
Risk of digital assets: Developments in regulation and implementation

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Udo Milkau

Digital Counsellor, Baden-Württemberg Cooperative State University, Germany

Udo Milkau is a digital counsellor and lecturer at the Baden-Württemberg Cooperative State University in Mosbach, Germany. His experience includes such roles as Chief Digital Officer, Transaction Banking and lecturer at Goethe University Frankfurt am Main and Frankfurt School of Finance and Management. He has a PhD from Goethe University Frankfurt, and has worked as a research scientist at such major European research centres as CERN, CEA de Saclay and GSI. He is the former Chairman of the European Association of Cooperative Banks (EACB) Digital and Data Working Group, and a member of both the EACB Payments Services Working Group and the European Central Bank's Operation Managers Group.

Digital Counsellor, Baden-Württemberg Cooperative State University, Mosbach, Germany
E-mail: udo.milkau@web.de

Abstract The normative narrative about 'crypto' or 'digital assets' as potential substitutes for the traditional financial systems has the downside that such a new system could present new types of risk, thus requiring dedicated risk management. But is this narrative justified by reality? Actual implementations with a trend to centralisation, generic features of blockchain-based systems to be exploited by new types of intermediaries and recent events (including the collapse of the Terra ecosystem and the bankruptcy of FTX), triggered feedback from central banks and banking supervisors. Recently, the current development of regulations was toughened with a proposal that 'trading in unbacked digital assets should be treated by regulators like gambling'. This paper avoids any normative discussion of how crypto or digital assets should look theoretically, but focuses on the actual developments. An analysis of the whole stack of layers of blockchain platforms, from influencer marketing to features such as 'maximum extractable value', can be condensed to the litmus test of '*Cui bono?*' ('to whom is it a benefit?'). This perspective reveals that blockchain-based systems are determined by the objectives and intentionality of the (new) intermediaries and are typically a mixture of gaming, gambling and scam. Consequently, the revised high-level recommendations of the Financial Stability Board for 'global stablecoin' arrangements, the European MiCA regulation and the amended capital requirements to the Basel framework are benchmarks for the treatment of crypto and digital assets. These are based on the economic objectives: from E-money-like instruments on the balance sheet of (new) intermediaries via traditional securities (equity or credit) to native digital assets, which resemble gambling according to 'same business, same risk, same regulation'.

Keywords: *digital assets, regulation, native blockchain token, decentralised finance, stablecoins, gambling*

THE CURRENT PERSPECTIVE OF SUPERVISION ON DIGITAL ASSETS

For quite some time, the understanding of 'risk' shifted from $risk = invested\ amount \times probability\ of\ default$ to a more comprehensive perspective¹ such as

the current ISO31000 definition² of risk as an 'effect of uncertainty on objectives'. In other words: 'risk' always belongs to an intentionality of human actors. But what are the objectives when digital assets are talked about? While risk management in financial

institutions focuses on the statistical estimation of market and credit risk, retail and institutional investors will be concerned with issues of investors/consumer protection in situations with information asymmetry. Banking supervision has a focus on financial stability and contagion between market participants, as elaborated in a recent publication of the Financial Stability Board.³

The first challenge in applying this concept of risk to digital assets is the normative narratives in the crypto world, ie how digital assets should be compared to how they are actually implemented. For example, crypto currencies are neither currencies (issued by a sovereign within a legal framework) nor money (with the three traditional requirements of intertemporal stability, general usage and unit of accounting). Neither are they 'crypto' (except for cryptographic keys, as in any secure e-mail). And smart contracts are neither legal contracts (but computer code) nor smart (but fully deterministic with 'if-then-else' programming). In this sense, the *terminus technicus* 'digital asset' is currently not properly defined. Antagonistic perspectives are:

- (i) tokens on a blockchain platform;
- (ii) digital representations of real assets with or without future cash flows (such as a dematerialised financial instrument in the sense of a transferable security, or a digital register entry of real estate ownership);
- (iii) traditionally digital objects such as text, pictures, audio or video files.

These perspectives have some overlap. However, in this paper the first perspective is applied and, conversely, digital representations of financial instruments in the sense of transferable security, of vouchers or of some kind of fractional ownership (typically an option to access pre-defined service packages) are skipped.

A closer look at digital assets leads to the question of whether these tokens could substitute financial instruments and should be regulated according to 'same business, same risk, same regulation'. This applies whether they resemble jetons on a gambling table without a link to the real-world economy, or are mere narratives to lure investors into transactions outside any legal perimeter, or even into fraudulent

schemes. According to a recent opinion⁴ of Fabio Panetta, a member of the executive board of the European Central Bank, the answer is that: 'Trading in unbacked digital assets should be treated by regulators like gambling'. Consequently, the question about risk must be answered differently if digital assets match the objectives of financial instruments or of online gambling. However, the opinion of Fabio Panetta also indicates a tendency of supervisors to evaluate digital assets based on actual implementations but not on normative narratives.

The shock waves of the 'crypto winter' of 2022 revealed more concerns. The many rug-pull scams (ie 'offerings' in crypto or DeFi projects advertised on social media without any substance and shut down before funds could be withdrawn), belong to traditional black-market scams addressing greed. The collapse of the self-declared stablecoin system of Terra/LUNA resulted in a charge by the US SEC against the 'initiator' Terraform Labs and its CEO, Do Kwon, that they were orchestrating a 'crypto fraud scheme'. Gurbir S. Grewal, SEC Division of Enforcement, says in a press release:⁵

we look to the economic realities of an offering, not the labels put on it . . . As alleged in our complaint, the Terraform ecosystem *was neither decentralized, nor finance* [author's emphasis]. It was simply a fraud propped up by a so-called algorithmic 'stablecoin' – the price of which was controlled by the defendants, not any code.

And the bankruptcy of the Bahamas-based conglomerate of FTX crypto exchange and sister firms such as Alameda continues a long list of misconduct including Enron, Bernie Madoff and Wirecard.

The trend to centralisation of crypto and the recent events triggered feedback from central banks and banking supervisors. An assessment of the generic economic features of blockchain-based systems is key to evaluate potential risk. Within the scope of this paper, three aspects are analysed:

- (i) native blockchain tokens such as Bitcoin and so-called meme-tokens like Dogecoin (with its own blockchain infrastructure) or, recently, coins such as PEPE (as newly defined BRC-20 tokens

- based on the ‘Taproot’ upgrade of the Bitcoin blockchain);
- (ii) tokens and applications on top of blockchain systems, such as ERC20-token and especially distributed finance (DeFi) application;
 - (iii) gateways between the real and the crypto world, such as so-called stablecoins.

For these cases, the issue of risk based on ‘objectives’ are discussed. This leads to the conclusion that a good litmus test is always to ask, ‘*Cui bono?*’ to analyse the intentionality connected with digital assets and the emergence of (new) intermediaries. This assessment avoids narratives, but uses recent actions of banking supervisors as a benchmark to access the potential risks of digital assets and how they should be regulated. Especially for native tokens such as Bitcoin, so-called meme coins and DeFi tokens, the actual implementations support proposals for digital assets to be regulated in a similar way to gambling, rather than as financial services. All the usual regulations for casinos including anti-money laundering/combating the financing of terrorism (AML/CFT), know your customer (KNY), taxation rules etc) will apply, nonetheless. Conversely, any exposure of banks to such types of digital assets should be regulated according to the recent Basel Committee on Banking Supervision (BCBS) standard on the ‘Prudential treatment of cryptoasset exposures’.

NATIVE COINS SUCH AS BITCOIN: FROM A GAME-THEORETICAL CONCEPT TO GAMING WITH MEME COINS

The objective of Bitcoin was described in the original White Paper⁶ as ‘a purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution’. It was designed as a payment system without any aspiration to be a currency or an asset. Emulations of ‘electronic cash’ had been discussed since the 1980s, but, in 1985, the Fischer–Lynch–Paterson theorem proved the ‘Impossibility of Distributed Consensus with One Faulty Process’,⁷ which rendered any pure

technological approach impossible for ‘electronic cash’ in a network without intermediaries.

However, Bitcoin provided an alternative approach for a closed-loop electronic cash system based on game theory with

- (i) randomly selected ‘referees’ to decide on accepted transactions and providing a ‘probabilistic finality’;
- (ii) intrinsic vulnerability of a so-called 51 per cent attack, which could manipulate the underlying blockchain if costly resources are invested;
- (iii) an incentive structure to make cooperation more profitable than manipulation.⁸

While it was a marvellous idea to switch from technical concepts to a game-theoretical solution, this has a price tag. As Raphael Auer⁹ analysed some years ago:

The conclusions are, first, that Bitcoin counterfeiting via ‘double-spending’ attacks is inherently profitable, making payment finality based on proof-of-work extremely expensive. Second, the transaction market cannot generate an adequate level of ‘mining’ income via fees as users free-ride on the fees of other transactions in a block and in the subsequent blockchain.

Bitcoin — and blockchains with a proof-of-work consensus mechanism to select a neutral referee — is a brilliant solution for an ‘impossible’ problem, but with much higher costs compared to traditional payment systems. Solutions to overcome this limitation (aka level-2 blockchain solutions such as the Lightning network for payments, or the Liquid network as a Bitcoin ‘sidechain’ for trading) come with other limitations. Level-2 ‘off-chain’ systems can — technologically — avoid some limitation but are constrained to bilateral and pre-paid situations such as gift cards or vouchers. And level-3 applications on top of level-2, such as the remittances start-up ‘Strike’, or projects promising USD-accounts based on Bitcoin in countries such as El Salvador, add further participants, who are searching for profit. As generic payment systems, however, level-2 and level-3 applications are beyond the scope of this paper.

The use of Bitcoin and other crypto tokens for cybercrime, ransomware and money

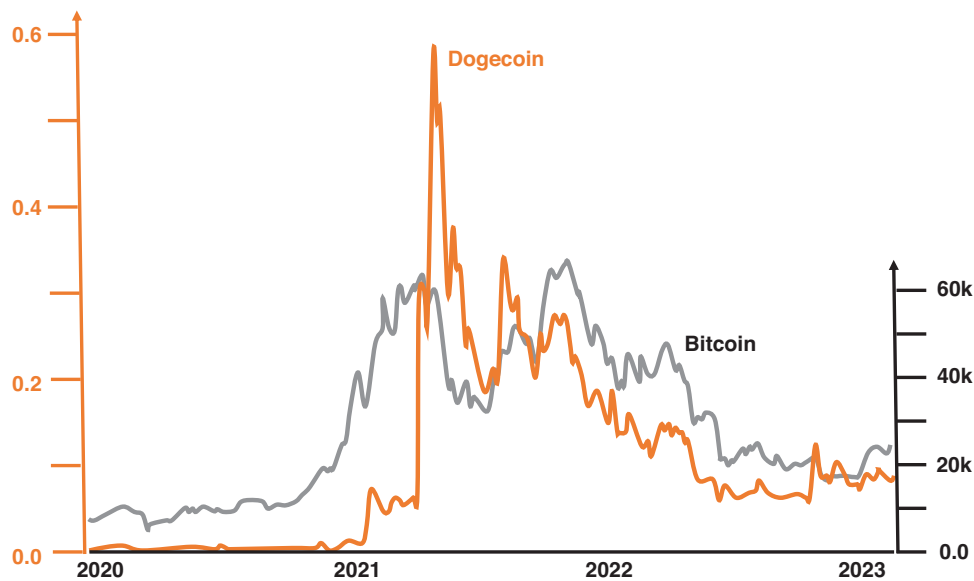


Figure 1: Price development in USD for Bitcoin (grey line, right scale in USDk) and Dogecoin (orange line, left scale in 0.x USD) for January 2020 to February 2023

Source: Data from Coinmarketcap, 21st February, 2023

laundering/terrorism financing should not be underestimated (including the use of so-called ‘crypto mixers’ as an obfuscation service) and the FATF standards on AML/CFT should be implemented anyway. It is difficult to check *ex-ante* whether a crypto transaction contains illicit heritage, but it is easy to analyse *ex-post* the whole transaction history, which renders any engagement in crypto an unpredictable reputational risk for financial institutions. But traditional fraud and scams¹⁰ are dominating the crypto universe.

Reports by Chainalysis¹¹ on a comparison between Brazil and Venezuela revealed that crypto adoption per capita in Venezuela is triggered by failure of government, while citizens in Brazil, as one of the advanced Latin American economies, are seeking an easy access to ‘alpha’ compared to saving products. The acceptance of Bitcoin by consumers shifted from original cyber enthusiasts to either niches in weak economies or to a ‘fear of missing out’¹² (FOMO). This FOMO is driven by narratives on social media that Bitcoin could make you rich — like winning the jackpot in a casino.

As all native blockchain tokens neither represent any future cash flow (like shares, bonds or rents from

real estates) nor are linked to any usability like commodities, any investment in these ‘coins’ is purely speculative. Typically, retail investors are lured¹³ by a narrative of ever-rising prices for crypto. This narrative is amplified by the message of the artificial scarcity of Bitcoin, with the limited number of coins being by design. Scarcity is never a proof of value — and blockchain-based tokens can be replicated easily. The herd behaviour driving speculation with these coins can be illustrated by a comparison of Bitcoin versus Dogecoin (see Figure 1).

Dogecoin is based on the popular ‘doge’ Internet meme featuring a Shiba Inu dog. The coin — created in December 2013 as a fork of Litecoin — was envisaged as a joke about ‘crypto’ with a funny logo and is inflationary by design. Dogecoin was priced on sub-Cent level until the crypto hype in 2021. Although designed as pure fun and with built-in inflation, Dogecoin has strong correlation with Bitcoin, and this lock-in of Dogecoin to the overall development of crypto is a strong indication that any ‘value’ depends on a collective herd behaviour of gamblers.

Searching for ‘alpha’, institutional investors got in touch with digital assets. Of course, nothing without

a fundamental value and/or future cash flow can be regarded as real asset, but an uncorrelated development of speculative prices could be used to place short-term bets. Between 2013 and the end of 2019, the development between Bitcoin and Big Tech stocks (eg Nasdaq100) was uncorrelated¹⁴ and fluctuated in a corridor of ± 0.4 . However, from 2021 on, the correlation was positive and increasing¹⁵ and even entered into a corridor between 0.75 and 1.0, bonded to Big Tech stocks.¹⁶

Obviously, native blockchain token such as Bitcoin share similarities with jetons on a gambling table or scores in multi-player online games. Such ‘gambling’ may start in (unregulated) peer-to-peer networks, but always has a tendency towards collective behaviour — often with disadvantages for average consumers due to information asymmetry. Future research is required to analyse the interdependencies between the spread of narratives on social media, large-volume crypto trades (by so-called ‘whales’ or institutional investors) and synchronised collective behaviour of average investors.

THE DEFI CRYPTO STACK: FROM ECONOMIC OBJECTIVES AND INTENTIONALITY TO GAMBLING

Here, tokens built on top of blockchain systems and DeFi application based on smart contracts, ie computer scripts executed on a blockchain infrastructure, are discussed. Proponents of DeFi follow the narrative of an alternative to the financial system, substituting traditional intermediaries. But this assertion disregards the key question: who provides the underlying infrastructure, develops and deploys the code, promotes the services to potential users and — finally — who expects profits: *Cui bono?*

There is always an objective and an intentionality, and as Deborah G. Johnson¹⁷ summarised some years ago: ‘Computer systems and other artifacts have intentionality, the intentionality put into them by the intentional acts of their designers.’ Perhaps the most characteristic testimony about intentionality was made by Sam Bankman-Fried, the bankrupt former founder of the insolvent crypto exchange FTX, in an interview:¹⁸

And then this protocol issues a token, we’ll call it whatever, ‘X token’. And X token promises that anything cool that happens because of this box is going to ultimately be usable by, you know, governance vote of holders of the X tokens. . . . And now all of a sudden everyone’s like, wow, people just decide to put \$200 million in the box. This is a pretty cool box, right? . . . *And then everyone makes money.*
[Author’s emphasis]

Of course, this is a single viewpoint, but it may illustrate the economics of crypto.

For the scope of this paper, a holistic approach is used, which analyses a whole stack of blockchain-based tokens and DeFi protocols (see Figure 2). The discussion of technical aspects is not covered (except for MEV, see below). Instead, it discusses five segments of the stack based on examples and recent rulings of supervisors. These are: Floki Inu’s marketing, how Uniswap offers its services, the Terra/LUNA ecosystem, and Kraken’s ‘staking-as-a-service’, plus a special discussion about maximum extractable value (MEV). These five examples are not full-fledged analysis but are rather characteristic for objectives and intentionality along the ‘crypto stack’.

The Floki Inu token is both an ERC-20 token on the Ethereum blockchain and a BEP-20 token on the proprietary Binance Smart Chain. According to the website, it is ‘The People’s Cryptocurrency’.¹⁹ The commercial entity ‘supporting’ Floki Inu (Floki Ltd) was very active on social media, but also in traditional sponsoring of football teams SSC Neapoli or Bayer 04 Leverkusen. Its marketing in the UK triggered the Advertising Standards Authority²⁰ to ban a particular advertisement:

The ad must not appear again in the form complained about. We told Floki Ltd t/a Floki Inu to ensure that they did not *irresponsibly exploit consumer’s fear of missing out* [author’s emphasis] and trivialise investment in cryptocurrency. We also told them to ensure that they did not irresponsibly take advantage of consumers’ lack of experience or credulity by not making clear CGT could be due on cryptocurrency profits.

The second example is the ‘decentralised’ crypto exchange Uniswap. An average user accesses Uniswap

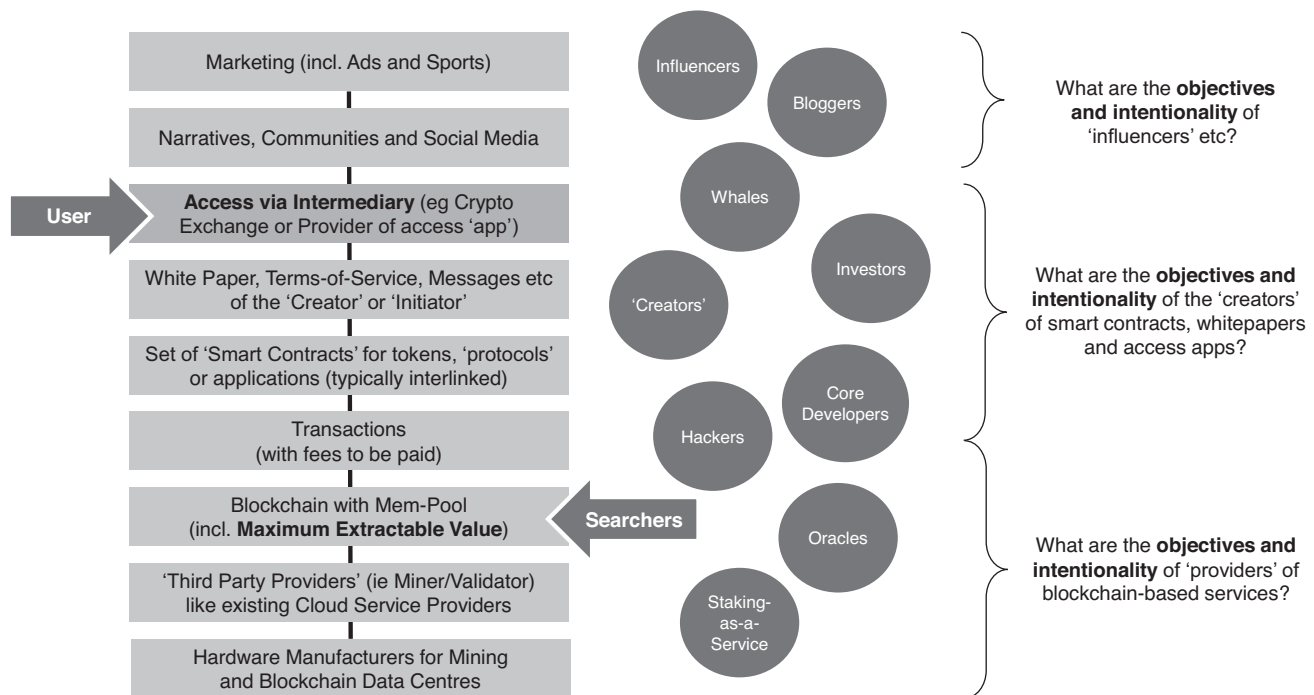


Figure 2: The stack of blockchain-based tokens and DeFi protocols. The arrows indicate the typical access of an average user, and the attempt to manipulate the sequence of transactions by so-called 'searchers'. The circles stand for 'new' intermediaries with economic objectives

via a dedicated (ie 'central') app which is provided by Universal Navigation Inc. d/b/a/Uniswap Labs. It asks the user for consent: 'By connecting a wallet, you agree to Uniswap Labs' Terms of Service and consent to its Privacy Policy'.²¹ Although described as a decentralised exchange (DEX), the service is provided by one central set of smart contracts developed by one commercial firm. The user finds, under Uniswap Labs Terms of Service as of 30th November, 2022, the following statement:²²

Although we [Uniswap Labs] contributed to the initial code for the Protocol, we do not provide, own, or control the Protocol, which is run autonomously without any headcount by smart contracts deployed on various blockchains. Upgrades and modifications to the Protocol are generally managed in a community-driven way by holders of the UNI governance token.

Similar exculpations are typical for nearly all DeFi services. These access apps facilitate the 'meeting of minds' (as a concept of contract theory) between the

potential customer and the vendor or broker of a service, which constitutes the contract. However, all supporting computer programs (aka smart contracts) provide technical processing, but no legal 'contracting'. And the reference to 'governance of token holders' does not demonstrate any peer-to-peer feature or separated economic entities, as the structure of UNI token holders is centralised with the top address holding 32.41 per cent, the top five addresses 46.22 per cent and the top ten holding 52.69 per cent (on 24th February, 2023²³). Assuming typical voting participation, this reveals strong centralisation, which was described by Aramonte *et al.*²⁴ as 'decentralisation illusion' in a recent BIS Quarterly Review.

The third example is the previously mentioned action of the US SEC against the Terraform ecosystem, consisting of interconnected components. These are the underlying infrastructure (Terra blockchain), the unstable 'algorithmic stablecoin' (TerraUSD or UST), the promised 'backing' (LUNA token), and the customer-facing DeFi application

(Anchor), with the promise of an investment opportunity:²⁵

The SEC's complaint alleges that Terraform and Kwon marketed crypto asset securities to investors seeking to earn a profit, repeatedly claiming that the tokens would increase in value. For example, they touted and marketed UST as a 'yield-bearing' stablecoin, which they advertised as paying as much as 20 percent interest through the Anchor Protocol.

The SEC did not decide to take single aspects out of this interconnected ecosystem, but asked holistically about the beneficiary and the promises to investors,²⁶ or simply: *Cui bono?* This is a crucial step from technical details to legal responsibilities and obligations.

The fourth case relates to underlying blockchain infrastructures seen from an economic perspective. The SEC charged Kraken (ie Payward Ventures, Inc., & Payward Trading Ltd) with failing to register their 'staking-as-a-service' as investment contracts, according to SEC Chair Gary Gensler in a press release.²⁷ Consequently, 'staking' has to be seen as investment in an enterprise with the expectation of future return from the commercial management of the infrastructure. This means running 'validator notes' for 'proof-of-stake' blockchains such as Ethereum (in the ETH 2.0 version since September 2022²⁸).

Despite the point of view of discussing a specific 'smart contract risk' in DeFi, which results from technical vulnerabilities and amateurish programming,²⁹ supervisors are going to ask who created the software, who is responsible for deployment and who is the beneficiary. For example, the vulnerability of smart contracts published on a public blockchain, readable for every hacker worldwide, invites the exploitation of these computer programs — but that does not remove the responsibility to comply with cyber security standards.

The final example features 'maximum extractable value' (MEV). As public blockchains are transparent for external spectators, all waiting and unconfirmed transactions in the so-called 'mempool' are — literally — an open book. As openly described in the documentation of Ethereum,³⁰ this generic feature allows so-called 'searchers' to detect a transaction with lower offered fees and inject their own 'front-

running' transaction with higher fees to achieve MEV for themselves. While generated blocks in a blockchain cannot be manipulated (or only with a costly '51% attack'), the more transactions are queued, the more value can be extracted from average customers, who use blockchain-based applications without the technical literacy to understand this information asymmetry. The average users have to 'offer' priority fees (for preferred processing by miners or validators) or may suffer from manipulation of the sequence of transaction. A recent BIS Bulletin³¹ pointed out:

Since these intermediaries can choose which transactions they add to the ledger and in which order, they can engage in activities that would be illegal in traditional markets such as front-running and sandwich trades. The resulting profit is termed 'miner extractable value' (MEV). MEV is an intrinsic shortcoming of pseudo-anonymous blockchains. Addressing this form of market manipulation may call for new regulatory approaches to this new class of intermediaries.

Although DeFi is proposed as a substitution of traditional intermediaries by peer-to-peer transactions mediated by smart contracts, currently DeFi resembles a self-referential gamble of tokens-versus-tokens.³² These examples illustrate that typical features of blockchain-based systems are the commercial objective of intermediaries with the expectation that 'everyone makes money'. The bankruptcy of the crypto exchange FTX and associated companies emerged as a synonym for this issue, and the SEC charged the founder, Sam Bankman-Fried, with defrauding investors and diversion of FTX customers' funds.³³ (This leaves the question of what the objectives of the investors were in depositing their funds with FTX unanswered.)

GATEWAYS BETWEEN THE WORLDS: STABLECOINS AND THEIR INTRINSIC INSTABILITY

All actual financial services require a link to the 'real' economy³⁴ and — as a textbook example — a transformation of savers' money against lending to borrowers with the risk on the balance sheet of an

intermediary. Applications based on public³⁵ blockchains suffer from anonymity (or pseudonymity), which renders risk-taking or risk-transfer impossible, if credit risk is not extremely over-collateralised.³⁶ However, there are gateways between the real and the crypto world (so-called on/off-ramps): so-called stablecoins. As ‘stablecoin’ promises redemption against its ‘reserve’, there is a traditional counterparty risk, but also a mark-to-market risk to the value of this ‘reserve’.

Consequently, as summarised by Agustín Carstens,³⁷ General Manager of the BIS,

what sustains fiat money is not the application of novel technologies but all the institutional arrangements and social conventions behind it. And it is precisely these arrangements and conventions that make money reliable for the public. . . . Stablecoins must import their credibility from sovereign fiat currencies. They do not benefit from the regulatory requirements and protections applying to bank deposits.

Some time ago, Jerome Powell and Jens Weidmann³⁸ pointed out that any real stability has to be borrowed from real currencies.

Recently, the New York Department of Financial Services called for a shutdown of the issuance of Binance-branded stablecoin BUSD by Paxos. It cited ‘several unresolved issues’ related to Paxos’ relationship with Binance after the US SEC issued a notice to Paxos that the BUSD token would be considered a security.³⁹ It depends on the applicable legislation whether stablecoins are equivalent to constant net asset value (CNAV) money market funds,⁴⁰ claims against the issuer, non-registered securities or — simply — jetons for gambling in the crypto world.

The recent collapse of Silicon Valley Bank (SVB) (and some other mid-size corporate banks in the US) was due to missing and/or ineffective risk management of interest rate risk following the re-evaluation of SVB’s re-investment of customers funds in US treasuries and mortgage-backed securities. Although they are commonly believed to be ‘non-risky’ assets, they are sensitive to interest rate changes on a mark-to-market basis and, consequently, revealed a principal vulnerability and generic instability of those stablecoins. The issuer of

the USDC stablecoin, the US company Circle, had to reveal that nearly US\$4bn of USDC’s ‘reserve’ of US\$40bn was held in uninsured accounts at SVB. This triggered a sharp decrease in the ‘stable’ value of USDC, on 12th March, 2023, to under US\$0.969 until the Federal Deposit Insurance Corporation (FDIC) transferred all — insured and uninsured — deposits to an *ad hoc* FDIC-operated ‘bridge bank’ to provide protection to all depositors of SVB (including Circle). In contrast, the value of the Tether stablecoin peaked to nearly US\$1.008 on the same day. While the reaction to the counterparty risk (of uninsured funds) is understandable, it remains strange that the mark-to-market valuation of the ‘reserve’ of stablecoins in high-liquid assets — typically US treasuries and mortgage-backed securities as at SVB — was not an issue from the point of view of stablecoin holders. Nonetheless, all asset-backed tokens have the same intrinsic problem as traditional CNAV funds — and would require dedicated management of liquidity and interest rate/mark-to-market risks.

The Financial Stability Board (FSB) published two consultative reports in October 2022: the ‘Regulation, Supervision and Oversight of Crypto-Asset Activities and Markets’⁴¹ and ‘Review of the FSB High-level Recommendations of the Regulation, Supervision and Oversight of “Global Stablecoin” Arrangements’.⁴² While the first report addresses the role of authorities and the consistency and comprehensiveness of regulatory, supervisory and oversight approaches, the second report made detailed recommendations especially on redemption rights and the stabilisation mechanism of so-called ‘Global Stablecoins’. The European Market in Crypto Assets regulation (MiCA,⁴³ adopted on 20th April, 2023) is a first implementation aligned to these recommendations but is also a step forward. MiCA does not try to regulate stablecoins, but intermediaries such as issuers and service providers of E-money tokens. This covers claims on the issuer of asset-referenced tokens with either a claim on the reserve or a right for redemption, or of other crypto tokens, for which only whitepapers are required. This is a risk-based approach with transparent responsibilities of issuers and service providers depending on the objectives and legal claims, but not on normative narratives.

Owing to the structure of the stack of public blockchain systems (see Figure 2), blockchain-based stablecoin transactions require high fees to be paid and suffers from congestion. Hyun Song Shin, Head of Research at the Bank for International Settlements,⁴⁴ pointed out: ‘In a way congestion is a feature, not a bug’ and normally ‘network effects mean the more the merrier, but crypto achieves exactly the opposite, the more the sorrier’. While ‘pre-paid’ E-money or E-money-tokens⁴⁵ can have advantages for special ‘closed-loop’ use cases, the original (pre-paid) PayPal system and the former German (pre-paid) *Geldkarte*⁴⁶ to payments at vending machines are examples that dedicated payment systems do not require digital assets. Likewise, existing real-time payment systems (aka faster or instant payment systems)⁴⁷ provide speed, universality, convenience and low costs. Consequently, stablecoins have to prove that there is any convincing advantage other than being ramp-on/off gateways to the crypto world.

In an additional report⁴⁸ titled ‘The Financial Stability Risks of Decentralised Finance’, the FSB analysed the interlinkages with, and transmission channels to, the traditional financial system:

The extent to which these highlighted vulnerabilities can lead to financial stability concerns largely depends on the interlinkages and associated transmission channels between DeFi, TradFi and the real economy. These channels include financial institutions’ exposures to DeFi [author’s emphasis]; confidence and wealth effects stemming from the involvement of households and firms in DeFi; and the extent to which DeFi applications may facilitate the use of crypto-assets for payments and settlement [author’s emphasis]. To date, these interlinkages are limited, as shown by the modest impact of the May/June 2022 crypto-asset market turmoil and the November 2022 FTX collapse on TradFi. However, if the DeFi ecosystem were to grow significantly and become more mainstream as a result of the broader adoption of crypto-assets and the development of real-world use cases, then interlinkages would deepen and the scope for spillovers to TradFi and the real economy would increase.

The publication^{49,50} on 16th December, 2022 of the Basel Committee on Banking Supervision (BCBS) standard, ‘Prudential Treatment of Cryptoasset Exposures’, amends the consolidated

Basel Framework concerning the capital requirements for digital asset exposures of banks. This standard should be implemented and transposed into national legislation until 2025, and the standard distinguishes two groups. The first group includes tokenised financial assets (ie perspective (ii) in the Introduction to this paper) and stablecoins (with a rather similar definition compared to MiCA), which are subject to capital requirements based on the existing Basel Framework. The second group consists of ‘unbacked’ digital assets, including native blockchain tokens, second level tokens and so-called ‘algorithmic’ tokens with no or ineffective stabilisation mechanisms. The group-2 digital assets are ‘subject to a newly prescribed conservative capital treatment’ with a risk weight of 1,250 per cent (tantamount to a 100 per cent capital requirement), which reflects the untypical high risk (or ‘gambling’, according to Fabio Panetta).

Finally, the Committee on Payments and Market Infrastructures (CPMI) and the Board of the International Organization of Securities Commissions (IOSCO) published, in July 2022, final guidance⁵¹ on stablecoin arrangements confirming application of the Principles for Financial Market Infrastructures. This guidance follows the ‘same business, same risk, same regulation’ approach and is extending the established standards for (technical) payment, clearing and settlement systems to include systemically important stablecoin arrangements.

CONCLUSION

The actual implementations — especially during the ‘crypto winter’ of 2022 — triggered central banks and banking supervisors such as ECB, BIS and SEC to assess the risk of digital assets from a holistic perspective and ask for economic objectives instead of discussion of the specific technical details of blockchains (see Figure 3 for a summary).

Native tokens such as Bitcoin, Dogecoin and other Altcoins diverged from the original concept of a ‘peer-to-peer’ network towards a mixture of online gambling plus multi-player online gaming with information asymmetry. This was driven by narratives on social media and large-scale token holders (‘whales’) dominating the markets. A recent BIS Bulletin⁵² put it succinctly as ‘but whales sold

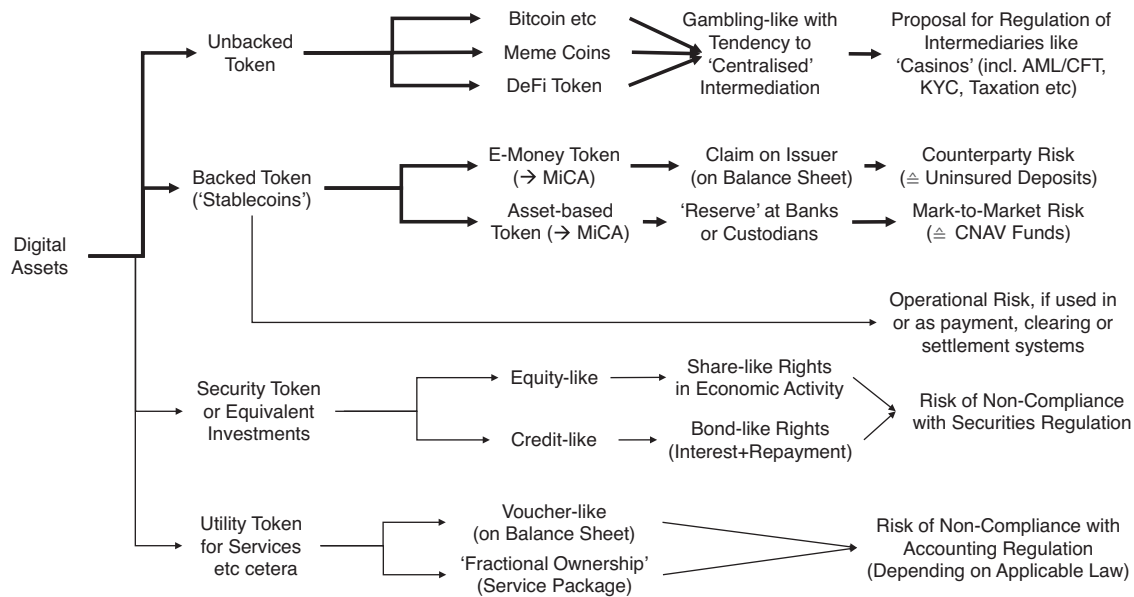


Figure 3: Taxonomy of digital assets and the respective risks as described in the text. As this paper focuses on unbacked and backed tokens, a discussion of security and utility tokens and of the operational risk of technical infrastructures is beyond its scope. The acronyms are explained in the text

while krill bought' (as an example of the asymmetry, here for the situation after the FTX collapse).

Secondary tokens and DeFi applications on blockchain platforms belong to a stack of many layers, which are dominated by economic agents with their objectives and intentionality. The litmus test of '*Cui bono?*' helps to distinguish narratives on social media from economic objectives and intentionality, which are characterised best by MEV.

Finally, so-called stablecoins can act as gateways between the real and the crypto worlds. While deposited funds at crypto gateways could cause a risk of re-importing the instability of the crypto world to the financial system, the BIS Bulletin⁵³ pointed out:

Nevertheless, despite crypto's large user base and the substantial losses to many investors, the market turmoil in 2022 had little discernible impact on broader financial conditions outside the crypto universe, underlining the largely self-referential nature of crypto as an asset class.

Native blockchain tokens, meme coins, Defi Tokens and stablecoins are dominated by a mixture of gaming, gambling and information asymmetry, but are decoupled from the real-world economy.

Any attempt to impose financial regulation on these tokens would give the crypto world an official endorsement, which could be compared to casinos being regulated as financial institutions. As indicated in Figure 3, another part of the token world with securities tokens and utility tokens is not covered in this paper but belong to the traditional regulation of securities-like or voucher-like instruments.

For those digital asset tokens covered by this paper, a regulation similar to that for gambling could provide a minimum consumer protection, whereas enforcement against offshore and/or anonymous casino providers remains a well-known problem. In the predominantly self-referential⁵⁴ crypto world of today, risk management of digital assets is like putting jetons on a gambling table: losing money is not a risk but a feature, as in any casino. Nonetheless, careful monitoring⁵⁵ of the development is required, as neither innovative developments nor spillover to the financial systems can be excluded.

ADDENDUM

The UK House of Commons Treasury Committee⁵⁶ published a report titled 'Regulating

Crypto' on 17th May, 2023. In this report, the cross-party Committee of MPs pointed out that crypto such as Bitcoin and unbacked digital assets have no intrinsic value and serve no useful social purpose and concluded that the Government should regulate crypto like gambling. They said, 'We therefore strongly recommend that the Government regulates retail trading and investment activity in unbacked cryptoassets as gambling rather than as a financial service, consistent with its stated principle of "same risk, same regulatory outcome"'.

This example seems to reveal a trend for the same regulation applied to online casinos to be used against the risk of unbacked tokens without a link to the real economy and only very weak interconnections to traditional financial services. There are some different cases — such as contracts-for-difference for retail investors, which are similar to betting but at least are linked to some underlying financial support, but unbacked tokens represent a separate business with an individual risk profile compared to financial services products. It remains to be seen if this trend leads to a consistent regulatory approach.

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