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Unpacking the Societal and Institutional Risks of Crypto Assets: The Policy-Innovation Nexus

Short Paper

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Abstract

The Crypto Winter of 2022 exposed multi-dimensional risks in the crypto ecosystem which extend beyond technical imperatives to include societal and institutional factors. A domino effect saw several major crypto firms losing large amounts of investor cash or becoming bankrupt. This practitioner focused study adopts a grounded methodology to gather empirical data from regulators, crypto firms, and investors on developing a policy framework for crypto assets. The case study context is the US regulatory environment. Findings show regulatory agencies face ideological, operational, and technical obstacles, as they engage in debates about the efficacy of competing regulatory scenarios. The paper presents two major tensions which require the attention of policy makers and legislators to mitigate future societal and institutional risks from crypto assets.

Keywords: *Crypto Asset, Crypto Winter, Regulation, Compliance*

Introduction

Crypto assets emerged more than a decade ago along with the challenge to develop effective public policies to oversee their impact on society and institutions. The first was Bitcoin (BTC) which represented the successful adaptation of a blockchain using decentralized ledger technology. Earlier, von Hayek had argued the limitations of fiat currency have “...the defects of all monopolies: one must use their product even if it is unsatisfactory, and, above all, it prevents the discovery of better methods of satisfying a need for which a monopolist has no incentive” (von Hayek, 1975, 28). Such a movement had lost all trust in banks and government, and instead openly argued for digital financial privacy, trust in cryptography and open-source code. BTC developed following the 2008 financial crisis and offered an alternative to government-controlled finance. Here the societal and institutional risks are clear. If government control of finance is replaced by a decentralized financial structure, control over an economy is lost. The risks to a financially stable society increase as the sources of funds (tax) to pay for services are removed, economic control of the money supply is reduced, and the new medium of exchange is managed by those in control of the technology. This paper offers financial regulators and policy-makers an overview of the risk profile of crypto assets and unpicks the complex societal, economic, and political pressures which compromise regulatory decision-making.

As a nascent technology, crypto assets were perceived as niche products, mainly of interest to technology entrepreneurs and enthusiasts rather than the public at large. Benefits included faster and cheaper cross-border payments, increased financial inclusion, portfolio diversification, and the opportunity for citizens to use decentralized finance (DeFi) (Zetzsche et al., 2020). Built on blockchain technology, powerful rhetoric

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promoted improved operational resilience, and increased transparency, financial inclusion, and traceability of transactions. Despite the opportunities presented by the underlying technological innovation, many of the purported benefits from crypto assets have not materialized.

Our research was based in Chicago, the second largest financial hub in the US. Interviews were focused on crypto asset policy and legislation. Interviewees included regulatory agencies, crypto asset/software firms, and retail investors. Findings reveal contrasting views on the crypto phenomenon, which manifest as conflicts of interest among those who support tough regulatory controls, and others who argue that too much regulation will stifle innovation in this new asset class. To synthesize the diverse range of opinions from different stakeholder groups, we ask: *What are the societal and institutional risks emerging in the crypto asset ecosystem relevant to the policy making process?*

The growth in crypto asset market capitalization has been volatile. The interconnectedness with the financial sector has exposed serious weaknesses in regulatory oversight (Peters et al., 2015). At the end of 2022, the global capitalization for a basket of nearly 13,000 crypto assets tracked across 618 different exchanges was valued at \$845 billion, which marked a 65% year-over-year decline (CoinGecko, 2022). The decline in the value of crypto asset valuations, coupled with the failure of centralized exchanges (FTX) and other crypto firms (Voyager Digital, Three Arrows, Celsius) culminated in the period now referred to as the *Crypto Winter*. The decrease in the value of crypto assets and trading volume over the year was the result of several different risk factors, each of which intensified the need for an effective policy framework to oversee crypto assets (Harvey et al., 2022).

The events leading to the *Crypto Winter* exposed several multi-dimensional risks arising from the technology. Macroeconomic risks impact the effectiveness of monetary policy, capital flow volatility, and fiscal risks. Other risks involve financial stability and integrity, consumer protection, and market integrity (Arner et al., 2023). Risks in the underlying technology adversely affect the operations of crypto firms. However, a more fundamental societal risk is the lack of policies and their enforcement to ensure effective oversight of crypto assets. The challenge is intensified as crypto asset firms exist within a global ecosystem, located in offshore jurisdictions, marketing their services globally. To address the complex array of risks, policy makers working with practitioners develop a variety of national approaches to oversee crypto assets. Some countries introduce outright bans on the technology (e.g., China), while others consider targeted restrictions depending on their use cases. Some jurisdictions introduce combinations of regulation, supervision, oversight, and taxation. Other countries opt to grant unbacked tokens a legal tender status within a policy framework to incentivize their use, including guaranteeing the existence of a convertibility mechanism with a fiat currency (e.g., El Salvador).

This paper is structured as follows. In the next section we present definitions of crypto assets, and how they have developed over the past decade. This is followed by an overview of the research project and how our data was collected. We develop our data structure using the Gioia methodology. Next, we discuss market tensions in the Findings and Discussion section. We conclude the paper with our main contributions to debates on crypto asset regulation, and suggestions for future research.

The Crypto Asset Ecosystem

Nakamoto's paper which spearheaded the crypto asset phenomenon asserts, "What is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party" (Nakamoto, 2008, 1). Since its publication, more theoretical and empirical contributions have emerged from the information systems field on the societal, institutional, and technical factors relating to digital assets. Table 1 provides a taxonomy of the different types of crypto assets which have so far been developed.

<i>Asset Types</i>	<i>Description</i>
Exchange Tokens	The first decentralized asset was BTC, whose blockchain was designed to be a medium of exchange. Many other blockchains have been developed (e.g., Ethereum network) but these provide limited rights. No single issuer. They support peer-to-peer transactions. Also known as a cryptocurrency, which suggests similarity to fiat currency. However, they are primarily speculative assets, with a price dependent upon an individual's willingness to pay the price.

Central Bank Digital Currency (CBDC)	Issued by the central bank and tied to its fiat currency, represents a value stable currency. In an IMF report 100 countries are reported to be investigating this (IMF, 2023). The Peoples Bank of China began trading digital renminbi (e-CNY) April 2020. This is a private blockchain and has nothing to do with unbacked exchange tokens which operate on distributed ledger technology.
Non-Fungible Tokens (NFT)	A unique digital identifier which is recorded onto a blockchain. Represents ownership of a real-world digital asset such as a video or piece of digital art. Often centrally issued.
Security Tokens	A form of an exchange token (cryptocurrency), centrally issued, which represents the ownership of a product or service. Allows the holder to influence activities of the issuing company, in proportion to their holdings. If a company wanted to raise funds, tokens which offered fractional ownership could be sold.
Asset Reference Tokens	Price stability (decreased volatility) is designed by pegging an exchange token (cryptocurrency) with another commodity, currency, algorithm, or financial investment. Not used as an investment. Tether has the highest daily trading volume. Also known as stablecoins.
Utility Tokens	Commonly issued during an initial coin offering (ICO) and are used to access services provided by the issuing project, but do not represent any ownership stake.
Table 1. Definition of Existing Digital Assets	

Theory-driven and empirical research on emerging technology usually begins after the technology has gained traction in the market (Rotolo et al., 2015). Practitioner literature shows digital technologies are often promoted with little discussion about their risk profiles (McKinsey, 2022; PWC, 2023). Crypto asset classes are heterogenous, each requiring a policy framework to enhance their benefits while reducing risk. So far, the debate among policy makers and practitioners about how to govern crypto assets has been piecemeal and inconclusive. This paper discusses research findings from the US context which illustrate the complexities and tensions in defining fit-for-purpose regulatory regimes for crypto assets.

Methods

The research presented in this paper is part of a longitudinal study on the evolving crypto asset ecosystem. Data was collected over a nine-month period and forms the first phase of the research study. The research approach was grounded in a phenomenological perspective which asserts that much of the world is socially constructed (Berger and Luckman, 1966; Schutz, 1967). How people perceive and react to the world influences all areas of social life (Weick, 1979). An inductive, theory-building approach was used. Beginning with a series of empirical observations, from which patterns emerge from the data, the aim was to theorize the process of policy making on crypto assets. The duration of the study (June 2022-February 2023) witnessed widespread global turbulence in the crypto asset firms, with many ceasing their operations with large scale losses to investors (Allayannis and Sesia, 2023). Adopting a grounded theory approach enabled sequential data collection and analysis, with many repeat contacts with informants to provide a nuanced understanding and interpretation of the complex risks associated with crypto assets.

Data Sources

The data collection is shown in Table 2. A total of 18 informants were interviewed. The informants were divided into three categories (regulators, crypto firms, and institutions). Interviews were carried out in August 2022 in Chicago, USA, with follow-up online interviews in October 2022, and January 2023). Semi-structured interviews with informants lasted between 45 and 90 minutes. The interviews were recorded and transcribed using an artificial intelligence tool (<https://www.rev.ai/>). Following transcription of the interviews, informants were contacted to clarify the meaning of some of their comments. To supplement the primary interviews, further data sources were obtained through participant observation, informal discussions, and archival data. The authors are members of a crypto asset industry association which

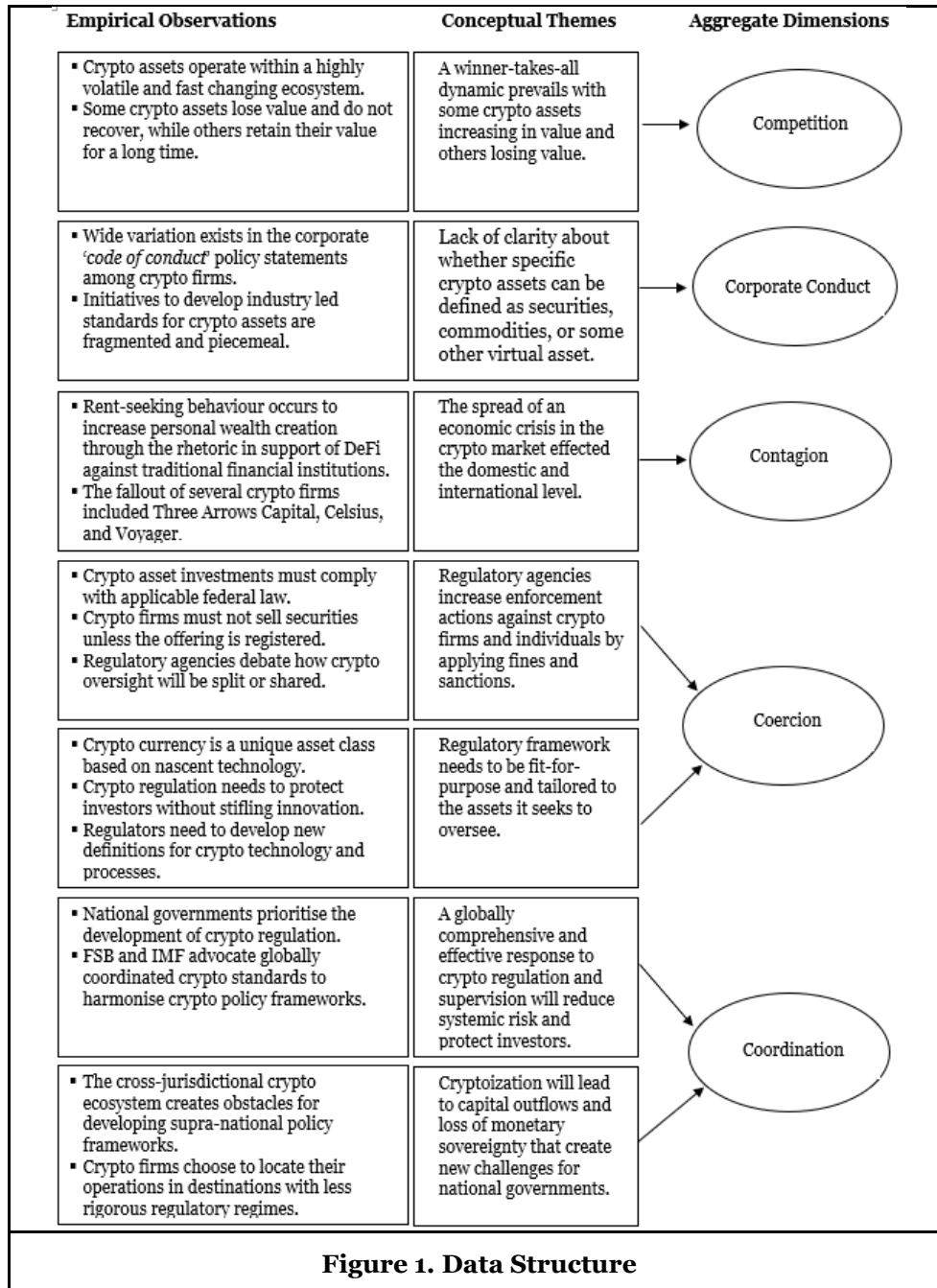
provides a collective voice for firms in the digital asset and exchange token industry. This association provided an excellent source of contacts for formal and informal discussions.

<i>Primary Data Source</i>			
Informants	Risk Focus	Description	
Regulator = 5 Interviews (RG#)	Societal	Policy makers, legislators and compliance officers engaged in setting and enforcing regulatory policy.	
Crypto Firm = 6 Interviews (CF#)	Institutional	FinTech start-ups and technology firms engaged in the trading of crypto assets.	
Investors = 7 Interviews (IV#)	Investor	Firms managing institutional and retail investors, together with private investors.	
<i>Secondary Data Source</i>			
Publications from SEC CTFC, IMF, European Central Bank	Academic Sources - journals, conference proceedings and working papers	Consultancy Reports/Analysis – Gartner, PWC, McKinsey	Crypto Industry Bodies – Global DCA Attendance in meetings and discussions on crypto regulation.
Table 2. Current Primary and Secondary Data Sources (June 2022 - February 2023)			

Data Analysis

A variant of grounded theory was used to organize the data (Corley and Gioia, 2004). The approach enables flexibility in interpretive research by recognizing that interview questions, and sometimes the main research question, must change with the progression of the research. The interview protocol supports the observation of qualitative/interpretive researchers (Langley, 1999; Lincoln and Guba, 1985) that it is ‘artificial to parse the interviewing and the analysis, as they tend to proceed together.’ (Gioia et al, 2012:20).

Using the Gioia methodology, a data structure (Figure 1) includes empirical observations, conceptual themes, and aggregate dimensions. Beginning with 1st order analysis, primary and secondary source data was analyzed to identify empirical codes and terms. Open coding is the analytic process by which concepts (codes) to the observed data and phenomenon emerge (Strauss and Corbin, 1990). The next stage is 2nd order analysis to identify conceptual themes. Axial coding is used to reveal core themes during qualitative data analysis. It is used to relate codes (categories and concepts) to each other. The results of the 1st and 2nd order data analysis encapsulate the informants’ and researchers’ responses.



Iterating between the primary and secondary data, the emerging findings, and the stakeholder literature, we unpack the societal and institutional risks of crypto assets with the purpose of developing a policy framework. Each of these aggregate dimensions is discussed in the next section.

Findings and Discussion

As shown in the data structure (Figure 1) this section combines the 1st order empirical observations and 2nd order conceptual themes to reveal five aggregated dimensions which illustrate the complexity of risks from crypto assets. Working with the data set while observing the increasing price volatility in crypto assets, the focus on policy making to regulate this nascent technology emerged as a central research theme.

The first blockchain, developed 2009, was for unbacked BTC and represented an electronic payment method to democratize payments. The Ethereum (ETH) blockchain, developed in 2015, has been modified not only for a speculative crypto currency but for a host of decentralized applications (dApps) such as NFT's, Tokens, Stablecoins and smart contracts. Dollar-denominated stablecoins are presented as inflationary hedges and an alternative currency.

The Competitive Ecosystem of Crypto assets

The promise of high returns is associated with speculative investments into many crypto assets. Investors are aware that prices can go down as well as up. So far, one of the more high-profile crashes occurred in May 2022. On the 5th LUNA was trading at \$86 but by the 13th it had fallen to \$0.006. The LUNA token was pegged against the stablecoin UST (both issued by Terraform Labs). The huge incentive for investors to buy and then deposit their UST, was the expected financial return to earn up to 20% annual percentage yield. The rapid growth of LUNA and UST highlighted flaws in the algorithm used to peg them together. As the peg price collapsed, many investors tried to convert UST for LUNA. This saw hyperinflation of supply as the number of tokens grew from 380 million to 6.5 trillion, and both assets became worthless. Over \$40bn was lost in just a few days, and over the following weeks, half a trillion dollars was lost from the crypto ecosystem valuation. One investor commented *“LUNA is the poster child of a terrible investment gone terribly wrong. But that happens with experiments, right? Sometimes they fail. I looked at it and said, if this works, money can be stable without deposits behind it. Before the blow up I wasn't alone in believing that it was a worthwhile investment. And now I look at it and say, how could that ever work? It becomes obvious after the fact, but, but we need to continue to develop ideas.”* (IV#1).

A Code of Conduct for Crypto Firms

The dynamic evolution of dApps has created an evolving crypto eco-system. Firms argue the unregulated structure allows innovation to develop better alternatives to those used in traditional finance. One investor said *‘We have a hundred investments because we believe these things are worth investing in. And by the way, there's more than that because we invest in a lot of tokens, support nodes and technologies. And if they all fail, that's the cost of doing business’* (IV7#). It's not just in finance that the development occurs. Another investor said *‘We're going to find a way to replace Facebook, Twitter, and Uber. That's happening. There's no way in my mind that there's not a decentralized version of Uber. Think about all these things with Web3 and where things are moving, these investments are going to make a difference’* (IV4#).

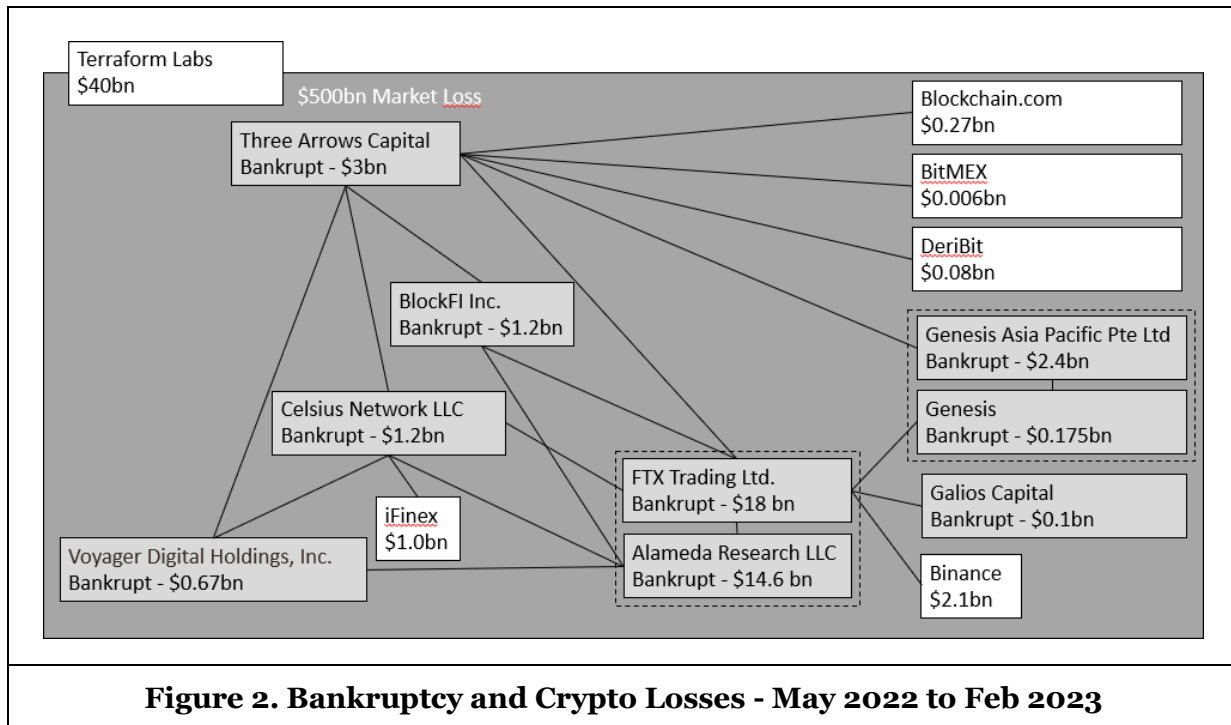
Even when activities are subject to regulatory oversight, it is difficult to generate a clear picture of events because of the cross-border decentralized nature of transactions. There are many actions that need to be investigated but there are not enough resources. One investor said *‘I was a participant in Corner Stone (a working group set up by Department of Homeland Security), but I will tell you that law enforcement from my perspective, from where I sat, was just swamped – the water was going over the sides. I'd send an agent a case that was \$m's and they be like “I don't have time”’* (IV5#).

The absence of a rigorous governance structure also influences how the regulator operates. Comments were made by on compliance officer, *‘I really see the benefits of market surveillance. I think it's one of the important things that is done in the current exchange scenario, globally. But it's not done in crypto. That needs to be made to happen and enforced. And unfortunately, it can't happen because nobody has all the data, because the exchanges are decentralized’* (RG1#). Without requirements to record and share all trade data, crypto markets operate as they see fit. Another added *‘Under the Bank Secrecy Act (BSA), you have got to record all purchases which exceed \$10,000 a day, and that way we can detect money laundering,’* (RG2#). But without records, control is made much harder.

Crypto Market Contagion

The failure of LUNA/UST heralded the collapse of different types of crypto operator. Three Arrows Capital (3AC) was a hedge fund, Celsius a crypto lender, Voyager a broker and FTX an exchange. From a market valuation of almost \$3 trillion in November 2021, it continued fall to \$0.9 trillion by mid-March 2023. Figure 2 shows players in the crypto web that either became bankrupt (grey box) or lost significant amounts

of money, and how loans between these players were linked. The risk conditions and outcomes are interconnected and complex, and masked within the overall crypto ecosystem, unbeknown to regulators and government legislators.



Investments made between these companies showed when one collapsed freezing access to accounts, others followed. One investor likened this to ‘a ripple effect, as investors panicked and tried to remove their funds from the crypto market, and this bank run created liquidity issues’ (IV#2).

The first firm to file for Chapter 15 bankruptcy was 3AC blaming their collapse on LUNA. The largest and most high-profile failure was FTX/Alameda Research. FTX was, by volume, the second largest crypto exchange (Binance was the first), used customer accounts to fund speculative investments made by Alameda Research. Almost \$6bn of Alameda’s valuation was made up from the token (FTT) that was created and valued by FTX.

Regulatory Coercion vs. Unbridled Innovation

Obfuscation exists in how crypto assets are defined with different jurisdictions creating their own regulatory structures. No regulatory framework exists in the US, UK, or European Union but processes have been initiated. One crypto firm manager said ‘The previous chairman of the SEC, Jay Clayton, is on the record as saying Bitcoin is not a security. But he couldn’t define Ethereum, the second biggest cryptocurrency. Then Gary Gensler said the third biggest cryptocurrency, Ripple, is a security.’ (CF1#).

However, there is a clear definition of the laws surrounding Anti-Money Laundering (AML) and Counter-Terrorist Financing (CTF). The Office of Foreign Assets Control (OFAC) is a financial intelligence and enforcement agency of the U.S. Treasury Department. In August 2022 they arrested a software developer suspected of developing Tornado Cash, used to launder over a billion dollars of exchange tokens. One crypto manager said ‘If you fall foul, even unknowingly, you get sent to jail and fined \$5/10m. We would use a tool that would scrub OFAC’s list of known offenders about every 5 mins. It’s incumbent upon the financial institution to make sure that they are not doing business with any sanctioned entity’ (CF2#). One officer commented ‘The treasuries Title 31 exam stipulations say “You shall...”, which means if you don’t you are going to get heavily fined’ (RG3#). It is interesting to note that in the UK, the FCA reported ‘85% of the companies that applied to join the regulator’s crypto register did not pass the FCA’s anti-money laundering tests’ (UK Parliament, 2023).

Whilst one investor said *'US regulators fail to provide clear guidance, while enforcing ill-suited archaic regulations'* (IV3#), powerful counter arguments to regulation are presented by lobbyists from the crypto industry itself. In just five years the amount spent on lobbying increased from \$2.5m to nearly \$26m in 2022. The argument that regulation stifles innovation was used as a powerful disincentive to regulate fledgling fintech firms and products.

National Crypto Policy vs. International Coordination

Every jurisdiction develops distinct policies within a decentralized crypto industry. Traditional financial firms have invested in distributed ledger technology (DLT), which lags the innovation of crypto firms. The total market value of the crypto market has fallen. However, interest in asset classes remains high. In October 2022, the Financial Stability Board (FSB) produced a report that recommends international actions on how crypto assets should be managed. This includes cooperation across country borders, the supervision of lending between wallets, and the need for a standard regulatory framework (FSB, 2022). The challenges of the process are summarized by one investor who said, *'I've heard Hester Peirce from the SEC suggest, "we really know how to regulate DeFi", but they really have no idea'* (IV6#). The challenge to create effective policy is inhibited by information asymmetries between regulators and technical innovation. The speed of change also inhibits effective policy. One crypto manager commented *'They are definitely reactive; they cannot be pro-active because things in this industry happen very fast'* (CF4#).

A crypto manager commented, *'The concerns that regulators have, depending on the country, are about undermining their currency, and this is a huge risk'* (CF3#). The IMF echoes these concerns: *'The IMF's Digital Money Strategy, endorsed by its Executive Board in July 2021, gives the institution a mandate to help ensure that digital money fosters domestic and international economic and financial stability'* (IMF, 2023). The pressure to develop a CBDC to mimic fiat structures is clear.

Conclusion and Policy Implications

A goal of the research is to bridge academic theory and practice in the context of policy making on the evolving crypto asset ecosystem. Primary data from regulators, crypto firms, and investors, illustrate the diversity of views, agendas, and recommendations on how to develop and implement fit-for-purpose crypto asset policies. The fallout from the crypto winter of 2022 points to increased urgency for regulation to protect investors.

The study contributes to practitioner focused information systems literature in three ways. First, the research speaks to the extant literature on digital assets which seeks to understand how information technology impacts the wider societal, institutional, and organizational environment (Beck et al, 2018; Rossi et al., 2019). Crypto assets represent an emerging technological phenomenon which polarizes public opinion about their value to society (Peters et al, 2015). This research positions crypto assets as nascent technology which produces a set of complex challenges for policy makers, regulatory agencies, industry participants, and investors. We show how disruptive market events create moral panic among policy makers to expediate regulatory oversight to eliminate risks from unbridled innovation. However, regulators face asymmetry of information as financial inter-connections among crypto asset firms are not transparent.

Second, the grounded approach reveals a complex risk profile inherent in crypto asset firm strategies and operations. Risks are not confined to technical imperatives (e.g., problems with computer code) but extend to wider systemic and institutional factors. Informants' perceptions about the benefits and risks of crypto assets are underpinned by competing normative and operational priorities. The crypto winter exposed price volatility in the competitive environment, lack of attention to developing a code of conduct, and crypto market contagion, as negative events triggered a chain reaction which saw the demise of several crypto firms.

Third, to frame the empirical and conceptual observations, the research adopted a variant of grounded theory by developing a data structure (Gioia et al, 2013) to illustrate market tensions which compound the difficulties and challenges in developing national regulatory policy. Tensions emerge as the drive to impose stringent regulatory controls on crypto firms do not inhibit innovation strategies for new digital business models. The challenge is compounded as national policies on crypto assets become ineffective as less regulated jurisdictions allow crypto firms to 'pick and choose' operational destinations with little or no

regulatory rules. This scenario increases the risk profile generated by firms (e.g., FTX) that locate their operations offshore while serving domestic customers.

In sum, the regulatory-innovation nexus extends the challenges for policy makers beyond focusing on technical imperatives to include multi-dimensional risk factors with implications for national (and global) financial stability. Further research is needed to track how digital assets are served by regulatory laws – to evaluate how current rules need to be supplemented by further legislation to mitigate the risks of this complex and evolving asset class.

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