered by the FCA (stocks, bonds, Collective Investment vehicles) but has still proven too high for some major firms (like Binance).

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"Registered cryptoassets businesses should be careful to avoid using language that might give the impression that registration is a form of endorsement or recommendation"

Crypto products are unregulated and firms selling them must make this clear whether the firm is licensed or not (e.g., a licensed bank dealing in cryptoassets must make clients aware these are not regulated products or enjoying the related protections even though the firm selling it is a regulated entity).

In the UK there is a clear distinction between Security Tokens (or digital assets) whose requirements are the same as any security or bond in the London market (i.e., a specified investment). That said the FCA still has to approve such securities or trading facilities in that it is satisfied with the elements using cryptography and/or DLT.

An example is Archex, which is a licensed regulated Multilateral Trading Facility to trade security tokens. Archex also separately is a registered Cryptoasset exchange and custodian wallet provider: the latter are unlicensed products and outside the scope of the Financial Services Ombudsman (FSB) for complaints. Complaints against Archex, for any of its licensed activities can be taken to the FSB. By contrast Zodia Custody in London which has an impeccable ownership - Standard Chartered, Northern Trust and SBI – can offer investors no access to the FSB as it is dealing in unregulated products only.

This varies market by market. In **Switzerland** FINMA licenses both brokers and banks and follows the same approach as the UK – cryptocurrencies only need AMLA (Anti-Money Laundering) compliance while cryptoassets are treated as securities and subject to the full related licensing requirements. Licensed Banks and Broker-dealers are already AMLA compliant so can deal or custody cryptocurrencies. FINMA approval is required to offer a custody service for securities so a bank without a custody approval would need to go through that process: it's not clear whether a bank/broker dealer with a securities custody licence would need new approval ("stapled") or could just inform/seek FINMA consent or approval.

However, that is not the end of the story in Switzerland. VFQ, based in Zug, has held the function of an official FINMA-recognised Self-Regulatory Organisation (SRO) pursuant to the Anti-Money Laundering Act (AMLA) since 1998. Historically it has covered parabanking an umbrella term covering payments, asset managers, lawyers , trust companies. So, it has provided a natural home

to entities that deal with crypto but could not meet full FINMA licensing requirements (Bitcoin Suisse is the best known example).

That is just two countries. A common theme and this is true of most countries, is that the ability to comply with Money Laundering requirements is the minimum first regulatory step. The next step is whether this is a positive step to place an entity on an approved list or register or a negative one, not allowing entities that have not formally demonstrated MLR/AML capabilities to conduct business in their country or (another wrinkle) with customers based there.

What's a qualified custodian?

The term "qualified custodian" originates with the SEC rules governing where SEC registered investment advisors may custody their assets: typically; banks, broker-dealers, futures commission merchants or other entities that maintains client funds and securities in specific ways. As noted earlier the SEC has proposed a new rule mainly to respond to crypto asset issues.

Why does it matter so much? The answer is simple: regulated investors can only deposit assets in custodians that the investors' regulators permit (which may be different for different asset classes). And regulated investors are what matters in global markets.

This is very specific per country and the investor entities involved. There are general trends globally the most important are:

- Introducing rules to govern how crypto assets are custodied (probably with most focus on retail investor protection)

- The treatment of Security Token custody as part of the securities framework with licensed broker-dealers or banks being allowed (or required to gain additional approval) to add these to custody of conventional securities.

- Increasing efforts to create an overall framework for all Virtual Assets encompassing crypto and all other digital assets (security tokens and tokenised real assets) and linked to traditional securities.

What do different investors require?

The USA is probably the place to start for several reasons:

- End-investors control large pools of money (see Table 4), especially out of the United States. These institutions dominate the conventional markets today. They are also the institutions that can turn tokenisation from an idea into a global reality.
- The regulators (especially SEC but also the OCC) are taking an approach seemingly designed to make custody of digital assets very difficult in contrast to most parts of the world.

Table 4

Assets under Management of End-Investors

Group	AuM
Employee Retirement Income Security Act of 1974 (ERISA) pension funds in the United States	US$34 trillion
1940 Investment Company Act Mutual Funds and Exchange Traded Funds (ETFs) in the United States	US$29 trillion
Undertakings for Collective Investment in Transferable securities (UCITS) funds in Europe	US$19 trillion
Total	$ 82 trillion

Source: Investment Company Factbook 2023

Generally, these pools of money entrust investment to one group of third parties (asset managers) and custody to another group of third parties (the global custodians). Few employ more than a handful of people and, barring a few exceptions, want to focus on setting investment goals and monitoring actuarial risks.

For many years now they have entrusted expansion by their asset managers into new markets or asset classes to their global custodian. They are not – unlike cryptocurrency investors – natural supports of "self-custody," especially of operationally awkward new asset classes such as digital assets.

More importantly still, however enthusiastic end-investors are about digital assets, they face stringent constraints and controls over what sort of custodian they can appoint to safekeep their portfolios. This is best understood through the prism of the regulations that govern the custody appointments of the major American pools of money.

Why? Because the United States is home to the largest pools of investment capital in the world (see Table 4) and American regulators have long set the terms by which those pools of capital can be custodied at home and abroad.

The Employee Retirement Income Security Act of 1974 (ERISA) is the primary legislation that governs private corporate pension plans, of both the defined benefit and defined contribution kind. Most public sector pension funds in the United States also, by statute, follow ERISA guidance.

So as a pension fund you have adhere to what ERISA approves: for what assets you can buy and what custodians you can use. This is pretty straightforward with domestic assets sticking with SEC rules. Outside the US (and what does that mean with cryptoassets?) ERISA 404(b) is the governing rule: it obliges ERISA funds to use as custodians banks whose principal base of business is in the United States. This generally means appointing an American global custodian, which can use sub-custodians to hold assets abroad, but they must meet specific conditions.

ERISA puts an outside limit on what is the investment universe but individual plans charters and investment rules may limit choice further. Sometimes funds have quite idiosyncratic rules or tend to be conservative particularly union funds and state or local government.

Similarly, asset managers in the United States face comparable restrictions on their freedom of action to appoint custodians.

Between 1984 and 2001, the SEC added rules (Sections 17(f)5 and 17(f)7) to the 1940 Investment Company Act which set minimum standards for the custody of assets of American funds held in foreign jurisdictions with similar constraints to ERISA.

That is in the USA but other jurisdictions – the EU with UCITs is most important – have similar restrictions especially on Collective Investment vehicles.

Such formal and informal restrictions are almost certain to delay institutional adoption of digital assets. A fund may have a major real estate allocation but be unable, on account of investment restrictions embedded in its charter, to invest in those same assets in tokenised real estate form. After all, even the move by American funds and asset managers to invest outside the United States took decades to become established.

In the short term, the formal and informal restrictions will be felt most keenly by those newer digital asset custodians that emerged from the cryptocurrency markets.

Already American pension funds place assets with a narrow range of custodians, especially outside the United States.

The established global custodian banks – BNY Mellon, Citi, J.P. Morgan, State Street, Northern Trust and others - are clearly best-placed to exploit the opportunity as institutional funds move into the digital asset markets, not only because they have a relationship with the funds already but because regulations give them an additional advantage.

As Joseph Chalom, Managing Director and Head of Strategic Ecosystem Partnerships at BlackRock, has put it: “We go to jail if we don't know who we are trading with; we can only participate in ecosystems who are well regulated and understood."[9]

Of the new crop of digital asset custodians only those owned by established firms (such as Fidelity Digital) or licensed by the NYDFS (such as the publicly listed Coinbase, the ten-year-old BitGo or the always institutional-grade provider Standard Custody & Trust) as special purpose trust companies have a chance of competing with the banks.

What is the SEC doing?

In the United States, the recent behaviour of regulators is bound to encourage this innate conservatism.

In June 2023 the SEC charged Coinbase with operating its trading platform as an unregistered national securities exchange, broker, and clearing agency. The SEC also charged Coinbase for failing to register its “staking” service. [10]

Earlier, in February 2023, the SEC had issued a Wells Notice to the Paxos Trust Company, informing the company of the substance of the charges that it was recommending for legal action. Yet no digital asset service provider has tried harder to achieve full regulatory status than Paxos.

The company secured a State trust company charter from the NYDFS in 2015. In April 2021 it received preliminary conditional approval from the Office of the Comptroller of the Currency (OCC) to establish a national trust bank.[11] In October 2021, Paxos applied to the SEC for a clearing agency licence so it can settle securities on a blockchain network. In July 2022, the company became the first Stablecoin issuer to disclose the reserves underpinning a Stablecoin.[12] In November 2022, Paxos received a licence from the Monetary Authority of Singapore (MAS) to offer digital payment token services.[13]

Measures taken against established and reputable digital asset firms are consistent with an increasingly aggressive approach to digital assets in general and cryptocurrencies in particular on the part of some American regulators.

In fact, it is not hyperbolic to say that the SEC has embarked on a path – probably inadvertently - that will make it impossible for anyone to offer regulated digital asset custody.

In March 2022, SEC Staff Accounting Bulletin No. 121 (SAB 121) prescribed how digital assets held in custody on behalf of customers should be shown on the financial statements of entities registered with the SEC.

SAB 121 requires digital asset custodians to show customer assets held in a fiduciary custody basis on their balance sheet. This treatment of custody assets is unprecedented in the history of custody, an industry whose commercial economics rest on the fact that it is an off-balance sheet, fee-earning business. The SEC justified such a dramatic change on the grounds that digital assets pose new risks.

The net effect once digital asset custody begins to scale would be to make it extremely difficult even for large, regulated banks to provide a digital asset custody service.

The five largest global custodians, all of them American, have a collective AuC of US$154.1 billion (see Table 2) and total balance sheet footings of less than a twentieth of that figure (US$6.9 trillion). Unaltered, SAB 121 will make it impossible for the leading global custodian banks to custody digital assets, let alone the smaller digital asset custodians that have emerged from the cryptocurrency markets.

But SAB 121 is not the only obstacle set by the SEC. The regulator is also proposing changes to the Investment Advisors Act of 1940 - legislation that applies to all investment advisers registered with the SEC – to change how investment advisers safeguard client assets.

A new Rule 223-1 would apply Rule 206(4)-2, known as the “custody rule,” to all client assets, not just securities and funds, and so embrace digital assets in particular.

Advisers would have to place the assets in bankruptcy-remote accounts with a custodian prepared to indemnify clients for any losses occasioned by their own negligence. Clearly, these provisions would erect another barrier to entry and success for the less established digital asset custodians.14

Importantly, the definition of an acceptable custodian is restricted to American banks or savings associations (including trust companies), broker-dealers registered with the SEC, futures commission merchants (FCMs) registered with the Commodity Futures Trading Commission (CFTC) and certain types of foreign financial institutions licensed to offer services in the United States.

Considered purely in domestic terms, the revised "custody rule" is no more than a logical attempt by the SEC to extend a longstanding American concept of a "qualified custodian" - an idea embodied in Section 17(f)5 and Section 404(b) - to cryptocurrencies and, by extension, digital assets as a whole.

The term "qualified custodian" has gained traction because it expresses a simple idea (that regulated investors must only custody assets with custodians that the regulators permit) and addresses directly a major trend that is gathering pace (the irruption of institutional investors into the digital asset markets).

The difficulty is that "regulated investors" are not an undifferentiated mass.

The intensity of regulation has always varies enormously from hedge funds, via insurers, to pension funds. Different investors need different levels of protection, and regulation has always recognised that. That complexity is multiplied when regulations in other jurisdictions must be taken into account.

But American regulation in particular seems set on a path that refuses to recognise the complexities. The change in the "custody rule" might so narrow the definition of a "qualified" custodian that only federally chartered banks will be able to provide a service.

Of the non-traditional providers, a restriction of "qualified custodians" to federally chartered banks would leave only Anchorage Digital Bank of the non-traditional providers in the field at all. The cryptocurrency exchanges that offer services, and the digital asset custodians licensed by the NYDFS, will not "qualify" to provide a service.

As it happens, the OCC that licensed Anchorage Digital Bank in the first place is also now reconsidering its earlier willingness to licence digital asset custodians.

Though it approved the application of Anchorage Digital Bank to establish a national trust bank in April 2022. It gave conditional approval to Paxos to do the same in April 2021, but in March 2023 it allowed the Paxos application to expire. Protego Trust Company also received conditional approval in 2021 but that lapsed in February 2023.

So, it is noteworthy that in June 2023, four months after the SEC published the proposed revisions to the "custody rule" and just a week after the SEC sued Coinbase for operating an unregistered trading platform, BlackRock actually chose Coinbase as the custodian for its proposed Bitcoin ETF.

While sophisticated asset managers such as BlackRock are always less conservative than pension funds, this looked like a bold decision. But it may be that BlackRock had less choice than the roster of digital asset custodians might suggest. The safekeeping and servicing of digital assets requires a different set of capabilities than most traditional custodians currently possess.

A more comprehensive take on the proposed changes to the Investment Advisors Act is provided by Polygon in the next section.

Country Level review of Regulatory Authorities and Business permissions (Cryptocurrencies)

The table below is a summary level of the basic regulatory authorities in the largest global capital markets for Cryptocurrencies. Security Tokens are covered under the existing securities regulations in each of these markets.

COUNTRY	REGULATORS	BUSINESS TYPE	TYPE OF PERMISSION
	AMF	DASP (Digtal Asset Services Provider)	Registered satisfying AML
	BAFIN	Crypto Custody Provider	Licensed Crypto Custodian
	FINMA	Crypto/Digital Asset Custody	Licensed Broker or Bank
	VQF Financial Services Standards Association	Crypto Custody Provider	Registered satisfying AML
	Financial Conduct Authority (FCA)	Crypto Custody Provider	Registered satisfying AML
	HKMA (Hong Kong Monetary Authority)	Crypto/Digital Asset custody	Registered satisfying AML
	The FSA (Financial Services Agency)	CAESP (cryptoasset exchange service provider)	Registered under Payment Services Act
	MAS (Monetary Authority of Singapore)	Digital Payment Token Servicees	Major Payments Institution License
	SEC	Bank or Broker-dealer Custodian	Qualified Custodian
	OCC (Office of Controller of the Currency)	National Charted Bank	Qualified Custodian
	Stat Level - Mainly NYDFS	Limited Purpose Trust	Qualified Custodian

Source: Future of Finance Research

An article by Standard Custody & Trust Company, a PolySign company

New Custody Rules to Reshape the Digital Asset Market

On February 15, 2023, SEC Chair Gary Gensler issued new SEC 'Proposed Rules Regarding Investment Adviser Custody' that will vastly expand the role and remit of Qualified Custodians (QCs) in digital asset capital markets, as well as other asset classes.

In the first of our multi-part series on the SEC enhanced safeguarding rule, **Patrick Clancy**, Head of Digital Asset Strategy at PolySign, highlights the essential provisions of the new rules to help advisers, funds and institutions in the crypto space ensure that their businesses are ready for the future.

The last 18 months have shone a spotlight on the many weaknesses in the digital asset industry. In the wake of collapsed centralized crypto platforms, depegged stablecoins, code-exploited hacks, instances of fraud and the bankruptcy of a prominent offshore crypto exchange, we heard a loud call for reform from investors and policymakers.

Seemingly overnight, we saw the downfall of several Tier 2 banks deeply embedded in the start-up, technology, and VC markets. These incidents have shifted the conversation. Now, the discussion is less about the hype and potential of crypto and distributed ledger technologies and more about balancing centralized risks with equitable regulation in a way that does not hinder innovation. To date, regulators have dug into specific policy issues, specifically around improving risk management practices, separating, and segregating business functions such as custody from the day-to-day operations at the exchanges, and implementing better internal controls to mitigate malfeasance and augment investor protections.

Many policymakers have looked to pull existing practices from traditional capital markets into this nascent industry. On February 15, SEC Chair Gary Gensler released a statement proposing to expand the role of QCs in securing assets on behalf of investors. If enacted, this legislation would reign in the activities of fiduciaries, who have a legal responsibility to ensure that "advisers don't inappropriately use, lose, or abuse investors' assets." These new proposed SEC rules would represent the most significant change to the custodial function since 2009. In summary, regulators would move digital assets into a framework requiring Registered Investment Advisers (RIAs) to direct capital from QCs and implement a series of controls to safeguard digital assets.

Gensler's proposal presents significant changes to digital asset fund managers (and how they deploy capital for investment management) as well as institutions and fiduciaries. This would include the segregation of duties, the roles between counterparties and the intermediaries used to

facilitate such trades. Understanding the impact and taking the appropriate action will be vital for the investment management community. Specifically, for some exchanges, the proposal is expected to require compliance by as soon as mid-2024.

Below we highlight essential provisions in the new proposed legislation, referred to as the "Safeguarding Rule," to help institutions, fund managers, and advisers better understand how to prepare for this ruling that could be enacted within a year of the proposal being approved.

1) Expanded scope of the custody rule
The scope of the current custody rules will broaden to apply to client funds, securities, and any client assets, including cryptocurrencies and tokenized physical assets such as real estate, commodities, private equity, private debt, artwork, and financial contracts held for investment purposes.[1] Notably, the rules extend and strengthen the role of QCs[2] to support a wider array of assets.

2) Segregation and protection of assets
The new rule will also compel advisers to properly segregate investors' assets[3] and obtain reasonable assurances (e.g., contractual agreements) from QCs that investor assets are protected in the event of insolvency and bankruptcy.[4]

3) Use of Qualified Custodians
RIAs and fund managers will be required to use QCs[5] and not self-manage the custody of clients' crypto or digital assets. For many institutions, using QCs under the new rules will require a significant change to their operations in order to comply with U.S. law.

4) Discretionary authority to trade
The proposed rules also widen the definition of custody to include discretionary authority or "the authority to decide which assets to purchase and sell for the client."[6] Under the existing rules, a RIA is deemed to have "custody" of client assets in scenarios such as an adviser being "authorized or permitted to withdraw or transfer beneficial ownership of [the] client assets."

Going forward, advisers would need to ensure that the QC has "possession or control" over client assets**,** including instances where the adviser is applying "discretionary authority."[7]

5) Timeline
The legislation is generally expected to include the provisions highlighted above.
Depending on the threshold of the adviser's assets under management, the proposed compliance date comes into effect:

- More than $1b under management, 12 months after the effective date
- Up to $1b under management, 18 months after the effective date.

If enacted, private fund managers should note that compliance with the proposed rules will not be required until mid-2024 at the earliest.

Key terminology and resources

What is a Qualified Custodian (QC)?
A QC is a legal term defined by the SEC as a bank, registered broker-dealer, futures commission merchant or certain foreign entity that maintains client funds and securities in a particular manner. A QC either manages client funds and securities in a separate account for each client under that client's name or in accounts that contain only that client's funds and securities under the name of the investment adviser as agent or trustee.

Requirements of Qualified Custodians
At least annually, the QC will obtain and provide a written internal control report with the opinion of an independent public accountant on the effectiveness of the QC's internal controls.

- **Recordkeeping**: QCs must notify and maintain records of how funds are held and share this with clients on a regular basis. Furthermore, they must issue quarterly accounting statements to clients.
- **Discretionary authority**: The new rule updates the definition of "custody" to include discretionary authority: "the authority to decide which assets to purchase and sell for the client."[8] Under this proposed ruling, an investment adviser would have "custody" of client assets including any instances when the adviser is "authorized or permitted to withdraw or transfer beneficial ownership of [the] client assets."[9] This provision means that the adviser will now need to ensure that a QC has "possession or control" over client assets when deploying capital, including instances where the adviser executes "discretionary authority."
- **Internal controls:** At least annually, the QC will obtain and provide a written internal control report with the opinion of an independent public accountant on the effectiveness of the QC's internal controls.
- **Written agreement:** The QC must have a written agreement[10] in place between the QC and the investment adviser. The advisers need to enter the arrangement with the reasonable belief that the QC is capable and able to meet its contractual obligations. The agreement must also refer to the provision of records, where the QC can provide records of the client's assets to the SEC or a qualified accountant upon request.
- I**ndemnification and insurance:** The QC will indemnify an advisory client when its negligence, recklessness, or wilful misconduct results in the loss of client assets. QCs must have adequate insurance arrangements in place to protect the client.
- **Sub-custodial agreements:** An adviser or custodian isn't exempted from its duties to the client as a result of any sub-custodial or another similar arrangement.
- **Liens or collateralized asset reporting**: Client assets must not be subject to any right, charge, security interest, lien or claim in favour of the QC, its related persons or creditors. An exception to this provision is possible when authorized by the client in writing.[11]

As you can see above, the new rules will impact how all registered investment advisers deploy capital, segregate assets, and interact with intermediaries. We expect to see many parties opine on these changes (including traditional and digital asset managers and counterparties). Overall, these proposed rules mark a significant step forward in the effort to balance centralized risks with equitable regulation to protect investors in the digital asset industry.

In our next article, we will compare the new rules, address the potential impacts, and provide guidance on what you need to do to be in compliance with the proposed changes.

[1] Release at 18
[2] Rule 206(4)-2(d)(6).
[3] Release at 63–66.
[4] In the Release, the SEC stated that, "the account terms should clearly identify that the account is distinguishable from a general deposit account and clarify the nature of the relationship between the account holder and the QC as a relationship account that protects the client assets from credits of the bank or savings association in the event of the insolvency or failure of the bank or savings association." Although the Proposed Rule does not contain any requirements in respect of these terms, the SEC did request comments on these terms.
[5] Rule 206(4)-2(d)(6
[6] Proposed Rule 223–1(d)(4).
[7] Release at 67.
[8] Proposed Rule 223–1(d)(4).
[9] Proposed Rule 223–1(d)(3)(ii).
[10] Proposed Rule 223–1(a)(i).
[11] Release at 177.

For more in the series:
Part 2: Considerations for the Proposed SEC Custody Rules
Part 3: The Intersection of Digital Asset Regulations and Compliant Solutions
Part 4: Our Take on the New Safeguarding Rules

Written by Patrick Clancy, Head of Digital Asset Strategy, PolySign.

7.0 Digital asset custody services are not the same as traditional custody services

In conventional custody arrangements, custodian banks tend to be confined mainly to post-trade services, such as settling transactions, safekeeping assets and servicing assets in terms of entitlements such as dividends and interest payments.

In digital asset custody, providers have tended to be more directly involved with the trading process.

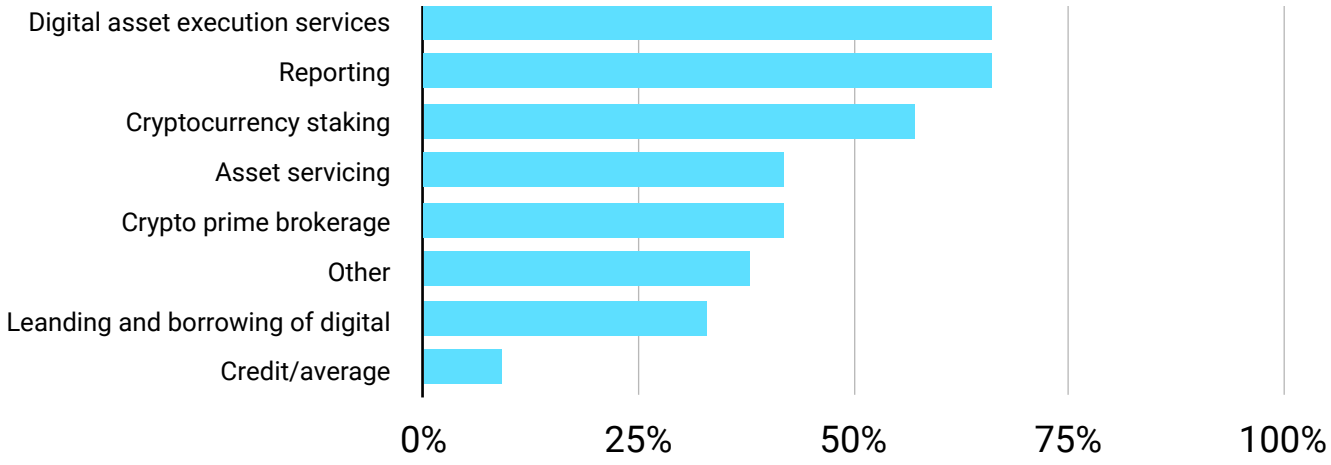
In addition to the traditional custodial activities of safekeeping, settlement and asset servicing – which themselves present novel challenges, such as "atomic" settlement, operating digital wallets and managing corporate actions such as "air drops" – the earliest digital asset custodians active in the cryptocurrency markets developed a range of new services.

These include "staking" and collateralised lending.

These services were first developed to generate an income for holders of cryptocurrencies that do not generate conventional sources of income such as interest or dividends (see Chart 2) but rely instead on growth in capital value to yield a return at all.

Chart 2

Services provided by Digital Asset Custodians



Source: Future of Finance Research

“Staking” does offer less munificent returns than it did before the market began to shrink in November 2021 and a major cryptocurrency lender (Celsius Network) failed in July 2022. Returns of 50 per cent or more on allegedly “risk free” staking are no longer being offered.

However, with the trend for blockchain protocols to move from Proof of Work to Proof of Stake validation of transactions, a more stable market with predictable yields is likely to emerge because of reduced transaction settlement crises (where unsettled trades drive up the price of validation as some investors pay more to jump the queue) and lower energy consumption.

The second largest cryptocurrency and biggest platform for Decentralised Finance (DeFi) applications, Ether, transitioned recently from Proof of Work to Proof of Stake. There is currently US$30 billion of Ether “staked” and it is producing 5-8 per cent yields on a consistent basis (Coindesk).

Digital asset custodians often provide execution services too. This is largely because servicing holders of cryptocurrencies developed within cryptocurrency exchanges, which meant they provided custody services as well as issuance and execution. But even independent digital asset custodians have developed execution services, rather as some global custodian banks have done in the traditional securities industry.

Another service which has a parallel in the conventional securities services industry is cryptocurrency “prime brokerage.”

In the conventional securities markets, the term refers to hedge fund managers using investment banks as credit intermediaries for their trades – in effect, renting the balance sheet of the bank as a counterparty to trade with third parties - and to lend them cash and securities to leverage transaction or cover short positions.

In the cryptocurrency markets, “prime brokerage” is closer to the foreign exchange (FX) prime brokerage business, in which the digital asset “prime broker” enables professional traders – many of them drawn from the conventional FX industry – to trade currency pairs with other counterparties or exchanges.[15]

In cryptocurrency prime brokerage, the model deployed by digital asset custodians such as Copper (Copper ClearLoop) or BitGo (BitGo Settlement) uses closed circles of cryptocurrency exchanges approved by the custodian. The exchanges are reassured that the trades will not fail because they can see at any time that the counterparty holds in their custody account the cryptocurrency or cash tokens they need to settle a trade.

But the most significant way in which digital asset custody differs from conventional custody is in the way that assets available in digital form only oblige custodians to develop new techniques for fulfilling their principal duty: protecting the safety and security of customer assets.

An article by Cactus Custody

The Importance of 'Third-Party Custody' for Web3

Custodians have been integral to the traditional banking system, safeguarding various assets for decades. However, the rise of the Web3 era prompts us to question the role and importance of digital asset custodians in this new paradigm. As blockchain technology and cryptocurrencies gain prominence, it becomes increasingly crucial to examine how market participants should adapt to the evolving Web3 ecosystem and ensure the security of digital assets. The transformation of custodial services in this era presents both new possibilities and challenges that necessitate a careful evaluation of their evolving role in protecting and managing digital wealth.

Security First

Security has always been a top priority. From 2009 to 2023, the landscape of private key management and securing crypto assets has witnessed remarkable changes. Initially, individuals relied on paper wallets during the early stages of cryptocurrency adoption. However, as cryptocurrencies grew in popularity and complexity, more convenient and secure solutions were sought. This led to the emergence of third-party custody services, revolutionising the handling of private keys and digital assets.

Reputable financial institutions and cryptocurrency custodians began offering these services, allowing individuals and institutional investors to entrust their private keys and crypto assets to experienced professionals. Unlike custodians in traditional finance, digital asset custodians do not technically store digital assets; instead, they secure private keys as all data and transactions exist on the blockchain.

While security concerns historically focused on mitigating external risks, such as attacks on exchanges and private key disasters, the market has faced persistent threats from malicious actors.

Greater Calls for Transparency

Recent incidents, such as the collapse of prominent lending CeFi entities triggered by the Terra Luna collapse and the FTX implosion that resulted in the misappropriation of billions of dollars in customer funds, have severely damaged trust between users and CeFi entities. Consequently, customers now demand transparency and visibility, recognising the high cost of inaction. In response to this demand, some exchanges have published self-generated proof-of-reserves reports. However, the lack of independent verification of liability undermines their credibility.

Many exchanges have turned to third-party custody services to regain user trust and confidence. Digital asset custodians are dedicated to addressing these challenges by offering tailored solutions that enhance transparency, while maintaining an exceptional user experience.

Compliant Platforms to Secure Digital Assets

Institutional investors and their asset managers face regulatory restrictions that prevent them from directly handling assets in the same manner as individual users. This regulatory framework aims to safeguard investor holdings against potential risks such as theft and fraud.

As a result, custodians have emerged as crucial players responsible for securely holding assets on behalf of institutional investors. Major financial institutions, like Fidelity, with an impressive $7.2 trillion in client assets under administration, recognise the need for custodial solutions specifically tailored to digital assets. This development underscores the increasing recognition of cryptocurrencies within the traditional financial landscape and emphasises the significance of secure and compliant custodial services in managing and protecting institutional investors' portfolios.

Why Third-Party Custody is Essential

Two primary methods exist for securing digital assets: third-party custody and self-custody.

Self-custody is suitable for individuals who can keep up with timely updates and upgrades to protect their digital assets from evolving hacking methods. On the other hand, third-party custody provides effective support for non-Web3 native businesses, allowing them to interact with the Web3 ecosystem in a familiar Web2 environment. Unlike self-custody, third-party custody eliminates the need for users to develop internal expertise in safeguarding private keys, as the custodian handles any technical difficulties. Keeping pace with rapidly developing public chains requires continuous research, development, and upgrades, which necessitates a significant investment in establishing a professional custody infrastructure.

Collaborating with a third-party custodian brings notable cost savings through economies of scale, benefiting from specialised and centralised private key management. Given that mismanaging private keys can result in the complete loss of digital assets, utilising third-party custodians efficiently mitigates such costs and risks.

Third-party custody also proves valuable for regulators in their supervisory efforts. In February 2023, the SEC proposed amending federal custody requirements to include cryptocurrencies, indicating that regulators recognise the role of digital asset custodians in ensuring client assets are segregated and held in accounts designed to protect them. The rise of peer-to-peer transactions has created a loophole wherein self-custody solutions can easily bypass important Know Your Customer (KYC) and Anti-Money Laundering (AML) regulations. The inherent anonymity of blockchain technology poses challenges for regulators to effectively monitor transaction compliance. The lack of regulatory experience in overseeing the intricacies of the rapidly evolving crypto industry, including decentralised finance (DeFi), security token offerings (STOs), native staking, and more, makes third-party custodians even more valuable for both users and regulators. Third-party custody services can offer native solutions tailored to regulatory and audit-related concerns, ultimately reducing regulatory costs, and enhancing supervision capabilities.

Furthermore, working with third-party custodians has become a non-negotiable requirement in the digital assets market for asset management institutions, exchanges, and other financial service providers. Users are increasingly aware of the potential conflict of interest when a single legal entity offers both asset custody and investment services. Institutions are assuring users that their assets remain separate from bankruptcy risks by utilising third-party custodians to enhance security and bankruptcy remoteness. Without such assurance, users may hesitate to engage with these institutions.

Moreover, to satisfy regulatory requirements and internal control processes, the value of adopting third-party custody solutions becomes inherently clear. The availability of crypto-friendly functionalities, such as multiple administrative capabilities and enhanced smart contract security controls, has also facilitated the shift from self-custody to third-party custody for many users.

The Road Ahead

Third-party custody is poised to become the foundational infrastructure of the Web3 ecosystem, eliminating vertical integration and transitioning towards neutral and independent custody as mainstream adoption grows. As the industry becomes more specialised, prime brokerages, investment funds, and exchanges will focus on their core business strategies while entrusting asset security to compliant third-party custodians. Custodians will handle crucial tasks such as settlement, accounting, and safeguarding digital assets in strict adherence to relevant laws, regulations, and custodian contracts. Institutional custodial services will prevent asset misappropriation, ensuring the integrity and independence of digital asset management while protecting the legitimate rights and interests of investors.

In conclusion, the role of custodians is evolving in the Web3 era, with a focus on securing digital assets, enhancing transparency, and meeting regulatory requirements. Third-party custody offers convenience, expertise, and compliance, making it an essential tool for both users and regulators. As custodians continue to adapt to the changing landscape, they will play a crucial role in protecting and managing digital wealth in the future.

Cactus Custody™ is a qualified custodian and a Hong Kong Trust Company that meets the capital reserve requirement and acts within regulatory and AML guidelines. To learn more about our solutions, visit https://www.mycactus.com/en.

8.0 Digital asset security and protection

For any asset owner the security and protection of their assets is always the basic duty of the custodians they appoint. It is akin to a form of insurance. In this respect, cryptocurrencies and digital assets do not differ from conventional assets.

However, the history of hacks and thefts in the cryptocurrency and DeFi industries means that this fundamental duty is of particular concern. Criminals have provided remarkably adept at stealing cryptocurrencies, switching from hacking exchanges (where many of the thefts were inside jobs) to exploiting weaknesses in inter-protocol "bridges," smart contracts and DeFi applications.

Fortunately, independent third-party custody of cryptocurrency has proved remarkably safe, with no customer assets being lost by independent custodians until the failure of Prime Trust in June 2023. All of the respondents to the 2023 ***Future of Finance*** survey of digital asset custodians that answered the question affirmed that they had never lost customer assets.

This record is surprising, given the lower barriers to entry to the digital asset custody market. Normal criteria such as capital, regulatory licences, independent audit and internal control structures were secondary to the technological capability to provide a service at all.

That service has had to adapt rapidly to the changing patterns of cryptocurrency trading activity. The development of "prime brokerage" services, for example, followed pressure on digital asset custodians to sponsor client buy and sell orders on multiple exchanges out of a single custody account.

But, the assets being digital, ***technology*** is central to digital asset custody services because it is the main point of vulnerability.

Digital asset custody technology is trapped in a Red Queen race to stay ahead of equally sophisticated hackers, many of them State-sponsored. Already, some digital asset custodians are claiming to offer protection from hackers armed with quantum computers that can break present, prime number-based cryptographic encryption.

The principal purpose of digital asset custody ***technology*** is to ensure the safety of private keys. This is because cryptocurrencies are "bearer" instruments. As the cryptocurrency industry aphorism has it, "not your keys, not your coins" (the same is not true of other digital assets, such as security tokens, where stolen assets can be destroyed and replaced by a registration function).

So far, the cryptocurrency industry has developed three main technological techniques for protecting private keys.

The first is ***Hardware Security Modules (HSM).*** As the name suggests HSM describes a physical computing device – though there are now Cloud-based HSMs - that safeguards and manages digital keys, performs encryption and decryption functions for digital signatures, and offers strong transaction authentication and other cryptographic functions.

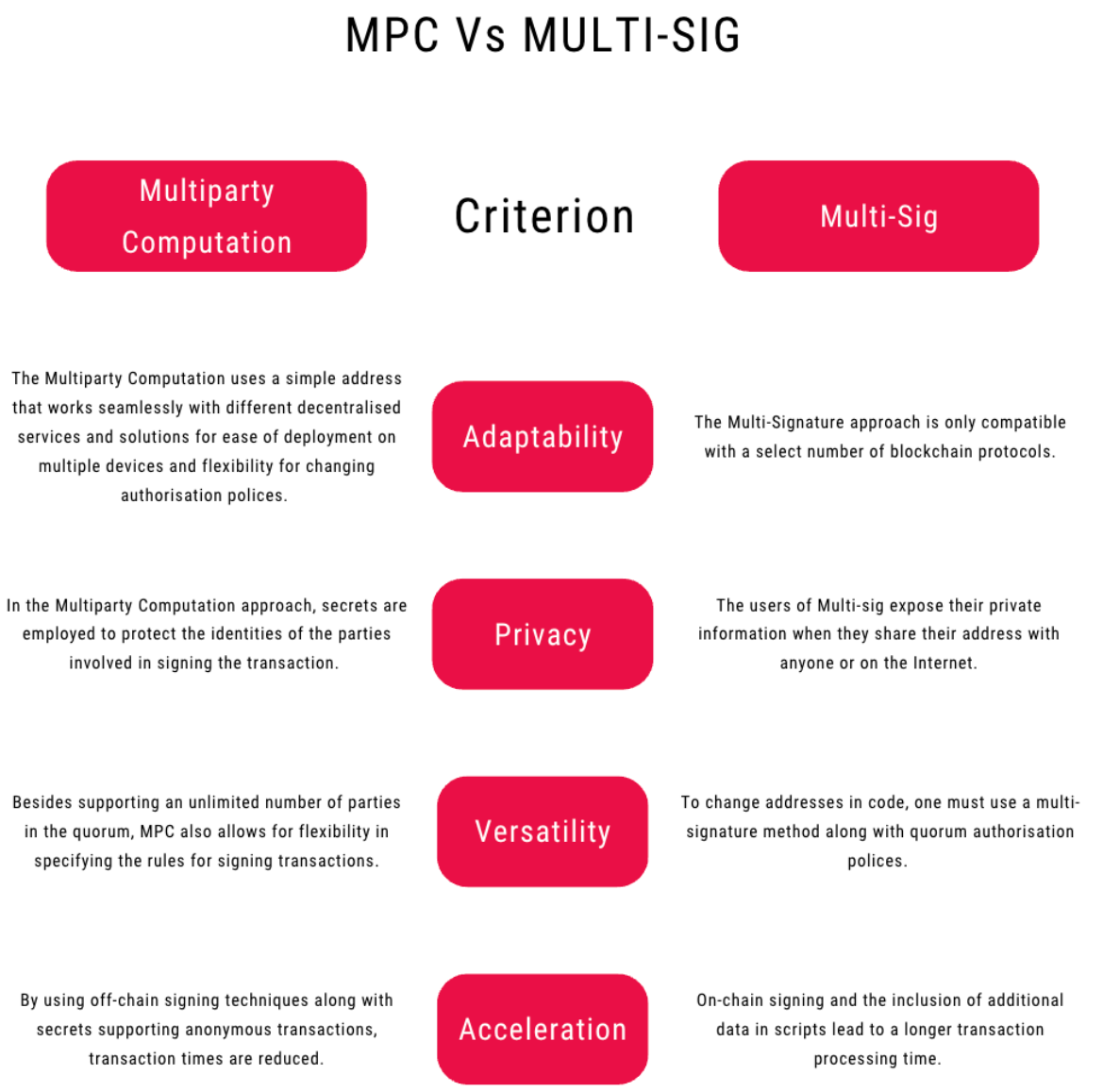
The main risk HSM struggles to mitigate without additional measures is that control of the keys can be acquired by a single person who works for the custodian (or a hacker). It was to solve this problem that two other techniques were developed. The first is ***Multi-signature Wallets*** (Multisig). The other is ***Multi-party Computation (MPC)***.

Multisig imposes, at its simplest, the requirement for more than one signatory to authorise a transaction. It is the on-chain equivalent of multiple actors with their own private keys coming together to sign a transaction. Usually, the client as the ultimate owner of the asset - or the asset manager to which the asset owner has delegated control of the portfolio - initiates the transaction, which must be co-signed by the custodian.

Multisig has proved hard to scale as transaction volumes increase. The fact that multiple private keys are stored in different places is also not proof against their being compromised by hackers or fraudsters.

MPC solves the single point of failure by replacing indivisible private keys by giving multiple participants a piece of data about a key that enables the participants collectively to compute the key while keeping their own piece of data secret. The separation of pieces of the key makes it much harder for malicious actors to locate all the pieces to unlock the asset. MPC needs more computational resources to run, so tends to be slower.

But neither Multisig nor MPC is the final destination of private key protection. New services are being developed whose proponents claim they offer superior security, flexibility and ability to integrate with any blockchain protocol.



Source: Blockchain Council

The second layer of protection for digital assets that the cryptocurrency industry has developed is internal ***procedural policies and controls.*** These lay down the processes employees of digital asset custodians must follow. They also set controls designed to pick up breaches of compliance and to limit attacks on software.

The policies and controls are similar to those used by regulated custodian banks to align their business with a typical technology risk management framework.

Box 1

Customer Asset Security Policies, Procedures and Controls Digital Asset Custodians Should Follow

The key policies, procedures and controls digital asset custodians must implement are:

- Strong authentication access controls, data encryption and other security and technical controls to meet the requirements.
- Appropriate and effective network access and security controls such as firewalls, intrusion prevention system, advanced threat protection and proxy server systems as a gateway between systems and the Internet, so that other on-premises environments are not exposed to unauthorised access.
- Security controls to protect against attacks (e.g., network intrusion attempts, Denial of Service (DoS) attacks).
- Preventative and detective data controls to keep data secure and prevent data loss, covering data in storage, data in transmission (i.e., data that is actively moving from one location to another) and data in use.
- The principles of "never alone", "segregation of duties", and "least privilege" when granting staff access to information assets so that no one person has access to perform sensitive system functions.
- Granting of access rights and system privileges according to the roles and responsibilities of the staff, contractors, and service providers.
- A user access management process that grants, changes and revokes access rights to information assets.
- Authorisation and approval of access rights by appropriate parties, such as the information asset owner.
- Accountability, with records, so user access and user management activities are uniquely identified and logged for audit and investigation purposes as needed.

Source: NIST

Increasingly, digital asset custodians must provide clients with a second layer of assurance: external standards that attest to the efficacy of their internal policies, procedures and controls.

The basic form of external validation is to publish financial records audited by a recognised and reputable accounting firm. The case of FTX is reminder that this essential requirement was not always met in the cryptocurrency industry.

More granular sources of external validation favoured by digital asset custodians include the System and Organisation Controls (SOCs) defined by The American Institute of Certified Public Accountants (AICPA).

There are three SOCs. SOC 1 provides the management of the digital asset custodian and its auditors with an independent opinion of the quality of the internal controls over financial information and reporting. This is germane to digital asset custody, since the existence of the assets and the

authenticity of transactions and entitlements are governed entirely by the availability of information in digital form only.

The SOC 2 provides digital asset custodians' management, customers and regulators with assurance that system controls are adequate to protect the security of assets, the availability of services, the ability to process transactions, and the confidentiality or privacy of information. The ability to deliver these benefits is crucial to the provision of a safe digital asset custody service.

The third SOC is used for potential customers that want an external review of the controls at a digital asset custodian they are using or propose to use, and so effectively repeats the work of a SOC 2 assessment but on behalf of a third party. A summary of SOCs 1 and 2 can be found in Table 5.

Table 5

A Summary of the SOC Certifications Used by Digital Asset Custodians

	SOC 1	**SOC2**
Area of review	**Financial controls**	**Information controls**
Focus	Internal controls related to financial management.	Internal controls related to information and data security.
For	Firms which can impact client financial statements.	Firms which store/process data especially personal or sensitive data.
Key factors reviewed	Internal financial controls, quality of accounting team, financial statements and cash flow analysis.	Security, confidentiality, processing integrity, privacy Availability.
What it tells customers	How the service provider has addressed and mitigated risk that its financial system failures could impact the client.	How the service provider has taken steps to protect data/information and that their service is reliable.
TYPE 1	One-time assessment	One-time assessment
TYPE 2	Review over 6-12 months of controls including testing and operating effectiveness; audit repeated annually	Review over 6-12 months of controls including testing and operating effectiveness; audit repeated annually

Source: Future of Finance Research

Another external validation favoured by digital asset custodians is the International Standard on Assurance Engagements (ISAE) 3000 standard. Issued by the International Federation of Accountants (IFAC), the standard governs reports by accountants on the internal controls of a client. The report describes the controls and their objectives and assesses them against an industry norm.

Digital asset custodians have sought an ISAE 3402 certificate in particular because this assures clients that the firm meets SOC 1 requirements and has procedures in place to ensure it continues to do so.

Two out of three respondents to the 2023 ***Future of Finance*** survey of digital asset custodians have a SOC or ISAE certification or both; two out of five had a certificate of compliance with the ISO 27001 standard – the International Organisation for Standardisation (ISO) standard for information security management systems.

The third and final layer of assurance for clients: an ***insurance*** policy that makes customers whole if their assets are lost. Just shy of four out of five respondents to the 2023 ***Future of Finance*** survey of digital asset custodians have bought insurance.

The purpose of insurance, especially for digital asset custodians with limited capital, is obvious: it is to provide customers with assurance that, if something does go wrong, their assets will enjoy some level of financial protection.

That level of assurance varies. As digital assets are a new area of coverage for insurers, no standards have yet emerged over which risks are insurable or in what amounts. The policy purchased by the digital asset custodian might not cover all the assets or activities of a client, or provide sufficient cover for potential losses, especially if they are incurred in more than one incident.

This is why some investors have opted to purchase insurance directly. This eliminates reliance on the cover secured by the digital asset custodian, reducing the risk of conflict over who is covered for what risks in the event of a claim.

Some digital asset custodians boast that the level of security they provide means that clients should self-insure. However, institutional investors are likely to prefer the proxy insurance cover they have long purchased from traditional global custodians: the large balance sheet and borrowing capacity of a regulated bank.

An article by GK8

The Imperative for Institutions to Control Their Own Digital Asset Destinies

The collapse of FTX and the ensuing banking crisis have shaken the foundations of the financial world, exposing vulnerabilities in the current digital asset landscape. In an era characterized by turmoil and mistrust, institutions are left grappling with a fundamental question: How they can truly safeguard their digital assets? A pervasive sense of fear has prompted a critical examination of existing practices. For many institutions, it has become increasingly evident that relying on exchanges and third parties to safeguard their digital assets is no longer a viable option.

As the institutional adoption of cryptocurrencies surges, so does the interest of cybercriminals. The realm of digital assets has become a playground for hackers, where anonymity and decentralization can be both a blessing and a curse. Experienced hackers view this landscape as a profitable opportunity. Seeking the most lucrative returns on their investments, hackers are increasingly targeting points of centralization such as exchanges, bridges, and smart contracts.

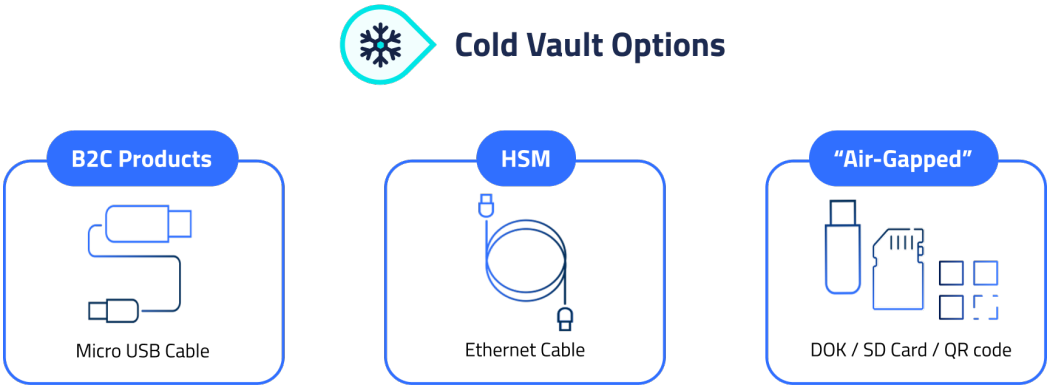
Amidst this climate of uncertainty, the interest in self-custody solutions is growing amongst retail investors and institutions alike. Both recognize the imperative of taking control of their digital asset destiny. However, navigating the landscape of custody solutions presents a variety of challenges. Choosing the right approach to manage and secure these assets is not an easy task. The options boil down to two distinct categories: hot wallets and cold wallets.

Cold Wallets

Cold wallets or vaults offer enhanced security by keeping private keys offline, thereby significantly mitigating the risk of cyber-attacks. Cold wallets, like vaults, are primarily used for custody or for low-frequency, high-risk transactions and interacting with smart contracts or staking functions.

Cold vaults often employ additional security technologies such as Hardware Security Modules (HSMs). However, it is important to note that these HSMs are often supplied by a third party and rarely purpose-built for blockchain technology. The provider of the HSM becomes yet another vendor on which the institution must rely for service and support.

The Achilles Heel of Cold Wallets - Crypto transactions need unique, real-time data from the blockchain to be signed and validated. In other words, almost all 'cold solutions', whether connected by LAN cable, Bluetooth, USB, or QR code and camera, need to connect to the network to pull this data. This means that most 'cold' wallets are not really cold, because at some point they need to go online, and the minute they connect is when 'cold' becomes 'hot'. This connectivity is their 'single point of failure' and prevents them from being 100% secure.



Hot Wallets

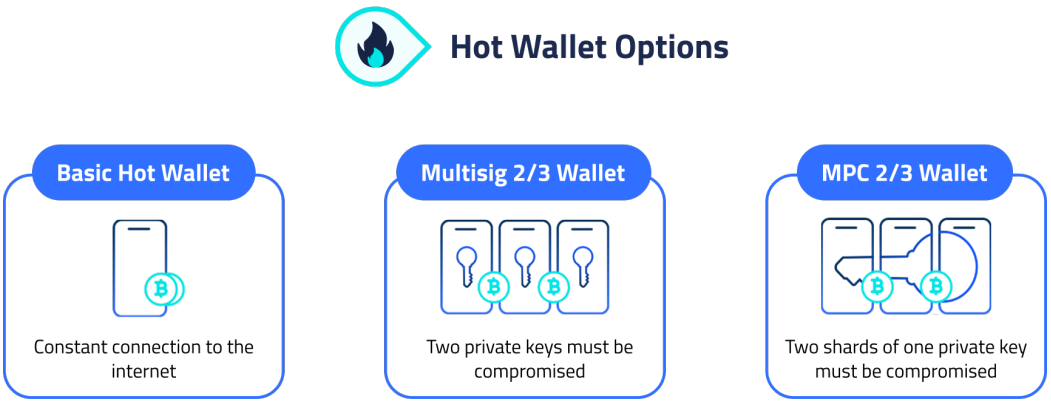
Hot wallets, by definition, are connected to the internet and hence, vulnerable to attack. To mitigate risk, these hot wallets use more advanced technologies such as multi-sig or MPC (multi-party computation). Their benefits include remote operation and automation. Hot wallets, like ATMs, are better suited for high-frequency, low-risk transactions.

Multi-sig (multiple-signature) wallets

Multi-sig, originally created to enable account sharing and approval, has been transitioned into a security instrument for crypto transactions. Multi-sig systems require 'quorum' approval for a transaction to be signed. While the 'quorum' depends on the policy decided upon by the client, popular multi-sig solutions require a majority of 2 out of 3 signatories for a transaction to be approved.

MPC (Multi-Party Computation) solutions

MPC has been widely adopted in the blockchain industry over the last few years. MPC utilizes a technology that uses algorithms and multiple servers to generate a private key in such a fashion that no one server hosts the entire private key at any point. Similar to multi-sig, MPC also requires a minimum number of cosigners to be involved in any signing ceremony.



Both solutions suffer from similar critical vulnerabilities

1. **More difficult is not impossible** - while hacking more than a single computer is more difficult, it is not impossible. Majority approval policies mean that cybercriminals need to hack, 2 of 3 signatories. That is why 'hot solutions" are more suited to transactions than custody.
2. **Performance implications** - In both systems, the more signatories required - the more resources required. Therefore, standard multi-sig/MPC networks don't exceed 3-4 co-signatories because of performance implications and compute resources.
3. Both solutions are **ruled by a policy engine** that defines processes and procedures, such as transaction caps, hierarchies, whitelists, and more. If a hacker is able to compromise the system housing the policy engine he can change the policy and siphon the funds.

The Need for a Multi-Tiered Solution

While each self-custody technology offers unique advantages, a multi-tiered solution combining both hot and cold technologies provides a comprehensive approach to balancing security and agility. When paired with a granular, state-of-the-art policy engine, with robust quorum policies, institutions can manage their crypto as they do their fiat. Digital asset insurance adds another layer of security and peace of mind.

In the ever-evolving digital asset market, the imperative for institutions to seize control of their own destinies through the adoption of self-custody solutions cannot be overstated. Beyond the security considerations, self-custody empowers institutions to enhance operational and capital efficiencies. Equally noteworthy is the ability to leverage the custody infrastructure to unlock additional revenue streams, including custody as a service, staking, tokenization of tradtional assets, NFT custody, and participation in decentralized finance (DeFi) opportunities.

The future of digital asset custody lies in robust, secure, and adaptable solutions that empower institutions to safeguard their assets while embracing the opportunities of the digital age.

For more information:

- Overcoming Common MPC Shortcomings:
- 5 Common Cold Wallet Myths:
- No Real Cold Solutions Out There:
- Hunker Down and Build for the Next Boom:

Written by Lior Lamesh, Co-founder & CEO at GK8.

For more information contact@gk8.io//

9.0 Consolidation in the digital asset custody industry has started

Insurance is a classic instance of an immature industry reaching for the obvious stopgap when clients express concern about the absence of capital.

Boasting about the quality of the technology, or of the value of SOC or ISAE or ISO certification, also provides limited assurance by comparison with placing assets with a large and highly regulated bank.

For banks, however, there is work to be done before they can become digital asset custodians of the kind institutional investors want. And that work requires a degree of flexibility absent from conventional custody, because the rate of change in digital asset markets is faster.

Traditional custody networks add new markets or asset classes at a pace measured in years, whereas digital asset custodians have to add new blockchain protocols, newly issued cryptocurrencies, Stablecoins, NFTs and a range of DeFi apps at a pace dictated by customers that demand instant access to everything continuously.

So banks need to find a way to develop the flexibility to maintain the capabilities they to service digital assets.

For some established banks and exchanges, that way can be found in-house. SDX, for example, has developed a cryptocurrency "staking" service.[16] But SDX has also invested in a digital asset custodian.

Acquisition is an obvious solution to missing capabilities, and SDX is not alone in taking that path. Cryptocurrency exchange Coinbase and Hauck & Aufhäuser, a German private bank with a technology bias, have both bought digital asset custody businesses in the last three years (see Table 6).

Image Source: Getty Images/iStockphoto

Table 6

Mergers and Acquisitions in Digital Asset Custody

Seller	Buyer	Date
Volt1	Genesis Trading	May 2020
Custodigit	SDX	December 2020
BitGo Trust	Galaxy Digital Holdings	May 2021*
Bloxxon sub Kapilendo	Hauck Aufhäuser Lampe Privatbank AG	September 2021
Unbound	Coinbase	November 2021
GK8	Celsius Network	November 2021**
Trustology	BitPanda	February 2022
Pyctor (ING consortium)	GMEX	July 2022
GK8	Galaxy Digital Holdings	December 2022**
Prime Trust	BitGo Trust	June 2023***

*This purchase was cancelled in September 2022.
** GK8 was sold again after Celsius Network failed.
*** This purchase was cancelled almost immediately, and Prime Trust was put into receivership (see page [8] above)

Source: Future of Finance Research

Other acquirers were aiming to enhance existing capabilities. Genesis Trading bought the Volt1 digital asset custodian, for example, as the foundation of its prime brokerage capabilities.

Although market turmoil ultimately forced Celsius Network to sell GK8 to Galaxy Digital Holdings, the initial acquisition of the Israeli technology firm aimed to bolster the cyber-security capabilities of Celsius. The eventual owner of GK8, Galaxy Digital Holdings, had in September 2022 abandoned a long-standing ambition to acquire digital asset custodian BitGo Trust.

BitGo Trust, which was established as long ago as 2013, is among the most prestigious names in cryptocurrency custody, with FINMA and BaFin regulatory licenses and AuC of US$64 billion in November 2021, the month the cryptocurrency markets began their steady decline.

Difficulties in the cryptocurrency market help to explain why BitGo Trust is also the beneficiary of an interesting outsourcing arrangement announced in March 2023 by which customers of Genesis Trading can make use of a counterparty risk-reducing tri-party custody service provided by BitGo Trust.[17] BitGo has had a longstanding partnership with Genesis on the trading side.[18]

Similar sensitivity to counterparty credit and custody risk is evident in the decision by Blockchain.com, provider of a cryptocurrency trading app, an exchange and a digital wallet, to

appoint Standard Custody & Trust Company as the custodian for clients of Blockchain.com Asset Management (BCAM).

In addition to acquisitions and outsourcings, the difficulties in the cryptocurrency markets have also seen three digital asset custodians disappear from the market (see Table 7). Two of the withdrawals accompanied the failure of the Signature and Silvergate banks in the aftermath of the collapse of Silicon Valley Bank (SVB) in March 2023.

The third digital asset custodian to fail was DigiVault, the first cryptocurrency custodian to receive a licence from the FCA as compliant with Anti Money Laundering (AML) regulations. The parent company, Eqonex, failed in November 2022, and no buyer could be found for DigiVault amid the difficulties in the cryptocurrency markets.

Table 7

Liquidations of Digital Asset Custodians

Company	Nature of business	Date
Signature Bank	Specialist cryptocurrency bank	March 2023
Silvergate Bank	Specialist cryptocurrency bank	March 2023
Digivault	FCA-regulated cryptocurrency custodian	May 2023

Source: Future of Finance Research

Yet the digital asset custody market also continues to attract new entrants, not only from banks under pressure from clients to offer a service[19], but from long-established exchanges. CBOE Clear Digital has announced digital asset custody services. So the field of contenders is expanding even as it consolidates.

The challenge is to understand an evolving marketplace in digital asset custody services, as new entrants, established cryptocurrency custodians and traditional custodians adapt their services to the implicit and explicit demands of institutional investors, while remaining mindful of what it will take to become a “qualified” custodian.

10.0 Mapping the current state of the industry

Per the UK Law Commission "Digital Assets: Consultation paper" we believe it is appropriate to draw a distinction between direct custody services (that is, holding crypto-tokens on behalf of or for the account of other persons and having capacity to exercise or terms of both its positive and negative aspects) and custodial or other technology-based services that do not involve a direct custody relationship – this is most notably where client assets are poled and held by Exchanges.

In this paper we split the types of custody provision along the lines of other papers but with some changes in approach.

Regulators (notably in the European Union, where assets in custody with broker-dealers lacked the protection they enjoyed in the United States[20]) have reinforced this change by laying obligations on third party custodians to segregate customer assets and take responsibility for any losses of cash or securities.

The cryptocurrency markets, by contrast, developed a different custodial structure. It consists of three distinct models.

The first is pure digital asset custodians that provide digital asset custody services to investors as a fiduciary that segregates client assets.

The second is providers of digital asset custody technology:

- that enable an investor to self-custody
- provide technology some level insourcing to digital asset custodians

The third is hybrids of the two, that is bank or non-bank custodians offering technology services as well.

There is an obvious explanation why cryptocurrency custody developed so differently from traditional custody.

The current segmentation reflects the origins of the industry where in the early days:

a) the technological ability to deliver secure custody of keys was the paramount issue

b) many early adopters (and the more adventurous end of the institutional market) wanted to self-custody either as matter of principle, in this brave new world, or out of caution that holding the private keys themselves was the only truly safe option.

At that point specialist technology companies that could provide highly secure safekeeping of private keys were compelling, whatever their lack of formal banking licenses and regulatory frameworks. And these technology-based custodians emerged in two forms: an independent digital asset custody service or a set of technological tools that customers could use to self-custody.

This combination has worked surprisingly well in practice, given that most providers had no capital, no established financial controls and no regulatory oversight.

Over time we think this section will provide more focus on the types of custodian and services offered. Technology will remain, but as a critical component but more to entities that are custodians serving end-clients, rather than an end in itself. Institutional self-custody will be a much smaller piece of a much bigger market.

Technology vendors will develop products to support sectors of the market. Larger custodians may build or buy systems or components thereof. A survey of Technology vendors will remain highly relevant but have a different focus – already many of the big Tech vendors have a large slice of financial clients who are offering custody services to asset owners. The custodian buys-in whatever technology pieces they need but these are inputs to their business, not the business itself.

The segments:

Direct Custodians:

Directly secure the digital assets of others. They perform key management and assume the risks associated with the safe keeping of assets.

The key issue is how safe is my custodian? Custodians take on the primary role of managing and protecting a customer's private key information. The issue of what is a qualified or regulated or licensed custodian is left to the next section, but the absolute issue is still relevant with or without regulation. Concerns about this are still very strong as per SEC Accounting 121 shows.

Direct custodians have full control, or control shared with designated client staff and processes, over the private keys of the assets in their care. They typically operate by collecting a percentage fee based on the amount of AuC, other forms of revenue include trading fees and withdrawal fees, and revenue from other forms of value added services they provide. The level of activity and range of services has typically been greater than for traditional custodians allowing a potentially higher margin on assets.

The reasons why institutions outsource their custody are the same in crypto as in traditional asset custody and the long-term universal trend to outsource functions that are not core businesses.

In traditional asset custody the custodian is: handling securities into up to 80 markets and dozens of sub-custody relationships or CSD memberships; dealing with corporate actions; tax issues per country; regulatory changes per country; selecting and running a sub-custody network; securities lending; maintaining up to date systems and cybersecurity. The list is endless, and most pension funds have small staffs. Why would you do this rather than hand over to a specialist doing this for hundreds of clients who also, under most regulations , effectively provides very broad guarantee against losses.

With crypto and digital assets, you face the same fundamental issues. There may be a greater variation with different blockchains rather than security types; country has made less difference but

that is changing; the pace of custody of software change and cyber risk is higher; the range of connected services (links to exchanges and trading) and products (staking, lending) is higher.

The newness and pace of change make this challenging even with a strong Tech vendor's support. Regulators also have, and continue, to create many rules about what regulated entities have to do re custody.

Tech providers support for :

- Self-Custody
- Custodians

Self-Custody supported by Tech providers:

Vendors provide software and hardware solutions that enable their customers to self-custody.
While there are certain clear benefits to operating with a licensed direct custodian, for certain firms the need to control risk internally and concerns about trusting what are, from a broader perspective, small undercapitalised fintech startups. Even the "establishment" firms like BitGo are barely ten years old. In that context the cost of investing to develop policies, hire or train staff, and building or buying systems may seem a wiser choice.

These providers are not regulated and do not provide regulated services. They provide software/ hardware, training and sometimes staff under contract to help operate the customer's custody requirements. They do not or should not have control of either customer private keys or funds.

These companies offer a range of software (MPC and multi-sig) and hardware (HSM) solutions and services that allow for customers to secure their digital assets without transferring ownership of the private keys.

The explosion of Web3 services also offers a rich vein of potential of clients who may need applications for new or differently configured business models that most direct custodians will struggle to integrate with their "legacy" infrastructure in a timely manner if at all (if such a term can be used in digital asset custody).

However high-quality or cutting-edge the products and services of technology providers there are downsides. The largest of which is that, just as with other forms of self-custody, the end customer bears the risk of properly maintaining and backing up their keys and/or key shards.

Custody supported by Tech providers:

Direct custodians now and in the future will need to make build or buy decisions around hardware and software systems.

Crypto custody has been so much about crypto that building your own systems has been an industry norm.:

- The entrance of established bank custodians who may not want to develop these systems from scratch. BNY Mellon the world's largest custodian with over $ 40 trillion in AuC is partnered with Fireblocks to create its initial system. We do not think anyone would describe this as BNY Mellon "self-custody": it's a major custodian insourcing the technology.

- Over time custodians will make these decisions to build or buy their whole custody system or to build the core system but to outsource specialised areas (particular HSM , a staking or key management structure). Security will likely play a role as may the size of the AuC base – the bigger the more revenue to spread technology build costs over. A sign of the mutability of this issue was the State Street/Copper which was announced and dissolved within a year. State Street the number two global custodian behind BNY Mellon chose a different path.

Typically, technology providers operate by charging subscription and plan fees, as well as revenue from value added services.

Hybrid:

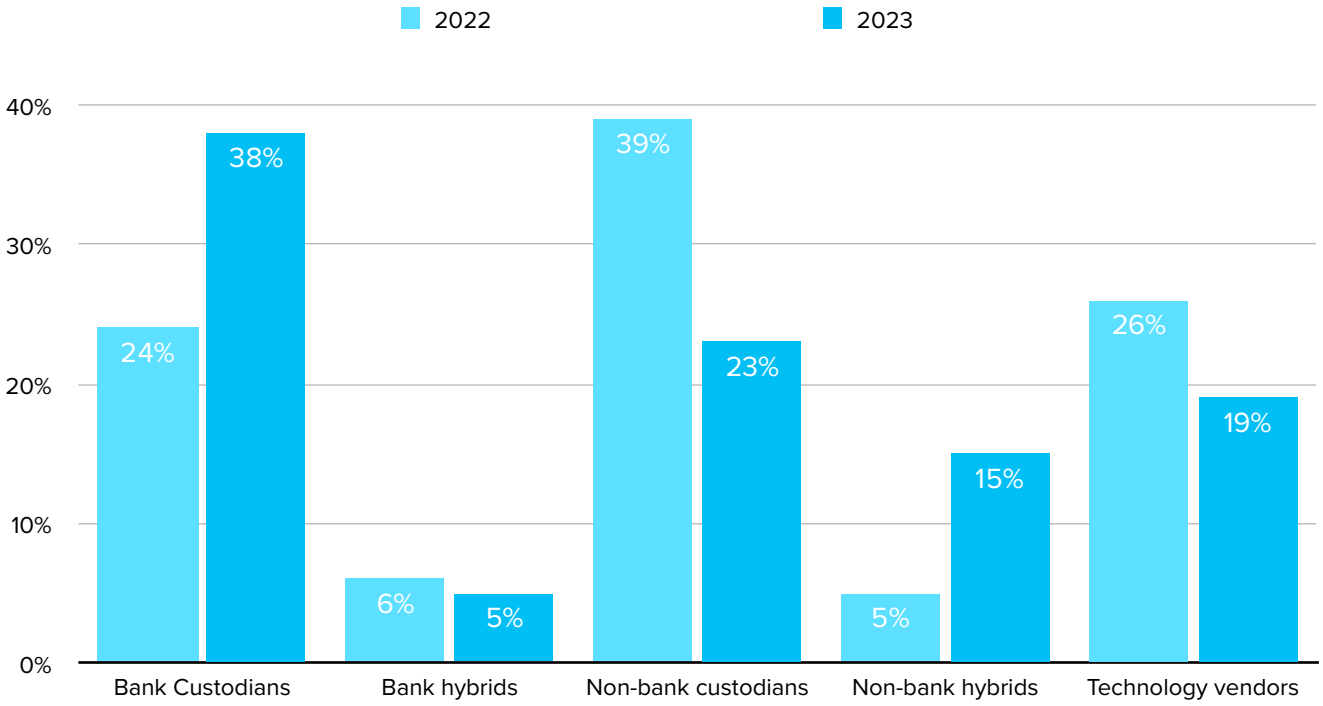
Providers that offer both direct custody and self-custody technology solutions. The majority of this category is simply companies that provide both direct custody and technology based solutions.

The entry of the banks has complicated the market structure because banks are not only offering custodial services but also technology services (including asset tokenisation services).

The current market structure, is depicted in Figure 1. Non-bank hybrids include firms such as NASDAQ - an exchange that became a technology company but also offers custody and, in some markets, CSD services.

Chart 3

The Structure of the Digital Asset Custody Market - By custodian type

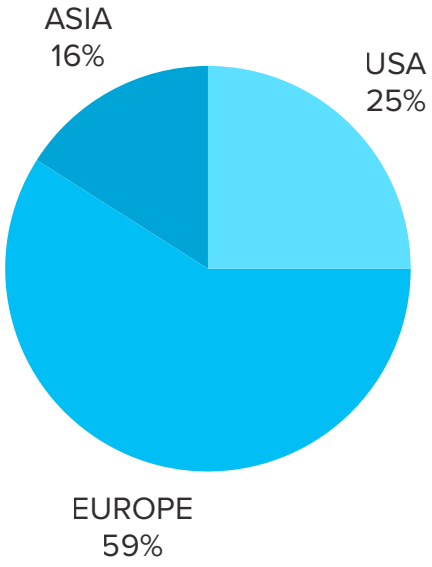


Source: Future of Finance Research

As Figure 1 also shows, the proportion of bank custodians recorded in the *Future of Finance* database has increased since 2022 from a quarter to over forty percent including hybrids, while non-bank custodians including hybrids have shrunk from 44% to 38%. Technology companies fell in percentage terms but were steady in numbers.

Chart 4

The Structure of the Digital Asset Custody Market - By custodian location



Source: Future of Finance Research

At present, the state of that contest is hard to measure in terms of AuC, because the majority of digital asset custodians do not disclose the figures.

We were surprised to be able to produce any analytical important information on AuC but data on a number of names where something was available.
In total we gathered some type of data from 24 names with $ 420 billion in AuC for custodians directly and Tech companies indirectly. This is purely crypto tokens with no security tokens or digital assets.

Caveats abound as you would expect which we will note below. The interesting example available of hard data is Coinbase. The Q4 2021 data ,which is still out there as the only information generally reported in studies ,was at would be very inflated given price moves. Coinbase however had $ 90 billion AuC at end Q3 2021 but $ 124 bn at the end of Q1 2023 which was a surprising result (and is an SEC 10-Q of an NYSE listed firm). The numbers were much higher than expected and are more than 10% of all cryptocurrencies.

Table 8

The Structure of the Digital Asset Custody Market - By (Self) Reported AuC

	AuC	Number of respondents	Share of total
Custodians	US$310.2 billion	17	73 per cent
Of which:			
- NYDFS-licensed custodians	US$218.0 billion	3	52 per cent
- Other custodians	US$92.5 billion	14	21 per cent
Technology vendors	US$112.0 billion	7	27 per cent
Total	**US$422.2 billion**	**24**	**100 per cent**

Source: Future of Finance Research

This bias towards regulated custodians is evident also in the performance of Coinbase since the events of 2022 shook the confidence of investors.

The publicly listed cryptocurrency exchange saw the value of its AuC increase from US$80 billion at the time FTX failed in November 2022 to US$129 billion by the end of the first quarter of 2023 (see Chart 1). US$129 billion was equivalent to more than a tenth of the total value of the cryptocurrency markets at 31 March 2023.

The most prominent of these developments in the cryptocurrency market - a shift towards pure third-party custodians, and especially regulated ones, coupled with a shift towards transparent and regulated cryptocurrency exchanges – suggests digital asset custody is moving away from the original cryptocurrency model.

In that original model, the technological ability to deliver secure custody of private keys was the paramount issue, and self-custody of the private keys using technological tools supplied by specialist vendors was the only truly safe option. In other words, self-custody is on the wane.

This is not to suggest that self-custody supported by technology providers will disappear altogether. Certain firms will always prefer to control cryptocurrency risk internally instead of trusting their assets to under-capitalised specialists with limited track records (even BitGo is barely ten years old). That means buying systems from technology vendors and hiring people to operate them.

The vendors are not regulated and do not provide regulated services. All they provide is technology, training and sometimes staff under contract to help operate a system on behalf of a customer. They do not – and should not - have control of either customer private keys or customer funds.[21]

Self-custody is nevertheless likely to remain a minority choice. No matter how compelling the technology offered by vendors turn out to be, in any form of self-custody the end-customer bears the risk of properly maintaining the security of their private keys.

Why? Because direct custodians directly secure the digital assets of customers in much the same way as conventional global custodians.

The direct custodians that operate the cryptocurrency markets today have full control - or least control shared with designated client staff and processes - over the private keys of the assets of customers that are in their care.

They operate by collecting an ad valorem fee on AuC, supplemented by trading and withdrawal fees plus revenue from other services they provide. In short, their business model is the same as that of a traditional custodian.

This makes it familiar to institutional investors embarking on digital asset investing. And the reasons why institutions will want to outsource their digital asset custody needs to direct custodians are also much the same as those which drive their use of traditional custodian banks in the securities markets today: it is better to let a specialist third party handle the operational complexities.

Instead of the complexities of settling trades or reclaiming tax or collecting dividends in 80 markets around the world like a traditional global custodian, a digital asset custodian will grapple with the difficulties of settling trades and collecting entitlements on assets traded on dozens of different blockchain protocols.

Institutional investors can also count on direct custodians to make technology choices on their behalf. Established global custodians entering the digital asset custody market have already shown they do not want to always develop the necessary systems in-house.

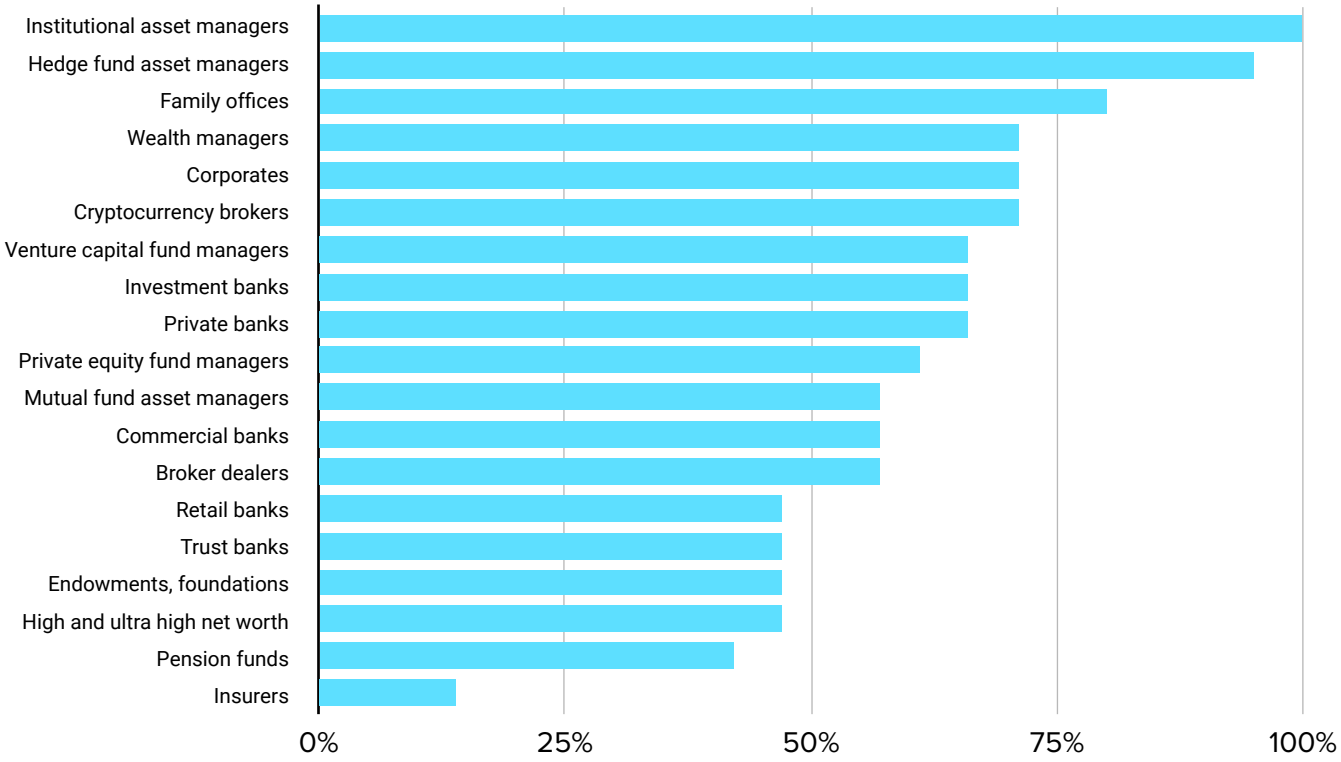
BNY Mellon, the largest global custodian in the world, has established a partnership with technology vendor Fireblocks to create its initial system.

However, there are other paths. A sign of the mutability of this issue was the partnership between State Street and technology vendor Copper, which was announced and dissolved within a year.

The destination of the institutional digital asset custody industry is not yet clear, but it is becoming clearer, and it can be see already that the dominant model will be more like the securities markets of 2000 past than the cryptocurrency markets of 2018.

Chart 5

Target Clients of Digital Asset Custodians



Source: Future of Finance Research

The data from our survey participants on who Digital asset custodians view as Target Clients, provides quite a clear picture.

100% of respondents chose Institutional asset managers as a target: they are huge assets holders but as yet have little in digital assets and may be more open to approach.

The high numbers for Hedge Funds, Family Offices and Wealth managers reflects how active these players have been to date.

Equally interesting are some of the choices getting less focus:

Pension funds: these are the entities that actually employ custodians for a very large piece of AuC globally. Asset managers choose the custodian of their own Funds: they do not choose the custodians of the large separate accounts they manage such as pension and endowment funds. However, reaching pension funds is a notoriously difficult process and they are very cautious.

Insurers: Are one of the largest holders of assets globally so the low priority is striking.

This may reflect a view that insurers are conservative in their approach to asset class expansion. The larger insurance groups also often have separate asset manager arms that manage internal as well as third party assets; so some of the Institutional asset manager focus may capture Insurers.

11.0 Going Forward

To monitor the continuing evolution of the institutional digital asset custody industry is the purpose of the DACG. The future is of course hidden, but there are already a number of areas where it can be stated with confidence that future issues of the DACG will explore the topic

We intend to make the Guide a mix of regular items and a number of specific sectors, and combine that with in-depth research by ourselves or expert partners.

The first regular item will the database which we will be growing and pruning all the time and periodically refreshing, with a view available through the web at www.futureoffinance.biz . Our goal is to increase the range of data we provide per name and to get deeper understanding of each name. We will periodically remove names that are more marginal in size or not really offering digital asset custody as a product. In time we hope the database will have enough information to be usable for various purposes.

The main sections we will maintain are:

A ***"Current"*** section showing some of the tables in this issue for M&A, new entrants and exits, custodian types, AuC, outsourcing and any headline developments.

Custodian types and services:

A key area will be trying to track is market shares by type, and as custodians start to offer custody in multiple classes (crypto, digital assets and traditional securities) and whether this is presented as an integrated product in business or legal terms.

Regulation & Country environment:

This will continue to track how regulation is developing worldwide mapping all classes of digital asset. we will also undertake studies at the country level which will mean the entire tokenisation, trading , post-trade and custody elements. Near term possible targets are: looking at Germany's crypto custody arrangement; a review of the activity in the Gulf Cooperation Council where there is a huge investment in creating a state of the art environment for digital assets; and not to forget the USA.

Security:

Technology development will continue to be the most critical issue in security but we will also track the other areas around organisational controls. The development of insurance will also be a topic to really understand what different custodians are offering in detail rather than the headline. Over time see whether insurance becomes more or less important as new entrants especially traditional banks enter the market.

Consolidation. The ***Future of Finance*** database currently lists more than 100 suppliers of digital asset custody services in a market whose total value is at best a fraction of the size of the global equity or bond markets. While we expect lots of new bank entrants to enter the space in the short-term, the number of providers will be reduced drastically over time by consolidation, to some combination of giants and specialists, even as the digital asset markets grow. After all, it is a proven characteristic of markets in general, and the custody market in particular.

In all of the above there will be a focus on the gradual **fusion** of crypto, securities tokens, other digital assets, and traditional securities across the asset lifecycle. The SDX dual-listing is a foretaste of a long process.

What are the complete regulations per country for all digital asset types and which custodians are covering which sector of the business? As noted at the start of the Guide a lot of the bigger investors are deterred from investing as too few major traditional custodians substantive crypto services and crypto focused custodians have hardly started looking at traditional assets.

We will shortly be sending out a new Survey to Digital Asset Custodians with some additional questions that we feel will provide a fuller picture. It is our intention to considerably broaden the number of items we show in the database and for some of the most interesting we cannot usefully use public data (e.g. desired client profiles), so in that case fields will be blank for non-responders. The Survey will close September 15th 2023.

Data Sources:

The data has come from both the Future of Finance Survey of Digital Asset Custodians and from public and Future of Finance sources.

The Survey was conducted earlier in 2023 and collected a total of 21 responses from a range of providers, with some bias to Technology vendors versus the wider population. The survey asked 44 questions ranging from the name to quite complex questions on how assets are kept safe, customer focus and non-custody services provided which are not easy to extract from public data in a manner that is comfortable to use (we would rather have the custodian tell us their customer priorities than try and make our own judgement from public data). Overall the survey gave a strong sense of what the respondents are offering.

The new survey we will send out shortly will have been expanded to 56 questions as we have learnt from experience. We hope with more respondents we can provide fuller public data sets.

The publicly sourced data is from a wide range of sources: company web sites and reports, surveys and reports on the industry especially at a more local level, data published by regulators especially on licensing conditions and licensees. There is a large amount of data available.

Assets under custody is the hardest data to get. At some level we surprised to be able to get fairly credible (if not necessarily current) data from twenty-four names out of our one hundred and two, especially as many of the new bank entrants report no data and probably do not have meaningful numbers to show. The sources for our numbers were: firstly Coinbase as a public company has to report real numbers quarterly; secondly a sizeable number of our Survey respondents provided this data; thirdly there is a set of numbers that have been reported in numerous places dating back to November 2021; and lastly a couple of instances where a service provider has listed its partners and quoted AuC for them - while not direct information it is reasonable to assume they must have had consent to share such sensitive data.

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Survey Results

For the Survey Results, please click here.

Tables, charts and Figures

[1] See *Stablecoins: Where They Came From, Where They Are Now, Where They Are Going Next*, at https://futureoffinance.biz/

[2] See "Nevada Financial Institutions Division files court petition to place Prime Trust LLC in receivership" at https://business.nv.gov/News_Media/Press_Releases/2023/Financial_Institutions/Nevada_Financial_Institutions_Division_files_court_petition_to_place__Prime_Trust_LLC_in_receivership/

[3] See Petition For Appointment Of Receiver, Temporary Injunction, And Other Permanent Relief versus Prime Core Technologies, Inc., Prime Trust, LLC, Prime Ira, LLLC, Prime Digital, LLC, 26 June 2023, at https://www.docdroid.net/Q5WNMMS/prime-core-technologies-et-al-petition-pdf

[4] https://futureoffinance.biz/why-the-case-for-regulating-cryptocurrencies-is-becoming-unanswerable/

[5] https://www.fintechnews.org/tokenization-of-securities-will-be-the-next-evolution-in-markets-blackrock-ceo/

[6] https://www.blackrock.com/corporate/investor-relations/larry-fink-annual-chairmans-letter

[7] See "What CSDs can do about Tokenisation" at https://futureoffinance.biz/future-of-finance-institute/

[8] Future of Finance Research

9 https://coinmarketcal.com/en/news/blackrock-touts-monumental-impact-of-tokenization-even-if-it-arrives-slowly

[10] https://www.sec.gov/news/press-release/2023-102. See page [TK] below for further discussion of "staking."

[11] Office of the Comptroller of the Currency (OCC), OCC Conditionally Approves Chartering of Paxos National Trust, news release, 23 April 2021. This expired on 31 March 2023).

[12] Paxos press release, Paxos Leads Digital Asset Industry by Becoming First Issuer to Disclose Full Monthly Reserve Holdings Backing USDP and BUSD Regulated Stablecoins, 8 July 2022.

[13] Paxos Press Release, Paxos is the first US-Based Blockchain Infrastructure Platform to Secure Regulatory Oversight in Key Financial Hubs of New York and Singapore, 2 November 2022.

[14] https://www.sec.gov/rules/proposed/2023/ia-6240.pdf

[15] See "What cryptocurrency prime brokerage might and might not mean for digital asset markets" at https://futureoffinance.biz/what-cryptocurrency-prime-brokerage-might-and-might-not-mean-for-digital-asset-markets/

[16] See "SDX services non-custodial Ethereum staking service is live" at https://futureoffinance.biz/sdx-web3-services-non-custodial-ethereum-staking-service-is-live/

[17] https://www.businesswire.com/news/home/20230329005384/en/Genesis-Expands-Custodial-Tri-Party-Solution-by-Forming-Collaboration-with-BitGo-Custody

[18] https://www.bitgo.com/newsroom/press-releases/bitgo-launches-partnership-with-genesis-global-trading

[19] See page Section 4.0 above.

[20] In the United States, client assets in custody with investment banks were ring-fenced from creditors (under SEC customer protection Rule 15c3-3) and insured (by the Securities Investor Protection Corporation).

[21] Another potential client group for these vendors is firms capitalising on the structural shift from Web 2.0 (characterised by closed platforms owned by centralized Big Tech firms creating value by monetizing data) to Web 3.0 (characterised by open platforms owned by users creating value by trading peer-to-peer). They need peer-to-peer applications that third party digital asset custodians may struggle to deliver.


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