CLEARTOKEN

White Paper

Creating Financial Market Infrastructure for Digital Assets:

Securing Tokenised and Cryptoasset Trading

March 2024

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In Summary

1. Successful settlement underpins every trade in any marketplace, and digital assets, including cryptoassets*, are no exception; whereas DLT facilitates a decentralised market, its adoption does not force a market to become decentralised.

2. Lack of central clearing in digital asset markets means that all trading is bilateral, creating capital inefficiencies and high risk of exposure to unregulated counterparties and failure of trades.

3. Clearing houses have proven to be essential for the smooth operation of traditional markets because of the benefits they confer to participants, including netting (up to 98% reduction in settled quantities[1]), capital allocation, and risk mitigation, and by ensuring settlements complete.

4. Market participants should not forgo the traditional benefits of centralised clearing when seeking to access decentralised finance. Without the right market infrastructure, market liquidity is compromised, limiting the potential of the new generation of digital assets.

5. Introducing well understood concepts of clearing and settlement for the new generation of digital asset markets will increase their potential whilst making them safer, more efficient and operationally stable.

6. ClearToken intends to offer a fully regulated clearing and settlement financial market infrastructure in line with traditional market principles but modernised for digital assets.

* **ClearToken uses the UK law definition of cryptoasset from Financial Services and Markets Act 2023, Section 69:** "cryptoasset" means any cryptographically secured digital representation of value or contractual rights that (a) can be transferred, stored or traded electronically, and (b) that uses technology supporting the recording or storage of data (which may include distributed ledger technology). https://www.legislation.gov.uk/ukpga/2023/29/section/69

Successful Trade Settlement Underpins Every Market; Digital Is No Different

It's time to separate myth from reality. Using blockchain technology will bring many benefits, but it does not mean that markets must become completely decentralised. Financial markets depend on the correct exchange of assets to complete trading contracts, and managing counterparty risk and ensuring successful clearing and settlement are critical to guaranteeing the success of trade lifecycles. Technology alone cannot achieve this.

Bilateral trading arrangements among market participants are operationally intensive, require individual KYC checks on every trading counterparty and limit the trading pool to partners with which such arrangements are in place. If a participant's counterparty fails to deliver on its side of the contract within the agreed terms, or default in entirety, there is no protection for the participant in handling the entailed loss and failed settlement.

All modern developed financial markets have adopted consistent approaches to clearing and settlement because of the robust security and substantial benefits this brings.

Clearing houses have existed in some form across the asset landscape for over a hundred and fifty years and have increasingly been used to mitigate credit risk and provide predictable and reliable settlement. Clearing houses, (also known as central counterparties (CCPs)), exist to guarantee both sides of a contract, protecting their clearing members from any failed settlement due to counterparty error or default. This protection is achieved through **trade novation**, a process in which trade information is sent to the CCP and the CCP becomes the buyer to the seller, and the seller to the buyer. Through novation, trading participants move their trading positions to face the clearing house and away from the other counterparty, hence the term "central counterparty". The CCP now bears the counterparty risk and responsibility for closing out the trades and participants have no longer have direct exposure to the original counterparty.

As regulated entities of systemic importance, CCPs have a legally privileged status and usually operate to international standards, bringing credibility and stability to the market. CCP members must meet regulatory KYC and AML standards as well as credit and collateral requirements to contribute to the centralised pools of collateral (margin and default fund) which are used by the CCP in the case of trade failure or participant default. Strict regulation demands that CCPs have sufficient capital resources to provide clearing services, especially during periods of market stress, when margin calls and defaults are more likely. For example, in the UK, CCPs default funds are expected to be able to cover the unlikely event of their two largest clearing members simultaneously defaulting.

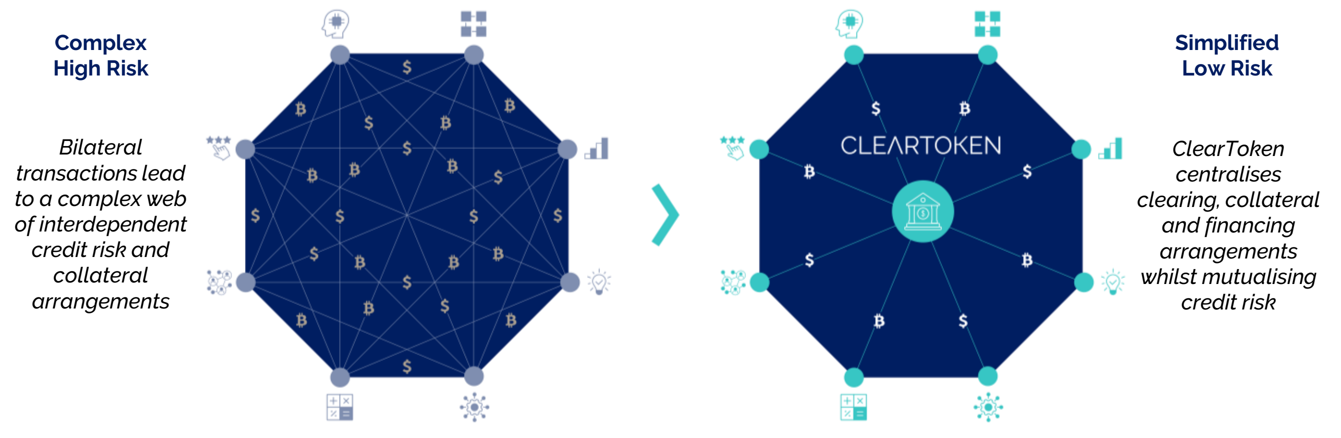
Once the CCP verifies that both sides of the trade have been successfully novated, it works with custodians and depositories to ensure that the asset exchange is completed securely. The infrastructure in entirety provides legal certainty that once a trade is settled, it stays settled, and simplifies trading for market participants. Furthermore, settlement complexities are simplified because obligations are being netted to a single movement between the member and the clearing house.

Clearing houses serve the market better when they are 'horizontal', connected across multiple trading venues, as opposed to 'vertical', serving just one venue in a silo.

Horizontal models enable participants to trade across multiple venues and provide mechanisms to streamline their clearing and settlement activities in a single place, bringing operational and cost benefits and encouraging wider access to multiple pools of liquidity.

Currently, digital asset markets have no horizontal centralised clearing infrastructure; this is hindering the development and uptake of tokenised and cryptoasset trading because risk is concentrated with a few unregulated firms.

Central Counterparties (CCPs) Simplify Trading and Settlement Obligations

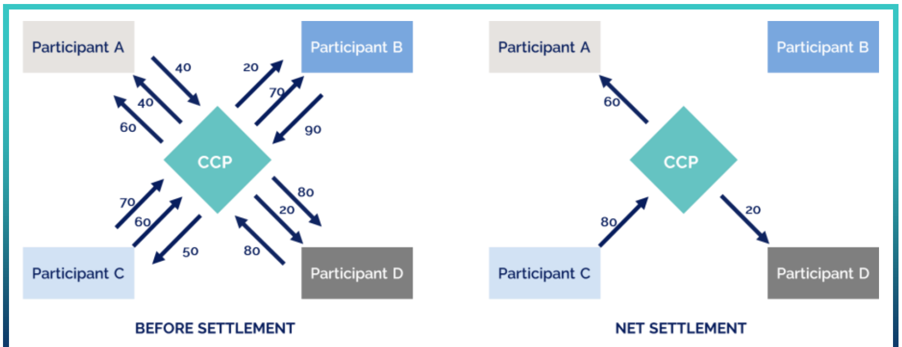


DLT Can't Deliver Modern Market Efficiencies Without Multilateral Netting

A core pillar of centralised clearing and novation is multilateral netting, allowing a clearing member's hundreds, or thousands of daily trades across connected trading venues and counterparties to be summed up in real-time to a single settlement instruction per instrument to the CCP. This compression of gross transactions vastly reduces margin requirements, tied-up capital, operational complexity, risk exposure, settlement failure and costs.

Conversely, bilateral tokenised and cryptoasset trading is conducted on a gross, unnetted basis, additionally forgoing the wider effects and advantages for the stability and growth of modern trading ecosystems.

Having capital freely available to allocate to trade is a hallmark of an efficient market. Reducing unnecessary funding requirements is essential to ensure that sufficient liquidity is able to circulate.



Multilateral Netting with a CCP Simplifies Trades Down to Single Instructions

Modern securities markets often rely on market makers to continuously quote both buy and sell prices, providing stable liquidity and depth to make trading more efficient and, in times of price volatility, more resilient.

To fulfil this vital market role, market makers depend on capital not being tied up in funding requirements and managing their increased risk exposure. This is supported by multilateral netting, currently absent in digital asset markets.

Blockchain trading requires prefunding: Participants and market makers must prefund their trades by putting up the total amount they trade with counterparties *before* entering into the transactions. There are huge opportunity costs associated with locking up this capital, not to mention the risk of committing it to a single unregulated counterparty. Therefore, the amount of business the market maker can do, and the liquidity it can provide to the market, is limited.

Trading based on credit lines and gross settlement: Trading an instrument with various counterparties requires each trade to be settled sequentially. If a market maker has bought from counterparty A and sold to counterparty B, it needs to wait for A to deliver the assets before being able to onward settle with B. This means that the market maker takes on the credit risk of both parties and may also be forced to post collateral to cover open positions before settlement. Credit lines are needed to cover any unsettled position not covered by collateral, which could result in a whole transaction leg, or even both, having to be fully funded with the exchange or counterparty. The market maker is therefore unable to deliver maximum liquidity and execution opportunities.

However, centralised clearing nets down unsettled positions and their funding obligations, freeing up capital: A CCP steps into both trades and nets down its members' positions on its books. The market maker that near-simultaneously bought from A and sold to B, resulting in two settlement instructions, now only has a single net position with the CCP instead. In the event of a net position of zero, the market maker only has a profit or loss balance with the CCP. As a result, it has limited capital requirements and no use of a credit line with either the exchange or counterparty. Additionally, the market maker no longer must settle either of its trades and can use the resulting capital saving to do more business.

The DTCC claims an overall netting efficiency of 98-99%; for a market maker with all trades centrally cleared, the netting can approach 100%.[1]

Market makers and other market participants cannot forgo the benefits of multilateral netting that they are used to in traditional markets, inbuilt into centralised clearing, for decentralised finance philosophy.

In 2022, typically $2.1 trillion gross US equities transactions was netted to only $38 billion in settlements....

...this is a 98% trade compression achieved through multilateral netting in real-time, reducing costs and freeing capital...

...and supported by a reserve fund of only $12.0 billion; just 0.57% of traded volume.[2]

Netting can generate 100% compression;
market participants will cannot forgo these benefits for a decentralised finance philosophy

Institutions Won't Settle For Less

Traditional market infrastructure provides further benefits to the market than just counterparty risk mitigation and multilateral netting; market participants, especially institutional investors, want these features in tokenised and cryptoasset markets.

Capital Efficiencies

The considerable volumes settled by modern securities markets are in part due to the capital efficiencies offered through centralised clearing being collateralised by margin and default fund contributions.

In 2022, the US National Securities Clearing Corporation (NSCC) processed an average daily value for cash equity markets of over $2.1 trillion[2] with a default fund of $12 billion[3]. That year, the US equity market had a market cap of around $40 trillion[4]; meaning 4% of the US market cap was traded every day with a default fund of just 0.57% of the ADV. Centrally cleared trading can occur at a fraction of the capital necessary for bilateral or prefunded exchange trading.

Bitcoin alone has a market cap of around $1.64 trillion[5] and Bitcoin spot ETFs now have a market cap over USD$63 billion[6] following regulatory approval in the US. If the market structure developed to incorporate the same benefits that the US equity market enjoys, the exchange-based digital assets market could become more efficient and endure less frictional costs, enabling it to develop through freeing liquidity for trading, rather than prefunding.

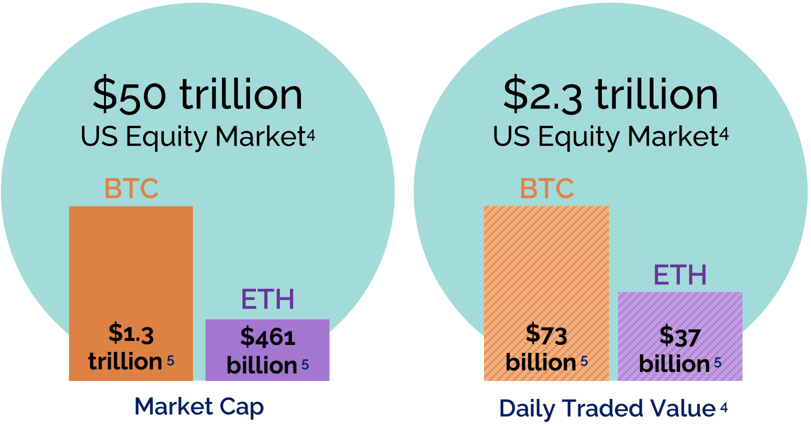
Delivery vs Payment (DvP) Settlement

Major asset transactions, such as buying a house, typically involve the use of an escrow account, or some other neutral intermediary, to ensure that the asset is only handed over to the buyer when payment is available for clearing to the seller, and vice versa. This is DvP in a nutshell.

Without central clearing, counterparties trading bilaterally would both have principal settlement risk versus one another. In other words, Participant A could risk moving first, making payment with no guarantee of asset delivery, and vice versa for Participant B. Such "free of payment" (FoP) transactions have a higher default risk than DvP and often attract unfavorable regulatory capital treatment.

Central clearing eliminates principal risk as settlement occurs only once the assets required on both sides of the transaction are in place for guaranteed exchange. The CCP takes the risk of the settlement failing should one side fail to deliver on their side of the trade.

Digital assets have a long way to go to be fully invested in by the market:
2024 data



Cryptoasset trading is already a significant and attractive market....

2023 Institutional Investors Survey[7]

- 60%+ of current crypto investors expected to increase their allocation over the next 3 years.
- 45% of those not currently invested in crypto expected to make an initial allocation.

...but missing the essential market infrastructure critical for institutional investors to participate.

"Our bilateral contracts for spot crypto trades are quickly becoming very complex."

\- Global Asset Manager

"We often have to stop trading in the middle of the day because our capital has been fully utilised."

\- Global Market Maker

The Solution: Rethink Market Structure To Embrace Digital Assets

Modern financial market infrastructure is largely absent from digital asset markets. There is a great opportunity to modernise traditional market structure principles to facilitate and secure digital asset markets; increasing flows and opening digital assets to a new investor community. It starts with re-examining crypto itself.

Though often thought of synonymously, cryptoassets (including cryptocurrencies) and tokenised assets are not the same as decentralised ledger technology (DLT) (e.g., blockchain) or the underlying philosophy of decentralised finance (DeFi). Digital assets are fundamentally products that can be traded on or off-chain.

DLT's utopian promise, that it will eliminate existing post-trade market infrastructure for frictionless and instantaneous settlement, is flawed.

Perhaps the most important, but not the only, criticism of this premise, is that undertaking DvP between crypto and fiat is inhibited by the rails on which they run. Transactions can only occur in that blockchain's protocol-particular coin so the change of that coin's ownership can be recorded on-chain, but what guarantee is there that the seller will get the fiat currency, or alternative crypto coin in return (off-chain) and that the transactions have legal certainty? Whilst some technical solutions have been developed, they are operationally inefficient and are constrained to select coins.

Current digital asset market structure lacks robust tried and tested, regulated market infrastructure, risk mitigation, settlement predictability and legal certainties already valued by institutional investors and regulators.

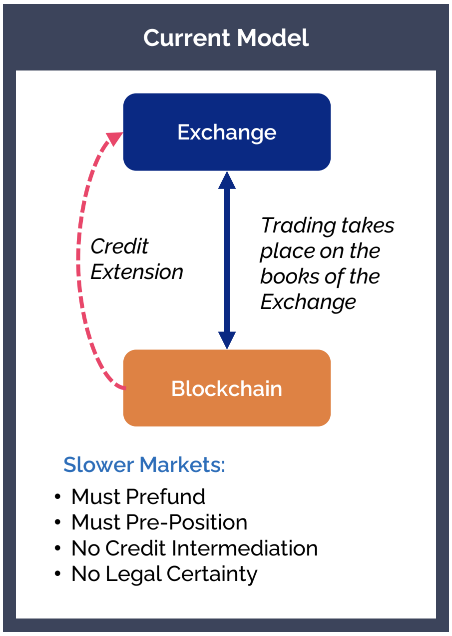
Many institutions do not want to settle their trades on the public blockchain or on unregulated exchanges without robust custody, a reliable record of ownership, and balance sheet transparency. Additionally, settlement is not as predictable as in traditional markets, with unknown network fees levied from the traded amount on-chain on a trade-by-trade basis. If 0.05% less than the traded bitcoin expected arrives with the buyer, is this deemed a settlement failure and how would it be resolved between parties? This makes bilateral trading even more contentious and labour intensive.

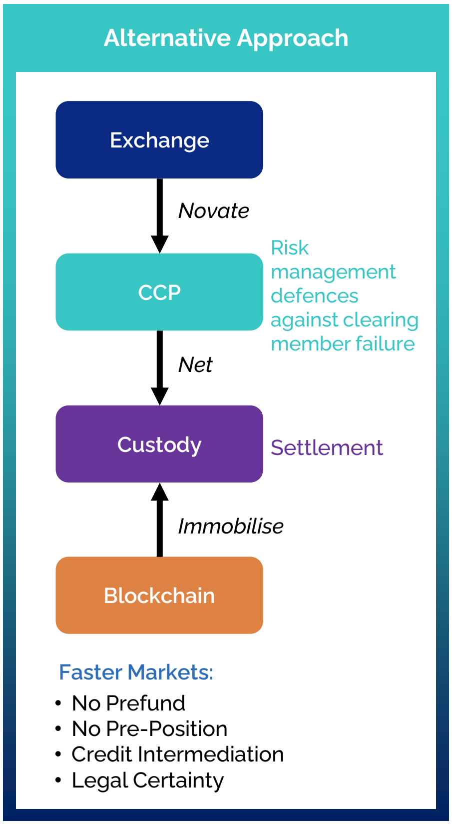
Digital asset market infrastructure rarely meeting international regulatory and AML/KYC standards when trading with anonymous on-chain wallets is a very real risk.

Vertically integrated crypto exchanges do not separate custody from settlement. It is impossible to imagine that prudential regulators would allow the title to trillions of dollars of existing securities or government-controlled databases of assets to exist on a public blockchain that could risk the misappropriation of assets. Anti-terrorist financing and money laundering rules still apply to digital assets, and CCPs and custodians have an important role to play in verifying the status and compliance of counterparties and crypto wallets. The SEC's enforcement-led approach to crypto moderation in the US demonstrates the urgency with which the market needs to recognise that new technology will still depend on traditional policymaking.

For these reasons, the philosophy of decentralised finance is still uninviting to the market at large.

Traditional concepts of centralised clearing, custody and settlement will continue to be essential to regulated entities as they reduce risk, reduce the capital and liquidity requirements of trading and ensure that client assets are kept safe.

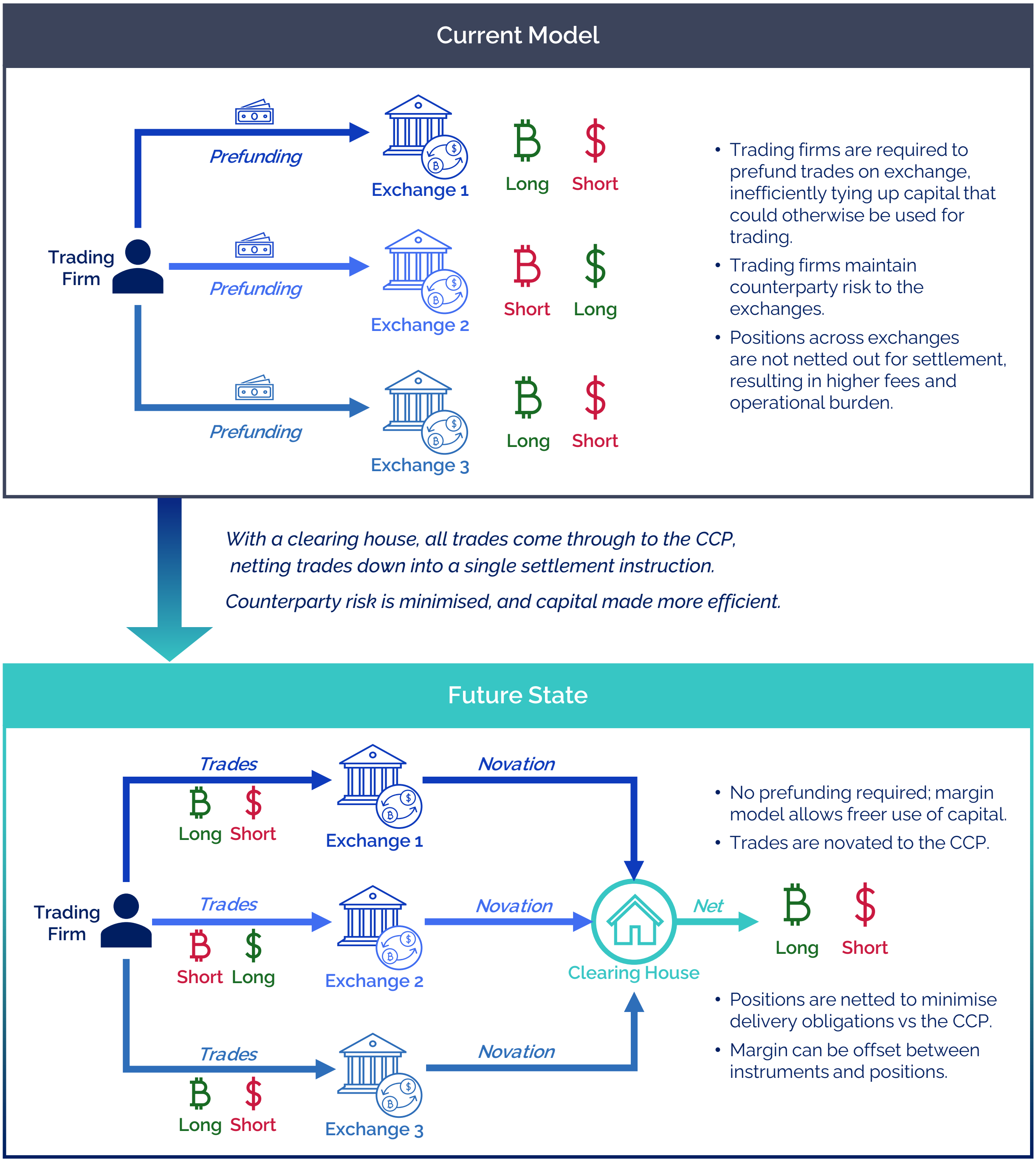




Current vs Future Models

To source liquidity from multiple venues, trading firms must prefund with each venue ahead of trading and settle separately. This leads to higher costs and increased risk from counterparties and settlement operations.

Many digital asset trading venues operate more similarly to broker-dealers rather than traditional exchanges, in that they act as principal and hold customer assets whilst operating the venues, albeit whilst unregulated. It is likely that the regulation of cryptoassets will mean that these activities will become subject to existing securities regulation in which clearing, settlement and custody are fortified as individual market functions, potentially compelling the use of CCPs and custodians.



Tried and Tested

The current model in decentralised markets creates a number of problems which institutional investors are not able to easily overlook when traditional market structure has resolved these issues for many decades.

	Current Digital Assets Market Model	Traditional Finance Market Model
Market Makers' Ability to Provide Liquidity	**Market makers must typically prefund their trades when trading on exchanges.** • Trading is compromised as prefunding or credit is depleted, ultimately ceasing completely. • This limits a market maker's ability to provide liquidity to the market and to manage risk.	**The required liquidity can be much smaller than the total amount settling on a given day.** • Horizontal clearing enables market makers to provide liquidity across multiple venues. • CCPs and securities settlement systems optimise settlement flows given the available liquidity.
Capital Efficiencies	**Market participants require capital for the gross sum of their risks across multiple trade counterparties, with no multilateral netting.** • Settlement costs are applied to each trade, not on netted volumes. • Capital is inefficiently tied up in meeting funding requirements that could otherwise be used for trading.	**Members post collateral as initial and variation margin at the CCP based on the multilaterally netted risk position.** • Multilateral netting reduces risk; CCPs call for margin on the net risk position only when needed. • A CCP default fund is a capital-efficient backstop to risks above margin; rules on its management ensure liquidity and safeguarding of funds. • This often results in highly liquid cleared markets.
Impact on Asset Manager Funds	**Asset managers must sell out of one position before posting 100% of funding for the next.** • This creates a drag on fund performance.	**Asset managers do not have to sell out of one position before buying into the next.** • This enhances fund performance.
Segregation and Custody of Client Assets	**Client assets are held at mostly unregulated entities:** • The mostly unregulated "exchanges" are also acting as an unregulated clearer and custodian. • There is little balance sheet transparency. • There may be no segregation of assets. • Systemic and unknown risks exist in opaque organisations with no oversight. Defaults are unmanaged.	**Client assets are segregated at a fully regulated entity:** • Exchanges are segregated from the entities with responsibility for the safety and settlement of assets. • The clearing house's balance sheet is transparent. • Assets can be further segregated if clients wish. • Risk is appropriately mitigated with known default management processes in place.
Standardisation of Contracts	**Non-standardised contracts** • Bespoke, bilateral contracts between counterparties. • Increasing opacity and counterparty risk.	**Standardised contracts** • Centralised clearing promotes standardisation. • Margin offsets fungible and highly correlated instruments across venues.
Delivery vs Payment	**No delivery versus payment (DVP)** • Cash and securities are not always delivered at the same time; credit exposure is to the whole delivery amount.	**Delivery versus payment (DVP)** • Cash and securities delivered at the same time; credit exposure is only to the net value of trades.

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ClearToken: Supporting the Future of Markets

The development of cryptoasset markets has shown that institutional investors will wait until the infrastructure is evolved enough to allow them to engage; this will be true for other digital assets.

The reasons for institutional hesitancy include capital inefficiency, unnecessary credit risk, uncertain settlement and the fact that client assets are often unsafe in unscrutinised and unregulated entities in a still volatile and risky market landscape.

Without sufficient safeguards, as the digital asset market grows the likelihood of market participant failures causing economic disruption increases. To increase adoption there is an increasing necessity for financial market infrastructure which enhances fair and orderly markets, reduces systemic risks and protect investors.

Regulators are already developing policies to oversee digital assets more deeply to protect investors and economies in guarding against future collapses and bad actors in the sector. Beyond that, legal and regulatory recognition of digital currencies and tokens, such as the SEC's approval of the bitcoin ETF in January 2024, gives the philosophy of decentralised finance a broader reality.

Digital markets are limited under current nascent regulatory oversight, as institutional participation, flow, liquidity and investment cannot meaningfully expand. Centralised clearing and settlement infrastructure are deemed essential for safe, secure and efficient markets, and are embedded in regulatory standards around the world. For the new generation of digital assets to thrive and make real world impact, there needs to be bolstered confidence and increased participation to make it more attractive to investors. The market needs updated traditional clearing and settlement concepts to reduce systemic risk within strong regulatory frameworks.

ClearToken is building a clearing house with a robust settlement solution for digital assets to solve these problems and ultimately enable the institutional adoption of digital assets.

Looking past absolutist utopian narratives, the mass adoption of digital assets will change financial markets, how we use and interact with physical and digital assets and transform economies. There is a huge social utility to be gained from decentralisation and digital asset adoption.

ClearToken will be offering a true centralised clearing solution, standing between trading counterparties, protecting participants against default risks and ensuring settlement. Moreover, as a horizontal CCP, ClearToken will connect across reputable trading venues, enabling members to choose where they want to trade and which custodians they want to look after their assets; opening access outside siloed ecosystems.

By having a true CCP, we can replicate the traditional segregation between trading venue, clearing house and depository in a modern, fully digital setting.

Two key elements are required. First, a regulated clearing house is needed to reduce credit risk, offer cross-venue netting opportunities and provide a trusted counterparty for trades. Second, a robust settlement and registration solution to allow asset delivery to occur only when the right payment has been made (and vice versa), with definitive recording of who owns what on both trade legs. This will facilitate substantial liquidity and capital efficiencies. Settlement will be predictable and legally certain.

Introducing ClearToken.

"For institutions, risk management when entering the digital asset space can be challenging. By leveraging the benefits of the traditional finance ecosystem, particularly central clearing, it provides counterparties with the ability to mitigate their risk and ensure they can operate within their risk appetite framework.

Flow Traders believes ClearToken's central clearing solution will contribute to improving the digital asset market structure, effectively addressing some of today's challenges."

Tamara Maris-Mravunac
Global Head of Risk
Flow Traders

"As a regulated institutional exchange established off the back of our experience in FX - one of the original financial markets formed to bring order to the evolving economy - we recognise the importance of robust, institutional grade market structure to drive growth.

We welcome ClearToken's clearing capabilities which will support the development and maturation of increasingly tokenised financial markets."

Jenna Wright
Managing Director
LMAX Digital

"The future of the ecosystem is dependent on close collaboration between infrastructure providers — allowing institutions to leverage the power of digital assets without compromise."

Julian Sawyer
CEO
Zodia Custody

About ClearToken

ClearToken is building a Central Counterparty (CCP) to deliver robust financial market infrastructure to the digital asset ecosystem. This infrastructure will mitigate bilateral counterparty risk for settlement, financing, and derivative transactions by centralising clearing, collateral, and risk management arrangements. The company will operate 24/7 to provide uninterrupted service while managing risk in real-time through margin and default fund contributions.

As a horizontal CCP, ClearToken will facilitate transactions from multiple venues and OTC markets globally. ClearToken intends to be multi-custodial and will adhere to the highest AML and KYC standards. ClearToken's team comprises established corporate governance and financial markets professionals who share the objective of implementing the necessary framework for the digital asset market.

As a planned financial market infrastructure, ClearToken is seeking authorisation and recognition with the Bank of England and other relevant regulatory bodies and will adhere to the IOSCO principles for financial market infrastructures together with all relevant legislation applicable to clearing houses, payment systems, securities and derivative depositories.

For more information, please visit: www.cleartoken.io

Contacts

Benjamin Santos-Stephens
CEO
ben@cleartoken.io

Niki Beattie
Chair
niki@cleartoken.io

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ClearToken Services UK Limited:
60 Cannon Street, London, EC4N 6NP

www.cleartoken.io

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