

Breaking the mould with caution: Promises and risks of crypto-inspired clearing models in traditional central clearing

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ABSTRACT

While numerous crypto exchanges have failed, their innovative clearing models may hold value for the traditional central clearing space. After describing the representative model of traditional clearing and with its strengths and challenges, this paper reviews the external pressures that often dissuade central counterparties (CCPs) from deviating from this archetype. The paper reviews the design innovations in post-trade services in crypto markets and critically examines the potential for implementing certain facets of such alternate models in traditional clearing contexts, taking a view of their promises as well as risks. The paper strongly advocates for a contingency-based approach to CCP design and discusses specific contexts where alternate clearing models could prove valuable for the markets. This journey must preserve the balance of efficiency and safety, anticipation and prudence, in order to maintain the resilience of CCPs while redesigning crucial procedures for improved market services.

Keywords: central counterparty, clearing, alternative clearing models, market infrastructure design

INTRODUCTION

The essence of a central counterparty (CCP) can be succinctly captured in its primary function: assuming the role of a counterparty through open offer or novation and guarantee the performance of transactions. Considering this as the necessary and sufficient definition of a CCP, one could imagine there to be several different ways in which CCPs could be designed. CCPs across the world are isomorphic, however, with many more similarities in design and procedures than differences — so much so, that when LedgerX LLC (doing business as FTX US derivatives) made an alternate CCP design proposal to the Commodity Futures Trading Commission (CFTC) in 2022,¹ it appeared alien and attracted startled reactions.^{2,3} The FTX itself and multiple other crypto exchanges have failed,⁴ but the reasons have been information security breaches, financial/operational mismanagement or fraud. They do not necessarily indicate a failure of operating models of these exchanges, which may still represent valuable innovations for CCPs.

This paper seeks to answer three questions: first, why do CCPs across the world have a similar design, and what are the strengths and limitations of this design? Second, what are the risks and benefits of alternate clearing models prevalent in the

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crypto industry? And third, under what circumstances could such models be useful for traditional CCPs? The paper argues that the homogeneity in CCP design is a result of external institutional forces which incentivise the CCP to conform to, rather than deviate from, the traditional clearing model. The paper further argues that the alternate clearing models transform some key risks from one type to another or transfer some risks from one entity to another. It is possible to imagine situations where such risk transformations or transfers will make it possible for the CCPs to better serve the markets and may be desirable.

In essence, the paper recommends adoption of a contingency perspective for design of CCPs. CCPs and their supervisors should assess the different risk profile of alternate clearing models vis-à-vis traditional clearing models in unique individual contexts and be willing to deviate from conventional design if they find adopting alternative clearing models more suitable.

In this study, the discussion surrounding technological aspects of crypto versus traditional markets is avoided. The paper restricts itself to core design principles and conceptual design of traditional and alternate clearing models. Further, given some of their features such as disintermediation with large number of investors, automated liquidation in case of margin shortfalls etc., the alternate clearing models lend themselves for adoption more easily in exchange traded markets as compared to over the counter (OTC) markets. The discussion is therefore restricted to an exchange traded market, with OTC markets being considered beyond its scope. Crypto service asset provider (CASAP), a term used in IOSCO's consultation report titled 'Policy Recommendations for Crypto and Digital Asset Markets',⁵ may be a better term to refer to the crypto exchanges, since they may be involved in multiple activities including trading venue, brokerage, market maker, proprietary trading, CCP, custody, lending,

etc. However, following the common parlance, the term crypto exchange is used in this paper.

The remainder of this paper is organised as follows: the second section describes the elements of the traditional clearing model, and the forces that cause isomorphism of CCPs. The third section describes the alternate clearing models, typical of crypto markets. The fourth section discusses the risk transformations in alternate clearing models, and the contexts in which the alternate clearing models may hold value. The fifth section summarises the analysis and concludes.

TRADITIONAL CLEARING MODEL AND ISOMORPHISM OF CCPS

While the procedures and design of CCPs may differ at an operational implementation level, most CCPs are architecturally similar. The characteristics of these models are used to construct an archetypal traditional clearing model. This section discusses the traditional model with its strengths and limitations.

Traditional clearing model

Figure 1 illustrates the elements of the traditional clearing model. These include: intermediated access, separation of trading and post-trade activities, multilateral netting and deferred settlement, margining and risk management, and loss mutualisation.

- (1) *Intermediated access*: CCPs typically follow an intermediated structure. Barring exceptions such as house/proprietary business or participants in specialised products such as commodity and energy, participants typically do not directly access the CCP. Typically, broker-dealers or clearing members facilitate access for the market participants to the CCP. There are multiple issues with intermediated access: In addition to increasing regulatory/capital costs, such access requirements create barriers for

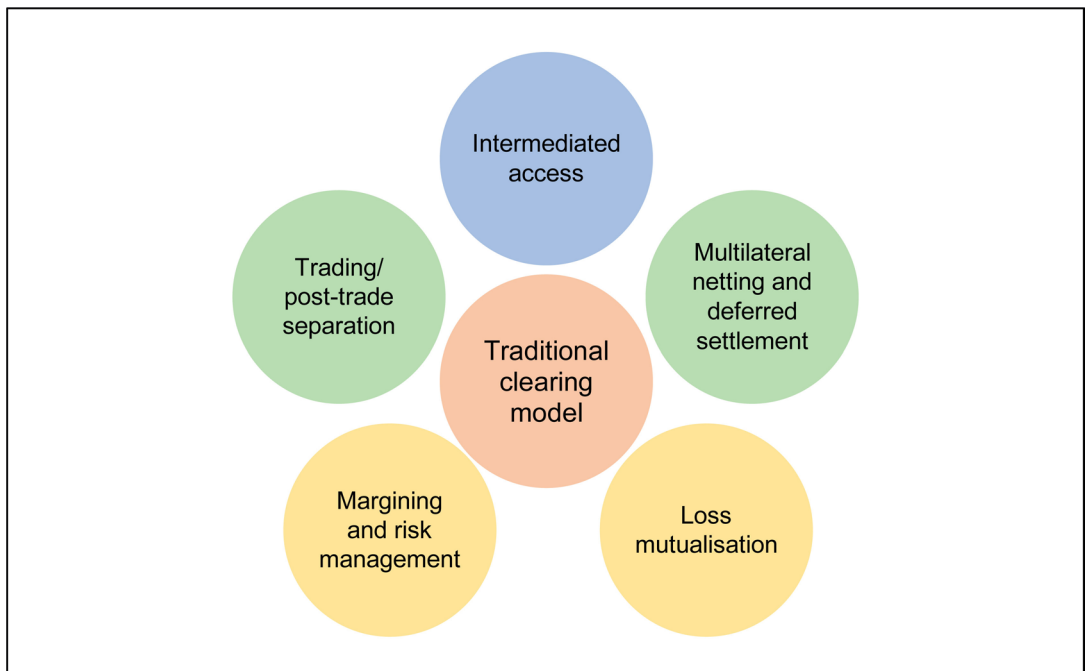


Figure 1 Elements of traditional clearing model

entities such as regulated funds from directly accessing the CCP, often due to prohibition on participating in loss mutualisation. The access and participation requirements and associated capital and other financial/compliance requirements also lead to clearing being capital-intensive and costly.⁶ Some CCPs offer alternative direct or sponsored access models for clients, but these in essence involve shifting of default fund contribution obligations from the direct/sponsored access customers to other parties. Medium/small investors typically get left out:⁷ the direct/sponsored access programmes or individually segregated accounts at CCPs are unsuitable/costly for them. In addition, the capital and other financial/compliance requirements for intermediaries need very careful calibration. If intermediaries are required to have stronger capital/regulatory requirements, clearing becomes a costly affair for smaller customers. On

the other hand, a lower barrier to entry and light requirements for the intermediaries will increase the credit exposure for customers whose assets are in control of such intermediaries. India seems to be an exception, where CCPs are required by regulation to maintain individually segregated accounts for all customers, including retail investors;⁸

- (2) *Trading/post-trade separation*: The traditional model distinguishes between the roles of matching, clearing, settlement and custody. Different entities typically assume these functions to maintain checks and balances, and to manage risks associated with trading, clearing and asset safety. While there are many examples of segregation of exchange–CCP–central security depositories (CSD) role, there are also examples of CCP and CSD roles being played by the same entity in many equity markets. Performance of centralised clearing activities by exchanges is rare — so much so, that

they are excluded from the principles for the financial market infrastructures (PFMI).⁹ On the other hand, integration of exchange–CCP–CSD roles is commonplace in crypto exchanges.¹⁰ There are compelling reasons for the segregation of exchange–CCP–CSD roles, notably better governance and management of conflicts of interests, as well as ring-fencing of risks faced by these critical financial market infrastructures; however, the drawbacks of such separation include weaker market oversight. The way market oversight is weakened when the same activity (say, trading) is spread across several venues,¹¹ oversight will also be weakened where parts of the transaction life cycle are handled by different entities. This will be true of oversight by authorities over FMIs as well as by FMIs over participants. Separation of roles can also increase costs and reduce operational efficiency;

- (3) *Multilateral netting and deferred settlement*: CCPs traditionally engage in multilateral netting, where multiple trades are offset against each other to calculate a net settlement obligation. Settlement is typically deferred to a later point, reducing the amount of money required to be transferred and hence the liquidity risk. Deferred net settlement increases capital efficiency and is seen as a practice that can help reduce settlement fails in stressed market periods.¹² The well-known liquidity spiral effect¹³ describes the phenomenon of the linkage between market and funding liquidity: market liquidity improves if market participants have better access to funding liquidity, and vice versa. Prefunding or gross settlements would place greater funding liquidity demands on the market participants and affect market liquidity. Despite these benefits, the deferred settlement remains the most fundamental source of risk exposure of CCPs. For essential capital market

instruments — equities and bonds — CCPs ought to be seen as critical utilities and their resilience and functioning on an ongoing concern basis is critical;

- (4) *Margining and risk management*: CCPs implement robust risk management procedures, including the collection of initial and variation margins. CCPs act as an independent risk manager which treats all participants equally in accordance with their rulebook. Margins serve as financial buffers to cover potential losses that could occur if a participant defaults on their obligations. Margins are necessitated by deferred settlement and help improve the funding position of participants. The need to ensure prefunding could only place greater demands on market participants but will also affect price stability and consume liquidity if the CCPs begin liquidating portfolios the moment there are inadequate upfront collaterals to cover for losses. On the other hand, this approach allows exposures to build, rather than timely limiting them. Besides, there can be an incentive problem — during liquidation, the CCP may seek to prioritise minimisation of losses within available margins over early crystallisation of losses. CCP failures are rare; the only researched CCP failure is that of *Caisse de Liquidation des Affaires en Marchandises*, a Paris-based CCP sugar derivatives CCP.¹⁴ This CCP failed due to delay in closing out defaulter's position and establishing matched book by betting on reversion of prices — hoping that losses could be managed within defaulter's margin and would not have been funded by CCP's equity;
- (5) *Loss mutualisation*: The CCP design requires a system of appropriately designed incentives to ensure that neither the participants nor the CCP itself game the mechanism. A crucial component of this system of incentives is

the default waterfall, which specifies the resources to be used in case of default by a participant, and their order of utilisation. CCP's own skin in the game and member contributed default fund typically form an important part of the default waterfall. CCPs mutualise losses when utilising the default fund. Here, losses that exceed the defaulted participant's margin and default fund contributions are distributed across surviving clearing members. This ensures that the CCP remains solvent even in extreme market conditions. Default fund and loss mutualisation procedures ensure availability of adequate resources to ensure resilience of the CCP; however, they can exclude some potential participants, either due to regulatory requirements or preferences.¹⁵ Moreover, as in the case of other insurance mechanisms, loss mutualisation can create moral hazard by reducing the incentive for a participant to avoid default; since the cost of managing at least part of the default will be borne by other participants and the CCP.¹⁶

Isomorphism of CCPs

Why is a distinct trend of isomorphism, ie convergence towards homogeneous practices, observed among CCPs? Three potential explanations could account for this phenomenon: discovery of a universally optimal model, organisational inertia within CCPs, or external pressures compelling conformity to the traditional clearing model.

- (1) The first possibility is that a single, superior model exists, optimal for all situations, rendering any deviation valueless. This appears implausible, however. CCPs face vast diversity in economic priorities, market development, market expectations and payments and market infrastructure. It seems improbable that a one-size-fits-all model could address all these variables efficiently and effectively;
- (2) The second possibility is that whether due to legacy, organisational inertia or other internal factors, the desire or the ability to innovate is lacking. This too, however, seems unlikely. While it is conceivable that a few CCPs might resist

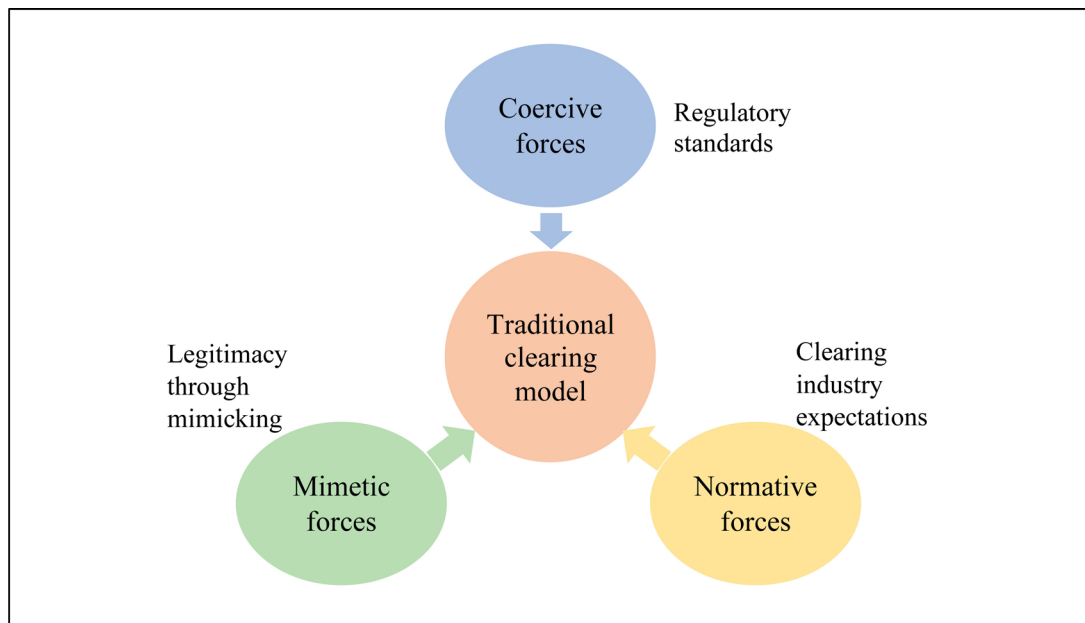


Figure 2 External forces leading to CCP isomorphism

change due to internal reasons, it is hard to believe that all CCPs, operating in the fiercely competitive landscape of global financial markets, share this inertia;

- (3) The third possibility is that external forces exert considerable pressure, compelling CCPs to conform to the traditional clearing model rather than deviate. This explanation appears most likely. Here, institutional theory¹⁷ can offer a perspective to understand these forces and their influence on the behaviour of CCPs.

Institutional theory provides a framework for understanding the dynamics of organisations within their institutional environments. Central to this theory is the concept of isomorphism, a process by which organisations in the same field or industry become more alike over time due to coercive, mimetic and normative forces (see Figure 2). These forces can play significant roles in shaping the homogeneity of CCPs across the globe.

Coercive isomorphism

Coercive isomorphism can arise from the influence of the regulatory framework governing the operations of CCPs. This isomorphism can stem from the following factors:

- (1) Commitment of regulatory bodies around the world to adopt common standards or the tendency to refer to precedence while framing regulations. These factors can lead to convergence of regulatory standards;
- (2) Due to cross-border regulations, framework of one country or region can become applicable to CCPs operating in other jurisdictions due to 'equivalence requirements' which dictate that a CCP from another country meet certain regulatory standards to service participants in the host country;

- (3) Regulators may sometimes frame prescriptive rather than principle-based regulations, which will further promote homogeneity in CCP practices.

Mimetic isomorphism

Mimetic isomorphism is likely to be particularly prevalent in emerging markets. This can be attributed to several factors.

- (1) Emerging market CCPs may often lack the understanding, expertise or confidence to create new systems or rules. As such, they find comfort and confidence in adopting tried-and-tested procedures from their counterparts in developed markets. The cost of failure arising out of deviation from 'global best practice' is likely to be higher for emerging CCPs;
- (2) Furthermore, emerging market CCPs might use mimicry as a tool to stake a claim to legitimacy. By aligning their operations with established practices, these CCPs can boost their credibility and gain the trust of market participants;
- (3) Another driving force of mimetic isomorphism in emerging market CCPs can be the influence of expertise sought in setting up new CCPs. These experts, often sourced from developed markets, bring with them the practices and systems of their home markets. Given that their understanding of the local market dynamics might be limited, these experts could try to replicate what they know best, further reinforcing the mimetic process.

Normative isomorphism

Lastly, normative isomorphism is a force exerted by professional standards and the expectations within the industry. Particularly in an intermediated market, where the end investors might lack a deep understanding of the CCP's operation, the

clearing industry — comprising of intermediaries and sophisticated international institutional investors operating in multiple jurisdictions — will play a significant role in shaping the CCP's policies. This influence can be exerted informally or through formal channels such as relevant committees or public consultations. Certain norms may be deemed mandatory by the clearing industry for participation in a CCP. CCPs would be compelled to adhere to such expectations of the industry for fear of ostracisation.

ALTERNATE CLEARING MODELS IN CRYPTO MARKETS AND RISK TRANSFORMATIONS

Why could crypto exchanges break the mould?

The crypto markets, when they first emerged, diverged significantly from the traditional clearing model, opting for a fundamentally different approach to central clearing. This deviation can largely be attributed to the absence of institutional forces that shape the practices of traditional CCPs.

When crypto markets were established, they mainly operated in a regulatory vacuum. Some regulators have since introduced measures to govern these markets, but the regulatory landscape remains markedly diverse, lacking the convergent force observed in the traditional finance space. Notably, the CPMI IOSCO only recently,¹⁸ in May 2023, published their consultation for standards for crypto market regulation. Evidently, coercive forces pushing for the adoption of conventional practices were absent during the early days of crypto markets.

In addition, the customer base of crypto exchanges, primarily comprised of individual investors with direct access, differs greatly from that of traditional CCPs. Crypto investing began without traditional institutional investors¹⁹ and remained so for some

considerable time, with any meaningful activity by institutional investors succeeding the development of market infrastructure for crypto markets.^{20,21} Lacking knowledge of inner workings of financial market infrastructures and being less likely to harbour normative expectations typically held by the clearing industry and international institutional investors, crypto markets did not face normative pressures.

This different customer base also had an impact on the mimetic motivations for crypto markets. Adopting the traditional clearing model to establish legitimacy might have seemed less compelling. Moreover, the technological basis of crypto markets and the direct access they offered rendered the traditional model potentially unsuitable, even if there had been a desire to mimic it.

Alternate clearing models

The crypto exchanges made significant departures from each element of the traditional clearing model. These departures are depicted in Figure 3.

First, unlike the intermediated access requirements under traditional clearing models, crypto exchanges offer direct access to customers. This process, known as 'disintermediation', removes the need for intermediaries and permits individuals to transact directly with each other on the platform.

Secondly, crypto exchanges offer a monolithic infrastructure that combines trading, clearing and custody operations into a single platform (while they could additionally play other roles, including market making, lending, etc., they are not relevant for this discussion). Unlike traditional models that separate these functions to mitigate risk, crypto exchanges merge these roles to streamline operations and eliminate the need for inter-platform communication. This approach could potentially speed up activities and lower costs.

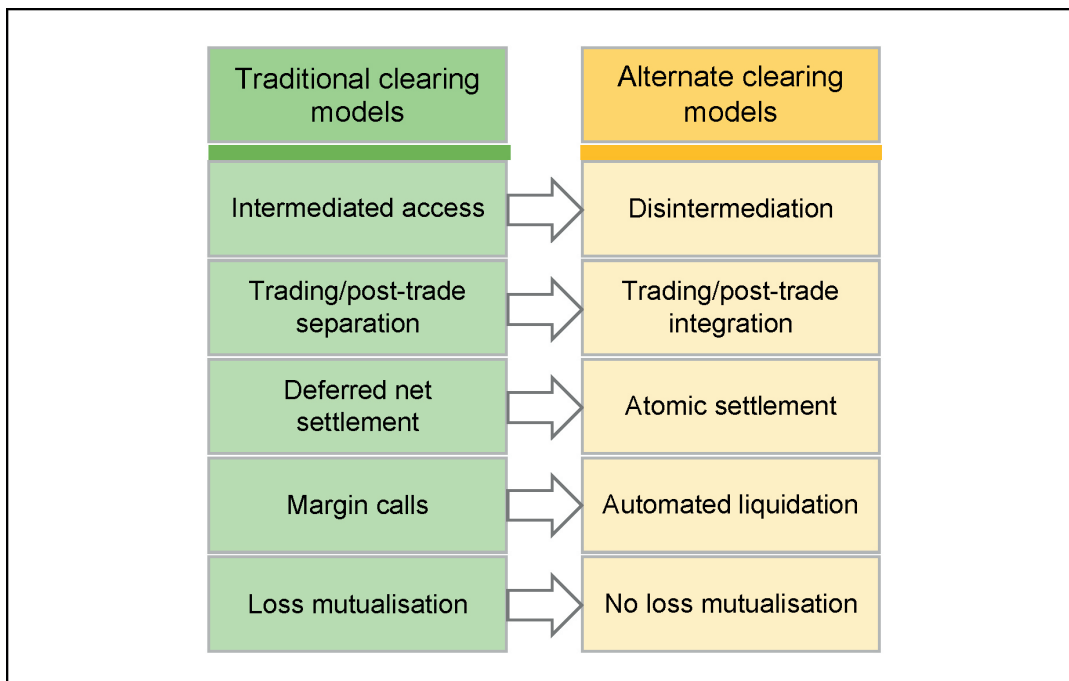


Figure 3 Alternate clearing models

A third fundamental departure from traditional models is the use of atomic settlement, meaning transactions are completed instantly, ensuring that the transfer of both sides of a transaction (assets and payment) happens simultaneously or not at all. This mechanism minimises counterparty risk and facilitates near-instantaneous transfer of assets.

Crypto exchanges also differ in their approach to risk management. Traditional CCPs manage risk through margin calls, where additional funds are requested to cover potential losses. In contrast, crypto exchanges use automated liquidation. If a trader's position falls below a certain threshold, the system automatically closes the position, selling the assets to mitigate potential losses. This system allows for a more rapid response to market fluctuations, but it also exposes traders to abrupt position closures.

Finally, crypto exchanges diverge from traditional models in terms of loss

allocation. Traditional CCPs employ loss mutualisation, where the financial risk of a participant's default is shared among other participants. Crypto exchanges, however, do not require participants to partake in loss mutualisation. Losses are contained within the defaulting participant's position, and the risk does not spill over to other participants.

Risk transfers and transformations

While the alternate clearing models employed by crypto exchanges have benefits and reduce risks in some areas of traditional clearing, they are not superior in all aspects and do not eliminate risks. Rather, they fundamentally shift the dynamics of risk from one entity to another and/or replace one type of risk with another. For instance, disintermediation may remove oversight and controls instituted by intermediaries, monolithic infrastructures could become single points of failure, automated liquidation may trigger market volatility, and the need of

substantial prefunding due to atomic settlements can affect efficiency and market liquidity.

Desirability of these changes is highly context-dependent, hinging on market needs and priorities. Certain markets or situations may benefit more from the immediacy of atomic settlements or the autonomy of disintermediation, while others may find

more value in traditional practices' stability and risk control measures. The risk transfers and transformation due to each of the clearing model deviations are discussed below. These are discussed individually and can be considered as independent from each other; it is conceivable that a CCP might adopt some, but not all, facets of alternate clearing models.

Disintermediation

Risks reduced/efficiency brought in	Risks introduced, enhanced or transferred
<ol style="list-style-type: none"> 1. Individual account structure enhances protection of customer assets. It may however be noted that individual account segregation can be achieved by traditional CCPs without disintermediation. 2. Direct exposure to CCP may eliminate counterparty risk of customers towards intermediaries. 3. Decreases operational risk, including frauds as well as operational failures at intermediaries. 4. Potentially lower costs and fees. 	<ol style="list-style-type: none"> 1. Counterparty credit risk of CCPs increased, with direct exposure to clients rather than financially stronger intermediaries. 2. Operational burden, and consequently risks increased for the CCPs. 3. CCPs may be less equipped to educate customers, and monitor and ensure compliance with regulatory norms, including anti-money laundering/know your customer (AML/KYC). 4. Customers may be ill-equipped to manage liquidity requirements, increasing risks for the CCP.

Vertical integration

Risks reduced/efficiency brought in	Risks introduced, enhanced or transferred
<ol style="list-style-type: none"> 1. Vertical integration can enhance speed, reduce cost and improve operational efficiency by combining trading, clearing and custody. 2. Better visibility of the entire transaction cycle can aid surveillance and risk management. 3. Risk of miscommunication/coordination issues among entities is reduced. 	<ol style="list-style-type: none"> 1. Integration can create a single point of failure. In case of operational failure, cyberattack or insolvency, all functions will be compromised. 2. The structure may lead of conflict of interests and poorer governance. 3. The structure may create unhealthy concentration of market power and risks in a single entity.

Atomic settlement

Risks reduced/efficiency brought in	Risks introduced, enhanced or transferred
<ol style="list-style-type: none"> 1. Atomic settlements involve simultaneous exchange of typically prefunded assets, the counterparty risk of CCP is eliminated. 2. Atomic settlements eliminate risk of settlement shortages, liquidity risk of CCP is eliminated. 3. Atomic settlements speed up the process of settlements, which can be carried out instantly. 	<ol style="list-style-type: none"> 1. Atomic settlement increases liquidity demand and risks for participants, who will need to prefund their transactions. 2. As a result of greater demand for funding liquidity, the market liquidity may weaken, and spreads may widen. 3. Operational risks are enhanced, since future trading ability, even on intraday basis, can be affected if prior transactions are not settled. The model has greater technology dependence and associated risks.

Market liquidation

Risks reduced/efficiency brought in	Risks introduced, enhanced or transferred
<ol style="list-style-type: none"> 1. Market liquidation reduces the default risk for the CCP. Unlike the traditional model, where a margin call may not be met and CCP exposure may increase, market liquidation keeps the positions in check by piecemeal liquidation. 	<ol style="list-style-type: none"> 1. Market liquidation can have destabilising procyclical effect. Liquidation by CCP can move prices further away, trigger further liquidations in a vicious cycle. The liquidations may not be at optimum prices due to short-term microstructure effects. 2. The mechanism can expose traders to abrupt position closures.

No loss mutualisation

Risks reduced/efficiency brought in	Risks introduced, enhanced or transferred
<ol style="list-style-type: none"> 1. Eliminating loss mutualisation can promote wider range of participants to participate in the CCP: those who could not participate under loss mutualisation requirements due to regulatory restriction or out of choice. 2. Elimination of loss mutualisation will be associated with more stringent defaulter-pay resources, and will likely reduce the moral hazard problem of participants taking excessive risk, knowing that it will be mutualised. 	<ol style="list-style-type: none"> 1. Additional financial resources will need to be maintained by the CCP itself. The risk of failure of CCP itself is enhanced.

CCP DESIGN: MARKET PRIORITIES AND ALTERNATE CLEARING MODELS

Significance of market context

The design and structure of CCP functions are contingent on the specific context and characteristics of the market they serve. Let us consider the instance of crypto markets. These markets have adopted an approach that involves taking on greater credit risk with regard to CCP functions, primarily by providing direct access and eliminating mutualisation; however, they have simultaneously mitigated credit risk through the implementation of atomic settlement and market liquidation. These specific choices are apt in the unique context of crypto markets. In an environment with a regulatory vacuum where institutional intermediaries may be disinclined to participate, offering direct access can be an ideal solution. Likewise, the elimination of mutualisation becomes a practical necessity given the nature of direct retail participants. With the weaker creditworthiness of direct participants and the inherently volatile nature of crypto assets, market liquidation and atomic settlement are logical strategies that can be best implemented under a vertically integrated market structure.

Similarly, the traditional clearing model, while effective under certain circumstances, may not be universally suitable. The most appropriate clearing model depends heavily on the specific needs and priorities of a market. For instance, direct access with respect to collateral maintenance and settlements may be a desirable feature in a market where customer asset protection is a high priority. Similarly, atomic settlements could be beneficial in markets that value extremely short settlement cycles, for example, spot foreign exchange markets.

Therefore, while CCP design can draw inspiration from various models, the final configuration should be driven by the unique context and market needs, rather than following a one-size-fits-all approach.

Priorities in CCP design

While CCPs share a common overarching institutional pattern, they also demonstrate key differences shaped by various design priorities. These institutional logics can vary from one CCP to another, or even within a single CCP at different points in time. Some of the prominent priorities guiding the operations and designs of CCPs include:

- (1) *Systemic stability and CCP resilience*: Ensuring the overall stability of the financial system and the ability of the CCP to withstand shocks and provide critical services as a going concern;
- (2) *Efficiency of central clearing*: Striving to make the clearing process as streamlined and cost-effective as possible;
- (3) *Price stability*: Aiming to avoid shocks to market prices due to CCP's actions, and help avoid infrastructure-caused volatility and uncertainty in the market;
- (4) *Customer asset protection*: Prioritising the safety of customer assets and ensuring they are not put at undue risk;
- (5) *Settlement cycles*: Balancing the desire for rapid settlements with the need to manage risk and ensure all transactions are accurately recorded and settled.

Each of these priorities represents a different dimension in the design choices for CCPs, and striking the right balance among them is a complex task, especially as they can be conflicting. For example: CCP resilience may require greater financial requirements from participants, which may reduce the cost efficiency of central clearing. Commitment to customer asset protection would require the CCP to assume the fellow customer risk under omnibus models onto itself, weakening the CCP's resilience to a degree. Commitment to price stability through anti-procyclical margins could either mean less responsive margins that affect the CCP's resilience or permanently high margins that affect cost efficiency of central clearing.

The traditional clearing model represents a particular anchoring point in this multidimensional space, and minor tweaks within this framework may only allow for limited deviations from this point; however, the optimal combination of design choices that best serves a given market may be much farther from the traditional anchoring point.

Breaking the mould, with caution

The traditional clearing model for CCPs has provided a sturdy and reliable model over the years. This model has provided time tested principles and processes that ensure systemic resilience. Small adjustments within this framework often provide just enough flexibility to cater to a variety of market scenarios without significantly compromising on the primary objective of CCP resilience, which is paramount, since the stability of the entire financial system often hinges on the solidity of the CCPs.

This conservative approach, however, can sometimes constrain the capacity of CCPs to fully meet the evolving policy objectives of their markets. While incremental deviations from the traditional model are safe, they may not always be the most effective. In certain scenarios, more radical deviations from the traditional model might be warranted, which might involve the adoption of alternative clearing models, such as those observed in the crypto markets or others that we have not yet seen. It is not a question of replacing one model with another wholesale, but of having the flexibility and the openness to pick and choose elements that might better serve the market in specific contexts. This, of course, requires the willingness and courage to part with some elements of the traditional clearing models.

This is definitely not a call for reckless abandon. The guiding principle should be a careful and measured approach to innovation, but willingness to gradually unshackle

from the traditional model where it makes sense.

SUMMARY AND CONCLUDING REMARKS

CCPs are characterised by a high level of similarity or isomorphism that extends across geographies with dissimilar market structures, participants, market priorities and policy objectives. These similarities are not accidental but shaped by a trinity of external institutional forces — coercive, mimetic and normative — that compel CCPs towards convergence in practices and procedures. The result is the traditional clearing model, a time-tested structure that has stood the test of time.

Alternative clearing models have emerged, particularly with the advent of cryptocurrency markets. These crypto markets, born in a regulatory vacuum, shaped by a different clientele, powered by novel technologies and without having to face the coercive, normative and mimetic forces, could make bold deviations from traditional models, introducing practices such as disintermediation, monolithic infrastructure, atomic settlement, market liquidation and the absence of loss mutualisation. Yet, this divergence is not without its complexities. While these alternative clearing models offer certain benefits and can potentially mitigate some risks inherent in the traditional clearing models, they also give rise to new forms of risk and entail the transfer and transformation of existing risks. This calls for a nuanced understanding and critical evaluation of these models, weighing their promises against their risks.

Markets have an individually unique set of economic priorities, market development, payment and market infrastructure, market priorities and policy objectives, and need their own CCP design for their individual context. While the traditional clearing model offers a safe and tested platform, CCPs and their regulators must be prepared for more

radical deviations from this model to meet their policy objectives most effectively. This calls for a judicious exploration of alternative models, including those from the crypto space; however, any journey towards innovation must be undertaken with caution, maintaining the delicate balance between efficiency and safety, anticipation and prudence. This way, CCPs can ensure their continued resilience while optimising their capacity to serve their markets effectively.

AUTHOR'S NOTE

Any views expressed in the paper are solely of the author and may not represent the views of NSE Clearing.

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