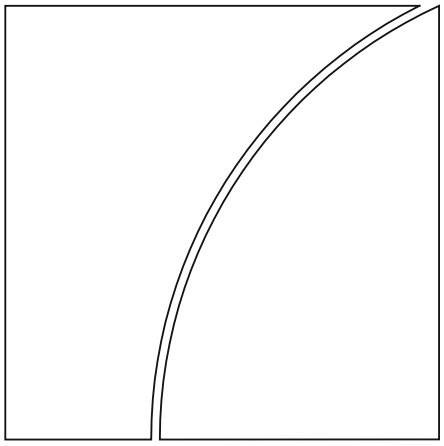
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Occasional Paper

No 27

Cryptoasset service providers as financial intermediaries: risks and policy approaches

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April 2026

JEL classification: E42, G18, G23, G28, O30, O38

Keywords: cryptoassets, cryptoasset service provider, decentralised finance, multifunction cryptoasset intermediary, regulation, supervision, virtual asset service provider.

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ISSN 1020-9999 (online)

Abstract

Cryptoasset service providers (CASPs) have expanded well beyond their initial roles as trading platforms and custodial service providers. The largest firms now offer a broad range of products, including yield/earn programmes, margin and secured lending, derivatives and token issuance. Some of these products closely resemble financial intermediation activities traditionally performed by banks and prime brokers. As such, many institutions can be better described as multifunction cryptoasset intermediaries (MCIs). When MCIs accept customer cryptoassets through investment programmes and use those assets to fund lending, market-making and other activities, they take on credit, liquidity and maturity risk. Yet in many jurisdictions, MCIs operate without the prudential safeguards that typically apply to financial intermediaries engaged in comparable risk transformation.

This paper provides a structured overview of MCI products and maps them to the functions of financial intermediation. Drawing on a review of the terms and conditions (T&C) of selected large MCIs conducted between November 2025 and March 2026, as well as interviews with some providers and authorities, it shows how "earn" products that transfer ownership of customer assets to the MCI create short-term redeemable liabilities economically similar to deposits, while margin loans and derivatives amplify credit and market risks. The financial intermediation functions performed by MCIs introduce significant vulnerabilities, in particular given the volatile nature of cryptoassets, the interconnectedness of MCIs and the absence of schemes similar to deposit insurance or central bank liquidity facilities. Strikingly, many MCIs do not publish financial statements, and there are notable gaps in the applicability of existing or new regulatory frameworks. The failure of Celsius Network and FTX in 2022 and the cryptoasset flash crash of October 2025 illustrate how these risks can materialise and propagate, with growing potential for spillovers into the broader financial system as MCIs deepen their links with traditional finance.

Comprehensive policy approaches are needed to address these risks. MCIs engaged in financial intermediation should be subject to prudential requirements, including capital and liquidity buffers, robust governance and risk management frameworks, and stress testing. A combination of entity-based (EB) and activity-based (AB) regulation offers the most effective policy mix. However, several challenges remain, including incomplete coverage of borrowing and lending activities within existing cryptoasset regulatory frameworks, the need for effective cross-border supervisory cooperation, limited supervisory resources and – despite the public nature of blockchains – the underdeveloped state of data availability and reporting standards compared with those for traditional financial intermediaries.

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Cryptoasset service providers as intermediaries[1]

Section 1 – Introduction

Cryptoasset service providers (CASPs) offer a variety of services related to cryptoassets, including exchange, custody, wallet and payment services. CASPs include centralised exchanges that hold customer assets and settle transactions off-chain, decentralised exchanges enabling peer-to-peer trading through smart contracts and hybrid platforms that combine trading with lending and other financial services.[2] This diversity reflects the broader growth of the cryptoasset market. Estimates suggest there are between 200 and 250 active centralised spot exchanges, with a small number of large platforms accounting for most global trading volumes.[3]

CASPs differ significantly in size, business model and scope of activities. While some focus exclusively on spot trading or custody services, the largest platforms have evolved into multifunction cryptoasset intermediaries (MCIs), also known as crypto conglomerates. As defined by the Financial Stability Board (FSB), MCIs are individual firms or groups of affiliated firms that combine a broad range of cryptoasset services, products and functions that are typically conducted by separate legal entities in traditional finance.[4]

The emergence of MCIs reflects deliberate economic choices, as combining multiple activities within a single group generates economies of scale and network effects. However, the FSB highlights that this combination of functions creates vulnerabilities that are absent in more disaggregated structures.[5]

Not all CASPs are MCIs: the term refers to the subset of CASPs that bundle multiple financial services within a single group. These platforms now offer exchange, custody and wallet services alongside investment products (eg staking-as-a-service, earn/yield accounts), collateralised and margin lending, derivatives and structured products. Many also issue or promote platform-linked tokens and offer other financial and non-financial services.[6] Examples of MCIs include Binance, Bybit, Coinbase, Crypto.com, MEXC and OKX (and FTX prior to its collapse). Some of these firms have ownership links with stablecoin issuers and have a wide geographic reach, operating in many jurisdictions around the world, often with local subsidiaries.[7] MCIs and the intermediation-related risks they pose are the focus of this paper.

[1] Denise Garcia Ocampo (Denise.GarciaOcampo@bis.org), Bank for International Settlements; Peter Goodrich (Peter.Goodrich@fsb.org) and Gian-Piero Lovicu (Gian-Piero.Lovicu@fsb.org), Financial Stability Board. The authors are grateful to Parma Bains, Jonathan Beissinger, Juan Carlos Crisanto, Johannes Ehrentraud, Jon Frost, Fernando Restoy and Nobu Sugimoto for their helpful comments and to Charlotte Gardini for administrative support.

[2] For a detailed mapping of the architecture of crypto exchange markets, distinguishing between centralised, decentralised and hybrid structures along a spectrum from custodial to non-custodial design, see Villanueva Collao (2026).

[3] As of 2025, Binance maintained approximately 39% of global centralised exchange spot trading volume, while the top 10 centralised crypto exchanges collectively handled approximately 90% of global trading activity. See CoinMarketCap, "Top cryptocurrency spot exchanges", ranked by volume, coinmarketcap.com/rankings/exchanges/ and S Lee, "Market share of centralized crypto exchanges, by trading volume", CoinGecko, January 2026, www.coingecko.com/research/publications/centralized-crypto-exchanges-market-share.

[4] See FSB (2023b).

[5] For example, ESRB (2025) notes that many large non-bank groups that originate from, or are primarily active, outside the European Union and that combine multiple cryptoasset activities at scale are relevant from a macroprudential perspective.

[6] Some MCIs provide additional services beyond cryptoasset trading, including financial services like trading of equity securities and non-financial services such as blockchain infrastructure support.

[7] See FSB (2023b).

Cryptoasset markets have grown in recent years. The total market value of cryptoassets was approximately USD 3 trillion at the end of 2025, and trading volumes at centralised exchanges are substantial (in recent quarters around USD 6–8 trillion in spot and futures markets, respectively). Interlinkages with traditional financial institutions and markets are growing through product partnerships, exchange-traded products, custody arrangements and stablecoin issuers' reserve asset holdings. Large global banks' prudential exposures to and custody of cryptoassets are increasing, though they remain small.[8] MCIs sit at the centre of this ecosystem, and their growing size and connectivity raise questions about the potential for disruptions to spill over into the broader financial system.

Many MCIs' offerings involve activities that give rise to risk transformation. When MCIs accept customer assets through investment programmes and use those assets to fund lending, market-making and other activities, they take on credit, liquidity and maturity risk. Customers may regard MCIs as safe places to hold their digital assets, yet in many jurisdictions these platforms operate without the prudential safeguards, such as capital and liquidity requirements, that typically apply to financial intermediaries engaged in comparable risk transformation. For example, cryptoasset borrowing and lending remain outside the regulatory perimeter in many jurisdictions. This regulatory gap reflects a broader asymmetry: traditional banks' direct exposures to cryptoassets remain small, while a "shadow crypto financial system" of lightly regulated MCIs has grown to serve both retail and institutional clients.[9]

The size of the largest MCIs, combined with their growing connections to the traditional financial system, means that a disruption at a major MCI could have consequences beyond the cryptoasset ecosystem. Events in 2022 highlighted this risk: the collapse of Celsius Network, a major crypto lender, triggered failures across interconnected platforms. Celsius's inability to meet redemptions led to the insolvency of crypto hedge fund Three Arrows Capital, which had extensive borrowing ties. This contagion culminated in FTX's collapse, in which losses from its affiliate Alameda Research spread across the group. The FTX case also exposed how intragroup arrangements amplified losses as confidence declined.[10] As MCIs deepen links with traditional finance (eg via custody, exchange-traded products and institutional investors), spillover risks to the broader financial system increase.

This paper provides a structured overview of the services offered by MCIs, exploring their activities through the framework of financial intermediation. The objective is to clarify the economic nature of MCIs' products, highlighting where risks resemble those in banking and securities markets. It maps common products offered by MCIs to balance sheet assets and liabilities, highlights where risks mirror those in banking and securities markets, identifies safeguards that supervisors usually apply to similar functions in traditional finance and explores possible policy approaches to address identified gaps. The analysis draws on terms and conditions (T&C) reviewed between November 2025 and March 2026, as well as interviews with selected providers and authorities.

The structure of the paper is as follows: Section 2 describes MCIs' business models and products. Section 3 outlines intermediation functions and balance sheet implications. Section 4 explores policy approaches and challenges to addressing the identified risks. Section 5 concludes.

8 See FSB (2025).

9 See Auer et al (2022).

10 See ESRB (2025).

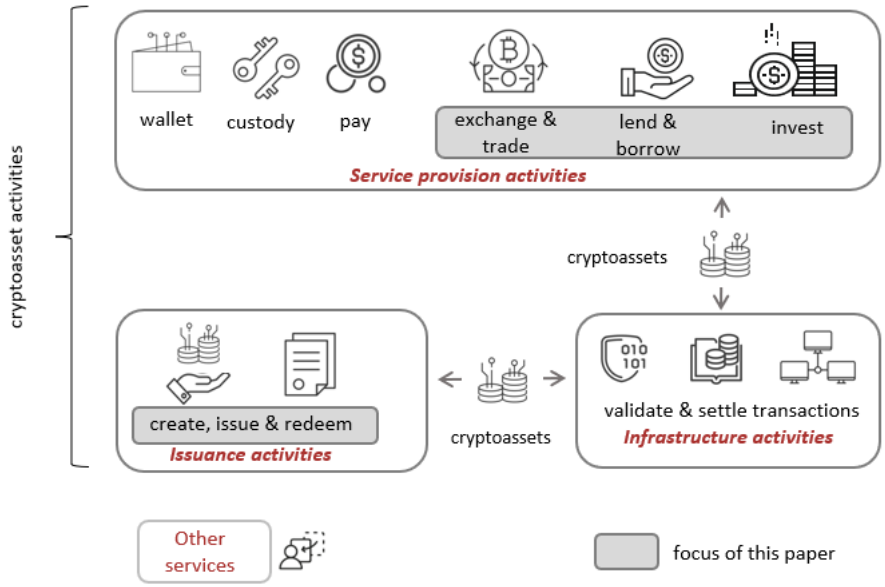
Section 2 – MCIs' business models and products

Cryptoasset activities can be grouped into three main categories. These are:

1. those related to the issuance of cryptoassets (eg creation, issuance, distribution and redemption);
2. those related to the operation of a distributed ledger technology (DLT) infrastructure (eg validation and settlement of transactions with cryptoassets); and
3. those related to the provision of services related to cryptoassets (eg wallet, custody, payment, exchange, trading, lending, borrowing or risk management services).

There are additional activities, referred to as "other supporting services". These include services such as developing code, providing data external to the network (eg oracles), providing application programming interfaces (APIs) and cloud services, providing risk advisory services or conducting audits. Graph 1 gives an overview of these activities and shows (in grey) the focus of this paper.

Classification of cryptoasset activities — Graph 1



Source: Authors' own elaboration based on D Garcia Ocampo, N Branzoli and L Cusmano, "Crypto, tokens and DeFi: navigating the regulatory landscape", *FSI Insights on policy implementation*, no 49, May 2023.

In practice, many of the largest MCIs operate across several of these activities.[11] Some large MCIs are active in token issuance, eg Binance (BNB and RWUSD tokens), MEXC (MX token) or OKX (OKB token). Many also operate infrastructure services related to DLT, eg Binance (BNB chain), Coinbase (Base chain) or Crypto.com (Cronos chain). Most of the large MCIs also offer wallet and custody services, along with staking, lending, spot and derivatives trading, collateralised products (such as crypto-backed loans) and other prime brokerage services.

The scale and reach of these platforms are significant. Trading volumes in recent quarters have amounted to USD 6–8 trillion in the spot and futures markets, respectively, and a handful of large

[11] Some CASPs also offer access to traditional financial services such as stock and commodities trading, but these are typically operated by partner firms.

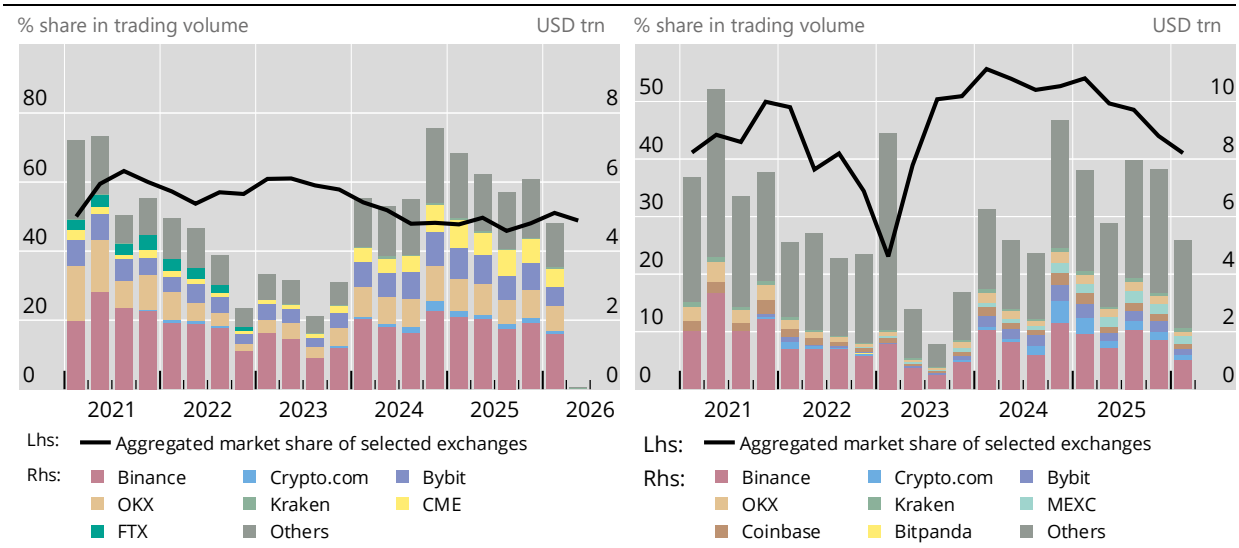
exchanges account for a little under half of all trading volumes. Graph 2 shows the dominant role of specific exchanges in spot trading (panel A) and BTC futures (panel B). The largest MCIs report operating in over 100 jurisdictions, often through local subsidiaries or separately licensed entities, and serve a global user base.[12] According to the crypto yield 2025 report, the top five MCIs collectively serve approximately 200–230 million unique users, of whom an estimated 10–15% (20–34 million individuals) engage with staking or earn products, compared with only 0.5–0.7 million retail participants in decentralised finance (DeFi) yield products.[13] The expansion of this user base over recent years reflects in part the cyclical nature of retail participation in cryptoasset markets, with price increases driving new user adoption when market valuations are elevated and experienced traders may be reducing exposure.[14] This concentration of users and activity within a small number of MCIs underscores the breadth of financial services they provide and the potential systemic implications of disruptions at any one of them.

Major players dominate crypto trading on exchanges

Graph 2

A. Quarterly spot trading volumes for centralised trading platforms

B. Quarterly volume of BTC futures by exchange



Aggregated market share of Binance, MEXC, OKX, Kraken, Crypto.com, Bybit, Coinbase and Bitpanda in panel A; Binance, OKX, Kraken, Crypto.com and Bybit in panel B.

Sources: FSB; The Block; CryptoCompare.

The focus of this paper is on activities that most closely resemble financial intermediation. These are referred to in the taxonomy in Graph 1 as "create, issue & redeem", "exchange & trade", "lend & borrow" and "invest". The economic nature of these activities broadly mimics those performed by intermediaries in banking and securities markets.

[12] For geographic availability, see the websites of Binance (binance.com), Bybit (bybit.com), MEXC (mexc.com), OKX (okx.com), Coinbase (coinbase.com), Kraken (kraken.com), Bitpanda (bitpanda.com) and Crypto.com (crypto.com).

[13] See Moremarkets (2025).

[14] See Auer et al (2023).

For this paper, financial intermediation activities are classified into five main categories:

1. Issuance – includes activities whereby the MCI issues a token, where holders may or may not have redemption rights.
2. Investment products – include "yield" or "earn" programmes in which users pledge or deposit their cryptoassets with the MCI in return for an economic reward. The MCI may have rights to reuse cryptoassets that are pledged or deposited at its discretion or for a specific stated purpose.
3. Secured lending – includes lending for purposes other than trading. These products allow users to borrow against their cryptoassets and withdraw the funds from the MCI for general use.
4. Leveraged trading – includes margin loans, whereby users borrow against their trading portfolios, and derivative products whereby the MCI provides trade execution, clearing and settlement.
5. Proprietary activities – include the MCI's overall operations, liquidity management, market-making, proprietary trading and venture investing.

In practice, many large MCIs offer a broad range of these intermediation activities simultaneously, effectively functioning as vertically integrated financial platforms. Table 1 illustrates the combination of these activities across major MCIs. Specifically, it maps the product offerings of a selection of large MCIs against the five intermediation categories identified above.

Selected MCIs: mapping activities to traditional finance activities[1] Table 1

Activity	Example	Binance	Bitpanda	Bybit	Coinbase	Crypto.com	Kraken	MEXC	OKX
Issuance (no redemption)	Utility token	✓	✓	✓	✗	✓	✗	✓	✓
Issuance (w/ redemption)[2]	Wrapped/pegged token	✓	✗	✓	✗	✗	✗	✗	✗
Investment products	Yield/earn	✓	✓	✓	✗	✓	✓	✓	✓
	Staking-as-a-service	✓	✓	✓	✓	✓	✓	✓	✓
	DeFi lending	✓	✓	✓	✓	✓	✓	✗	✓
Secured lending	Fixed-term/open loan	✓	✗	✓	✗	✗	✗	✓	✓
Leveraged trading	Margin loans	✓	✓	✓	✓	✓	✓	✓	✓
	Derivatives	✓	✓	✓	✓	✗	✓	✓	✓
Proprietary activities		nd	nd	nd	nd	nd	nd	nd	nd

nd = not disclosed. The absence of publicly available information on proprietary activities does not imply that these MCIs do not engage in such activities. As discussed in Section 2.5, limited public disclosures make it difficult to assess the nature and scale of MCIs' proprietary activities.

[1] The taxonomy of activities used to classify MCIs' products in this paper follows a functional economic classification rather than a regulatory or accounting framework. [2] MCIs could in principle issue their own stablecoins, though no MCI covered in this paper appears to do so currently.

Source: Authors' own elaboration based on T&C published on MCIs' websites, Nov 2025–Mar 2026, available in the Annex.

2.1 Issuance

Issuance of tokens by MCIs generally takes two forms, "utility" tokens and "wrapped" tokens, each with different economic characteristics and balance sheet implications. In addition, MCIs could in principle issue their own stablecoins, though no MCI covered in this paper appears to do so currently.

i) Utility tokens

Utility tokens contain some equity-like features but are not equity. These are unbacked cryptoassets issued by an MCI that typically grant holders access to platform services or benefits, such as discounted trading fees, priority access to new products or staking rewards. Some tokens, sometimes referred to as governance tokens, may also provide governance rights to vote on decisions taken by the MCI or other token holders with respect to its blockchain platform. Governance rights and utility functions are not mutually exclusive, and a single token may combine elements of both. Although utility tokens are not equity in the sense that they represent a claim or ownership stake in the MCI's business, they still offer the MCI an initial source of funding through initial coin offerings (ICOs) of the utility token, without any obligation to redeem or repay those token holders. Token holders have no legal ownership interest in the MCI entity, no rights to dividends or distributions and no priority claims in the event of insolvency or liquidation. To incentivise customers to hold utility tokens, MCIs often provide discounts to customers using them to pay platform fees (eg for trading). They may also confer special access to some products, such as new token launches, and allow tokens to be "staked" to earn return.

Utility tokens can also be used within the MCI ecosystem for various purposes that create additional balance sheet exposures. Customers may trade utility tokens on the MCI's exchange like any other cryptoasset. Many MCIs accept their own utility tokens as collateral for margin loans or secured loans. When an MCI accepts its own tokens as collateral, it creates concentrated exposure to its own token's price volatility. If the utility token's price declines sharply, multiple customers may simultaneously face margin calls or liquidation, creating clustered credit risk for the MCI. Additionally, if the MCI holds significant amounts of its own utility token on its balance sheet (either from market-making activities, retained holdings from the initial issuance or tokens received as fee payments), it faces market risk from price declines for its own token.

In some cases, MCIs have made public pledges to repurchase their utility tokens, intended to support the token price and reward holders. While economic analysis suggests that such buyback pledges can increase initial funding raised, the cost of executing the buyback commitment typically exceeds the additional capital generated, a reflection of underlying capital market constraints rather than optimal financing.[15] These pledges can also expose MCIs to operational vulnerabilities: if the token price declines sharply or trading conditions deteriorate, honouring the buyback commitment may become unfeasible, as FTX experienced with its token (FTT), where the inability to sustain the buyback pledge was a key trigger for the loss of confidence that preceded the platform's collapse.

The largest utility token, BNB, is issued by Binance, and by the end of 2025 it was the fourth largest unbacked cryptoasset by market value.[16]

ii) Wrapped tokens

Wrapped tokens reference an underlying cryptoasset (unbacked or stablecoin) and operate as a receipt token that the MCI issues upon subscription to an investment programme. When a customer deposits an

[15] See Garratt and van Oordt (2024).

[16] See CoinGecko, "Cryptocurrency prices by market cap", www.coingecko.com/.

underlying cryptoasset or stablecoin (eg ETH or USDC) into an MCI investment product, the underlying asset is locked or immobilised for the duration of the arrangement, and the MCI may issue a wrapped token that represents the customer's position in that programme, combined with accumulated yield or reward. In this way, these tokens are an extension of the investment programmes discussed below. Yield can be paid directly or by embedding the cumulative yield via a higher price for the wrapped token and the underlying cryptoasset it references. The economic nature and balance sheet implications of wrapped tokens depend on the structure of the underlying investment programme they represent.

MCIs allow wrapped tokens to be used for several purposes on the platform beyond simply representing an underlying position. These include trading, as margin and collateral for loans, or re-staking (ie the wrapped token representing an underlying cryptoasset is reused to secure other blockchains). In theory, the reuse of these wrapped tokens means that holders can rehypothecate their underlying cryptoassets many times, potentially with leverage. These additional uses can create complex webs of exposures and amplify risks.

2.2 Investment products

Investment products offered by MCIs take several forms that have implications for intermediation activities and shape their inherent risks. MCI products that pay returns on deposited or deployed cryptoassets can be categorised by their return mechanisms and the ownership/control they provide to the MCI in the use of such assets as follows:

- discretionary investment products, whereby customers transfer ownership to the MCI and earn returns funded by the MCI's asset deployment in (potentially multiple) activities;
- directed deployment products, whereby customers authorise the use of their assets in a specific activity, such as staking or lending, and earn returns tied to those activities; and
- platform incentive products, whereby rewards are funded by the MCI's alternative revenue streams rather than by deploying customer assets.

The following paragraphs describe the main categories of investment products, focusing on the structural features and yield sources.

i) Discretionary investment products

Discretionary investment products usually involve customers depositing cryptoassets or stablecoins with an MCI in exchange for regular yield payments, with the yield funded by the MCI's use of those assets for its own purposes. These products are marketed under various names, such as "simple earn", "flexible savings" or "easy earn", and often emphasise the ability to earn returns on idle holdings while retaining the ability to request access to funds. The defining feature is that customers receive yield payments in return for transferring control and/or ownership of their assets to the MCI, without directing or authorising any specific use for those assets. Box 1 describes the T&C of different earn products.

The MCI determines how to use the assets and retains the profits from doing so, paying customers a portion as yield. An MCI's discretionary uses of the assets include lending (either direct to its customers or through DeFi), trading, staking, market-making or other activities. Unlike in traditional finance, many discretionary investment products do not make an ex ante promise of how much yield they will pay. The advertised yields are indicative and based on historical yield payments; the actual yield is determined at the time of payment by the MCI. Such a practice allows the MCI flexibility to maintain a positive spread between the revenue it generates and the yield it pays. Generating profits in this manner is a characteristic of financial intermediation.

Box 1

Earn products: terms and conditions

One common type of discretionary investment is the so-called earn product. The T&C of most earn products grant the MCI the right to customer assets deposited through earn programmes. While the specific language varies, the outcomes for MCIs appear similar across most – but not all – MCIs. The analysis of these T&C demonstrates that at most MCIs, the ownership and title of the cryptoassets deposited into an earn programme are transferred from the user to the MCI, the customer's assets are no longer segregated but commingled with other users' assets, and the MCI has full discretion to use the customer assets as it deems necessary to generate yield.

For example, Binance's Simple Earn product terms state: "by accepting these Simple Earn Terms, you hereby unconditionally and irrevocably […] explicitly consent to, and grant Binance Group Entities all necessary rights for, Binance Group Entities using your Simple Earn Assets as described in these Simple Earn Terms and any associated risks…" Furthermore, the Simple Earn terms state that "Simple Earn Assets may, at Binance's sole discretion and without prior notice, be used for operating purposes by Binance Group Entities…" and "Simple Earn Assets […] will not be segregated from the Digital Assets of others… You will not have a right to recover any specific Digital Assets…"

Bybit's Easy Earn product T&C state: "we may combine your Easy Earn Assets with other users' Easy Earn Assets… [and]… you irrevocably authorise us to deal with your Easy Earn Assets in any way it deems fit to generate the yield rate displayed on the Platform…"

Kraken's Opt-in Rewards Program offers more unambiguous T&C. It states: "by participating in the Opt-In Rewards Program, you provide a standing instruction to lend Opt-In Assets to us and authorisation to us to borrow those contributed Opt-In Assets from you…" and "'Utilized Opt-In Assets' mean[s] that they have been borrowed from you by us, with title to and control of such assets passing to us on a non-custodial basis".

Bitpanda's Earn on Stablecoins has T&C that are similarly unambiguous, stating: "each Earn Transaction is a remunerated, unsecured loan in kind […] [T]he Lent Assets are transferred from your 'E-Token Wallet' to a wallet of Bitpanda […] Bitpanda will therefore hold the Lent Assets in its own name and for its own account for the term of the respective Earn Transaction…" Moreover, "during the term of the Earn Transaction […] You cannot dispose of the Lent Assets, ie they are not withdrawable, stakeable or transferable, and they are therefore beyond your control and power of disposition".

Source: Authors' own elaboration based on selected MCIs' T&C, available in the Annex.

ii) Directed deployment products

Directed deployment products include staking-as-a-service and DeFi lending, which are described in the following subsections.

ii.1) Staking-as-a-service

Staking-as-a-service products allow customers to participate in proof-of-stake (PoS) blockchain validation, generating yield directly from the blockchain protocol's rewards. Customers holding native cryptoassets of PoS blockchains (eg ETH for Ethereum or SOL for Solana) can stake these assets to help secure the network. In return, they receive a share of staking rewards, which usually include block rewards and transaction fees.

The economic characteristics of staking products vary depending on how T&C are structured, as discussed further below. Unlike discretionary investment products, staking-as-a-service products generally involve an explicit direction to the MCI that staked assets are used only to validate transactions on a particular blockchain. However, the product's T&C could create either a principal or agency relationship. If the MCI pools together customer assets and stakes them on its own behalf, with an obligation to pass through some or all of the staking returns and return the staked assets, then this could result in a principal relationship and intermediation activity.

Whether staking is structured on an individual or pooled basis is often determined not only by the MCI's business model but also by the interaction between protocol-level technical requirements and the characteristics of the customer base. Some PoS protocols impose minimum stake thresholds (eg 32 ETH for Ethereum) that individual retail customers may be unwilling or unable to meet. Where MCIs initially offer staking as an institutional product (eg staking on behalf of a cryptoasset ETF whose asset size supports staking on an individual account basis), the extension of the service to retail customers with smaller holdings tends to make pooling operationally necessary. As a result, the expansion of staking from institutional to retail customers can push MCIs toward the principal end of the spectrum described above, as pooling requires the MCI to aggregate customer assets and exercise a degree of discretion over the pooled stake that is not present in individual staking arrangements.

On the other hand, contractual terms may establish an agency relationship: the customer retains ownership (often via segregated wallets), the MCI acts as a technical service provider operating or facilitating access to validator infrastructure on the customer's behalf, and the MCI has no right to use the customer's staked assets for any purpose other than the authorised staking. The MCI earns a service fee (eg a percentage of staking rewards) for this technical facilitation but does not earn profits from deploying customer assets at its discretion.

Regardless of whether the structure of the staking arrangement results in a principal or agency relationship, staking-as-a-service introduces operational risks as many MCIs do not operate validator infrastructure directly but rather outsource these operations to third-party vendors. The vendor's operational practices, its access to cryptographic keys during the staking process and the safeguards implemented to ensure that the platform operator retains control over staked assets throughout the process are all critical factors influencing the product's risk profile.

ii.2) DeFi lending and integration products (ranging from facilitation to intermediation)

Some MCIs offer products that connect customers to DeFi lending protocols so that customers do not have to participate directly in the blockchain. Such products range from pure facilitation to pooled intermediation. These products allow customers to earn yield by supplying their assets to DeFi protocols like Aave, Compound and Morpho. There, users can borrow cryptoassets against collateral and pay interest. Yield generally comes from borrower interest, not MCI discretion in how the assets are used.

In pure facilitation models, MCIs provide technology interfaces that do not involve customers transferring ownership of assets.[17] Users interact directly with DeFi protocols, retaining control of their assets through private keys, while MCIs earn facilitation fees. Customers face protocol risks, such as smart contract bugs or collateral volatility, but not MCIs' credit risk. If the MCI fails, customers can still access their assets through other interfaces, as the MCI does not hold or control the funds.

In contrast, pooled vault products aggregate customer assets, taking ownership and exercising discretion over their allocation across multiple DeFi protocols. In these products, customers transfer ownership and control of assets to the MCI (or to smart contracts controlled by the MCI) and the MCI pools cryptoassets and allocates capital across DeFi protocols to optimise returns. Customers receive a blended yield reflecting aggregate returns, and the MCI may charge management or performance fees.

Several factors determine where a DeFi integration product falls on this spectrum: (i) whether cryptoassets are held in the MCI in a segregated custody account or in an MCI pooled account; (ii) whether the MCI or the customer controls allocation decisions; (iii) whether the smart contracts are controlled by customer keys or MCI keys; (iv) the nature of customer claims (against the DeFi protocol directly or against

[17] Such is the case of non-custodial yield products offered by MCIs through the integration of their infrastructure with Morpho protocols. For examples of these products, see Morpho, "Customer stories", morpho.org/stories/.

the MCI); (v) whether the user is exposed to the credit risk of the MCI or the borrowers on the protocol itself; and (vi) the MCI's fee structure (facilitation fees only or management or performance fees).

The classification of DeFi integration products along this spectrum is further complicated by the emergence of hybrid wallet products offered by some MCIs. In these arrangements, cryptographic keys are shared between the MCI and the customer through multi-party computation or similar key-splitting technologies, creating a model that is neither fully custodial nor fully non-custodial. When customers use such wallets to access DeFi lending protocols, the MCI may characterise its role as that of a technology provider on the basis that it does not unilaterally control the customer's assets. However, the MCI's partial control over the keys, combined with the user interface it provides, may in practice give it significant influence over how and where customer assets are deployed. Unlike the two ends of the spectrum described above, where control is clearly held by either the customer or the MCI, hybrid wallet models distribute control ambiguously, making it difficult to determine the nature of customer claims, the location of risk and whether the MCI's role constitutes facilitation or intermediation.

iii) Platform incentive products

Some MCIs offer platform incentive products that resemble discretionary investment products but differ in their economic characteristics. In these products, reward payments are funded via sources other than the use of customer assets. Rewards can be linked to the user's behaviour on the platform (eg trading activity, platform engagement etc) without the user transferring ownership of their assets to the MCI. The MCI does not use the assets for its own purposes, and reward payments are funded via external revenue sources, commercial arrangements or promotional budgets rather than returns generated from investing the user's assets. Economically, such programmes resemble merchant cashback, loyalty or transactional reward schemes rather than deposit-taking. The risk profile also differs from that of discretionary investment products: customers retain ownership of their assets and face only the risk of reduced or discontinued rewards.

2.3 Lending

Lending activities are central to MCIs' business models. MCIs extend credit to customers mainly through two channels: margin loans that facilitate leveraged trading and secured loans that customers can use for general purposes. Both types of lending are usually collateralised by cryptoassets or stablecoins, but the structure, risk characteristics and balance sheet implications differ in important aspects.

i) Margin lending for trading

Most MCIs covered in this paper offer margin loans to facilitate leveraged spot and derivatives trading. One MCI also offers a margined staking product, whereby customers can take a leveraged position in a cryptoasset and then stake those cryptoassets to earn a reward.

MCIs allow customers to use both cryptoassets and stablecoins as collateral to meet margin requirements, depending on the product. Where cryptoassets are posted as margin, haircuts are used to account for their market risk and procyclicality from using cryptoassets as margin to borrow other cryptoassets (whereby the prices of the margin and the underlying exposure are potentially positively correlated). These loans can allow high levels of leverage in margin trading, depending on the MCI (leverage allowances differ among MCIs, but in some cases reach up to 150x leverage, including for retail users). MCIs usually provide no guarantee to notify users of a margin call, instead requiring users to continuously monitor their positions to ensure sufficient margin in their accounts. If margin falls below a prespecified level, MCIs will automatically liquidate a position to repay the loan before it enters a negative balance. Due to the volatility in cryptoasset prices and gaps in liquidity and prices during periods of extreme volatility, borrowed cryptoassets may at times become insufficient in value to repay the margin

loan before MCIs' liquidation occurs (ie the loan enters a negative balance). In these instances, MCIs state that customers remain liable to repay the negative loan balance, although some MCIs have an insurance fund to cover such losses. In extreme circumstances, some MCIs reserve the right to expropriate funds from other borrowers' positions to repay the loans (so-called automatic deleveraging).

The complexity of margin loan products varies depending on the MCI. At their simplest, MCIs will separate margin loans supporting each position (one-to-one). However, some MCIs also allow for cross-margining, whereby a margin loan can support multiple leveraged positions simultaneously to take advantage of potentially offsetting price moves (one-to-many). One MCI also offers multi-asset margining, whereby a basket of cryptoassets supports a margin loan on multiple positions in potentially different cryptoassets (many-to-many). In the case of cross- and multi-asset margin loan arrangements, MCIs specify complex rules to determine how positions might be liquidated to repay the loan.

ii) Secured loans for general use

Some MCIs also offer secured loans of cryptoassets and stablecoins to customers. These loans tend to be collateralised with cryptoassets, which often receive a substantial haircut to reflect their market risk. Loans appear to be funded by the MCI using the proceeds from investment products and other activities, though several MCIs also offer peer-to-peer products to facilitate bilateral loans between customers.

These loans are distinct from margin lending in that users can use the loan proceeds outside the MCI's platform. Both fixed- and variable-rate loan products are available, and borrowing rates are generally lowest for the largest cryptoassets (eg at the time of writing, one MCI offered rates of 0.5% for BTC, 2.5% for ETH and ~4% for USDT and USDC). MCI loans of reserve-backed stablecoins that are collateralised by cryptoassets appear similar in substance to MCIs offering fiat currency loans, since such stablecoins can easily be converted to fiat currency at par and moved off the platform. Given the volatility of the underlying cryptoasset collateral, MCIs often employ margin calls and automatic liquidation of secured loan products to ensure that they do not enter a negative balance. For example, one covered MCI offers loans with an initial loan-to-value ratio of 78%, will initiate a margin call at 85% and will liquidate a position at 91%.

2.4 Derivatives

Most of the MCIs covered in this paper offer leveraged derivatives trading and act as market-makers, funded by investment programmes**.** The most popular product offered is a perpetual futures contract. Unlike traditional futures contracts, perpetual futures do not have an expiry date, allowing them (theoretically) to be held indefinitely. This feature makes them particularly suitable for 24/7 trading in cryptoasset markets. Since perpetual futures lack an expiry date, the prices in the spot and perpetual futures markets do not naturally converge over time. To address this, perpetual futures employ a mechanism known as a funding rate. Through this mechanism, holders of short (long) positions pay a regular fee to holders of long (short) positions based on the difference (or basis) between the spot price and the futures price. This funding rate incentivises traders to supply liquidity to the side of the futures market with excess demand, thereby promoting the convergence of the futures price with the spot price. The MCI ensures the smooth operation of the funding rate mechanism by intermediating trades and filling gaps in liquidity in the market.

Some MCIs also offer traditional futures contracts with an expiry date, options trading and over-the-counter (OTC) or request-for-quote (RFQ) derivatives markets, though these are less common. Similarly, other MCIs also offer structured investment products that function like an option and are targeted at retail investors. Products of this type are often marketed as investment programmes and carry names that suggest they may be targeted at retail investors, such as "dual investment", "double win", "discount buy" and "smart leverage". They require the customer to make a prediction about the future price of an underlying cryptoasset, with a payoff if certain prespecified conditions are reached. Where such

products involve leverage, the customer may not be required to post margin, implying that these products are designed to attract retail investors who may not trade in traditional derivatives markets.

2.5 Proprietary activities

While publicly available information is limited, it seems that MCIs may engage in proprietary activities to support their operations. These could include market-making, proprietary trading and liquidity management (eg maintaining liquid cryptoassets on deposit with other MCIs). In some jurisdictions, proprietary activities are prohibited or restricted to certain types of licence or legal entity.

It is useful to distinguish between the deployment of customer assets under earn/yield programmes and pure proprietary trading. As described in Section 2.2, discretionary investment products typically involve the MCI describing, at least in general terms, the types of activity it may undertake with customer assets (eg lending, staking, DeFi deployment or market-making). While these descriptions are often broad and non-binding, they constitute a form of investment strategy communicated to the customer as part of the product's T&C. By contrast, pure proprietary trading refers to activities whereby the MCI deploys its own capital, whether from retained earnings or other sources, without any preset or disclosed investment strategy and without an obligation to generate or pass through returns to customers. The distinction matters because the deployment of customer assets under investment products, even where the MCI retains broad discretion, creates a liability to those customers and entails a degree of implicit or explicit accountability for investment outcomes. By contrast, pure proprietary trading exposes only the MCI's own capital and does not give rise to the same customer-facing risks. In practice, however, the boundary between these two categories can be difficult to draw, as MCIs may fund proprietary activities partly with customer earn accounts and partly with their own capital, without clearly delineating the source of funding or the associated risks, as well as generate returns that can be used to pay customer investment product yields.

Section 3 – Intermediation functions and balance sheet implications

As outlined in Section 2, MCIs engage as principal in a range of activities, such as issuance, trading, lending and borrowing, that resemble traditional financial intermediation. In many cases, these activities create distinct assets and liabilities on MCI balance sheets, which in turn give rise to liquidity, maturity, credit and collateral transformation. This section maps these activities to MCI balance sheets, identifies financial intermediation implications and explores how they contribute to financial stability risks.

3.1 Balance sheet implications

The aim of this subsection is to assess how the products for which an MCI acts as a principal map to its balance sheets (ie assets and liabilities) and where they create exposure to credit, liquidity or market risk.

On the liability side, MCIs create obligations through products that require them to return customer assets or fulfil redemption promises. For example, some earn programmes involve customers lending their cryptoassets to MCIs in exchange for fixed or variable returns, creating on-demand or fixed-maturity liabilities. See Box 2 for a description of how investment products may be considered liabilities for MCIs. Similarly, tokens with redemption rights represent unsecured liabilities, as the MCI receives customer funds and promises to return a fixed value at a later date. These liabilities are a key source of funding but expose MCIs to liquidity risks, particularly during periods of heightened redemption demand.

Box 2

Are investment products liabilities for MCIs?

The description of MCI investment products in Section 2.2 focuses on structural and economic features. Whether a product gives rise to balance sheet liabilities for an MCI depends on two related considerations: the structure of the T&C governing a product and the regulatory requirements governing such product.

In relation to T&C, four elements, when present, can lead to the creation of balance sheet liabilities:

i. Transfer of ownership and control: T&C usually specify that the customer is lending their cryptoassets or stablecoins to the MCI. Legal title and possession transfer to the MCI, which gains the right to use those assets for its own purposes. The customer no longer has a specific claim on the deposited assets but becomes a general creditor of the MCI with a contractual right to receive back an equivalent amount of the same cryptoasset, usually at par value.

ii. MCI discretion over use: T&C usually grant the MCI permission to use customer assets for a wide range of purposes, including: funding for general operations, funding for margin and other lending, to provide liquidity for the MCI's intermediation activities (eg in perpetual futures markets, see below) and to provide liquidity directly to DeFi protocols for similar lending and market-making purposes. Customers generally have no visibility into or control over these deployment decisions. Their assets may be mixed with the assets of other customers and the MCI's own funds.

iii. Obligation to return funds: In return for the transfer of ownership, the MCI promises to return an amount equal to that of the original deposited cryptoasset. This obligation exists regardless of the profitability of the MCI's deployments. MCIs often offer both flexible and fixed-term programmes, analogous to sight and term deposits, in which short-term redeemable liabilities may be repayable on demand (for flexible products) or at fixed maturity (for fixed-term products). However, MCIs set a range of conditions for customers to redeem their assets, including fees, timing delays and the forfeiture of partially accumulated yield. Additionally, MCIs generally reserve the right to vary these conditions without notice or delay or permanently suspend the ability to redeem assets at any time. Such terms can provide the MCI a margin of flexibility in how and when it returns customer funds.

iv. Yield funded via asset deployment: The MCI uses customer deposits to generate revenue through lending, trading, market-making or other activities, and pays customers a portion of these returns as yield. The yield offered is usually lower than the revenue the MCI generates, with the spread representing the MCI's margin. Unlike in traditional finance, MCIs may not promise to pay a specific yield ex ante. Advertised yields are indicative and based on historical yield payments; the actual yield is determined at the time of payment. Such a practice allows the MCI an additional degree of flexibility to maintain a positive spread. Generating profits in this manner is a characteristic of financial intermediation.

Taken together (transfer of ownership, MCI discretion over use, an obligation to return funds and yield funded via deployment), MCIs' investment products create short-term redeemable liabilities on MCI balance sheets and resemble deposit-taking activities.

From the MCI's perspective, product subscriptions are a funding source used to earn revenues in excess of the yield paid to customers. From the customer's perspective, these products are generally an unsecured claim on the MCI that depend on the MCI's solvency and willingness to honour its obligations. This structure creates credit, liquidity and maturity transformation risks. However, contractual structure alone does not always determine classification. The applicable regulatory framework may independently require that certain products be treated as liabilities for MCIs regardless of how their T&C are drafted.

The interaction between contractual structure and regulatory classification means that similar products may be treated differently across jurisdictions and that regulatory requirements may override conclusions that would otherwise follow from a purely contractual analysis.

Source: Authors' own elaboration based on selected MCIs' T&C, available in the Annex.

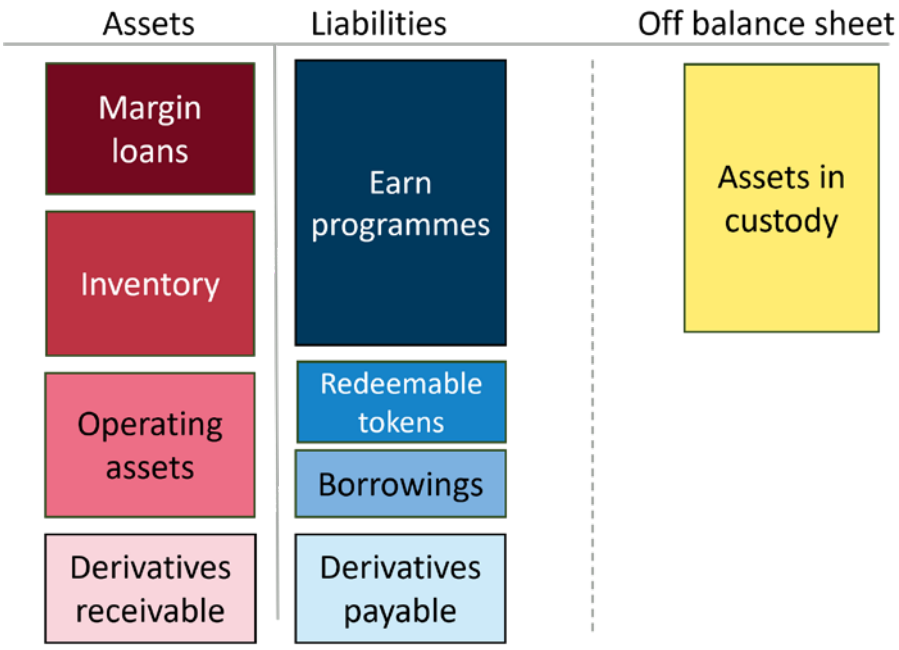
On the asset side, MCIs offer a range of products that resemble investment activities. First, MCIs extend credit to their customers through margin loans, offering leveraged trading strategies. Second, as part of their market-making and yield-generating business, MCIs may purchase outright or deploy cryptoassets on DeFi protocols, stake cryptoassets or make direct investments in venture projects. Third, MCIs may maintain operational and liquidity management buffers, including depositing funds at other MCIs or intermediaries, to fund their operations. This asset composition often results in liquidity and maturity mismatches, as MCIs rely on less liquid assets to fund liabilities that are expected to be redeemable on demand.

Derivatives activities generate both assets and liabilities for MCIs, depending on the customer and the MCI's hedging activities. An MCI may generate derivatives payable (liabilities) when underwriting perpetual futures and creating obligations to make payments as determined by the specific contract. Similarly, the MCI may enter into its own derivative contracts to hedge its market risk exposure, creating derivatives receivable (assets). In many cases, an MCI may be able to net derivative assets and liabilities, which reduces its overall exposure.

Graph 3 gives an overview of an illustrative MCI balance sheet. On the asset side, the MCI's deployment of assets appears as margin loans, inventory, operating assets and derivatives receivable. On the liability side, sources of funding include earn programmes, redeemable tokens, borrowings and derivatives payable. Assets held in custody that are segregated and not available for use by the MCI are shown to the right as an off-balance sheet item.

Due to the lack of regulatory reporting or other disclosures, most MCIs do not report any balance sheet information. As a result, there is limited ability to observe actual MCI balance sheets or to determine the size and scale of these intermediation activities.

An illustrative MCI balance sheet — Graph 3



Source: Authors' own elaboration.

3.2 Financial intermediation activities

Financial intermediation is the process of linking those who are seeking to invest assets with those seeking to borrow assets. Financial intermediaries sit between borrowers and investors to overcome challenges with liquidity, maturity, credit and collateral transformation. Financial intermediaries overcome these challenges by issuing claims on themselves and using the proceeds to purchase other assets. MCIs play a central role in cryptoasset markets, intermediating between those seeking to invest or earn a return on their cryptoassets and those seeking to borrow against their cryptoassets.

Maturity transformation

MCIs provide customers with immediate liquidity via token issuance and earn programmes with on-demand redemption, while investing those funds in longer-duration loans or assets. For example, an MCI may offer immediate or same-day redemption on earn accounts, while simultaneously using the collateral proceeds from these earn accounts to fund margin loans, staking activities or DeFi lending with fixed maturities greater than one day. This creates a maturity mismatch between the immediately available liability and the longer-duration asset. If these earn product customers withdrew their funds the MCI might not have a sufficient liquidity buffer to meet redemption requests.

Liquidity transformation

Some MCIs issue tokens, such as wrapped tokens, that are purported to maintain a value relative to the underlying asset and be redeemable on demand (essentially a general unsecured claim, similar to a deposit or free credit), or use yield/earn programmes to borrow customer collateral that is returnable on demand, to fund less liquid assets such as customer loans, market-making inventory or operating assets.[18] While the underlying assets on the MCI balance sheet may have high market liquidity, the purpose for which those assets are used may prevent immediate liquidation. For example, stablecoins may be easy to sell at or near face value on the secondary market, but stablecoins used for operating purposes, to fund margin loans or to manage a market-making portfolio may result in a loss of franchise value when liquidated to meet customer funding demands. To meet customer demands, the MCI could sell stablecoins otherwise used for market-making, though this may restrict the MCI's ability to continue providing market-making or other services critical for its business.

Derivatives activities further amplify liquidity transformation. MCIs often engage in derivatives trading, either as intermediaries for customers or for proprietary purposes. Derivatives such as futures, options and perpetual contracts typically require the posting of collateral (margin) to secure positions. The MCI may have the ability to reuse customer margin received through its derivatives intermediation activities, creating a source of funding for its own activities but also a liability to return the margin if the customer position value changes or the customer decides to liquidate their position. The MCI may face liquidity demands if the reused customer margin is unavailable but the MCI has an obligation to return the customer margin. In addition, the MCI may be subject to margin requirements itself if it is engaging in proprietary trading, particularly for derivatives trading on platforms other than its own.

Credit transformation

MCIs engage in credit transformation by borrowing from a group of investors and lending to a group of borrowers, with the MCI managing the credit risk of the borrowers failing to repay their loan. Although

[18] Some MCIs structure their loan contracts such that the loan assets are callable almost continuously. For example, one MCI specifies in the terms of its open-ended loan that it has the discretion to decide on the renewal of the loan contract once *every minute*. In theory, it could then liquidate the loan collateral almost immediately once a loan is called. In practice, exercising such a right, particularly at scale, may have reputational implications the MCI may wish to avoid. Thus, economically, the MCI may consider loan assets to be less liquid.

collateral requirements may mitigate a significant part of the MCI's credit risk, the speed and volatility of cryptoasset markets still create residual credit risk for the MCI. Through earn programmes, MCIs are effectively pooling funds from savers and using those funds to allocate credit to borrowers. MCIs are more similar to intermediaries than service providers, since they engage in credit risk assessment, setting collateralisation terms, monitoring and enforcing repayment terms if necessary.

Derivatives activities also involve significant credit transformation. MCIs often act as intermediaries in OTC derivatives markets, facilitating trades between counterparties. In these transactions, MCIs take on counterparty credit risk, as the failure of one party to meet its obligations can result in losses for the MCI. Even in centrally cleared derivatives, MCIs face credit risk if the collateral posted by customers becomes insufficient due to market volatility.

Collateral transformation

MCIs may borrow one type of collateral/cryptoasset from a customer (eg ETH), exchange it for a different cryptoasset (eg a stablecoin) and lend that stablecoin to a different customer. The MCI now has a mismatch between its liability obligation (ETH) and assets (stablecoins). The liability obligation can create market and funding risk, as the price of ETH may rise, increasing the MCI's liability and requiring greater funding to obtain ETH at a higher price in order to fulfil its obligation to return it to the customer. For some products, MCIs may allow the rehypothecation of tokens multiple times within their own platform. For example, they may issue a deposit-like token to a user depositing cryptoassets, use those cryptoassets for a proprietary activity and then also allow the user to deposit the token as margin. In this example, the same cryptoassets are effectively reused twice.

3.3 Financial stability implications

The financial intermediation functions performed by MCIs (ie liquidity, maturity, credit and collateral transformation) are central to their role in the cryptoasset ecosystem. However, these transformations also create significant vulnerabilities, particularly given the volatile nature of cryptoassets, the interconnectedness of MCIs and the lack of regulatory safeguards. The failure of an MCI could lead to spillovers to the traditional financial system and disrupt the functioning of services that support the real economy. This section examines the financial stability risks arising from MCI transformations, focusing on liquidity, market, credit and collateral risks. It also explores how these risks interact and propagate through the crypto ecosystem, highlighting implications for supervisory authorities.

Liquidity risk

Liquidity and maturity transformation, where MCIs issue liabilities that are redeemable on demand while holding less liquid or longer-duration assets, creates inherent liquidity risks. MCIs often fund longer-term or operational activities with liabilities such as earn programmes that customers expect to redeem immediately. For example, many MCIs offer fixed-term loans with maturities ranging from one to 90 days, while the T&C of earn products indicate that customer earn proceeds are used to fund these margin loans. Even in cases in which the underlying assets on MCI balance sheets (eg loans, market-making inventories) have high market liquidity under normal conditions, their specific use or purpose often prevents immediate liquidation. For instance, stablecoins used for market-making or margin loans may incur significant franchise costs if liquidated prematurely, potentially disrupting the MCI's ability to maintain its services and business.

These liquidity mismatches expose MCIs to the risk of run-like behaviour during periods of market stress. If customers lose confidence in an MCI's ability to meet redemption requests, they may withdraw from earn products en masse, forcing the MCI to sell its assets at fire sale prices. Such crises can trigger contagion effects across the crypto ecosystem, particularly if other MCIs or decentralised platforms are

interconnected through lending or collateral arrangements. Unlike banks and credit institutions, MCIs lack access to deposit insurance schemes and central bank liquidity facilities, leaving them particularly vulnerable to liquidity shortfalls.

A notable example was the collapse of Celsius Network in 2022, in which a surge in redemption requests overwhelmed the platform's liquidity, ultimately leading to insolvency. Box 3 recounts this case.

Box 3

Credit, liquidity and market risks and the failure of Celsius①

Celsius Network was a CASP whose core offering, the Earn programme, allowed customers to deposit their cryptoassets in exchange for yields. Marketed as a safer and more rewarding alternative to traditional banks, Celsius promised high returns while emphasising transparency and trust. However, the company's business model entailed significant credit, liquidity and maturity transformation, operating without the safeguards of regulatory oversight, capital buffers or robust governance. These vulnerabilities left Celsius exposed to financial risks that ultimately led to its collapse.

Celsius's T&C for the Earn product transferred ownership of deposited cryptoassets to the company. The bankruptcy court later confirmed that these terms unambiguously granted Celsius title to users' assets, clarifying that the Earn product was not a custodial service but instead established users as general unsecured creditors. Celsius failed due to a flawed business model and poor risk management. The company operated with a negative interest margin, with depositor rewards exceeding the returns generated from investments. Rather than aligning reward rates with sustainable earnings, Celsius set rates to attract customers and outpace competitors, further straining its financial position. Compounding this issue, Celsius paid rewards in its self-issued CEL token, which was actively traded on secondary markets. As CEL's price became a proxy for market confidence, Celsius diverted significant resources to buy CEL on the secondary market to maintain its price. In some cases, customer deposits of BTC and ETH were used to borrow stablecoins, which were then used to purchase CEL. This practice depleted liquidity, created a feedback loop of declining confidence and exposed Celsius to significant liquidity risks.

The company also suffered from poor investment and credit risk management. Celsius engaged in high-risk investments, including unsecured loans, speculative DeFi ventures and staking protocols, leading to significant losses, over USD 800 million in 2021 alone. Additionally, Celsius accepted volatile and correlated collateral, such as FTX's token (FTT), which amplified credit risks during market downturns. The firm's inability to track asset-liability exposures on a token-by-token basis further exacerbated these issues, leaving it unprepared to manage short positions in key assets like BTC and ETH.

The collapse of Celsius was triggered by a depositor run, a classic scenario in which the loss of confidence led to a rush of customer withdrawals. Between May and June 2022, Celsius experienced net withdrawals of over USD 1.4 billion. By 12 June 2022, the company was forced to pause all withdrawals due to liquidity constraints. When Celsius filed for bankruptcy on 12 July 2022, it revealed a billion-dollar hole in its balance sheet and significant deficits in key assets, underscoring the fragility of its business model.

Celsius's failure underscores how poor market and credit risk management can erode confidence and trigger a collapse. Losses from speculative investments and an unsustainable business model undermined trust, creating a feedback loop in which declining confidence led to a depositor run and liquidity shortfalls further deepened the losses. Ill-prepared to manage the liquidity shock due to its reliance on illiquid assets, Celsius was unable to meet withdrawal demands. This feedback loop underscores the critical need for MCIs to have robust governance, effective risk management and prudential safeguards.

① The analysis in this box is based on the findings from Final report of Shoba Pillay, *Examiner* dated 30 January 2023.

Market risk

Maturity transformation, where MCIs issue short-term or open-maturity liabilities to customers while holding longer-term assets, exposes them to significant market risks, particularly in the volatile cryptoasset environment. MCIs often invest customer funds in longer-duration loans or assets, such as margin loans

with fixed maturities. This mismatch exposes the MCI to repricing risk if liabilities are repriced at a faster rate than assets.

The high volatility of cryptoassets amplifies these risks. Sharp price declines can lead to cascading liquidations, particularly if assets are used as collateral for loans or margin accounts. Additionally, the high correlation among cryptoassets means that a downturn in one major asset, such as BTC, often triggers widespread price declines across the market. Stablecoins, which are frequently used as collateral or liquidity buffers, also pose market risks if they lose their peg to fiat currencies. The collapse of TerraUSD (UST) in 2022 is a stark example of how stablecoin de-pegging can destabilise the market, leading to a wave of liquidations and broader market disruptions. More recently, a flash crash in cryptoasset markets in October 2025 led to the largest cascade of liquidations observed in crypto markets to date and illustrates the risks faced by MCIs in intermediating derivatives markets based on volatile cryptoassets (see Box 4).

Box 4

Market risk in action: the cryptoasset flash crash of 10 October 2025

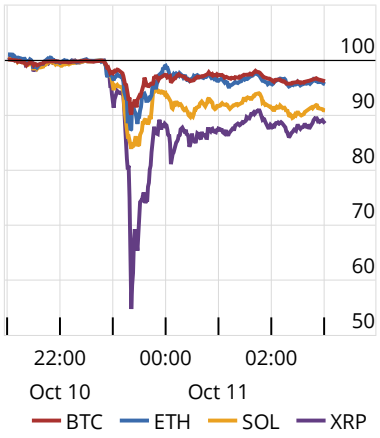
On 10 October cryptoasset prices experienced a flash crash-style event.① Price declines were amplified by a cascade of automatic deleveraging of crypto derivative positions across multiple platforms, including MCIs. The event highlighted the market risk that can be borne by MCIs both in intermediating markets in leveraged derivative products based on volatile cryptoassets and in conducting proprietary trading in them. No material collapses (ie such as during the FTX event) were observed following the event, though Binance did suffer a brief operational outage during the event that highlighted structural vulnerabilities in the leveraged derivatives market it operates. Institutional investors were reportedly among the biggest loss-takers from the event, though little is known about them or their linkages to the core financial system.

Cryptoasset prices fell sharply over a half-hour period on the evening of Friday, 10 October (CEST) before partially rebounding (Graph A.1). The speed of price movements was reminiscent of flash crashes in foreign exchange and equity markets (Graph A.2), events characterised by thin liquidity conditions, leverage and/or algorithmic trading, all of which are prominent in products offered by MCIs. The price moves were exacerbated by a cascade of automated liquidations related to margin calls on cryptoasset derivative contracts. Direct losses from these liquidations were reported at USD 19 billion on 11 October (a lower bound), likely amplified by a large increase in open interest in cryptoasset derivatives over 2025 (Graph A.3).② Reported losses are similar in magnitude to other notable instances of deleveraging in derivatives markets, such as the USD 20 billion loss from the selling of Archegos Capital Management's derivative positions in 2021, of which USD 10 billion was attributable to a handful of counterparty banks.③

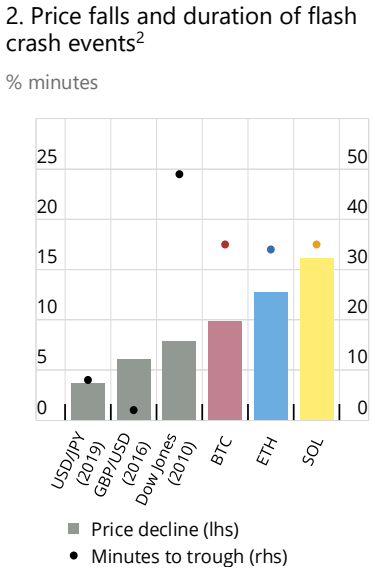
The cryptoasset flash crash of 10 October 2025 led to a cascade of forced liquidations of cryptoasset derivative contracts

Graph A

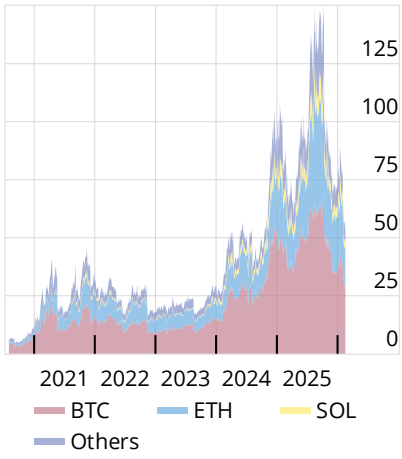
1. Cryptoasset prices on 10–11 October[1]



2. Price falls and duration of flash crash events[2]



3. Open interest in crypto futures



[1] 10 October 22:45 (CEST) = 100. [2] Peak-to-trough price falls and episode durations calculated from local peak directly preceding the sharp price fall. The US equity price flash crash refers to the fall in the Dow Jones Industrial Average on the afternoon of 6 May 2010; for more details see SEC and CFTC, Findings *regarding the market events of May 6, 2010: Report of the staffs of the CFTC and SEC to the Joint Advisory Committee on Emerging Regulatory Issues*, September 2010. Information on the USD/JPY and GBP/USD flash crashes is from the *Financial Times*.

Sources: SEC; The Block; Bloomberg; Coinglass; Financial Times.

Compared with traditional derivatives markets, the complexity and riskiness of the products offered by MCIs – alongside the vertical integration of several intermediation functions (eg brokerage, pricing, trading, clearing, settlement) – may increase the likelihood of cascade events from price shocks and amplify the market risk to which MCIs expose themselves.④ For instance, Binance experienced an operational outage during the event due to a "high service load". The outage restricted investors from closing positions and resulted in pricing discrepancies between Binance and the market, which led several tokens used as margin to de-peg on the Binance platform, including two wrapped tokens referencing cryptoassets and an algorithmic stablecoin.⑤

Other amplifiers that likely contributed to liquidations include high price volatility and low liquidity in some cryptoassets (Graph A.1), the automated liquidation of derivative positions, high leverage available in derivatives trading and the use of cryptoassets as margin (which increases the procyclicality of price falls).

① See A Carchidi, "Crypto just had a flash crash. Here's what you need to know", *The Motley Fool*, 14 October 2025. ② Loss estimates are a lower bound given that cryptoasset exchanges restrict the number of liquidation events (one to two) reported per second. For instance, Hyperliquid (a DeFi protocol for which data are complete) accounted for half of reported losses from liquidations but only 5% of open interest in cryptoasset futures prior to the event. For more information, see O Singh, "Oct 10 crypto flash crash: Here's which exchanges, whales and traders lost the most – and what's next", Crypto Citizens Network, 13 October 2025. For reference, the next largest liquidation event recorded historically for cryptoasset derivatives led to losses of USD 9 billion and occurred in April 2021 (see Coinglass for further details). ③ See S Horta e Costa, T Alloway and B Hu, "Billions in secret derivatives at center of Archegos blowup", *Bloomberg*, 29 March 2021. ④ For instance, FSB (2023b) discusses vulnerabilities from the vertical integration of financial intermediation functions. ⑤ The algorithmic stablecoin Ethena (USDe) briefly lost its peg and fell to USD 0.65 on the Binance platform, while two wrapped synthetic tokens pegged to ETH and SOL that can be used as margin in derivative contracts also de-pegged. The de-pegging of these three tokens reportedly led to customer losses of USD 600 million from liquidations. Binance has announced USD 283 million of compensation to affected clients. For more details, see K Munen, "Exclusive data reveals Binance oracle flaw in record $19B crypto crash", *CoinCentral*, 15 October 2025 and Binance, "Resolution of USDE, BNSOL, and WBETH price depeg and risk control enhancements", 11 October 2025.

Market risks are particularly pronounced for MCIs engaged in proprietary trading or market-making activities. A decline in the value of assets held for these purposes can erode an MCI's capital base and impair its ability to meet obligations. The failure of FTX in 2022 illustrates the systemic consequences of market risk. FTX's exposure to its own illiquid native token (FTT), combined with its inability to manage market volatility, led to a rapid loss of confidence, asset fire sales and eventual bankruptcy.

Credit risk

Credit transformation, where MCIs borrow from one group of investors and lend to less creditworthy borrowers, introduces credit risks, even when loans are collateralised. MCIs often accept cryptoassets as collateral for loans, but the value of these assets can decline sharply during periods of market stress, leaving the MCI under-collateralised. For example, an MCI may issue a loan backed by BTC, only to see the value of BTC drop by 30% in a single day, rendering the loan insufficiently collateralised. This creates a significant risk of loss, particularly if the MCI is unable to recover the full value of the loan.

The practice of collateral transformation further compounds credit risk. MCIs often engage in collateral substitution, whereby they lend one type of cryptoasset (eg ETH) while accepting a different type of collateral (eg stablecoins). This creates mismatches between the MCI's liabilities and assets, increasing exposure to price fluctuations and potential defaults. Additionally, some MCIs engage in rehypothecation, whereby collateral provided by one customer is reused to back loans to another customer. While rehypothecation can enhance liquidity, it also creates multiple claims on the same asset, increasing systemic vulnerabilities. If a borrower defaults or the value of rehypothecated collateral declines, the MCI may face cascading losses.

Interconnected risks

The risks arising from liquidity, maturity, credit and collateral transformations are deeply interconnected and mutually reinforcing. Liquidity shortages can force asset sales at depressed prices, amplifying market risks, while declining asset values can increase the likelihood of borrower defaults. These dynamics create feedback loops that can destabilise individual MCIs and propagate through the broader crypto ecosystem.

The interconnected nature of MCIs, particularly through rehypothecation and derivatives markets, increases the risk of contagion. A failure in one MCI can spread through the ecosystem, triggering cascading liquidations and amplifying financial instability. As institutional investors increase their exposure to cryptoassets, these risks could spill over into traditional financial markets, amplifying systemic vulnerabilities.

Section 4 – Policy approaches and challenges

The preceding sections have shown that many of the largest MCIs combine a range of activities that resemble financial intermediation, giving rise to credit, market and liquidity risks. Consistent with the objective of "same activity, same risk, same regulatory outcome", these MCIs should be subject to prudential oversight as is the case for traditional financial intermediaries.

While the FSB's high-level recommendations for the regulation, supervision and oversight of cryptoasset activities and markets provide broad principles as a starting point, jurisdictions face policy choices and trade-offs when designing and implementing a regulatory and oversight approach for MCIs.[19]

These regulatory and oversight approaches for MCIs can be analysed through the lens of the entity-based (EB) vs activity-based (AB) framework, as outlined by Restoy (2021), Borio et al (2022) and Ehrentraud et al (2022). This framework distinguishes between regulatory approaches that target specific financial activities (AB) and those that address risks arising from the combination of activities within an entity (EB). While AB regulation strengthens the resilience of individual activities, such as lending or trading, EB regulation focuses on the systemic risks associated with the bundling of activities within a single entity. The following subsections discuss EB and AB regulatory approaches for MCIs as well as challenges authorities face to ensuring their comprehensive oversight.

4.1 Entity-based regulatory frameworks applicable to MCIs

EB regulatory and supervisory requirements should be proportionate and tailored to each MCI's specific business model, complexity and risk profile. While some regulatory requirements, such as governance, risk management and supervisory oversight, should apply to all MCIs, other requirements, such as prudential capital and liquidity requirements and resolution planning, may be applied above a certain size or risk threshold. If MCIs continue to grow and become more interconnected with the traditional financial system, authorities may have to consider approaches to measuring their systemic footprint and consider whether it's appropriate to designate certain MCIs as systemic financial institutions.

Prudential capital and liquidity requirements

Credit, market and liquidity risks are inherent in financial intermediation. Prudential requirements, such as capital and liquidity buffers, are therefore critical safeguards to ensure that intermediaries can absorb losses and withstand liquidity shocks.

MCIs face credit risk from lending, market risk from trading and market-making, and operational risk from custody and technology failures. Without adequate capital buffers, these risks can lead to insolvency, as demonstrated by the collapse of Celsius Network.

Capital buffers should apply at the consolidated group level and be calibrated and sensitive to the unique risks of cryptoasset markets and MCIs' business models. For example, capital requirements should be tailored to the MCI's asset and counterparty risk profile and exposures to idiosyncratic and market stress. Capital requirements for prime brokerage-related balance sheet exposures such as securities borrowing, margin lending and OTC derivatives are a good starting point.

MCIs that engage in liquidity and maturity transformation through earn products should be required to hold a buffer of highly liquid assets to meet redemptions during periods of stress. Liquidity requirements should be calibrated to reflect the MCI's funding structure, including the runnability of its earn products, and the liquidity of its assets and investment strategies. Liquidity requirements should also reflect the absence of liquidity providers of last resort and schemes similar to deposit protection.

The Basel Committee on Banking Supervision (BCBS) Liquidity Coverage Ratio offers a framework for liquidity stress testing, but its methodology and assumptions would need significant updates to reflect the liquidity risk profile of earn products, perpetual futures and other contingent risks. In addition, a prudential liquidity framework for MCIs would have to consider which types of cryptoassets would be eligible for inclusion in the buffer of highly liquid assets.

[19] See FSB (2023a).

Governance and risk management

Strong governance is the foundation of an effective prudential framework. In the Celsius case, weak governance and inadequate risk management were root causes of its failure. To effectively manage the credit, market and liquidity risks inherent in their business models, MCIs should employ sound risk management practices, maintain board-level oversight of key risks and implement robust internal controls.

While prudential requirements are useful for setting minimum levels of capital and liquidity, sound risk management practices are a necessary complement to ensure that intermediation activities are conducted in a safe and prudent manner without undue risk to the MCI's customers and markets more broadly. For example, the BCBS *Principles for sound liquidity risk management and supervision* and *Final guidelines for counterparty credit risk management* would be useful starting points when evaluating an MCI's credit and liquidity risk management frameworks.[20]

In addition, given the 24/7 nature of cryptoasset markets, operational risk management is also key. As illustrated by an operational outage at a major MCI during the October 2025 flash crash (see Box 4), system failures during periods of stress can prevent customers from managing their positions and amplify losses across the ecosystem. Authorities should consider requiring MCIs to meet operational resilience standards, including business continuity arrangements and capacity stress testing, calibrated to the MCI's business model and risk profile.

Stress testing

Stress testing is a key component of prudential frameworks for MCIs engaged in financial intermediation. As demonstrated by the Celsius case study in Section 3, MCIs face interconnected credit, market and liquidity risks that can escalate rapidly during periods of market stress. Stress tests allow MCIs and supervisors to identify vulnerabilities before they materialise into solvency or liquidity crises. MCIs should employ both capital and liquidity stress testing to ensure that prudential buffers are calibrated to their risk profile and business model.

Combination of activity restrictions

Activity restrictions can help to address risks arising from the combination of specific MCI activities. For example, partial or comprehensive prohibitions on borrowing and lending services can be used to limit the degree of financial intermediation. These restrictions can be implemented across an entire sector within a jurisdiction or targeted to certain licence types. For example, MCIs that engage in the operation of a trading platform may be prohibited from also engaging in borrowing and lending activities or be required to conduct borrowing and lending through a separate entity, with arm's length requirements between affiliate entities.

Restrictions on proprietary trading can address conflicts of interest inherent in MCIs that combine a range of activities. Some jurisdictions prohibit MCIs that operate trading venues from trading on their own account, ensuring that platforms do not exploit customer order flow or trading strategies for proprietary advantage. Similarly, other jurisdictions require the segregation of customer holdings to prevent MCIs from using client assets for proprietary purposes.

A more stringent activity restriction is the prohibition against customers opting out of asset segregation requirements for cryptoassets. Where such a prohibition is in place, the transfer of ownership from customer to MCI that underpins discretionary earn products (as described in Section 2) cannot occur, effectively preventing MCIs from offering these products without the need for a direct prohibition on earn programmes themselves. This approach addresses financial intermediation risks at their source (by

[20] See BCBS (2008).

preventing the creation of the unsecured liability relationship) while preserving the MCI's ability to offer other platform services such as trading and custody. Some jurisdictions have implemented this approach as a phased strategy, enforcing strict segregation requirements while evaluating whether and under what conditions the reuse of client assets might be allowed in the future, such as in the context of developing licensing frameworks for cryptoasset custodians.

Another form of restriction observed in some jurisdictions is requiring margin lending to be conducted through separately licensed broker entities rather than directly by trading platform operators, even where the broker and the platform are under common ownership. This form of functional separation ensures that the credit risk associated with margin lending is managed within an entity subject to its own prudential requirements, rather than being commingled with the operational risks of the trading venue. In such arrangements, the broker may be permitted to accept cryptoassets as collateral for margin loans but is prohibited from rehypothecating or re-pledging that collateral, a restriction that limits the build-up of interconnected credit exposures within the MCI group. This structural approach mirrors traditional financial market requirements that separate the operation of a trading venue from the provision of credit to participants in that venue.

Recovery and resolution planning

Recovery and resolution planning ensures that financial institutions can restore financial health or wind down operations without destabilising markets. For example, when Celsius suspended withdrawals in June 2022, it lacked a coherent plan to restore liquidity or manage operations, resulting in a disorderly bankruptcy and significant customer losses.

Recovery plans should outline actions to address capital or liquidity shortfalls, such as raising additional capital or suspending specific business lines. Resolution plans should detail procedures for returning customer assets and managing residual liabilities. Supervisors should regularly review and test these plans to ensure their credibility and to ensure that there is no reliance on public support that could expose taxpayers to loss.

Consolidated supervision

Effective supervisory oversight is key to ensuring that MCIs comply with regulations and manage risks prudently. Supervisory mandates should extend to include credit, liquidity and market risks. A risk-based approach to supervision is critical, tailoring oversight intensity to each MCI's risk profile. Supervisors could prioritise MCIs with larger or faster-growing funding bases, riskier investment activities or weaker risk management for more intensive supervision.

Consolidated supervision is also essential for MCIs operating through complex group structures or across jurisdictions. Many MCIs allocate functions like trading, custody and lending to separate entities, often across multiple jurisdictions, obscuring risks and creating oversight gaps. Supervisors should evaluate group-level risks and risk management, including whether group structures or other arrangements are designed to evade regulation.

Regular onsite and offsite examinations are vital for carrying out supervisory responsibilities, understanding the MCI's business model and strategy and evaluating the adequacy of risk management.

4.2 Activity-based regulatory frameworks applicable to MCIs

In addition to EB regulations such as prudential requirements and supervisory oversight, AB regulatory measures can also address some – but not all risks – posed by MCIs' intermediation activities. These include leverage limits, customer asset safeguards and reuse requirements, as well as specific activity-based requirements.

Minimum margin requirements

Minimum margin requirements are a key consumer protection tool that can also provide some financial stability benefits. As noted in Section 2, some MCIs allow retail customers to access leverage ratios as high as 150:1 through margin loans and derivative contracts. Such extreme leverage amplifies market volatility and increases the likelihood of cascading liquidations during periods of stress. The analysis of the 2025 crypto flash crash in Box 4 highlighted how leverage embedded in derivative positions contributed to the rapid liquidation of nearly USD 20 billion in trades within a single day. Regulatory frameworks should establish minimum margin requirements for customer positions, with stricter limits for retail customers who may lack the expertise to manage highly leveraged exposures.

Customer asset protection rules

Customer asset protection rules safeguard custodial holdings in the event of MCI failure. Requirements for segregation, trust structures and insolvency protections can prevent customer losses. Some jurisdictions also mandate insurance or compensation schemes, although these must be tailored to address the unique risks of cryptoasset markets.

The use and reuse of customer assets should be subject to requirements to obtain the client's explicit prior consent to such arrangements, as outlined in IOSCO's crypto and digital asset recommendation 13.[21] In addition, MCIs should provide customers with clear and non-technical disclosures about the risks of consenting to the use of their assets, including the potential loss of their entire cryptoasset holdings.

Specific activity-based requirements

Beyond the broad AB requirements discussed above, several jurisdictions are introducing regulatory requirements tailored to specific MCI intermediation activities.[22] Two such activities, lending and staking, have attracted the most regulatory attention, offering insights into how activity-specific requirements can complement broader EB frameworks.

For lending activities, emerging regulatory frameworks focus on three key areas. These are: (i) disclosure requirements, under which MCIs are required to provide clear and standardised information about the nature of lending arrangements, including whether customer assets are transferred, commingled or pledged as collateral to third parties; (ii) collateral and risk management standards, including minimum collateralisation ratios, the application of appropriate haircuts to volatile cryptoasset collateral and the imposition of limits on reuse or rehypothecation of customer collateral; and (iii) segregation of lending and custodial books.

For staking services, activity-specific requirements are emerging around liability allocation and disclosure. The central regulatory question is whether the cryptoasset lender or the customer bears the risk of slashing (a protocol-imposed penalty for validator misbehaviour) and whether customers are adequately informed about this risk.

Beyond liability allocation for slashing, staking services raise questions about third-party vendor oversight and capital adequacy. Where MCIs outsource validator operations, authorities may need to assess whether the vendor's access to cryptographic keys or its operational practices introduce risks that the MCI has not adequately mitigated. In addition, as described in Section 2, the extension of staking services from institutional to retail customers may require MCIs to move from individual to pooled staking

[21] See IOSCO (2025).

[22] See FSB (2025).

models. In some jurisdictions, pooled staking arrangements (ie the MCI aggregates assets from multiple customers and stakes them collectively) may be classified as a collective investment scheme, triggering additional authorisation and conduct requirements beyond those applicable to staking-as-a-service.

4.3 Policy challenges

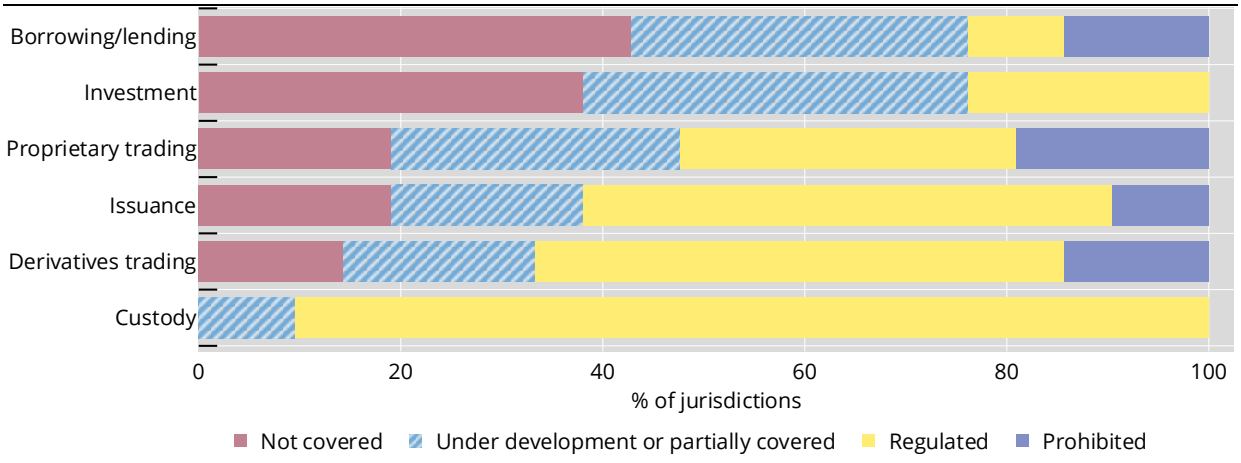
While there is a broad suite of existing EB and AB policy measures to address the financial intermediation risks of MCIs, jurisdictions still face the following policy challenges.

Regulatory perimeter and coverage of intermediation activities

In 2025, the FSB found that only 11 jurisdictions (39%) that participated in the thematic review had a finalised regulatory framework that addresses financial stability.[23] Furthermore, among those jurisdictions that have implemented regulatory frameworks, only two address MCI borrowing and lending, while three jurisdictions cover investment programmes such as earn products. This suggests that many jurisdictions have yet to bring MCIs within the regulatory perimeter.

Moreover, even when MCIs are brought within the regulatory perimeter, there are challenges to comprehensively addressing their activities that give rise to financial stability risks. Graph 4 shows the lack of coverage of CASP activities under existing regulatory frameworks. This partly reflects the early-stage development of many cryptoasset regulatory frameworks, which have prioritised AML/CFT requirements over development of prudential requirements.

Coverage of CASPs' activities under existing regulatory frameworks — Graph 4



Source: FSB (2025).

However, as this paper demonstrates, MCIs are rapidly expanding beyond their initial focus on operating trading platforms and providing custodial wallet services to engage in financial intermediation activities. These activities require a more comprehensive regulatory and supervisory framework to address the associated risks. Authorities should ensure that their frameworks adequately address financial intermediation activities and associated risks through prudential and other requirements (see Section 4.1) and, where necessary, product-specific requirements to reduce leverage among less sophisticated users.

Earn products that transfer ownership to the MCI and provide it with a source of funding similar to deposits pose particular regulatory perimeter challenges for authorities. While these earn products have

[23] See FSB (2025).

features that make them economically similar to deposits, MCIs that offer earn products may not need to obtain a banking or depository institution licence in most jurisdictions. Allowing cryptoasset deposit-like products to expand without proper safeguards will increase financial stability risks at a time when the links between cryptoassets and traditional financial markets are growing rapidly.

The degree of legal separation of activities within separate legal entities varies considerably across MCIs, raising challenges with EB regulation. Some MCIs operate through clusters of distinct entities, with different activities (eg exchange services, clearing and brokerage) allocated to separately licensed entities within the same jurisdiction or across multiple jurisdictions. In some cases, this separation is driven by regulatory requirements; in others, it reflects the MCI's own structural choices. At one end of the spectrum, some MCIs structure their operations to operate as principal, taking ownership of customer assets and deploying them at their discretion, generating short-term redeemable liabilities on their balance sheets. At the other end, some MCIs have opted for agency models, acting as technical intermediaries or custodians that do not take title to customer assets and do not generate short-term redeemable liabilities, designating customer assets as segregated holdings rather than balance sheet items. Between these extremes, many MCIs combine elements of both models, operating as principal for some products (such as earn/yield programmes) while acting as agent or custodian for others (such as spot trading or staking-as-a-service). These differences are material for risk assessment and for regulatory design: the characterisation of MCIs as undifferentiated conglomerates requires nuance, as not all MCIs engage in financial intermediation in the same way or to the same degree.

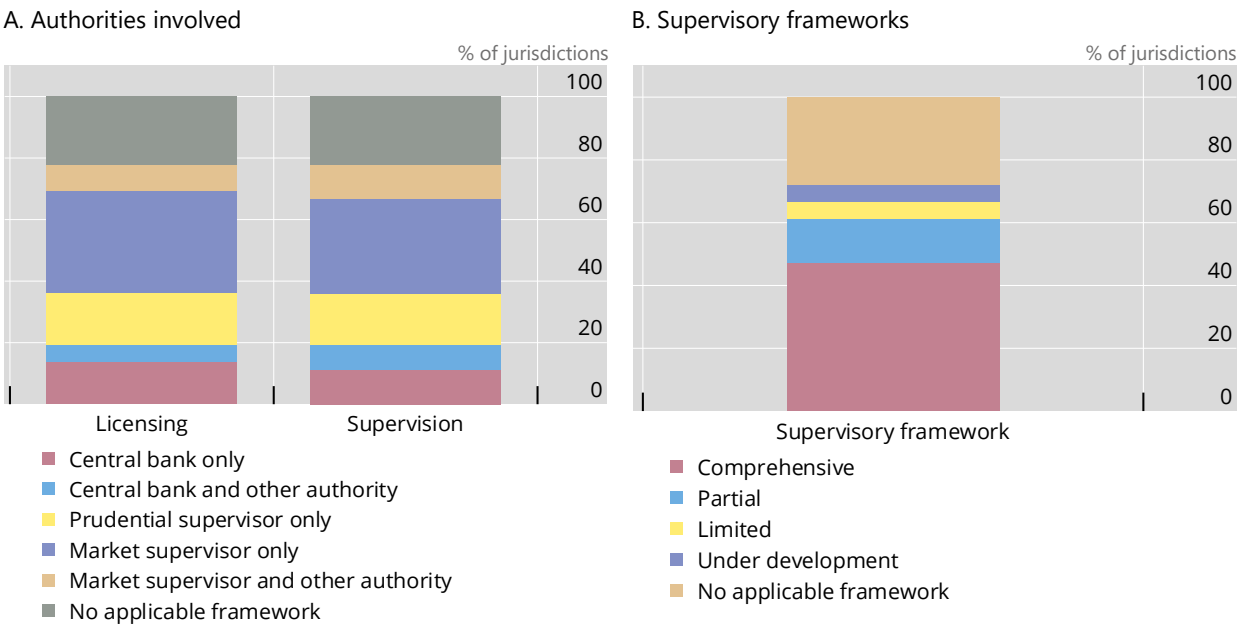
The combination of multiple intermediation activities within a group also creates intragroup connections that may span several jurisdictions and transmit losses and confidence shocks across the MCI. This is not just a theoretical concern; the failure of FTX in 2022 illustrated how losses originating in one part of a crypto conglomerate (ie its affiliated trading firm Alameda Research) cascaded across the broader group and ultimately triggered its collapse.

It is worth noting that traditional financial regulation has long recognised these risks by deliberately requiring the separation of certain activities. Requirements such as the structural separation of retail deposit-taking from proprietary trading, the prohibition on trading venues acting as principal in customer transactions or the ring-fencing of systemically important banks all reflect a regulatory judgment that combining certain intermediation functions within a single entity creates risks that outweigh the efficiency gains. Most large MCIs currently combine all of these activities, often without equivalent safeguards.

AB vs EB regulations

A key decision facing authorities is whether to adopt EB or AB regulation, or a combination of both. AB regulations, such as margin requirements or asset protection rules, can directly or indirectly address concerns regarding leveraged exposures. EB regulations can address the combination of different activities within entities that give rise to financial intermediation. However, authorities may not have or be able to fully implement the full range of AB and EB regulations. In many jurisdictions, MCIs fall under the oversight of securities regulators who primarily use AB regulations to achieve investor protection and market integrity objectives. Graph 5 gives an overview of the authorities overseeing stablecoin activities and the development of their supervisory frameworks, which may therefore have a greater inclination to use AB regulations for MCI activities.

Authorities' involvement in CASP supervision and supervisory frameworks[1] Graph 5



[1] CASPs are cryptoasset service providers. Data include 36 jurisdictions.

Sources: FSB (2025); BIS.

However, AB regulation alone may fail to address the market, credit and liquidity risks inherent in financial intermediation. For example, requirements for MCIs to disclose when customers opt out of a custodial relationship and minimum margin requirements on customer borrowings and derivatives fail to address the funding and liquidity risks facing MCIs.

Challenges may also arise if authorities with mandates to oversee MCIs do not have EB powers or tools, such as those to require capital and liquidity buffers. At the same time, EB regulation alone may also face challenges. Activities such as borrowing on margin may be difficult for supervisors to oversee effectively and consistently across many MCIs. In this case, minimum margin requirements for retail borrowers can provide an effective tool for limiting excessive risk-taking.

As a result, a combination of AB and EB regulation is the optimal policy mix to comprehensively address the financial intermediation risks of MCIs. Authorities need the powers and tools to require MCIs to hold capital and liquidity buffers, subject them to supervision and at the same time impose sector-wide requirements on riskier products, such as minimum margin requirements for retail borrowing.

Cross-border cooperation

The cross-border nature of MCIs' operations is among the most significant challenges to effective oversight. Many large MCIs allocate specific functions (eg trading, custody, lending and technology infrastructure) across multiple legal entities in different countries. MCIs may also spread specific functions (eg lending) across multiple legal entities due to different jurisdictional regulatory requirements. This fragmentation makes it difficult for any single authority to obtain a consolidated view of the risks the group poses.

Effective cross-border cooperation requires at a minimum that supervisors share information about the MCIs they oversee, including material changes to business models, group structures and risk exposures. The FSB's 2025 thematic review found that bilateral information-sharing between authorities remained ad hoc in most jurisdictions, with formal memoranda of understanding in place in only a minority

of cases.[24] The establishment of supervisory colleges for large MCIs (analogous to those used for internationally active banks) could provide a more structured forum for consolidated oversight, joint risk assessments and coordinated supervisory action. The FSB's high-level recommendations include a specific recommendation that authorities cooperate on the oversight of multi-jurisdictional MCIs,[25] but the practical implementation of this recommendation remains at an early stage in most jurisdictions.

A related challenge is the risk that different national regulatory frameworks create incentives for regulatory arbitrage. Where one jurisdiction imposes rigorous prudential requirements on MCI lending or earn products while a neighbouring jurisdiction does not, MCIs may restructure activities to register them in the more permissive jurisdiction while continuing to serve customers in the stricter one. The FSB thematic review found significant variation across jurisdictions in the scope of activities covered by cryptoasset frameworks: many jurisdictions that have introduced regulatory regimes focus primarily on market integrity and consumer protection rather than financial stability risks arising from intermediation. Convergence toward minimum international standards is therefore key to reduce arbitrage opportunities and ensure that the regulatory perimeter keeps pace with the evolution of MCIs' business models. This convergence can build on the FSB high-level recommendations and the IOSCO cryptoasset policy recommendations.

Supervisory resources

MCIs pose three different supervisory resource challenges. One challenge refers to the rapid pace of product innovation. New earn programmes, lending arrangements, staking products and derivative instruments are introduced frequently, with T&C that can change materially with little notice to customers or authorities. This dynamic environment calls for continuous monitoring of product terms, rather than relying only on a one-time licensing assessment. Several authorities that participated in the FSB thematic review noted a lack of staff resources and technical expertise to conduct ongoing reviews of complex and rapidly evolving MCI product offerings at the required frequency.

Another challenge relates to the technical complexity of cryptoasset products, which require supervisory staff to have specialised knowledge of blockchain technology, smart contract mechanics, DeFi protocols and the operational infrastructure of MCI platforms. This skillset differs from that required for traditional financial supervision and is highly sought after in the private sector, creating recruitment and retention challenges for public authorities. Some jurisdictions have responded by establishing dedicated cryptoasset supervisory units or implementing secondment arrangements with industry, though these approaches are not universally accessible.

The underdeveloped state of data availability and reporting standards for MCIs compared with those for traditional financial intermediaries is another key challenge. Unlike banks, which adhere to standardised prudential reporting requirements, most large MCIs do not provide consistent or timely reports on the balance sheet data, funding structures or risk exposures of all the entities that make up the ecosystem. Supervisors often depend on voluntary disclosures, public information and intelligence from peer authorities to assess large MCI risk profiles. Addressing these gaps will require regulatory reporting mandates to ensure that large MCIs submit regular, standardised data on their intermediation activities, along with investments in supervisory technology to efficiently process and analyse the resulting data.

[24] See FSB (2025).

[25] See FSB (2023a).

Section 5 – Concluding remarks

Many cryptoasset intermediaries have expanded beyond their initial roles as trading platforms, custodial service providers or fiat on/off-ramps to the cryptoasset ecosystem. Initial MCI product offerings primarily involved services without financial obligations, resulting in balance sheets and risk profiles more similar to those of third-party service providers or market infrastructures. However, many of the largest MCIs now engage in financial intermediation activities, offering a wide range of borrowing, lending and derivative products. These activities create financial obligations and expose MCIs to inherent market, credit and liquidity risks. As such, these entities should not be classified as service providers but rather as financial intermediaries.

This paper shows how many of the largest MCIs borrow from one group of customers to fund their operations, including lending to other customers. For example, earn products marketed by MCIs closely resemble short-term redeemable liabilities, such as bank deposits, and expose these entities to significant liquidity and maturity transformation risks. MCIs are also major providers of leverage to the cryptoasset ecosystem through margin loans and derivatives. The provision of leverage amplifies credit and market risks, which could threaten the solvency of these entities. Consequently, the products, business models and risk profiles of these MCIs more closely resemble those of banks or prime brokers than those of trading platforms, derivatives exchanges or custodians. Importantly, many of the largest MCIs combine financial intermediation with exchange, trading and custodial services, creating potential conflicts of interest that warrant regulatory attention.

Comprehensive policy approaches are essential to address the credit, market and liquidity risks associated with MCI intermediation activities. MCIs engaged in financial intermediation should be subject to prudential requirements, including capital and liquidity buffers, robust governance and risk management frameworks and stress testing requirements. Moreover, these entities should be subject to comprehensive consolidated supervision to ensure that they operate in a safe and sound manner. Prudential requirements should be tailored to each MCI's specific business model, complexity and risk profile. While client disclosure and asset segregation requirements are necessary to protect customers who do not wish to lend their assets to MCIs, such measures are less effective when customers knowingly consent to lend their cryptoassets.

Nevertheless, several policy challenges remain for regulatory and supervisory authorities. First, as highlighted by recent FSB work, many jurisdictions do not recognise borrowing and lending activities within their regulatory frameworks for cryptoassets. This leaves financial intermediation activities outside the regulatory perimeter in many cases. Jurisdictions may need to act swiftly to bring these activities within the regulatory scope. Second, determining the appropriate regulatory approach presents additional challenges. A key decision is whether to adopt EB or AB regulation. As demonstrated in Section 4, AB regulation may fail to address the market, credit and liquidity risks inherent in MCIs' financial intermediation, suggesting that EB regulation or a combination of AB and EB approaches may offer greater benefits. Third, supervisors face challenges to effective cooperation across borders, which is critical given that many MCIs operate globally. Finally, supervisory capacity remains a critical challenge given the pace of cryptoasset innovation, complexity of MCI intermediation activities and lack of regular data reporting. While cryptoasset sector representatives often tout the transparency of blockchain technologies, the striking lack of data is a glaring issue that keeps many risks of the MCI sector in the dark.

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Glossary

This glossary sets out a (non-exhaustive) list of terms used in this paper. Most definitions are based primarily on previous reports by standard-setting bodies. The use of these terms in this paper does not involve a judgment as to their appropriateness in all cases given rapidly evolving cryptoasset markets.

Cryptoasset: A type of private sector digital asset that is expressed primarily through cryptography and distributed ledger or similar technology (FSB (2023a)).

Cryptoasset trading platform: Any trading platform where cryptoassets can be bought and sold, regardless of the platform's legal status (FSB (2023a)).

Decentralised finance (DeFi): A set of alternative financial markets, products and systems that operate using cryptoassets and smart contracts (software) built using distributed ledger or similar technology.

Governance token: A token issued as an incentive, allowing the user the purported opportunity to become a partial owner and decision-maker in a DeFi protocol (FSB (2023a)).

Multifunction cryptoasset intermediary (MCI): An individual firm, or group of affiliated firms, that combines a broad range of cryptoasset services, products and functions typically centred around the operation of a trading platform (FSB (2023b)).

Native token: The base token of a blockchain which plays an integral part in the operation of the protocol it is issued on and that is created at its genesis. It is usually used to pay transaction fees (FSB (2023a)).

Smart contract: A cryptoasset term that refers to self-executing applications that can trigger an action if some prespecified conditions are met (FSB (2023a)).

Stablecoin: A cryptoasset that aims to maintain a stable value relative to a specified asset or a pool or basket of assets (FSB (2023a)).

Staking: The process of locking up cryptoassets for a set period of time to help support the operation of a blockchain in return for a share of transaction fees (FSB (2023a)).

Utility token: A token that allows users to access specific digital services or perform functions within a given DLT application when they redeem the token.

Wallet: An application or device for storing the private keys providing access to the cryptoasset. Hosted wallets are typically held by a third-party provider, unhosted wallets by the user (FSB (2023a)).

Annex

The following references are applicable to the product T&C analysed in this paper.

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