

GREAT CRYPTO CRISIS: THE PRUDENTIAL REGULATION OF SYSTEMICALLY IMPORTANT CRYPTO CONGLOMERATES

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Since the crypto winter began in early 2022, several market crashes and institutional collapses have ravaged the innovative financial ecosystem. Among global regulators, the major discourse is no longer the full prohibition of crypto-related activities but the protection of traditional financial systems from a “great” crypto crisis capable of disrupting financial stability. However, existing regulatory frameworks lack clarity on major aspects of the crypto ecosystem, especially relating to new associational risks and its potential to drive systemic risks among crypto conglomerates. This article examines the anatomy of recent crypto crashes and highlights the limitations of existing global regulatory developments toward preventing these threats from potentially spreading to traditional financial systems. To these emerging concerns, the article argues for the adoption of an entity-based approach to crypto regulations. Specifically, it proposes the application of adjusted prudential regulations to a new category of systemically important crypto intermediaries (SICs) like traditional systemic institutions.

I. INTRODUCTION

Digital currencies,¹ especially cryptocurrencies and global stablecoins (GSCs) are no longer novel phenomena. Since Bitcoin emerged over a decade ago, the number of cryptocurrencies and the volume of their activities has grown rapidly.² The proponents of the innovative digital ecosystem emphasise that its inherent advantages such as pseudonymity, regulatory flexibility and reduced transaction costs are some of the primary drivers of its growth trend. Moreover, most crypto owners still consider it a form of digital revolution providing pathways to escape the extensive regulatory regimes applicable to traditional financial institutions (TFIs) and financial activities. These opportunities extend across all the broad spectrum of crypto applications, whether as financial instruments, payment systems or, recently, investment securities.

But, despite these apparent benefits, the alternative ecosystem has since become known for other worrying trends, particularly financial and market crises. In 2021,

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¹ This term is used broadly to include all variants of crypto products, irrespective of their financial functions and linkage to traditional financial assets, including global stablecoins.

² Reaching nearly over 10,000 as of 2022. See Statista, “Number of cryptocurrencies worldwide from 2013 to November 2022” <<https://www.statista.com/statistics/863917/number-crypto-coins-tokens/>> (accessed 19 December 2022) (9 January 2024).

cryptoassets' exponential growth was formally recognised by the International Monetary Fund (IMF) as capable of impacting global financial stability.³ Although the initial taxonomy of digital currencies, particularly Bitcoin, emphasised the need for total disintermediation, the majority of crypto-related financial activities have undoubtedly involved extensive intermediation. This new taxonomy can be referred to as “shadow reintermediation”⁴ since the primary service providers are not regulated TFIs but new centralised intermediaries, especially crypto conglomerates.⁵ Initially, these conglomerates played critical roles as the gateways for new investors to enter the crypto ecosystem – including decentralised finance (DeFi)⁶ – while fostering growing interconnections with conventional financial systems.⁷ More importantly, with this linkage to re-intermediation, crypto activities have now increasingly become exposed to operational and technological risks, resulting in crisis, similar to traditional financial activities.⁸ Since their emergence, several crypto-intermediaries have been victims of financial and market risks, sometimes resulting in severe institutional instabilities and huge losses to customers.

More recently, the crypto market has grown exponentially. Concurrently, major crypto intermediaries are now performing similar critical financial functions to systemically important financial institutions (SIFIs), at least within the global crypto ecosystem.⁹ As a result, the disruptions from institutional failures and crashes among individual crypto-conglomerates can now easily escalate into a full-blown financial crisis within the crypto ecosystem and with growing potential contagion effects on connected financial systems.¹⁰ Furthermore, a large number of global jurisdictions are currently adopting a mostly permissive regulatory framework toward crypto-related activities.¹¹ In developing economies such as El Salvador and the

³ International Monetary Fund, “Global Financial Stability Report: COVID 19, Crypto, and Climate: Navigating Challenging Transitions” <<https://www.imf.org/-/media/Files/Publications/GFSR/2021/October/English/text.ashx>> (October 2021) [International Monetary Fund, “Global Financial Stability Report (October 2021)”].

⁴ Sijuae Animashaun, “Platformisation of Finance: DeFi’s Gradual Disintermediation Effect and the Leveraging of CBDCs in Smart Supervision” (2022) 9 City University of Hong Kong Law Review (Forthcoming 2023), available in SSRN, <<https://ssrn.com/abstract=4135621>> [Animashaun, “Platformisation of Finance”].

⁵ This term is used interchangeably to refer to prominent crypto native firms and actors, including hedge funds, trading firms, asset managers, lending platforms, centralised exchanges, venture capital firms and others.

⁶ Financial Stability Board, “The Financial Stability Risks of Decentralised Finance” <<https://www.fsb.org/2023/02/the-financial-stability-risks-of-decentralised-finance/>> (February 2023) at 22 [Financial Stability Board, “The Financial Stability Risks of Decentralised Finance”].

⁷ Raphael Auer *et al*, “Crypto trading and Bitcoin prices: evidence from a new database of retail adoption” (November 2022, revised July 2023) BIS Working Papers No. 1049.

⁸ Financial Stability Board, “The Financial Stability Risks of Decentralised Finance”, *supra* note 6 at 17–23.

⁹ Organisation for Economic Co-operation and Development, “Institutionalisation of crypto-assets and DeFi–TradFi interconnectedness”, *Organisation for Economic, Co-operation and Development Business and Finance Policy Papers* (19 May 2022), available in Organisation for Economic Co-operation and Development iLibrary, <<https://doi.org/10.1787/5d9dddbe-en>>.

¹⁰ International Monetary Fund, *The Crypto Ecosystem and Financial Stability Challenges* (Chapter 2) in “Global Financial Stability Report (October 2021)”, *supra* note 3.

¹¹ PwC, “Global Crypto Regulation Report 2023” <<https://www.pwc.com/gx/en/new-ventures/cryptocurrency-assets/pwc-global-crypto-regulation-report-2023.pdf>> (December 2022).

Central African Republic, for instance, cryptocurrencies have become recognised by national governments as legal tenders and financial instruments.

This emerging trend of crypto's growth poses considerable financial stability risks since the intricacies of cryptocurrency crashes and the potential effect from a full-blown crypto crisis on traditional financial systems remains largely unknown.¹² In traditional financial activities, extensive structural regulations such as entity-based prudential standards or systemic activity-focused "activity-based regulations" exist to ensure regulatory objectives such as market integrity and financial stability are observed.¹³ These regulations have evolved mostly in response to institutional instabilities, market crashes and financial crises.¹⁴ But the wealth of experience and practical developments that have stimulated the trajectory of traditional financial regulation is not readily available in crypto ecosystems due to their novelty and the limited understanding by regulators. Indeed, most of the developing global regulatory frameworks on crypto-related activities have largely focused on product and activity-based regulations (especially cryptoassets) with little clarity. However, considering and applying traditional or new bespoke regulations to crypto's major shadow intermediaries should be just as important.

Recently, in October 2021, the Financial Action Task Force (FATF) published updated risk-based approach guidance relating to Anti-Money Laundering (AML) and Countering the Financing of Terrorism (CFT) obligations among cryptoassets and their intermediaries.¹⁵ Similar guidance was issued by the Committee on Payments and Markets Infrastructures and the International Organisation of Securities Commissions (CPMI-IOSCO) in July 2022.¹⁶ The report provides clear guidance on the application of principles of financial market infrastructures (mostly related to governance, risk management and settlement finality and money settlements) to GSCs arrangements.¹⁷ Essentially, the included proposals are intended to apply to stablecoins designated as systemically important while excluding other variants denominated in or pegged to a basket of fiat currencies (multicurrency stablecoins).

¹² Lieven Hermans *et al*, "Decrypting financial stability risks in crypto-asset markets" (2022), Financial Stability Review.

¹³ Vincent Polizzato, "Prudential Regulation and Banking Supervision: Building an institutional framework for Banks (English)" *World Bank Group Policy, Planning and Research Department Working Papers*, No. WPS 340 (January 1990) <<http://documents.worldbank.org/curated/en/389501468764981235/Prudential-regulation-and-banking-supervision-building-an-institutional-framework-for-Banks>>; Claudio Borio, Stijn Claessens and Nikola Tarashev, "Entity-based vs Activity-based regulation: a framework and applications to traditional financial firms and big techs" (August 2022), Financial Stability Institute, Bank of International Settlements, FSI Occasional Papers No 19 at 4.

¹⁴ John Armour *et al*, *Principles of Financial Regulation* 1st ed (Oxford: Oxford University Press, 2016) [Armour, "Principles of Financial Regulation"]; Sijua Animashaun, "Regulating Virtual Currency Payment Systems" (2019) 4 Cambridge L Rev 29 [Animashaun, "Regulating Virtual Currency Payment Systems"].

¹⁵ Financial Action Task Force, "Targeted update on implementation of the FATF standards on virtual assets and virtual asset providers" (July 2022); Financial Action Task Force, "Updated guidance for a risk-based approach virtual assets and virtual asset providers" (October 2021).

¹⁶ CPMI-IOSCO, "Application of the Principles for Financial Market Infrastructures to stablecoin arrangements", <<https://www.bis.org/cpmi/publ/d206.pdf>> (July 2022); IOSCO, "IOSCO Decentralized Finance Report" <<https://www.iosco.org/library/pubdocs/pdf/IOSCOPD699.pdf>> (March 2022).

¹⁷ *Ibid.*

Although compelling, these emerging regulatory frameworks share several limitations as will be argued in this article. First, in most cases, the regulations are worded broadly to accommodate the blurry lines between the economic and financial functions of digital currencies. However, deductions from similar regulations applicable to traditional financial activities suggest that indeed these activities operate differently in their financial sectors, and, to a large extent, the inherent challenges may be dissimilar.¹⁸ Therefore, while the body of regulation can be effective in some aspect of risk mitigation, its lack of clarity may invariably increase existing regulatory gaps in other financial applications. Secondly, the institutional approaches prominent among the emerging regulatory regimes take no fundamental cognisance of how risks such as contagion effects may apply specifically within the crypto ecosystems.

In particular, this article will argue that a new form of systemic risk manifestation is emerging in crypto ecosystems where contagion from market and financial failures affecting a particular institution quickly spread, rather disproportionately, to *known* associates as a result of investors and customers' panic. These new risks are referred to as "associational risks" and as will be argued, have the potential to become significant enough over time to result in systemic events as observed in the recent crypto crisis. Indeed, if allowed to grow, it may also potentially creep through the established and developing connections between crypto ecosystems and conventional financial markets. In extreme cases, this may result in a *great* crypto crisis where the effect transmits financial distress and financial stability risks beyond the immediate crypto landscape and into identifiably connected conventional financial systems.

Concretely, the fallout from this hypothetical great crisis can particularly pose severe problems to the effectiveness of the existing regulatory architecture. In the event of a full-blown crisis across the crypto and traditional financial ecosystems, there appears to be no clear or robust provisions on associational risks, especially within the crypto ecosystems, even though it is quickly becoming an existential threat. The events during the "crypto winter" which started in early 2022 have been instructive because they highlight how extensive the impacts from crypto runs can become.¹⁹ More recently, the collapse of one of the largest crypto conglomerates FTX – including the arrest of its CEO, Sam Bankman-Fried, for financial fraud – has shocked the crypto world and global regulators alike.²⁰ Since the collapse, there has been increasing fear among crypto stakeholders, especially investors and customers, resulting in situations of extreme depositors' run and massive panic liquidation of cryptoassets in other *associated* major crypto firms like Binance, in attempts to prevent further potential losses. Therefore, it is suggested that in the absence of broad prudential regulations for systemic crypto intermediaries, it is increasingly likely that the progressive market disruptions and contagion effects may potentially pose systemic risks outside the crypto ecosystem in the future.

¹⁸ Richard Herring and Jacopo Carmassi, "The structure of cross-sector financial supervision" (2008) 17(1) *Financial Markets, Institutions & Instruments* 51.

¹⁹ Goldman Sachs, "The winter of crypto discontents" <<https://www.goldmansachs.com/insights/pages/top-of-mind/the-winter-of-cryptos-discontents/report.pdf>> (9 December 2022).

²⁰ Financial Stability Board, "The Financial Stability Risks of Decentralised Finance", *supra* note 6 at 20.

Overall, the above discourse makes it apparent that an analysis of a crisis situation within the crypto ecosystem is necessary to evaluate the potential fallout such instances may have on the traditional financial system. This especially becomes critical because of the growing exposure of traditional financial systems to crypto-related activities (especially GSCs) and the likelihood of contagion effects in situations of market instabilities. This is the foundation of this article. In the main, the article contributes to the growing discourse on crypto regulation by evaluating how systemic and new associational risks affect crypto ecosystems and their intermediaries. Furthermore, it explores hypothetical crisis situations using recent events where new associational risks can develop into a full-blown financial crisis within crypto markets. To prevent and/or manage the potential fallout from such a crisis, the article will propose the adoption and implementation of new prudential regulations, specifically within the crypto ecosystem as a potential solution to manage emerging manifestations of systemic risks. In particular, the article will suggest that the prudential regulation should be majorly applicable to a newly designated category of prominent crypto intermediaries (crypto conglomerates), referred to in the article as systemically important crypto intermediaries or “SICIs”.

The article is structured as follows. Section II sets the scene by providing a brief overview of the recent causes of financial and market crisis and institutional collapse in crypto ecosystems. Specifically, the section explores recent case studies of crashes – in FTX and Three Arrows Capital (3AC) – within the crypto ecosystem to identify the broad dimensions of systemic risks and the manifestations of emerging associational risks to crypto intermediaries. It also explores the potential of this manifestation to escalate into full-blown financial crisis in crypto and, possibly, to other conventional financial ecosystems. Thereafter, Section III investigates the scope and limitations of the existing traditional regulatory frameworks, especially prudential regulation, with regards to the regulation of crypto ecosystems generally and crypto intermediaries in particular. Following this, the article proposes the extension of existing entity-based prudential standards to designated SICIs as a complementary regulatory strategy for managing potential financial stability risks (contagion effects) and preventing financial crisis arising from systemic and new associational risks in crypto ecosystems. Section IV concludes.

II. THE UNUSUAL CULPRIT OF CRYPTO CRISIS: ASSOCIATIONAL RISKS AS SYSTEMIC RISKS

Financial crisis – referring to a situation where the value of assets drop and there is prolonged financial instability – is not a recent phenomenon.²¹ Indeed, crises have played significant roles in the development of modern financial markets, market economies and regulatory systems.²² Traditionally, financial crisis, particularly those arising from institutional instabilities, can result from either endogenous or

²¹ Ross Buckley and Douglas Arner, *From crisis to crisis: The global financial system and regulatory failure* (The Hague: Kluwer Law International BV, 2011) at 1-24.

²² *Ibid.*

exogenous factors, or a combination of both.²³ Endogenous causes arise from failures within a particular financial institution, such as financial fraud by individuals holding fiduciary positions, especially corporate directors. In this instance, financial crisis may result where significant losses to the financial institution spill over to the connected financial market systems. For example, some have argued that the unscrupulous activities by several corporate officers within systemically important financial institutions (SIFIs) relating to poor corporate risk management largely contributed to the last global financial crisis.²⁴ By not ensuring adequate risk management and regulatory compliance, they prevented financial regulators from promptly identifying the growing exposures among financial institutions to market risks which ultimately led to the full-scale crisis.

Similarly, exogeneous causes can arise from the exposure of financial institutions to external financial and market risks. Thus, in most cases, this emerges from extreme interdependencies and contagion effect from financial or market instabilities from other connected critical financial institutions, market infrastructures or financial systems.²⁵ Bank runs – situations where large-scale withdrawals are made by panicking depositors/investors *en masse* – provide an instructive example of an exogenous cause of financial crisis.²⁶ Where this occurs, it can substantially reduce the liquidity reserves (available cash) of financial institutions with the potential to result in their failure to meet wholesale credit obligations. Moreover, where due to internal instabilities a financial institution is unable to meet its credit obligations, contagion risks from the default can give rise to failures among other interdependent financial market actors. In severe cases, this is capable of occasioning a full financial crisis, especially where the institution is systemically important.²⁷ The failure of Bankhaus Herstatt – a critical actor in global large value payments (foreign exchange) – in 1974, for instance, resulted in disruptions of global payment settlements.²⁸ Importantly, the disruption heralded a domino effect of contagion failures among the interconnected financial institutions and financial systems, thus, the term “Herstatt Crisis”.²⁹

It is worthy to note that in instances where internal or external institutional failures result in financial crisis, it usually must have initially propagated systemic risks. Although there is no one definition of systemic risks,³⁰ a useful definition considers

²³ John Bellamy Foster and Fred Magdoff, *The Great Financial Crisis: Causes and Consequences* (New York: Monthly Review Press, 2009).

²⁴ Joseph Castellano, Susan Lightle and Bud Baker, “The role of boards of directors in the financial crisis” (2011) 81(9) *The CPA Journal* 54.

²⁵ Riadh Aloui, Mohamed Safouane Ben Aissa and Duc Khuong Nguyen, “Global financial crisis, extreme interdependences, and contagion effects: The role of economic structure?” (2011) 35(1) *Journal of Banking & Finance* 130.

²⁶ Hyun Song Shin, “Reflections on Northern Rock: The bank run that heralded the global financial crisis” (2009) 23(1) *Journal of Economic Perspectives* 101; Charles Calomiris and Gary Gorton, “The Origins of Banking Panics: Models, Facts, and Bank Regulation” in Robert Glenn Hubbard (ed), *Financial Markets and Financial Crises* (Chicago: University of Chicago Press, 1991) 109.

²⁷ *Ibid.*

²⁸ Armour, “Principles of Financial Regulation”, *supra* note 14 at 399.

²⁹ *Ibid.*

³⁰ Jaimes Caruana, “Measuring Systemic Risk” in Andreas Dombret and Otto Lucius (eds), *Stability of the Financial System Illusion or Feasible Concept?* (Cheltenham: Edward Elgar Publishing, 2013) 216;

it “the probability that cumulative losses will occur from an event that ignites a series of successive losses along a chain of [financial] institutions or markets comprising... a system”.³¹ Traditionally, there are two main dimensions of systemic risks which are significant to prudential policies: the time-related dimension (cyclicality) and the cross-sectional dimension (structural forms).³² The time dimension revolves around the evolution of systemic risks inherent in the pro-cyclicality of financial systems. In particular, booms during financial cycles can generate considerable systemic risks (eg, relaxation of credit standards) which accumulate over time in businesses.³³ In subsequent periods of bust, financial institutions become highly risk-averse in last-minute attempts to cushion the effects of unsustainable boom. However, the already accumulated risks can trigger financial distress and spread contagion throughout the financial system.³⁴ In contrast, cross-sectional dimensions deal with the cross-pollination of risks across financial systems due to interconnect-edness or similar exposures. Where the structure of financial systems is dependent on systemic market infrastructure, financial activity or financial institution, risks distribution from inherent vulnerabilities become apparent in periods of distress.

The above defining feature of systemic risks and its broad dimensions’ propaga-tion channels³⁵ is arguably the foundation of the dichotomy between institutional collapses of market actors and actual full-blown financial market crisis in inter-connected financial systems.³⁶ When financial institutions collapse, normally the effects are limited to the entities and absorbed under existing bankruptcy legisla-tions. However, such collapse can result in the transmission of financial stress in the financial system where the affected institution is a critical player with substantial asset interlinkages with other market actors. This is an instructive example of the structural dimension of systemic risks earlier discussed. Presently, there is arguably no other financial environment where the impact of both time-related and structural dimensions of systemic risks are more noticeable than in crypto ecosystems.

It is important to state presently that a full-blown crypto crisis capable of disrupt-ing traditional financial ecosystem has yet to occur and the chances are very slim

Pawel Smaga, “The Concept of Systemic Risk” (2014) Systemic Risk Centre Special Paper No 5, The London School of Economics and Political Science.

³¹ Steven L Schwarcz, “Systemic Risk” (2008) 97(1) Geo LJ 193 at 198 (Footnote 11).

³² Anat Keller, *Legal Foundations of Macroprudential Policy: An Interdisciplinary Approach* (Cambridge: Intersentia, 2020) 13.

³³ *Ibid.*

³⁴ Miquel Dijkman, “A Framework for Assessing Systemic Risk” (2010) World Bank Policy Research Working Paper 5282, 2.

³⁵ For detailed reading on the sources and channels through which systemic risks is propagated in tradi-tional finance, see Keller, *supra* note 32 (Chapter 2).

³⁶ The underlying factors fuelling increasing interdependence and interconnectedness among global finan-cial systems have been identified as including trade liberalisation, financial consolidation, globalisa-tion, regional integration, public policy and, recently, technological innovations (digitalisation). See Financial Stability Board, *Policy Measures to Address Systemically Important Financial Institutions* (4 November 2011) at 2; Chris Brummer, *Soft Law and the Global Financial System: Rule Making in the 21st Century* (Cambridge: Cambridge University Press, 2012) at 10. In a recent research by Policy 4.0, similar factors were revealed as contributors to interdependencies in crypto ecosystems too. See Douglas Arner *et al*, “Interdependencies in Crypto Ecosystems: Drivers, Implications and Policy Responses” (2023), University of Hong Kong Faculty of Law Research Paper No. 2023/17, available in SSRN, <<https://ssrn.com/abstract=4361739>> [Arner *et al*, “Interdependencies in Crypto Ecosystems”].

currently.³⁷ However, institutional crashes and full-blown crypto market crises are relatively common events. While financial stability risks within crypto ecosystems (eg DeFi) are clearly noticeable,³⁸ the risks to traditional financial ecosystems may be presently categorised as negligible or, at most, incremental. Following, this section proceeds with the hypothesis that should a great (ie, full-blown) crypto crisis capable of affecting traditional financial systems occur, how is it likely to happen and what could it look like? Furthermore, it also explores how such a crisis may impact connected financial systems' core regulatory policies such as consumer protection, financial integrity, and global financial stability.

Initially, because most crypto conglomerates (and DeFi platforms) perform similar traditional financial services, including deposit taking (e-wallets), they are similarly exposed to traditional financial and market risks.³⁹ DeFi ecosystems, for example, have been recognised as inherently vulnerable to liquidity and maturity mismatches, operational fragilities, leverage and interconnectedness, concentration and complexity.⁴⁰ These vulnerabilities of crypto are arguably worsened by the extreme market volatilities characteristic of digital currencies, the lack of tested stability mechanisms and resolution and recovery frameworks.⁴¹ Bitcoin, the first and most prominent cryptocurrency, for example, has been the subject of repeated price crashes and theft over the years with substantial impact on its market capitalisation. Moreover, as a mostly unregulated ecosystem leveraging untested digital technologies such as blockchain and distributed ledger, crypto conglomerates have also become disproportionately exposed to technological risks (partly from their interconnections with DeFi ecosystems)⁴², particularly cyber-attacks. Since the cyber-attack which led to the filing of bankruptcy by Mt. Gox in 2014,⁴³ the crypto ecosystem has suffered many other attacks, sometimes having far-reaching financial and economic consequences on stakeholders.

But unlike 2014 when the crypto market was still relatively small, the ecosystem has transitioned rapidly due to the influx of retail investors and institutional shareholders' adoption of cryptoassets (GSCs), resulting in severe systemic risks implications.⁴⁴ Similar to traditional financial markets, the crypto ecosystem is now closely interlinked and severely interdependent.⁴⁵ Indeed, recent research suggests that there is evidence of system-based and institution-based interdependencies, and with it, a high potential of both cyclical and structural forms of systemic risks.⁴⁶ The emergence and prominence of crypto conglomerates, for example, has occasioned fundamental interdependences and high leverage (and asset interlinkages) among

³⁷ Financial Stability Board, "The Financial Stability Risks of Decentralised Finance", *supra* note 6 at 2.

³⁸ *Ibid.*

³⁹ *Ibid.*

⁴⁰ *Ibid* at 16.

⁴¹ Alfred Lehar and Christine A Parlour, "Systemic Fragility in Decentralized Markets" (2022), available at SSRN, <<https://ssrn.com/abstract=4164833>>.

⁴² Financial Stability Board, "The Financial Stability Risks of Decentralised Finance", *supra* note 6.

⁴³ See Sandeep Rao, "Mt.Gox – The fall of a giant" in Shaen Corbet (ed), *Understanding Cryptocurrency Fraud: The Challenges and Headwinds to Regulate Digital Currencies* (Berlin: Walter de Gruyter GmbH & Co KG, 2021) 71.

⁴⁴ PwC, *supra* note 11.

⁴⁵ See Arner *et al.*, "Interdependencies in Crypto Ecosystems", *supra* note 36.

⁴⁶ *Ibid.*

several crypto-related financial activities, ecosystems and key intermediaries. As a result, instances of institutional failures or vulnerabilities in DeFi ecosystems can presently result not only in the bankruptcy of individual crypto intermediaries but also spread contagion effect leading to a full-blown crypto crisis.⁴⁷ In fact, the increasing interrelationships between crypto conglomerates and traditional SIFIs (eg, GSCs arrangements) have also highlighted the likelihood of cross-pollination of risks to conventional financial markets.⁴⁸ These risks and spillover effects may quickly become a reality as the interconnections grow, especially where the crypto conglomerates become systemic financial institutions too. In such interlinked ecosystems, the risks to financial stability and market integrity can grow rapidly and the likelihood of a full-blown cross-ecosystem financial crisis becomes ever more visible.

Indeed, the scenario above is arguably no longer hypothetical, at least, as far as crypto ecosystems interconnection are concerned. The recent market disruptions and institutional failures in the crypto ecosystem since May 2022 (“crypto winter”) provide an instructive case study worthy of exploration. This is because it shows how the different dimensions of traditional systemic risks (interdependencies and cyclical) are manifesting in the crypto financial system. Thus, understanding this event and its impact on crypto and connected financial systems could stimulate efforts toward effective and efficient regulation of financial stability risks going forward.

As previously stated, the DeFi crypto ecosystem is inherently prone to systemic risks arising from overleverage and interdependencies. On leverage, the unique intermediation dynamic in DeFi ecosystems necessitates heavy reliance on collateral to complement the pseudonymity. In particular, the reliance on oracle and automated liquidation as tools for price shocks arising from procyclicality can be affected by several factors including internal and external technological risks such as oracle manipulation (Exploits) and hacking.⁴⁹ For example, in October 2022, the manipulation of Mango Markets oracle by unscrupulous market players led to severe losses – US\$112m to 116m – by users and other market players.⁵⁰ Similarly, loopholes in underlying technologies may also be exploited by criminal elements through hacks resulting in panic liquidation and drastic falls in value assets in the highly leveraged ecosystem. The US\$570m Binance bridge hack in 2022 from an attack on the underlying blockchain for cross-chain asset transfers by hackers is an instructive example.⁵¹ In both instances of hacks and exploits, the resulting automatic liquidation of collaterals under stressed conditions can trigger drops in asset values in a market with reduced liquidity. In extreme cases, this can further result in significant spillovers of contagion effects. Overleverage within the interlinked DeFi

⁴⁷ Financial Stability Board, “The Financial Stability Risks of Decentralised Finance”, *supra* note 6 at 25.

⁴⁸ *Ibid* at 11.

⁴⁹ *Ibid* at 18-19.

⁵⁰ Bessie Liu, “Feature or Flaw? Aave Left With \$1.7m in Bad Debt”, *Blockworks* (23 November 2022) <<https://blockworks.co/news/aave-curve-bad-debt>>.

⁵¹ Ephrat Livni, “Binance Blockchain Hit by \$570M Hack, Exposing Crypto Vulnerabilities”, *The New York Times* (7 October 2022) <<https://www.nytimes.com/2022/10/07/business/binance-hack.html>>.

ecosystem is complex and borrowed funds in crypto markets can be used as collateral for other loans, rendering it difficult to manage resulting collateral chains.⁵²

There are also inherent systemic risks in the structural form of the DeFi ecosystem. Even though DeFi boasts of disintermediation and decentralisation, recent evidence suggests that the financial systems' structural forms are highly interdependent.⁵³ Multiple financial functions are stacked up using a common digital infrastructure (eg, blockchain) enabling interoperability and ease of access by all users, so-called composability.⁵⁴ Like in most cases, interoperability, while immensely beneficial to operational efficiency, carries the inherent risks arising from increased interconnections and interdependencies.⁵⁵ Specifically, the resilience of the whole financial system may be dependent on the vulnerabilities of its weakest link within the interconnected framework. Therefore, in the examples of hacks and exploits above, it is highly possible that failures to any system within the composability framework could spread financial shocks to other connected nodes. This is because the success of the financial system is mostly reliant on the performance of each of the connected nodes.

Recently, these vulnerabilities of DeFi ecosystems and systemic risks channels have spread to crypto conglomerates. Because they serve as conduits for new investors to access the innovative financial services offered within DeFi ecosystems, significant interlinkages and cross-pollination of risks now exist between the two unique systems.⁵⁶ In fact, these vulnerabilities have now become more worrisome since crypto conglomerates offer more possibilities of interrelationships with traditional financial systems than DeFi.

The events of the crypto winter illustrate this cross-pollination of risks and contagion effects. Prior to the catastrophic event, the crypto market had witnessed a period of boom evidenced by both institutional and retail investors engaging in high-leverage investments to generate higher returns from DeFi markets.⁵⁷ However, since May 2022, there have been several liquidity crises arising from leverage-induced bust in crypto lending firms.⁵⁸ In most cases, the bust is a result of market crashes where cryptoasset price falls force margin calls (or even automatic liquidations) of leveraged positions in low liquidity markets. Simultaneously, and due to heavy interlinkages among crypto institutions, the spillover from the resulting liquidity crisis has progressively spread to other prominent crypto conglomerates in contemporary financial sectors.⁵⁹ Specifically, the crypto winter disruptions began with the crash of DeFi ecosystem – Terra – sister tokens Terra (Luna) and TerraUSD (UST) in May, resulting in a loss of around US\$55bn. But unlike earlier crashes, Luna was heavily leveraged by major stakeholders within the DeFi market and the broader

⁵² Sirio Aramonte *et al*, “DeFi lending: intermediation without information?” *Bank for International Settlements Bulletin*, No. 57 (June 2022).

⁵³ Organisation for Economic Co-operation and Development, *supra* note 9.

⁵⁴ Financial Stability Board, “The Financial Stability Risks of Decentralised Finance”, *supra* note 6 at 9.

⁵⁵ *Ibid*.

⁵⁶ Organisation for Economic Co-operation and Development, *supra* note 9.

⁵⁷ Financial Stability Board, “The Financial Stability Risks of Decentralised Finance”, *supra* note 6 at 21.

⁵⁸ Arner *et al*, “Interdependencies in Crypto Ecosystems”, *supra* note 36.

⁵⁹ Luc Olinga, “Crypto: Liquidity Crisis Spreads to Major Exchanges”, *TheStreet* (8 July 2022) <<https://www.thestreet.com/investing/cryptocurrency/crypto-liquidity-crisis-spreads-to-major-exchanges>>.

crypto ecosystem.⁶⁰ In particular, considerable investment was made by a prominent global crypto hedge fund firm, 3AC, which served as an important financial intermediary in the crypto ecosystem.⁶¹

Essentially, the crypto conglomerate, 3AC, exemplified a critical channel of systemic risks resulting from structural forms in the crypto financial system. Its core activities as a hedge fund implied that its position was heavily leveraged because most crypto financial institutions and investors engaged its services to generate higher returns from their reserves.⁶² Furthermore, its function as a conduit between different crypto markets and participants created crucial interconnections within the crypto market – akin to institution-based interdependencies. As a result, the losses suffered by 3AC from its exposure to the Terra ecosystem quickly spread to other major crypto intermediaries from defaults in loan obligations. In the case of Voyager Digital, for example, default from the leveraged position in 3AC resulted in a loss of US\$667m which contributed to the end of the entity.⁶³

The failure of 3AC and the crippling financial disruptions it heralded represent similar circumstances to the “Lehman Brothers Crisis”.⁶⁴ The failure of the systemic financial institution (in this case, 3AC) within an interdependent financial market network resulted in contagion risks to other market participants. In response to 3AC’s default, many crypto retail and institutional investors and depositors in Voyager Digital and several other crypto lending firms who were associated with 3AC panicked.⁶⁵ Like traditional finance, the loss of confidence⁶⁶ resulted in a crypto run – akin to traditional bank runs⁶⁷ – on these associated entities. Not surprisingly, the overleverage and interdependency which exist among these institutions exacerbated the existing liquidity crisis in the associated crypto firms. Many crypto firms were forced to temporarily suspend withdrawals in attempts to manage their depleting reserves from internalised systemic risks, coupled with the effects of further cryptoassets price deterioration.⁶⁸ In the extreme corner, 3AC was thereafter forced into compulsory liquidation by a court while Voyager Digital filed for bankruptcy. These entities demonstrate how systemic risks are channelled within crypto ecosystems and their impacts were left unchecked.

But perhaps among the most worrisome trends the crypto winter events highlight is that the full list of casualties of 3AC’s failure was not fully known – and for obvious reasons. It is a known fact that risk management and responsible disclosure

⁶⁰ Arner *et al*, “Interdependencies in Crypto Ecosystems”, *supra* note 36.

⁶¹ *Ibid.*

⁶² *Ibid.*

⁶³ *Ibid.*

⁶⁴ US 110th Congress, *The Causes and Effects of the Lehman Brothers Bankruptcy* (Hearing before the Committee on Oversight and Government Reform House of Representatives, Serial No. 110 - 207, 2008) at 23 – 25.

⁶⁵ Some of the other exposed firms include BlockFi, Celsius Network, CoinLoan, CoinFlex and Babel Finance.

⁶⁶ Keller, *supra* note 32 at 38.

⁶⁷ Charles Calomiris and Gary Gorton, “The Origins of Banking Panics: Models, Facts, and Bank Regulation” in R Hubbard (ed), *Financial Markets and Financial Crises* (Chicago: University of Chicago Press, 1991) 109.

⁶⁸ Financial Stability Board, “The Financial Stability Risks of Decentralised Finance”, *supra* note 6 at 26.

practices are presently not among the notable traits among crypto intermediaries.⁶⁹ Indeed, subsequent evidence in Policy 4.0's contagion map on asset interlinkages suggest that other crypto firms outside the lending sector were equally exposed as a result of leverage and interdependencies.⁷⁰ For instance, trading platform, Blockchain.com, was found to have been exposed to 3AC to the tune of US\$270m.⁷¹

It is suggested that the contagion effect in these events is arguably a result of poor risk monitoring and management mechanisms of systemic risks in crypto firms. This is coupled with an emerging manifestation of systemic risks referred to as associational risks. In a general sense, associational risks refer to disproportionate adverse effects of internalised systemic risks among known associates of failing financial institutions. Even though risks cross-pollination spread throughout crypto financial systems, the broadest effects and major victims are entities who are known by investors as having high leverage in the failing institutions. For instance, available evidence from the crypto winter event suggests that most known associates of 3AC were the primary victims who simultaneously witnessed depositors' runs and panic asset liquidations that ultimately led to their collapse.⁷² This occurred even though there was little evidence to indicate that their apparent exposures to the failed crypto institution was so significant that it could affect their stability. This trend shows that emerging crypto runs, particularly through automatic asset liquidation and digital runs, could be more crippling than traditional bank runs. The immediate accelerant of this dynamic is arguably the lack of external mechanisms such as orderly liquidation in central counterparties and other institutionalised circuit breakers to cushion the impact of leverage-induced boom-bust market situations in crypto ecosystems.

Associational risks also demonstrate the precarious conditions surrounding consumer confidence in crypto financial systems. There is arguably no better evidence to indicate the lingering lack of trust in crypto financial markets, institutional stability mechanisms and regulatory frameworks than the behaviour of crypto consumers in situations of market distress. Indeed, the consequent failure of some of these associated entities from liquidity crisis arguably arose, in part, from the crushing effects of associational risks and customers' reactions to it. Crypto institutions who exhibited higher transparency by disclosing their leveraged position in failing institutions paradoxically failed to secure consumer confidence in their internal risks management framework. Instead, consumers of the known institutions leveraged this information in worsening the already chaotic liquidity crisis through crypto runs. In this instance, it may be the case that systemic risks in crypto ecosystems may be tied to higher transparency except where consumer confidence is concurrently sustained in the financial system's circuit breakers. This conclusion is further supported by the unintended effect the affected institutions' failed attempts to prevent risk transmission

⁶⁹ Financial Stability Board, "FSB: Regulation, Supervision and Oversight of Crypto-Asset Activities and Markets: Consultative Report" <<https://www.fsb.org/2022/10/regulation-supervision-and-oversight-of-crypto-asset-activities-and-markets-consultative-report/>> (11 October 2022) [Financial Stability Board, "Regulation, Supervision and Oversight of Crypto-Asset Activities and Markets"].

⁷⁰ Arner *et al*, "Interdependencies in Crypto Ecosystems", *supra* note 36.

⁷¹ Ian Allison, "Crypto Exchange Blockchain.com Faces \$270M Hit on Loans to Three Arrows Capital", *Coin Desk* <<https://www.coindesk.com/business/2022/07/08/crypto-exchange-blockchaincom-faces-250m-hit-on-loans-to-three-arrows-capital/>> (8 July 2022).

⁷² Arner *et al*, "Interdependencies in Crypto Ecosystems", *supra* note 36.

by suspending withdrawals had. Rather than plug the liquidity depletion, it instead occasioned further cryptoasset price deterioration, worsening the already fragile market situation. Conversely, while it is very possible that other crypto institutions were equally exposed to 3AC's failure, most blatantly refused to disclose this publicly. This lack of transparency on the part of the "unknown associates" may have protected their institutions from the contagion effects of the emerging associational risks (*ie*, crypto runs and liquidity crisis), even though temporarily.

Importantly, the above discourse highlights how associational risks may further manifest as systemic risks since not disclosing leveraged positions may initially protect entities from loss of consumer confidence, thus amplifying the boom market dynamic. But in a bust phase, the internalised exposures from such leverage and undisclosed interdependencies may result in gross risk implications, especially from credit defaults. In this regard, a catastrophic end similar to a liquidity crisis from the loss of consumer confidence may be inevitable. In both circumstances, the potential financial stability implication and market integrity prospects of crypto financial systems may assuredly remain in jeopardy. In light of this, the article argues that the internal board oversight mechanisms of crypto institutions supported by robust external regulatory interventions are needed to ensure long term stability crypto ecosystem, especially among its increasingly important institutions.

Concurrently, the emerging associational risks and their fast-evolving causation dynamics (including interdependencies) have also manifested in other forms than cyclical since the 3AC collapse. More recently, the threat of associational risks has been manifesting throughout the crypto ecosystem in light of yet another high-profile crypto conglomerate FTX's failure.⁷³ But unlike the 3AC event, however, the contagion effect from FTX's failure emanated from operational risks, particularly risk management and governance inefficiencies. Concisely, FTX failed as a result of customer deposit run (over US\$6bn) and its failure to secure a bailout from Binance after news from CoinDesk highlighted that customer funds had been unlawfully diverted to another quant trading firm, Alameda Research, owned by the CEO and collateralised by FTT.⁷⁴

Preliminary evidence suggests that this financial fraud was possible because there was no corporate oversight or independent board,⁷⁵ thus allowing the CEO and senior management direct and unchecked access to customer accounts and deposited funds.⁷⁶ Although the full extent of the loss remains unknown, it is projected that sums in excess of US\$7bn of FTX funds was lost from 7.6m customer accounts.⁷⁷

From the above discourse and case studies, it is deducible that crises in crypto ecosystems failures are multifaceted. In most cases, they can result from several

⁷³ Financial Stability Board, "The Financial Stability Risks of Decentralised Finance", *supra* note 6 at 22.

⁷⁴ Niha Masih and Julian Mark, "What to know about Sam Bankman-fried and the FTX crypto exchange collapse", *The Washington Post* <<https://www.washingtonpost.com/business/2022/12/13/sam-bankman-fried-ftx-collapse-explained/>> (13 December 2022).

⁷⁵ Financial Stability Board, "The Financial Stability Risks of Decentralised Finance", *supra* note 6 at 23.

⁷⁶ Lauren Aratani, "Five things we know about the collapse of FTX and Sam Bankman-Fried", *The Guardian* <<https://amp.theguardian.com/business/2022/dec/13/ftx-founder-sam-bankman-fried-money-fraud-what-we-know>> (13 December 2022). For a chronological map of the critical events leading to FTX's failure, see Goldman Sachs, *supra* note 19 at 9.

⁷⁷ *Ibid.*

causes including corporate fraud, overleverage, interdependencies, scams, cyber-attacks, high-profile crypto firm failures and mismanagement of customer funds.⁷⁸ Importantly, these events have awakened a new manifestation of systemic risks, *ie*, associational risks, spreading contagion effects of financial disruptions with higher potential to drive increased crisis situations in crypto ecosystems. In this regard, the failure of individual crypto institutions can now stimulate herding behaviour and panic liquidation among other crypto market participants – like traditional bank runs. In crypto firms providing deposit-taking services (*eg*, crypto e-wallets), the panic could result in crypto runs with adverse consequences on liquidity reserves. But as mentioned, the risks are not limited to deposit-taking crypto firms. Even where the associated institutions provide other financial services, such as trading platforms or hedge funds, the contagion effect from high leverage and interdependencies may also manifest in the form of reputational risks. In this instance, stakeholders, particularly investors, can quickly lose confidence in the firm and engage in massive panic automatic liquidation of their assets. In both instances, however, the panic and customer herding may occasion liquidity and credit crisis in both the failing institutions and associated firms; and in extreme situations, this could result in a full-blown crypto crisis.

This is quite worrisome since associational risks can deviate from traditional forms of systemic risks and contagion effects where institutional threats mostly result from financial exposures (leverage and interdependencies) to affected markets or failed institutions. In associational risks, particularly, in addition to the above conditions, the threat of failure to associated firms can remain heightened even where their initial financial exposures to failed institutions may not be substantial. In effect, associational risks leverage loss in customer trust and investor confidence arising from knowledge of corporate affiliation with failed entities in amplifying the impact of systemic risks.⁷⁹ Therefore, there is a need to develop agile regulatory frameworks to sustain consumer confidence in crypto intermediaries' risk management and stability mechanisms, especially in crisis cycles.

The above begs the question: whether and how the emerging anatomy of crypto crisis fuelled by associational and other forms of systemic risks can affect the resilience of traditional financial systems? Until recently, the crypto market has been a largely closed-loop niche ecosystem involving predominantly crypto enthusiasts.⁸⁰ As a result, there has been minimal financial and economic impact felt in the real economy from crypto's extreme market volatilities, institutional failures and other risk tendencies. However, the tide is quickly changing. Recent evidence, including the IMF's report on cryptoassets' financial stability implications earlier mentioned, suggests that the interrelationships between crypto markets and traditional financial ecosystems are becoming deeper.⁸¹ There is arguably no stronger evidence of these interconnections than the current proliferation of GSCs arrangements. This is only matched by the ever-increasing interlinkages among crypto conglomerates

⁷⁸ PwC, *supra* note 11 at 5.

⁷⁹ Financial Stability Board, "The Financial Stability Risks of Decentralised Finance", *supra* note 6 at 23.

⁸⁰ Goldman Sachs, *supra* note 19; Animashaun, "Regulating Virtual Currency Payment Systems", *supra* note 14.

⁸¹ PwC, *supra* note 11.

operating like global systemically important financial institutions (GSIFIs) in multiple financial systems. To facilitate seamless and efficient borderless crypto financial services, major crypto conglomerates are engaging in progressive bilateral/multilateral financial consolidation arrangements.⁸² These financial consolidations include crypto-native firms and even TFIs to ensure smooth convertibility of cryptoassets into traditional financial assets in designated jurisdictions.⁸³

The potential exposures from these financial arrangements and the attendant systemic risks from high cross-ecosystem leverage and interdependencies can be quite substantial, especially in the event of a failure of either institution. This is because the majority of existing regulatory frameworks are merely playing “catch up” with the fast-evolving crypto ecosystem.⁸⁴ In most cases, there is still a lack of adequate information and other regulatory data to develop clear and efficient regulatory measures. Although most crypto conglomerates directly (or indirectly through affiliates) engage in global financial activities with an ever-increasing customer base, they are still technically not construed as SIFIs like global banks. As a result, they are able to operate under minimal supervision within the broad perimeter of underdeveloped regulatory systems. The substantial regulatory gaps thus allow them to engage in potentially high-risk financial activities and generate considerable systemic risks without adequate oversight.

If left unchecked, the lingering regulatory gaps may ultimately transition into systemic threats for global regulators and financial systems, even sooner than expected. In many economies, cryptoassets are now becoming mainstream among not only niche consumers, but also institutional investors as alternative financial instruments and payment products.⁸⁵ Despite the recurring crypto crises, the innovative financial ecosystem has persevered and continues to scale and make waves globally. According to a recent study, prior to the FTX collapse, the percentage of crypto owners in the US who are likely to purchase crypto in the future was 89%.⁸⁶ Despite the crushing effects of the collapse, however, the new metric only dropped seven per cent, suggesting that crypto-curious sentiments hold steady even during the current crypto winter.⁸⁷ Furthermore, public interest in digital assets have remained high and new crypto listing projects are emerging to further attract retail and institutional investors; noticeable recoveries of Non-Fungible Tokens (NFTs) and security tokens are instructive examples.⁸⁸

Furthermore, the number of countries granting licences to crypto-native firms have also increased exponentially over the years and the financial stability

⁸² Arner *et al.*, “Interdependencies in Crypto Ecosystems”, *supra* note 36.

⁸³ Financial Stability Board, “Regulation, Supervision and Oversight of Crypto-Asset Activities and Markets”, *supra* note 69.

⁸⁴ Lee Reiners and Sangita Gazi, “Wanted: A Prudential Framework for Crypto-Assets” (2023) Ark L Rev (Forthcoming). The paper also provides a useful table on the current level of exposures of global banks to cryptoassets.

⁸⁵ Financial Stability Board, “Assessment of Risks to Financial Stability from Crypto-assets” <<https://www.fsb.org/2022/02/assessment-of-risks-to-financial-stability-from-crypto-assets/>> (February 2022).

⁸⁶ Bakkt, “US Crypto Study” <https://22005419.fs1.hubspotusercontent-na1.net/hubfs/22005419/collateral/US%20Crypto%20Study_DEC%202022_MV_FINAL.pdf> (December 2022).

⁸⁷ *Ibid.*

⁸⁸ PwC, *supra* note 11 at 6.

implications of this growth trend has attracted the attention of major international regulatory bodies.⁸⁹ Perhaps the most instructive example of cryptoassets making waves among regulators globally is GSCs, especially arrangements backed by traditional financial assets or basket of fiat currencies (multicurrency stablecoins).⁹⁰ Although the proposal was later abandoned, the global stablecoin – Diem – also included new and compelling opportunities of a blockchain-based crypto payment system capable of providing affordable payment services to over two billion individuals worldwide using its private digital currency.⁹¹ The financial stability risks inherent in this project generated considerable attention from global regulators and perhaps contributed to its cancellation.

Overall, if the recent crypto customer behaviour persists, it is possible that global economies may soon witness contagion between crypto ecosystems and traditional financial market ecosystems. In this regard, a significant negative consumer perception in either ecosystem could increase the potential of elevated associational and systemic risks in the other connected financial system. The desirable way forward may therefore lie in the efficiency of regulatory mechanisms and strategies engineered to manage it.

Recently, the FTX collapse transmitted considerable financial stability risks to other associated key players in crypto – including Binance which was discovered to be exposed to the FTT fraud. Investors and stakeholders in many forums encouraged the investing public to liquidate their cryptoassets and withdraw their deposits in the institution to protect their value.⁹² Consequently, panicked depositors withdrew around US\$1.14bn from their Binance account in a matter of days. Mazars, the international accounting firm that issues “proof of reserves” reports to evidence Binance’s ability to meet depositors’ demand, also withdrew its services, necessitating a public address by Binance’s CEO to reassure worried customers.⁹³ It is not hard to imagine the medium to long-term financial stability implications of this worrying trend if it persists. For one, it may result in yet another institutional failure, this time of Binance, with the potential to further exacerbate the recurring crisis cycle across the crypto ecosystem.

But so far, the real economy has remained insulated from these disruptions primarily because of its minimal exposure to the crypto ecosystem. However, this may not always be the case. In the admittedly rare but possible event that investors’ panic spreads from crypto-native firms to their known TFIs (eg, global banks), what could be the effect on traditional financial systems? This is among the leading questions

⁸⁹ Financial Stability Board, “Regulation, Supervision and Oversight of Crypto-Asset Activities and Markets”, *supra* note 69.

⁹⁰ *Ibid*; see also, Financial Stability Board, “Crypto-assets: Work Underway, Regulatory Approaches and Potential Gaps” <<https://www.fsb.org/wp-content/uploads/P310519.pdf>> (May 2019).

⁹¹ Dirk Zetzsche, Ross Buckley and Douglas Arner, “Regulating Libra” (2021) 41(1) Oxford J Leg Stud 80; Diem Association (formerly the Libra Association), Diem White Paper v2.0 (April 2020) <https://wp.diem.com/en-US/wp-content/uploads/sites/23/2020/04/Libra_WhitePaperV2_April2020.pdf> (accessed 30 August 2021).

⁹² David Gura, “Binance was once FTX’s rival and possible savior. Now it’s trying not to be its sequel”, *National Public Radio (NPR)* <<https://www.npr.org/2022/12/16/1143086648/binance-cz-ftx-crypto-bankruptcy-fallout-alameda-bitcoin>> (16 December 2022).

⁹³ *Ibid*.

among global regulators. Undoubtedly, an exposure of such magnitude – if it ever happens – may occasion substantial financial stability concerns capable of resulting in systemic events that have preceded most financial crises. The panic by financial customers in crypto, for instance, may result in bank runs among global banks and other interdependent financial institutions associated with the failing crypto conglomerate. If, or perhaps when, this occurs, the affected TFI bridge bank – especially if a SIFI – may suffer similar liquidity crisis and potentially default on its financial obligations to other traditional financial market participants. It is well-recognized that credit defaults and liquidity crisis within a SIFI (eg, Lehman Brothers) may carry significant contagion effects that can escalate into full blown financial crisis, unless swiftly and adequately managed by financial regulators.

Finally, it is true that since the last global financial crisis, extensive and updated prudential regulations (eg Basel III) have been introduced to monitor financial stability risks and ensure the resilience of global financial systems, especially through the regulation of systemic activities and SIFIs.⁹⁴ The sustained resilience of global financial institutions and market infrastructures despite the economic fallouts of the recent COVID-19 pandemic confirm that indeed these measures have been largely effective,⁹⁵ most notably in protecting traditional financial markets and financial institutions from systemic risks, at least where they are foreseeable. The important question then is: with the increased focus on innovation-centric crypto regulations among global economies, should regulators consider applying similar prudential regulations to systemically important crypto intermediaries to prevent the incessant failures in the innovative financial system? And importantly, can this regulatory approach potentially curb the inherent financial and market crisis plaguing the crypto ecosystem as a result of emerging associational and other systemic risks? The article will argue on the desirability and viability of adopting and implementing the entity-based prudential approach as a potential complementary solution to the regulatory strategies on financial stability risks and resulting failures in the global crypto ecosystem.

But first, the next section will evaluate the recent developments in global regulatory frameworks related to crypto generally. The aim of this brief exploration is to highlight the strengths and limitations of the existing frameworks, particularly with regards to emerging associational and systemic risks and the institutional threats in crypto ecosystems, with high potential to spread to conventional financial systems.

III. ASSOCIATIONAL RISKS AND THE GLOBAL REGULATORY DEVELOPMENTS IN CRYPTO ECOSYSTEMS

Crypto regulation has recently been at the forefront of debates at national, regional, and international regulatory forums. Fundamentally, the major theme has revolved around the application of existing traditional regulatory frameworks to crypto-related activities and intermediaries under the “same activity, same risk, same

⁹⁴ Buckley and Arner, *supra* note 21 at Chapters 9 and 10.

⁹⁵ Financial Stability Board, “Lessons learnt from the COVID-19 pandemic from a financial stability perspective: Final report” <<https://www.fsb.org/wp-content/uploads/P281021-2.pdf>> (October 2021).

regulations” principles.⁹⁶ In most regulatory initiatives, attention revolves around several aspects, including regulating systemic crypto intermediaries, promoting better rules enforcement, encouraging higher information quality (disclosure), and applying traditional regulatory frameworks to decentralised infrastructures.⁹⁷ But with the growth in crypto activities, manifestations of associated and systemic risks and crises, the regulatory regimes and supervisory standards are arguably far from developed. Indeed, a significant number of jurisdictions are still actively researching and consulting to bring crypto activities and products, particularly cryptoassets, under existing financial services frameworks.⁹⁸ In jurisdictions like Jordan, banks and most TFIs are still prohibited from dealing in digital currency activities generally, while other jurisdictions like Turkey have introduced limited prohibitions applicable to direct or indirect use of crypto-assets that are not qualified as fiat currency or financial instruments.⁹⁹

At the global level, standard-setting bodies and international regulatory institutions have been working frantically to design international frameworks to ensure efficient critical policy mandates such as financial integrity, consumer protection and financial stability.¹⁰⁰ Although the international standards are generally soft laws with no legal status, they are able to surmount several challenges that limit the efficiency of national regulations. Some of these primary challenges identified by the Financial Stability Board (FSB) include: (1) limitations of national regulators on extraterritorial regulatory powers; (2) risks related to overlap between several financial and economic functions of cryptoassets and their intermediaries; and (3) application of traditional regulatory frameworks to non-traditional infrastructures, particularly distributed ledger technology.¹⁰¹ As will be argued, these challenges also limit the efficiency of existing international regulatory frameworks within crypto ecosystems, particularly relating to the regulation of crypto intermediaries. This is, in part, because most crypto conglomerates operate globally and simultaneously perform multiple financial functions within the same entity. To understand how these challenges persist despite proactive regulatory initiatives, it is germane to first briefly analyse some of the recent global regulatory frameworks.

In October 2022, the FSB published a proposal including a set of recommendations on the design of a framework for the international regulation of crypto ecosystems under the existing traditional financial architecture globally.¹⁰² Concisely, the main recommendations highlight the growing threat that the lack of adequate governance frameworks and risk monitoring and management mechanisms among cryptoassets and conglomerates (including GSC arrangements) pose to global financial

⁹⁶ Financial Stability Board, “Regulation, Supervision and Oversight of Crypto-Asset Activities and Markets”, *supra* note 69.

⁹⁷ *Ibid*; PwC, *supra* note 11.

⁹⁸ For a detailed global list of crypto regulations and level of implementations as of December 2022, see PwC, *supra* note 11 at 7–8.

⁹⁹ *Ibid* at 8.

¹⁰⁰ *Ibid*. There have been similar regulatory efforts in other regional and national jurisdictions too.

¹⁰¹ Financial Stability Board, “Regulation, Supervision and Oversight of Crypto-Asset Activities and Markets”, *supra* note 69.

¹⁰² *Ibid*.

stability.¹⁰³ In response, the FSB therefore recommends an extensive framework for cross-sectoral and transnational cooperation and knowledge-sharing of data on crypto activities. The proposal is earmarked to be finalised in July 2023 with a review of implementation progress by the end of 2025.

While these recommendations are commendable, their implementation may however prove to be ambitious, especially since it may likely require extensive cross-sectoral and extraterritorial application.

First, it is deducible from earlier discourse that the approach of national regulators to crypto regulations presently vary significantly, perhaps highlighting national idiosyncrasies.¹⁰⁴ In fact, the main shared trait among most jurisdictions appears to be the insulation of the conventional financial system and TFIs from the crypto ecosystem. Therefore, reconciling these different approaches for ensuring regulatory harmonisation towards crypto regulation and supervision may not be easy to achieve in the absence of a common purpose. Second, the observed heterogeneity may also extend to applications within domestic financial regulations. While crypto activities have penetrated most core financial activities, the risks from their financial activities may be more pronounced in some respects than others. For example, the application of cryptoassets as investment securities (*eg*, stablecoins, NFTs and security tokens) have recently generated more attention among regulators for its potential financial stability risks than its use as payment systems in real economies.¹⁰⁵

Finally, the efficiency of regulatory implementations and compliance frameworks will undoubtedly be largely reliant on adequate transparency, as well as promptness and accuracy of data reporting.¹⁰⁶ In the core decentralised structure of crypto ecosystems, this may no doubt pose significant challenges as to readability, processing, and prompt interpretation of relevant data for meaningful strategic regulatory applications.¹⁰⁷ Indeed, this limitation is arguably at the foundation of the (mostly) reactive policy directions on crypto regulation, invariably closing the stall after the horse has bolted. Overall, these identified limitations are arguably amplified by crypto conglomerates providing multiple financial functions with complex risk profiles and inherent conflict of interests, consequently fuelling institutional collapse with far-reaching implications – from associational and systemic risks with contagion effect – on the broader crypto ecosystem. But this article suggests that indeed the intermediary-based structure at the foundation of crypto ecosystem's boom (and bust) may in fact offer the silver lining needed by global regulators to efficiently and effectively regulate crypto financial systems.

¹⁰³ *Ibid.*

¹⁰⁴ *Ibid.*

¹⁰⁵ Mitsutoshi Adachi *et al*, "A regulatory and financial stability perspective on global stablecoins" (2020) 10 Macprudential Bulletin, European Central Bank; Mehdi Manaa *et al*, "Crypto-Assets: Implications for financial stability, monetary policy, and payments and market infrastructures" *European Central Bank Occasional Papers*, No. 223 (May 2019).

¹⁰⁶ Arner *et al*, "Interdependencies in Crypto Ecosystems", *supra* note 36.

¹⁰⁷ Joshua Ellul *et al*, "Regulating Blockchain, DLT and Smart Contracts: A Technology Regulator's Perspective" (2020) 21(2) ERA Forum (Berlin: Springer Berlin Heidelberg) 209; Iwa Salami, "Decentralised Finance: The case for a Holistic Approach to Regulating the Crypto Industry" (2020) 35(7) Journal of International Banking and Financial Law 496.

Specifically, the intermediary-based market dynamic offers a pathway to leverage vibrant and robust entity-based regulations to systemic risks, where cross-sectoral implementation and international cooperation can be exploited in structural regulation of crypto conglomerates. In addition to providing new opportunities for regulating core financial activities concurrently using tailored management and governance frameworks, the limitations around extraterritoriality could be easily surmounted, most notably through the use of existing international arrangements (home v host state) on substitutive regulatory compliance. It is suggested that these arrangements should be applied particularly to giant (systemic) crypto intermediaries on a broader scale beyond the existing travel rule.

The next question is: what categories of crypto intermediaries should qualify for this robust and innovative regulatory framework? The article will propose the adoption of cluster prudential regulations for giant crypto conglomerates. In particular, it is suggested that such cluster should be designated as SICIs or “global systemically important crypto intermediaries” (G-SICIs), respectively. However, before considering this proposal in detail, it is important to first examine the existing framework on prudential regulations, specifically, and how it applies to the crypto ecosystems.

Generally, prudential regulation refers to the legal framework whose fundamental purpose is to ensure the financial health and stability of financial institutions (micro-prudential), market infrastructures and the broader financial system (macro-prudential).¹⁰⁸ Essentially, it requires financial institutions to operate efficient risk monitoring and management mechanisms and hold adequate capital in compliance with prescribed regulatory and supervisory frameworks on liquidity and related reporting requirements.¹⁰⁹ In the context of systemic risks and financial stability regulatory policy, prudential regulation revolves around the monitoring and management of all forms of risk build ups capable of affecting the resilience of financial systems.¹¹⁰ In traditional finance, particularly, prudential regulation focuses on systemic activities or institutions whose failure can impact the resilience of financial institutions, market infrastructures and/or broader financial systems.

In most economies, there are two broad approaches to prudential regulations – activity-based and entity-based – while a third, cost-benefit-approach, is gradually gaining prominence.¹¹¹ As earlier mentioned, activity-based prudential regulation targets specific systemic financial activities. Generally, it tends to be more flexible because it constrains individual activities and is therefore considered more desirable for regulating innovative financial activities. Conversely, entity-based regulations focus on constraining the combination of multiple financial activities within a single entity. In most instances, it is used as the major regulatory approach for achieving financial stability in financial systems. However, due to its relatively prescriptive nature, requiring extensive supervision and enforcement mechanisms,

¹⁰⁸ Mathias Dewatripont and Jean Tirole, *The prudential regulation of banks* (Cambridge, Mass: MIT Press, 1994) vol 6; Persaud Avinash, “Macro-Prudential Regulation” *World Bank Crisis Response Note*, No. 6, <<https://openknowledge.worldbank.org/handle/10986/10243>> (July 2009).

¹⁰⁹ Dewatripont and Tirole, *supra* note 108.

¹¹⁰ Keller, *supra* note 32, Ch 2.

¹¹¹ *Ibid* at 22.

it may be considered less effective for regulating new financial activities and innovation-centric ecosystems. This is because it can create substantial compliance costs or even situations of moral hazards for supported institutions to engage in higher risks. The third and fast-evolving approach is the cost-benefit approach.¹¹² In this direction, policymakers are given relative flexibility to decide between a combination of approaches after considering the associated costs in relation to the desired objectives.¹¹³ Research suggests that indeed many jurisdictions are actively implementing this approach in their macroprudential policy regimes.¹¹⁴ The question of which of these approaches is most desirable for the regulation of crypto ecosystem is considered later, but it suffices to state presently that the structure of the financial system and the nature of the attendant systemic risks are critical factors to be considered when deciding the appropriate approach or combination of approaches.

Prudential regulation and supervision are usually within the mandate of national central banks in domestic jurisdictions.¹¹⁵ However, at the international level, the global legal framework and international implementation is largely subject to the guidelines of the Basel Committee on Banking Supervision (BCBS).¹¹⁶ Understanding this regulatory dynamic is particularly significant when facing challenges arising from financial structures with borderless financial activities and high potential of transnational channels of systemic risks transmission such as crypto ecosystems.

The BCBS is the cooperative forum of national banks and supervisory authorities that sets the global standards for international banking prudential regulation. As a soft law, the Basel rules – most recently Basel III – are not directly applicable to domestic institutions but cover predominantly internationally-active banks.¹¹⁷ Recently, in response to the increased activities in and financial stability implications of crypto ecosystems and growing interconnections with conventional financial systems, the mandate and measures of the BCBS now include cryptoassets.¹¹⁸ In particular, the standard-setting body has led several policy consultations towards developing prudential measures for the treatment of cryptoasset exposures among global banks. The first consultation was published in 2021.

More recently, in June 2022, the BCBS published its second consultation on the categorisation and factoring of cryptoassets exposures within the capital adequacy and liquidity requirements of international banks. This could be viewed broadly as a general step towards the protection of traditional financial systems from systemic risks arising from crypto in the form of leverage (asset interlinkages) and

¹¹² John C. Coates IV “Cost-Benefit Analysis of Financial Regulation: Case Studies and Implications” (2015) 124 Yale LJ 882; Keller, *supra* note 32 at 122.

¹¹³ Matthew D Adler and Eric A Posner, *New Foundations of Cost-Benefit Analysis* (Cambridge, Massachusetts: Harvard University Press, 2006).

¹¹⁴ Keller, *supra* note 32.

¹¹⁵ For detailed reading on the macroprudential policy mandate of central banks in the UK, US and the EU, see Keller, *supra* note 32 at 22.

¹¹⁶ Bank for International Settlements, “The Basel Committee – overview” <<https://www.bis.org/bcbs/>>.

¹¹⁷ Bank for International Settlements, “Basel III: International regulatory framework for banks” <<https://www.bis.org/bcbs/basel3.htm?m=2572>>.

¹¹⁸ Basel Committee on Banking Supervision, “The prudential treatment of crypto asset exposures – second consultation” <<https://www.bis.org/bcbs/publ/d533.htm>> (June 2022).

interdependencies. In the current consultation,¹¹⁹ the treatment of a bank's exposures to cryptoassets now fall into two broad categories – Group 1 or 2 assets – depending on whether it meets a set of classification conditions or not, respectively. Concisely, the four main conditions include:¹²⁰ (1) whether the crypto asset is either a tokenised asset or includes a stabilisation mechanism linking its value to traditional assets (eg, stablecoins); (2) whether rights and obligations linked to the cryptoasset, including settlement finality, are defined and enforceable; (3) whether the functioning of the cryptoasset and its operating network includes a framework for risk assessment and mitigation; and (4) whether the entities involved in cryptoasset's processing are regulated and supervised or subject to adequate risk management standards. Depending on whether a cryptoasset meets all these conditions, the complying bank will be subject to reviewed capital treatments under the existing Basel credit and market risk framework. Additional capital requirements for liquidity and operational risks may also apply.¹²¹ Furthermore, the limit to large exposures is especially significant for Group 2 assets (eg, unbacked crypto currencies) which pose higher prudential risks; provisionally, the limit is set at one per cent of Tier 1 capital.¹²²

Similar to other global regulatory frameworks earlier discussed, the recent BCBS prudential standards in the consultation is undoubtedly a step in the right direction. This is because it acknowledges the increasing interrelationships between crypto and traditional finance and provides a framework for effective risks management. However, like the other initiatives, it is not without flaws.¹²³ Initially, the publication has confirmed the general claim that public interest in crypto ecosystems has remained high despite the inherent challenges. Indeed, the necessity of these recommendations serves as evidence of the growing interconnections between crypto ecosystems and conventional financial system, with its potential financial stability implications. However, the policy directions may inadvertently reinforce the worrying trend that is likely to continue setting back the efficiency of regulatory frameworks in preventing and/or managing crisis in crypto ecosystems. If the interconnection with the conventional financial system deepens overtime, it may thus be unable to adequately prevent a potential great crypto crisis arising from cross-pollination of associated and other systemic risks. This may occur for several reasons.

First, it appears from the main adjustments in the consultation that the primary objective remains significantly restrictive to traditional financial systems. Indeed, the measured conditions for determining bank's cryptoasset exposures suggest that the underlying goal among global regulators – including the BCBS – is to further insulate traditional financial systems from crypto ecosystems. While this may seem plausible and practical presently, it is suggested that it may not be in the best interest of regulators and indeed financial systems in the medium to long term. If anything, the developments in recent years have shown that crypto is here to stay and the interconnections with traditional financial systems will likely continue to deepen.

¹¹⁹ The final report is expected in early 2023.

¹²⁰ Basel Committee on Banking Supervision, *supra* note 118.

¹²¹ *Ibid.*

¹²² *Ibid.*

¹²³ See eg Reiners and Gazi, *supra* note 84.

Whether regulators join these fast-evolving developments to better understand and potentially manage the market dynamics and inherent risks may fundamentally determine the efficiency of future regulation and supervision to protect global financial stability and other policy objectives.

Second, except for the minor allusions to frameworks on cryptoasset organisations and processing entities in condition (4) of the BCBS consultation above, the fundamental approach of the BCBS's prudential regulation seems to be primarily aimed at cryptoassets and not centrally on crypto intermediaries through which the ecosystem flourishes. As previously mentioned, crypto conglomerates are well-recognised as the conduit that connects all aspects of financial activities and internal sectors – whether DeFi or centralised finance – within crypto systems.¹²⁴ Therefore, the consultation's direction by failing to acknowledge the structural form of crypto financial systems may also pose existential threats to global financial stability in the medium to long term. This is because the attendant systemic risks arising from cyclicity and structural interdependencies could remain unrecognised and therefore unmanaged. Furthermore, as previously stated, the regulation of crypto conglomerates among national jurisdictions is far from efficient or even coordinated. Evidence from case studies in Section II, particularly during the recent crypto winter, suggest that significant supervisory inefficiencies still exist on market fragilities and internal risks management. This is evident from the fundamental regulatory gaps driving operational risks and, increasingly, new associational systemic risks. Therefore, unless prudential regulations are equally focused on systemic crypto conglomerates operating internationally and with critical scale, threats to financial stability within the connected systems may likely continue to grow unabated. The deep interconnections between crypto actors and TFIs under the adjusted BCBS standards may in fact metamorphose into a new channel for further cross-pollination of systemic risks in the near future, most notably by failing to account for a new form “too-connected-to-fail”.¹²⁵

For instance, crypto conglomerates with the most basic – but recently proven inadequate – risk management frameworks may qualify under the BCBS framework in expanding their interrelations with global banks. In such a situation, where threats to the crypto conglomerates occur, it is possible that associated risks and other forms of systemic risks may result in a contagion effect capable of disrupting the financial stability of the affiliated global SIFIs. More concretely, it may trigger a silent depositors' run – alongside a crypto run – or diminish the positive public perception of these SIFIs. Lessons from the last global financial crisis gives credence to these preliminary deductions on causality between interdependences and systemic risks. Even though the crisis resulted from failures in the subprime mortgage markets and large investment banks such as Lehman Brothers, the contagion effect from the subsequent credit and liquidity crisis resulted in bank runs on non-investment institutions like Washington Mutual (WaMu) and Wachovia Bank.¹²⁶

¹²⁴ Sirio Aramonte, Wenqian Huang and Andreas Schrimpf, “DeFi risks and the decentralisation illusion”, *BIS Quarterly Review* <https://www.bis.org/publ/qtrpdf/r_qt2112b.htm> (December 2021).

¹²⁵ Imad Moosa, “The myth of too big to fail” (2010) 11 *Journal of Banking Regulation* 319.

¹²⁶ Rosalind Wiggins and Andrew Metrick, “The Lehman Brothers Bankruptcy H: The Global Contagion” (2014) Yale Program on Financial Stability, Case Study 2014-3H-V1.

Admittedly, the potential of bank runs disrupting traditional banks is severely limited by the extensive post-crisis prudential regulations and the guarantees of central bank's safety nets.¹²⁷ However, the guarantees which ensure investors and customers' confidence in financial institutions and the conventional financial system are not currently available to crypto intermediaries. Therefore, the customers and investors in crypto ecosystems – most likely customers of global banks too – who engage in crypto-related financial activities with crypto conglomerates may in extreme situations extend their panic response to threats of crisis beyond crypto ecosystems in the future. After all, herding and depositors' run do not necessarily follow logic to enable foreseeability and adequate risk management. The effective solution may therefore lie in identifying and preventing situations that can stimulate such financial disruptions. In this regard, it is suggested that presently, the most desirable regulatory framework for ensuring global financial stability concerns arising from the intersection of crypto and conventional financial systems should be through entity-based prudential regulation, particularly of designated systemic crypto intermediaries. Following, the article proposes the treatment of crypto intermediaries, especially giant crypto conglomerates, under similar regulatory regimes applicable to G-SIFIs. Indeed, it is argued that the time is ripe to assess the systemic conditions in crypto ecosystems and introduce a new category in the international regulatory/policy forum for designated SICIs. This proposal is elaborated in the next section.

A. *The Way Forward: Prudential regulation of Crypto Conglomerates?*

That crypto conglomerates are capable of generating systemic risks is no longer an academic statement. The recent crisis in the crypto ecosystem may have reinforced the concerns of global regulators and stakeholders on how extensively these emerging risks may disrupt global financial stability if it ever escalates into a great crypto crisis. Therefore, it may be prudent to increase the regulatory and supervisory efforts, particularly on the key risk generators, *ie*, crypto conglomerates.

In conventional financial systems, financial conglomerates such as global banks have also posed similar systemic risks.¹²⁸ Recently, a significant post-crisis initiative – in 2011 – by the FSB in conjunction with the BCBS and several national authorities was the identification of key actors in global financial systems.¹²⁹ The identified cluster were categorised as SIFIs, colloquially referred to as “too big

¹²⁷ The term ‘safety nets’ is used in this article to broadly refer to regulatory and legal guarantees available to regulated financial institutions, including deposit guarantees, special resolutions and bankruptcy regimes, and emergency liquidity lending. See Dan Awrey and Kristin Van Zwieten, “The Shadow Payment System” (2018) 43(4) J Corp L 101 at 120.

¹²⁸ Xin Huang, Hao Zhou and Haibin Zhu, “A framework for assessing the systemic risk of major financial institutions” (2009) 33(11) Journal of Banking & Finance 2036.

¹²⁹ Financial Stability Board, “Global Systemically Important Financial Institutions (GSIFIs)” <<https://www.fsb.org/work-of-the-fsb/market-and-institutional-resilience/global-systemically-important-financial-institutions-g-sifis/>> [Financial Stability Board, “Global Systemically Important Financial Institutions”].

to fail”¹³⁰ to demonstrate their scale and interconnectedness. Moreover, the cluster may also include non-bank entities such as hedge funds performing systemic financial functions capable of impacting the resilience of whole financial systems. Importantly, SIFIs represent institutions whose failure carries a high potential of resulting in financial crisis.¹³¹ Therefore, international policy makers and national regulators resolved that extra regulatory policy and supervisory attention must be directed at ensuring their financial health and/or managing the extensive adverse effects their failure may occasion. Depending on their score in the yearly predetermined assessment exercise for identifying SIFIs, the qualifying institutions are grouped into “buckets” corresponding to additional loss absorbency.¹³² Similarly, the policy measures applicable to SIFIs (such as the Basel III) are updated yearly to accommodate newly identified systemic risks and moral hazard risks associated with their operations. Essentially, these measures are geared towards constraining single entities from engaging in a combination of systemic financial activities with higher potential of spreading financial shocks in situations of market or financial distress. The cost of complying with the higher regulatory and supervisory regimes applicable to the designated group serves as a disincentive for smaller financial institutions to join the league, except they have the required internal risks and compliance framework.¹³³

Crypto conglomerates share several fundamental characteristics that also form the criterion for designating traditional SIFIs.¹³⁴ Firstly, most SIFIs are holding companies with subsidiaries operating globally (eg, JP Morgan). Similarly, crypto conglomerates also provide multiple financial functions across multiple jurisdictions directly or through affiliates and subsidiaries. FTX, for example, had its headquarters in the Bahamas, operated in the United States and also had subsidiaries in other jurisdictions, including the European Union. The importance of this transnational operation is that it can pose challenges, including associational and other systemic risks, to domestic regulatory frameworks, except where there are international agreements on regulatory compliance and supervision. Otherwise, a failure of the parent or significant subsidiary in one jurisdiction, as in the case of FTX, can occasion a substantial contagion effect and systemic risks transmission to other connected jurisdictions where the affiliates operate. In circumstances where the global financial systems rely heavily on these institutions for financial stability and economic growth, any disruption could potentially result in financial crisis with extensive economic consequences. In economies where crypto is increasingly becoming integrated with traditional finance like El Salvador, one need only consider the effect the recent market volatility of Bitcoin is having on the economy’s cryptoasset reserves.

¹³⁰ George G Kaufman, “Too big to fail in banking: What does it mean?” (2014) 13 *Journal of Financial Stability* 214.

¹³¹ Financial Stability Board, “Global Systemically Important Financial Institutions”, *supra* note 129.

¹³² *Ibid*; Paola Bongini and Laura Nieri, “Identifying and Regulating Systemically Important Financial Institutions” (2014) 43(1) *Economic Notes: Review of Banking, Finance and Monetary Economics* 39.

¹³³ For case reference on the cost implications of entity-based prudential regulations, see *MetLife Inc. v Financial Stability Oversight Council* 177 F Supp 3d 219 (DC Dist Ct, 2016) [*MetLife Inc.*].

¹³⁴ For the major conditions in designating and supervising SIFIs, see Keller, *supra* note 32 at 140.

Secondly, the qualifying financial institutions are usually big, providing massive levels of financial intermediation and acquiring dominant market shares in their financial services sector. This characteristic highlights the importance of leverage and interdependencies in financial systems. It also demonstrates the substitutability criterion of SIFIs since their scale makes it hard or too costly to replace their specialised activities in financial systems. In this regard, crypto conglomerates' size and their potential towards scale have also been instructive. It is well-recognised that the majority of crypto activities are processed through crypto intermediaries;¹³⁵ in most cases, by one of the many affiliated crypto-native and non-native firms within the established global crypto conglomerates. It is hard to imagine how the crypto ecosystem, for example DeFi markets, will generate the massive investor pool it presently has without the activities of crypto conglomerates who make the services available worldwide. Therefore, like SIFIs, situations resulting in financial distress within crypto conglomerates could also adversely impact other interdependent crypto-native firms and TFIs in the network and the financial systems in which they operate. Indeed, with the established interconnections that crypto conglomerates and new crypto products and related services have with conventional financial system, it may not be long before such contagion effects from crypto-related financial stress are capable of transmission into TFIs and conventional financial systems.

Thirdly, interconnectedness among SIFIs is usually significant enough to threaten the financial stability of broader financial systems in situations of financial distress.¹³⁶ Crypto conglomerates also demonstrate these systemic capabilities. The extensive interconnectedness among key players through asset interlinkages, for example, has been a contributing factor to the recurring crises in the niche financial ecosystem. From the case studies earlier mentioned, exposures and systemic and associational risks spillovers between multiple crypto firms ultimately exposed the whole financial network to systemic risks when 3AC failed. More recently, the struggles of Binance due to its interrelationship with the failed FTX is equally generating global panic among its customers, necessitating public announcements by CEOs to assure the clients of their solvency. Progressively, this interconnectedness may also expand critically to TFIs and conventional financial systems if cryptoassets adoption grows. The evolving regulatory frameworks may be paradoxically driving deeper interdependencies between the financial ecosystems by granting unintended legitimacy to crypto-related financial activities, even where this may not be the primary objective of the policymakers.

Finally, both SIFIs and crypto conglomerates face liquidity and mismatch risks from their financial activities.¹³⁷ Even though at varied degrees, these functions are capable of developing into systemic risks in situations of market or financial distress. While the last global financial crisis provides useful lessons within conventional financial systems, the events during the crypto winter suggest that concerns relating

¹³⁵ Animashaun, "Platformisation of Finance", *supra* note 4.

¹³⁶ Alin Marius Andries *et al*, "Risk Spillovers and Interconnectedness between Systemically Important Institutions" (2022) 58 *Journal of Financial Stability* 100963.

¹³⁷ Adrian Blundell-Wignall, Paul E Atkinson and Caroline Roulet, "The Business Models of Large Interconnected Banks and the Lessons of the Financial Crisis" (2012) 221(1) *National Institute Economic Review* R31.

to liquidity risks and mismatch may disproportionately affect crypto conglomerates. This is especially so because of their tendency towards higher unsustainable risk appetite and overleverage for higher returns on concentrated equity investments. This is apparent because they rely on extremely volatile digital currency markets dynamic, especially for unbacked digital currencies. The redemption-run risk in the crypto winter event and maturity mismatches in DeFi lending platform protocols in Luna provides relatable recent examples of how maturity mismatches can be equally catastrophic in crypto financial systems.¹³⁸

From the above discourse, it is evident that at least within the crypto ecosystem, crypto intermediaries, particularly crypto conglomerates, perform similar financial functions with systemic implications like SIFIs. It is therefore proposed that in the developing regulatory framework on crypto regulation, an assessment of crypto intermediaries based on adjusted existing BCBS methodologies should be applied in identifying and regulating systemically crypto intermediaries. The qualified entities may be referred to as SICIs or G-SICIs. Implementing this proposal, while admittedly not a silver bullet, carries significant potential that can benefit global regulatory and supervisory efforts towards ensuring stability in financial systems, including crypto ecosystems. The notable merits and potential drawbacks are briefly considered below.

Firstly, the categorisation of SICIs into buckets could ensure more efficient and effective regulatory interventions in the crypto ecosystem and associated financial systems. The inherent opportunities in entity-based regulatory strategies such as easier harmonisation and coordinated supervision can have immense benefits, especially in the crypto system where majority of financial consumers rely on crypto intermediaries for one or more core financial functions. In this regard, ensuring the soundness and stability of these institutions through targeted regulations and embedded supervision may invariably benefit the whole ecosystem. In fact, it could also reduce or even eradicate the crushing lack of trust and consumer confidence contributing to the many institutional failures and market crisis. This is because capital adequacy requirements, for instance, may be tailored into existing stability mechanisms in crypto firms to reassure consumers of their solvency and long-term stability.

Secondly, designating crypto conglomerates as SICIs could better protect global financial stability by providing regulators and supervisors with necessary and prompt information for developing innovative strategies.¹³⁹ The dynamics of crypto ecosystem include many applications such as DLT-based mechanisms that may provide significant efficiency gains if deployed within regulated financial ecosystems. Indeed, it can provide new leverage for regulatory technology¹⁴⁰ and supervisory technology¹⁴¹ in the context of crypto regulations. Initiatives on embedded

¹³⁸ Financial Stability Board, “The Financial Stability Risks of Decentralised Finance”, *supra* note 6 at 19.

¹³⁹ Financial Stability Board, “Regulation, Supervision and Oversight of Crypto-Asset Activities and Markets”, *supra* note 69.

¹⁴⁰ Tom Butler and Leona O’Brien, “Understanding RegTech for Digital Regulatory Compliance” in Theo Lynn *et al* (eds), *Disrupting Finance: Fintech and Strategy in the 21st Century* (London: Palgrave Pivot, 2019) 85.

¹⁴¹ Stefan Zeranski and Ibrahim E Sancak, “Digitalisation of Financial Supervision with Supervisory Technology (SupTech)” (2020) *J Intl Banking L & Reg* 309.

supervision through the use of central bank digital currencies (CBDCs) could also be tested initially within this controlled group – a form of crypto sandbox – to adequately measure the policy merits and identify potential gaps.¹⁴² In particular, it may help regulators understand how associational risks and other forms of systemic risks apply within crypto ecosystems, specifically, and better prevent known or foreseeable situations that occasion these challenges.

Furthermore, executing this proposal may also increase consumer confidence not only in innovative financial ecosystems but also on the ability of regulators and supervisors to foresee financial crisis and efficiently prevent it. This will no doubt boost the performance metrics of global regulators and policymakers in the eyes of stakeholders after the severe decline occasioned by the last global financial crisis. The recent survey earlier mentioned suggest that in the US, 61% of crypto-curious customers have not invested due to lack of understanding of the market dynamics.¹⁴³ Regulators can do a lot in providing the needed guidance to better educate the global investing public on the inherent benefits and risks.

Thirdly, proposals to allow crypto ecosystem “burn”¹⁴⁴ may no longer appear practical in light of recent events. In fact, it is arguable that as long as crypto conglomerates exist, new and ambitious investors will continue to move funds from traditional financial system to the mostly unregulated crypto markets. While the revenue diversion and potential disintermediation of TFIs may be negligible currently, there is no doubt that the trend will continue to grow. For TFIs, this can progressively result in financial distress with potential to affect economic growth, monetary policy and financial stability.¹⁴⁵ After all, a financially resilient economy relies not only on the soundness of its financial institutions and market infrastructures but also on the financial independence of its consumers. Therefore, engaging the key players in the crypto ecosystem may provide the opportunity to further knowledge-sharing and harmonise regulatory approaches to crypto regulation. Implementing this may over time reduce instances of regulatory arbitrage, plug existing regulatory gaps and further stimulate effective applications of existing international soft law, particularly on consumer protection, AML/CFT and financial integrity.

Conversely, argument can be made on whether entity-based regulation is the appropriate approach for crypto ecosystems. As earlier mentioned, entity-based regulations are mostly prescriptive and therefore are not considered favourable where the financial system is innovation-centric. There is no doubt that the crypto ecosystem is truly innovation-centric and may therefore require a more flexible approach, at least, until the market dynamics and associated risks and challenges are better understood. In traditional finance, there has been a notable shift from entity-based regulations towards more flexible activity-based regimes and, more recently, the cost-benefit approach.¹⁴⁶ In the US, for example, section 113 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) empowers the

¹⁴² Animashaun, “Platformisation of Finance”, *supra* note 4.

¹⁴³ Bakkt, *supra* note 86.

¹⁴⁴ Stephen Cecchetti and Kim Schoenholtz, “Let crypto burn”, *Financial Times* <<https://www.ft.com/content/ac058ede-80cb-4aa6-8394-941443eec7e3>> (17 November 2022).

¹⁴⁵ Animashaun, “Platformisation of Finance”, *supra* note 4.

¹⁴⁶ Keller, *supra* note 32 at 130.

Financial Stability Oversight Council (FSOC) to designate financial and non-bank financial entities who satisfy predetermined conditions as systemically important and subject them to higher prudential standards.¹⁴⁷ However, recent research suggests a paradigm shift by the FSOC towards activity-based prudential regulations under their mandate in section 120 of the Dodd-Frank Act.¹⁴⁸ Specifically, the shift can be credited to the *Metlife* case where a non-bank financial company challenged the FSOC's designation as a SIFI on the ground that it failed to consider the financial implications on the company.¹⁴⁹ In the aftermath of the case, particularly, on November 2017, the US Treasury published a report "Financial Stability Oversight Council Designations" where it was recommended that designations should be reserved for special cases and instead, the FSOC should focus on activity-based approaches which identify the activities and products at the source of financial stability risks.¹⁵⁰ Therefore, it is plausible to consider the viability of entity-based regulations in light of this shift in traditional finance.

The question surrounding the viability of entity-based regulations in crypto is arguably not too difficult to consider. As earlier discussed, the structural form of financial systems determines the appropriateness of specific mechanisms and approaches to reducing or eliminating the attendant risks. In crypto ecosystems, evidence has shown that indeed crypto intermediaries, especially crypto conglomerates, lie at the root of this market structure. Therefore, it is only appropriate that entity-based regulations which constrain the combination of systemic activities should be preferred in managing the inherent financial stability implications. This argument is supported by the most recent global policy directions in relation to crypto ecosystem regulations in light of the crypto winter events. In particular, the IMF in February 2023, published a policy paper "Elements of Effective Policies for Crypto Assets" in which nine elements were recommended for comprehensive, consistent, and coordinated policy response.¹⁵¹ One of the core elements (element 5) revolves around the development and enforcement of prudential, conduct and oversight requirements on all crypto market actors. It is undisputable that crypto conglomerates are important constituents among this group. So where crypto actors provide multiple functions, the IMF recommends that regulation should focus on risks generated by the entity as a whole and subjected to higher prudential regulations if designated as systemic.¹⁵² Based on the above premise, it is plausible to argue that entity-based regulations can provide the desirable pedestal to implement this core policy element and other associated recommendations. This is because it

¹⁴⁷ Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub L 111–203, 124 Stat 1376 (US) § 113(a)(1) (2010). Generally, the conditions revolve around whether the nature, scope, size, scale, concentration, interconnectedness, or combination activities can threaten the financial stability of US financial systems in situations of financial distress.

¹⁴⁸ Keller, *supra* note 32 at 141.

¹⁴⁹ *MetLife Inc*, *supra* note 133.

¹⁵⁰ The Department of Treasury, Report to the President of the United States, Financial Stability Oversight Council Designation <<https://www.treasury.gov/press-center/press-releases/documents/pm-fsoc-designations-memo-11-17.pdf>> (17 November 2017).

¹⁵¹ International Monetary Fund, Elements of Effective Policies for Crypto Assets <<https://www.imf.org/en/Publications/Policy-Papers/Issues/2023/02/23/Elements-of-Effective-Policies-for-Crypto-Assets-530092>> (23 February 2023).

¹⁵² *Ibid* at 24–25.

allows for the targeted regulation and supervision of the actors at the intersection of systemic risks propagation in crypto financial ecosystems.

Conclusively, the implementation of this proposal will no doubt require extensive good faith contributions on the part of global policymakers, national authorities, and crypto stakeholders. The important hurdle might lie in convincing major crypto stakeholders that this move and its potential to increase regulatory burden and transaction costs in the crypto ecosystem is ultimately in their favour. There have been calls for crypto to go back to its roots where decentralisation and the eradication of all forms of intermediation is the norm.¹⁵³ However, even though this may seem applicable in decentralised crypto ecosystems, evidence suggests that indeed decisions in such forums are ultimately made by software developers and holders of largest stakes – crypto whales.¹⁵⁴ If this is true, then there may be opportunity for the proposal to be welcomed by a larger segment of the crypto ecosystem and even conventional financial consumers. This is because it offers legitimacy and arguably even inclusiveness. Also, it may be hard to implement entity-based regulations as the only strategy in crypto going forward since there are also core financial activities that may serve as a source of systemic risks in the niche ecosystem. To this point, it is suggested that entity-based regulations could serve as the entry point to acquiring necessary data for efficient and effective implementation of other prudential approaches such as activity-based and cost-benefit regulations. It is clear that for these alternative approaches to be successful, regulators must first be armed with the necessary knowledge about the crypto's market dynamics and its critical market actors.

IV. CONCLUSION

The dramatic events in the crypto world do not appear to be ending anytime soon. For global regulators, insulating conventional financial systems may only be a temporary solution as cryptoassets and crypto conglomerates deepen their interconnections with TFIs and financial systems. In all this, the protection of financial stability, financial integrity and the prevention of financial crisis has become paramount as most economies are dealing with the debilitating impact of the COVID-19 pandemic.

Consumer panic and depositors' run are increasing in crypto's innovative financial market systems with strong systemic risks for firms associated with the failing institutions. In the absence of robust regulatory provisions for guaranteeing institutional safety within the crypto markets, the global regulatory framework may alternatively direct its attention towards structural regulation. Entity-based regulation of crypto intermediaries through which the bulk of financial activities are completed offer peculiar opportunities in this approach. The existing advanced and annually

¹⁵³ Hyun Song Shin, "The great crypto crisis is upon us", *Financial Times* <<https://www.ft.com/content/76234c49-cb11-4c2a-9a80-49da4f0ad7dd>> (17 December 2022).

¹⁵⁴ Angela Walch, "Deconstructing 'Decentralization': Exploring the Core Claim of Crypto Systems" in Chris Brummer (ed), *Crypto Assets: Legal and Monetary Perspectives* (New York: Oxford University Press, 2019), available in SSRN, <<https://ssrn.com/abstract=3326244>>.

updated prudential regulatory framework applicable to systemically important financial institutions offer new pathways to regulate crypto ecosystems more effectively. By designating qualifying crypto intermediaries within the regulatory clusters, global prudential standards can readily be applied to protect the crypto stakeholders from systemic risks arising from operational, financial and market challenges. Achieving this may provide a stable meeting point between the crypto ecosystem and the conventional ecosystem that can be efficiently regulated and supervised by the international community. The alternative approach of doing nothing and hoping the two systems do not collide is far from practical as recent events suggest.

Overall, determining the best approach to onboard centralised intermediaries and decentralised finance crypto networks into the proposed regulatory framework will be the focal point in the emerging regulatory landscape. However, one thing is certain, irrespective of whether stakeholders reach a consensus to integrate standards for both ecosystems, market forces will play its role in unifying the financial systems to leverage the market gains. It remains to be seen which triumphs between market innovations and regulatory interventions, and whether it will take a great crypto crisis for us to adopt the most effective approach.